SMMA

Project Management

November 20, 2020

Jennifer Flynn
Project Coordinator
Massachusetts School Building Authority
40 Broad Street, Fifth Floor
Boston, Massachusetts 02109

Re: Stoneham High School **Stoneham, Massachusetts**

District's Response to the Preliminary Design Program Review Comments *SMMA No. 20033*

Dear Jennifer:

Please find the District's Response to the MSBA's Preliminary Design Program Review Comments of November 6, 2020.

Very truly yours,

SMMA

Joel G. Seeley
Principal

cc: SSBC (MF)

enclosures: District's Response to the Preliminary Design Program Review Comments

1000 Massachusetts Avenue
Cambridge, MA 02138
617.547.5400

www.smma.com

ATTACHMENT A
MODULE 3 – PRELIMINARY DESIGN PROGRAM REVIEW COMMENTS

District: Town of Stoneham
School: Stoneham High School
Owner's Project Manager: SMMA
Designer Firm: Perkins +Will Architects
Submittal Due Date: November 3, 2020
Submittal Received Date: October 6, 2020
Review Date: October 6-November 3, 2020
Reviewed by: M. Esdale, C. Forde, C. Alles, J. Jumpe

MSBA REVIEW COMMENTS

The following comments[1] on the Preliminary Design Program ("PDP") submittal are issued pursuant to a review of the project submittal document for the proposed project presented as a part of the Feasibility Study submission in accordance with the MSBA Module 3 Guidelines.

3.1 PRELIMINARY DESIGN PROGRAM

Overview of the Preliminary Design Program Submittal	Complete	Provided; *Refer to comments following each section*	Not Provided; *Refer to comments following each section*	Receipt of District's Response; *To be filled out by MSBA Staff*
OPM Certification of Completeness and Conformity	☒	☐	☐	☐
Table of Contents	☒	☐	☐	☐
3.1.1 Introduction	☒	☐	☐	☐
3.1.2 Educational Program	☐	☒	☐	☐
3.1.3 Initial Space Summary	☐	☒	☐	☐
3.1.4 Evaluation of Existing Conditions	☐	☒	☐	☐
3.1.5 Site Development Requirements	☐	☒	☐	☐
3.1.6 Preliminary Evaluation of Alternatives	☐	☒	☐	☐
3.1.7 Local Actions and Approvals Certification(s)	☒	☐	☐	☐
3.1.8 Appendices	☒	☐	☐	☐

[1] The written comments provided by the MSBA are solely for purposes of determining whether the submittal documents, analysis process, proposed planning concept and any other design documents submitted for MSBA review appear consistent with the MSBA's guidelines and requirements, and are not for the purpose of determining whether the proposed design and its process may meet any legal requirements imposed by federal, state or local law, including, but not limited to, zoning ordinances and by-laws, environmental regulations, building codes, sanitary codes, safety codes and public procurement laws or for the purpose of determining whether the proposed design and process meet any applicable professional standard of care or any other standard of care. Project designers are obligated to implement detailed planning and technical review procedures to effect coordination of design criteria, buildability, and technical adequacy of project concepts. Each city, town and regional school district shall be solely responsible for ensuring that its project development concepts comply with all applicable provisions of federal, state, and local law. The MSBA recommends that each city, town and regional school district have its legal counsel review its development process and subsequent bid documents to ensure that it is in compliance with all provisions of federal, state and local law, prior to bidding. The MSBA shall not be responsible for any legal fees or costs of any kind that may be incurred by a city, town or regional school district in relation to MSBA requirements or the preparation and review of the project's planning process or plans and specifications.

3.1.1 INTRODUCTION

	Provide the following Items	Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Summary of the Facility Deficiencies and Current S.O.I.	☒	☐	☐	☐
2	Date of invitation to conduct a Feasibility Study and MSBA Board Action Letter	☒	☐	☐	☐
3	Executed Design Enrollment Certification	☒	☐	☐	☐
4	Narrative of the Capital Budget Statement and Target Budget	☒	☐	☐	☐
5	Project Directory with contact information	☒	☐	☐	☐
6	Updated Project Schedule	☒	☐	☐	☐

MSBA Review Comments:

No review comments for this section.

3.1.2 EDUCATIONAL PROGRAM

Provide a summary and description of the existing educational program, and the new or expanded educational vision, specifications, process, teaching philosophy statement, as well as the District's curriculum goals and objectives of the program. Include description of the following items:

	Provide the following Items	Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Grade and School Configuration Policies	☒	☐	☐	☐
2	Class Size Policies	☒	☐	☐	☐
3	School Scheduling Method	☒	☐	☐	☐
4	Teaching Methodology and Structure				
	a) Administrative and Academic Organization/Structure	☒	☐	☐	☐
	b) Curriculum Delivery Methods and Practices	☐	☐	☒	☐
	c) English Language Arts/Literacy	☒	☐	☐	☐
	d) Mathematics	☒	☐	☐	☐
	e) Science	☒	☐	☐	☐
	f) Social Studies	☒	☐	☐	☐
	g) World Languages	☒	☐	☐	☐
	h) Academic Support Programming Spaces	☒	☐	☐	☐
	i) Student Guidance and Support Services	☒	☐	☐	☐
5	Teacher Planning and Professional Development	☒	☐	☐	☐
6	Pre-kindergarten	☒	☐	☐	☐
7	Kindergarten	☐	☐	☐	☐

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
8	Lunch Programs	☒	☐	☐	☐
9	Technology Instruction Policies and Program Requirements	☐	☒	☐	☐
10	Media Center/Library	☒	☐	☐	☐
11	Visual Arts Programs	☒	☐	☐	☐
12	Performing Arts Programs	☒	☐	☐	☐
13	Physical Education Programs	☒	☐	☐	☐
14	Special Education Programs	☒	☐	☐	☐
15	Vocation and Technology Programs				
	a) Non-Chapter 74 Programming	☒	☐	☐	☐
	b) Chapter 74 Programming	☐	☐	☐	☐
16	Transportation Policies	☒	☐	☐	☐
17	Functional and Spatial Relationships	☒	☐	☐	☐
18	Security and Visual Access Requirements	☐	☒	☐	☐

MSBA Review Comments:

4b) In response to these review comments, please describe the District's curriculum delivery methods and practices.

RESPONSE: District's curriculum delivery methods and practices are described in the updated Educational Program, attached.

9) The MSBA suggests the District consider providing assisted listening technology in each classroom, as well as general use throughout educational spaces within the proposed project for hearing impaired accessibility. Please acknowledge.

RESPONSE: District acknowledges.

18) In response to these review comments, please confirm that first responding emergency representatives will be consulted in the planning process and associated requirements will be incorporated into the preferred schematic.

RESPONSE: The first responding representatives feedback will be incorporated into the Preferred Schematic.

Please note additional comments may be forthcoming.

3.1.3 INITIAL SPACE SUMMARY

	Provide the following Items	Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Space summary; one per approved design enrollment	☐	☒	☐	☐
2	Floor plans of the existing facility	☒	☐	☐	☐
3	Narrative description of reasons for all variances (if any) between proposed net and gross areas as compared to MSBA guidelines	☐	☒	☐	☐

MSBA Review Comments:

1) The MSBA has performed a preliminary review of the new construction space summary for 695 students in grades 9-12 and offers the following:

- ***Core Academic*** *– The proposed square footage for this category exceeds the MSBA guidelines by 8,500 nsf. Per the information provided, the following spaces will be proposed in order for the District to deliver its educational program:*

Anticipated Core Academic Spaces	***Grades 9-12 for 695 students***		
	Proposed No. Rooms	*MSBA Guidelines No. Rooms*	*Variance*
Classroom - General	*23*	*23*	*0*
Collaboration Space per Neighborhood	*6*	*0*	*+6*
Teacher Planning	*23*	*23*	*0*
Small Group Seminar (20-30 seats)	*2*	*2*	*0*
Science Classroom / Lab	*6*	*6*	*0*
Prep Room	*6*	*6*	*0*
Central Chemical Storage Room	*1*	*1*	*0*
Department Head Planning Area (max 8)	*1*	*0*	*+1*
Book Storage	*1*	*0*	*+1*
Interdisciplinary Project and Performance Room	*1*	*0*	*+1*
Health Classroom	*1*	*0*	*+1*
Huddle Rooms for Quiet Space	*6*	*0*	*+6*

The following spaces are variations to the MSBA guidelines:

  - ***Classroom – General –*** *The District is proposing (23) 900 nsf General Classrooms totaling 20,700 nsf, which exceeds the MSBA guidelines by 1,150 nsf. Based on the information provided the MSBA accepts this variation to the guidelines. No further preliminary comments.*

  - ***Teacher Planning*** *– The District is proposing (23) 100 nsf Teacher Planning areas totaling 2,300 nsf, which meets the MSBA guidelines. In response to these review*

comments, please provide information that describes the proposed location and adjacencies of the (23) Teacher Planning areas.

RESPONSE: The proposed location and adjacencies for the (23) Teacher Planning areas is described in the updated Educational Program, attached.

- ***Collaboration Space per Neighborhood –*** *The District is proposing (6) 500 nsf Collaboration Space per Neighborhood totaling 3,000 nsf in excess of the MSBA guidelines. Based on the information, and the proposed size of the General Classrooms compared to the square foot range allowed in the MSBA guidelines, the MSBA may participate in a portion of the overall proposed square footage associated with the Collaboration Space per Neighborhood. In response to these review comments, please provide additional information that demonstrates how these spaces will be scheduled, staffed, and supervised.*

  RESPONSE: The scheduling, staffing and supervision of the (6) collaborative spaces is described in the updated Educational Program, attached.

- ***Department Head Planning Area –*** *The District is proposing (1) 700 nsf Department Head Planning Area in excess of the MSBA guidelines. The information provided states: "The school's vision for the future is to have one central Department Head Planning Area of 700 sf to promote interdisciplinary collaboration between department heads. This would also eliminate the needs for any Department Offices." Please relocate this area to the 'Administration and Guidance' category.*

  RESPONSE: See attached Space Summary with revisions.

  Additionally, note any square footage exceeding MSBA guidelines in the 'Administration and Guidance' category will be considered ineligible for reimbursement. Please acknowledge.

  RESPONSE: District acknowledges.

- ***Book Storage –*** *The District is proposing (1) 500 nsf Book Storage area in excess of the MSBA guidelines. The information provided states: "A book storage area is needed near the Department Head Planning Area." Please relocate this area to the 'Administration and Guidance category or include it as part of the grossing area of the proposed building if it can be provided for within the MSBA's upper limit of 1.50.*

  RESPONSE: See attached Space Summary with revisions.

  Additionally, note any square footage exceeding MSBA guidelines in the 'Administration and Guidance' category will be considered ineligible for reimbursement. Please acknowledge.

  RESPONSE: District acknowledges.

- ***Interdisciplinary Project and Performance Room –*** *The District is proposing (1) 2,000 nsf Interdisciplinary Project and Performance Room in excess of the MSBA guidelines. The information provided indicates this space is intended "to support student performance, guest speakers, seminars, interdisciplinary collaborative activities and presentation and showcasing of student work". In response to these review comments,*

please provide additional information that demonstrates how this space will be scheduled, staffed, and supervised.

RESPONSE: The scheduling, staffing and supervision of the Interdisciplinary Project and Performance Room is described in the updated Educational Program, attached.

Additionally, please relocate this space to the 'Vocations and Technology' category.

RESPONSE: See attached Space Summary with revisions.

- ***Health Classroom –*** *The District is proposing (1) 850 nsf Health Classroom in excess of the MSBA guidelines. Based on the information provided the MSBA accepts this variation to the guidelines. No further preliminary comments.*
- ***Huddle Rooms for Quiet Space –*** *The District is proposing (6) 50 nsf Huddle Rooms for Quiet Space totaling 300 nsf in excess of the MSBA guidelines. The information provided states: "The District identified need for teachers to have an opportunity to have an heads-down space, outside of the common planning area which tend to be noisy due to collaborative discussions. These huddle rooms/quiet rooms will satisfy the important need to ensure there diverse types of spaces for all personal." Please relocate these spaces to the 'Administration and Guidance' category.*

  RESPONSE: See attached Space Summary with revisions.

  Additionally, note any square footage exceeding MSBA guidelines in the 'Administration and Guidance' category will be considered ineligible for reimbursement. Please acknowledge.

  RESPONSE: District acknowledges.

- ***Special Education*** *– The proposed square footage for this category exceeds the MSBA guidelines by 700 nsf. Please relocate the following spaces:*
  - *(4) 150 nsf Offices (School Adjustment Counselor, School Psychologist, SPED Transition Coordinator, and SPED Office), totaling 600 nsf to the 'Administration and Guidance' category.*

    RESPONSE: See attached Space Summary with revisions.

    Additionally, note any square footage exceeding MSBA guidelines in the 'Administration and Guidance' category will be considered ineligible for reimbursement. Please acknowledge.

    RESPONSE: District acknowledges.

  - *(1) 900 nsf ESL Services space to the 'Core Academic' category.*

    RESPONSE: See attached Space Summary with revisions.

    Please note that based on the information provided the MSBA accepts this variation to the guidelines. No further preliminary comments.

Please note that the Special Education program is subject to approval by the Department of Elementary and Secondary Education ("DESE"). The District should provide

the required information required with the Schematic Design submittal. Formal approval of the District's proposed Special Education program by the DESE is a prerequisite for executing a Project Funding Agreement with the MSBA. Please acknowledge.

RESPONSE: District acknowledges.

- ***Art & Music / Vocations & Technology*** *– The combined proposed square footage for these categories exceeds the MSBA guidelines by 645 nsf. The MSBA encourages the District and its consultants to continue to seek opportunities to increase efficiencies and align with MSBA guidelines. Please note that square footage exceeding MSBA guidelines will be considered ineligible for reimbursement. Please acknowledge.*

  RESPONSE: District acknowledges.

- ***Health & Physical Education*** *– The proposed square footage for this category exceeds the MSBA guidelines by 8,008 nsf. The MSBA encourages the District and its consultants to continue to seek opportunities to increase efficiencies and align with MSBA guidelines. Please note that square footage exceeding MSBA guidelines will be considered ineligible for reimbursement. Please acknowledge.*

  RESPONSE: District acknowledges.

  Please refer to the attached memo regarding the MSBA's policy on physical education square footage in excess of the MSBA guidelines. The policy states: "The district may choose to build a gymnasium and related spaces in excess of MSBA guidelines, but in no event shall the gymnasium exceed 18,000 nsf. The MSBA will participate in a gymnasium of up to 12,000 nsf unless adjusted by the MSBA to increase teaching stations for enrollment and/or the educational plan." Additionally, areas in excess of the MSBA guidelines will be at the sole expense of the district; and the MSBA will exclude from its grant the cost of the total gross square foot ("gsf") in excess of the guidelines for these areas.

- ***Media Center*** *– The proposed square footage for the category exceeds the MSBA guidelines by 400 nsf. The MSBA encourages the District and its consultants to continue to seek opportunities to increase efficiencies and align with MSBA guidelines. Please note that square footage exceeding MSBA guidelines will be considered ineligible for reimbursement. Please acknowledge.*

  RESPONSE: District acknowledges.

- ***Auditorium/Drama*** *– The proposed square footage for this category exceeds the MSBA guidelines by 2,393 nsf. The MSBA encourages the District and its consultants to continue to seek opportunities to increase efficiencies and align with MSBA guidelines. Please note that square footage exceeding MSBA guidelines will be considered ineligible for reimbursement. Please acknowledge.*

  RESPONSE: District acknowledges.

  Please refer to the attached memo regarding the MSBA's policy on auditorium square footage in excess of the MSBA guidelines. The policy states: "The district may choose to build an auditorium in excess of MSBA guidelines, but no more than 13,300 net square foot ("nsf") (based upon an upper limit of 1,000 seats). The MSBA funding limit will vary

depending on the agreed-upon design enrollment but will not exceed 10,400 nsf." Additionally, areas in excess of the MSBA guidelines will be at the sole expense of the district; and the MSBA will exclude from its grant the cost of the total gross square foot (gsf) in excess of the guidelines for these areas.

- ***Dining & Food Service** – The proposed square footage for this category exceeds the MSBA guidelines by 285 nsf. The MSBA encourages the District and its consultants to continue to seek opportunities to increase efficiencies and align with MSBA guidelines. Please note that square footage exceeding MSBA guidelines will be considered ineligible for reimbursement. Please acknowledge.*

  RESPONSE: District acknowledges.

- ***Medical** – The proposed square footage for this category exceeds the MSBA guidelines by 180 nsf. Please relocate the (2) 60 nsf Mothers Rooms totaling 120 nsf to the 'Non-Programmed Spaces' category. Currently, incorporating this square footage into the 'Non-Programmed Spaces' category results in a grossing factor of 1.50.*

  RESPONSE: See attached Space Summary with revisions.

  Additionally, the MSBA encourages the District and its consultants to continue to seek opportunities to increase efficiencies and align with MSBA guidelines. Please note that square footage exceeding MSBA guidelines will be considered ineligible for reimbursement. Please acknowledge.

  RESPONSE: District acknowledges.

- ***Administration & Guidance** – The proposed square footage for this category aligns with the MSBA guidelines. No further preliminary comments.*

- ***Custodial & Maintenance** – The proposed square footage for this category exceeds the MSBA guidelines by 500 nsf. The MSBA encourages the District and its consultants to continue to seek opportunities to increase efficiencies and align with MSBA guidelines. Please note that square footage exceeding MSBA guidelines will be considered ineligible for reimbursement. Please acknowledge.*

  RESPONSE: District acknowledges.

- ***Other** – The District is proposing 14,575 square feet for this category which exceeds the MSBA guidelines. The following spaces are proposed:*

  - ***School Store –** The District is proposing (1) 600 nsf School Store in excess of the MSBA guidelines. Please note that square footage exceeding MSBA guidelines will be considered ineligible for reimbursement. Please acknowledge.*

    RESPONSE: District acknowledges.

  - ***Pre-School Program (13,975 nsf):***

    - *(8) 1,200 nsf Pre-School Classrooms with toilets/changing (15 students)*
    - *(2) 175 nsf (totaling 350 nsf) Observation Areas: Childcare Development Pathway*

- *(1) 400 nsf Pre-School OT/PT*
- *(1) 150 nsf Pre-School Director Office*
- *(2) 250 nsf (totaling 500 nsf) Pre-School Speech/Language*
- *(1) 350 nsf Pre-School Conference Room*
- *(1) 275 nsf Reception Area with Secretary*
- *(1) 300 nsf Teacher Work Room/ Collaboration*
- *(1) 600 nsf Student Lunch Room*
- *(1) 150 nsf Social Worker Office*
- *(1) 150 nsf BCBA Office*
- *(1) 350 nsf Nurse*
- *(1) 350 nsf Conference Room – In response to these review comments, please clarify the use of this conference room and how it differs from the proposed (1) 350 nsf Pre School Conference Room identified above.*

  RESPONSE: The use of this Conference Room is as described in the updated Educational Program, attached.
- *(1) 450 nsf Sensory Room*

The MSBA's participation will be limited to Pre-School classrooms only, and potentially Pre-School spaces dedicated for special education, provided that the District submit additional information that further describes the proposed number of students, daily/weekly schedule, special education program, and space utilization impact on the schools in which these programs are currently housed.

RESPONSE: The proposed number of students, scheduling, special education programs and space utilization impact on the existing elementary schools is as described in the updated Educational Program, attached.

Please note that upon selection of a preferred schematic, the District may be required to adjust spaces/square footage that exceeds the MSBA guidelines and is not supported by the Educational Program provided.

No further review comments for this section.

3.1.4 EVALUATION OF EXISTING CONDITIONS

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Confirmation of legal title to the property.	☒	☐	☐	☐
2	Determination that the property is available for development.	☒	☐	☐	☐

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
3	Existing historically significant features and any related effect on the project design and/or schedule.	☒	☐	☐	☐
4	Determination of any development restrictions that may apply.	☒	☐	☐	☐
5	Initial Evaluation of building code compliance for the existing facility.	☒	☐	☐	☒
6	Initial Evaluation of Architectural Access Board rules and regulations and their application to a potential project.	☒	☐	☐	☐
7	Preliminary evaluation of significant structural, environmental, geotechnical, or other physical conditions that may impact the cost and evaluations of alternatives.	☒	☐	☐	☐
8	Determination for need and schedule for soils exploration and geotechnical evaluation.	☐	☒	☐	☐
9	Environmental site assessments minimally consisting of a Phase I: Initial Site Investigation performed by a licensed site professional.	☐	☒	☐	☐
10	Assessment of the school for the presence of hazardous materials.	☐	☒	☐	☐
11	Previous existing building and/or site reports, studies, drawings, etc. provided by the district, if any.	☐	☒	☐	☐

MSBA Review Comments:

3) The information provided indicates a Project Notification Form ("PNF") was submitted to the Massachusetts Historical Commission ("MHC") on August 27, 2020, and MHC approval was obtained on September 15, 2020.

8) The information provided on page 12-13 of the Preliminary Geotechnical Report prepared by Lahlaf Geotechnical Consulting, Inc. (LGCI), states:

> *"We recommended performing additional explorations, including soil borings and test pits during the next phase of the project after the proposed building layout, size, and location have been established. We believe that test pits are more suited for areas where the fill contains large cobbles and boulders. We recommend advancing at least (16) additional borings and excavating at least twelve test pits."*

In response to these review comments, provide a description of how this recommendation will be scheduled in future phases of project.

RESPONSE: The schedule of the recommended explorations will move forward after the PSR final option is determined once the building final footprint is determined. A building footprint

will be established during Schematic Design phase, and the explorations will be completed at that time.

9) Note that costs associated with the removal of fuel storage tanks and associated contaminated soil is considered ineligible for reimbursement. Please acknowledge.

RESPONSE: Acknowledged

10) It should be noted that all costs associated with the removal of asbestos containing floor and ceiling tiles are categorically ineligible for MSBA reimbursement. Additionally, the project team should be aware of the current policies associated with MSBA's participation in the abatement and removal of hazardous materials. Please note that work associated with the removal of associated contaminated soil and materials are considered ineligible for reimbursement.

11) In response to these review comments, provide any previous existing building and/or site reports, studies, drawings, etc. provided by the district, if any.

RESPONSE:

1. **Preliminary Design Study by HMFH, attached**
2. **Transportation Impact Study by Nitsch, attached**

No further review comments for this section.

3.1.5 SITE DEVELOPMENT REQUIREMENTS

	Provide the following Items	Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	A narrative describing project requirements related to site development to be considered during the preliminary and final evaluation of alternatives.	☐	☒	☐	☐
2	Existing site plan(s)	☒	☐	☐	☐

MSBA Review Comments:

1) As part of the District's Preferred Schematic Report ("PSR"), provide a site section that illustrates how the preferred schematic sits on the site and how the proposed location impacts access and circulation. Please acknowledge.

RESPONSE: Acknowledged.

No further review comments for this section.

3.1.6 PRELIMINARY EVALUATION OF ALTERNATIVES

DISTRICT RESPONSE
11/20/2020

	Provide the following Items	Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Analysis of school district student school assignment practices and available space in other schools in the district	☐	☒	☐	☐
2	Tuition agreement with adjacent school districts	☒	☐	☐	☐
3	Rental or acquisition of existing buildings that could be made available for school use	☒	☐	☐	☐
4	Code Upgrade option that includes repair of systems and/or scope required for purposes of code compliance; with no modification of existing spaces or their function	☒	☐	☐	☐
5	Renovation(s) and/or addition(s) of varying degrees to the existing building(s)	☒	☐	☐	☐
6	Construction of new building and the evaluation of potential locations	☒	☐	☐	☐
7	List of 3 distinct alternatives (including at least 1 renovation and/or addition option) are recommended for further development and evaluation.	☒	☐	☐	☐

MSBA Review Comments:

As part of the Preliminary Evaluation of Alternatives, the District explored the following ten (10) options for grades 9-12 with an enrollment of 695 students at the existing Stoneham High School site:

- *Option 1: Code Upgrade with an estimated project costs $115 million*
- *Option 2: Renovation with an estimated project cost of $173.4 million*
- *Option 3A1: Addition/Renovation with an estimated project cost of $175.7 million*
- *Option 3A2: Addition/Renovation with an estimated project cost of $175.2 million*
- *Option 3B: Addition/Renovation with an estimated project cost of $174.6 million*
- *Option 4A1: New Construction with an estimated project cost of $177.7 million*
- *Option 4A2: New Construction with an estimated project cost of $180.6 million*
- *Option 4A3: New Construction with an estimated project cost of $174.8 million*
- *Option 4B: New Construction with an estimated project cost of $172.9 million*
- *Option 4C: New Construction with an estimated project cost of $173.7 million*

1) The information provided indicates there are no available spaces within the District for swing space. As part of the District's PSR, please provide information that describes the anticipated impact to students during an occupied and phased construction project. Please acknowledge.

RESPONSE: The District acknowledges.

7) The District has indicated further evaluation of the following five (5) options as part of its PSR:

- *Option 1: Code Upgrade with an estimated project costs $115 million*
- *Option 2: Renovation with an estimated project cost of $173.4 million*

- *Option 3A2: Addition/Renovation with an estimated project cost of $175.2 million*
- *Option 4A3: New Construction with an estimated project cost of $174.8 million*
- *Option 4B: New Construction with an estimated project cost of $172.9 million*

No further review comments for this section.

3.1.7 LOCAL ACTIONS AND APPROVAL

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Signed Local Actions and Approvals Certification: (original)	☒	☐	☐	☐
2	Certified copies of the School Building Committee meeting notes showing specific submittal approval vote language and voting results, and a list of associated School Building Committee meeting dates, agenda, attendees and description of the presentation materials	☒	☐	☐	☐

MSBA Review Comments:

No review comments for this section.

3.1.8 APPENDICES

Provide the following Items		Complete; *No response required*	Provided; *District's response required*	Not Provided; *District's response required*	Receipt of District's Response; *To be filled out by MSBA Staff*
1	Current Statement of Interest	☒	☐	☐	☐
2	MSBA Board Action Letter including the invitation to conduct a Feasibility Study	☒	☐	☐	☐
3	Design Enrollment Certification	☒	☐	☐	☐

MSBA Review Comments:

No review comments for this section.

Additional Comments:

The MSBA issues project advisories from time to time, as informational updates for Districts, Owner's Project Managers ("OPM"), and Designers in an effort to facilitate the efficient and effective administration of proposed projects currently pending review by the MSBA. The advisories can be found on the MSBA's website. In response to these review comments, please confirm that the District's consultants have reviewed all project advisories and they have been incorporated into the proposed project as applicable.

RESPONSE: The Designer and OPM have reviewed the project advisories and have incorporated them in the proposed project as applicable.

DISTRICT RESPONSE
11/20/2020

Regarding Past Projects:

MSBA records do not indicate previous grants associated with Stoneham High School.

End

Space Summaries

RENOVATIONS ONLY

Stoneham High School	Existing Conditions			PROPOSED: Existing to Remain/Renovated			PROPOSED: New			PROPOSED: Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)		
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals
CORE ACADEMIC SPACES			**38,200**			**37,670**			**0**			**37,670**			**32,890**
(List classrooms of different sizes separately)															
Classroom - General	800	19	15,200	800	19	15,200				800	19	15,200	850	23	19,550
Classroom - General	900	2	1,800	900	2	1,800				900	2	1,800			
Classroom - General	1,000	7	7,000	1,000	2	2,000				1,000	2	2,000			
Classroom - General	500	1	500												
Collaboration Space per neighborhood				500	6	3,000				500	6	3,000			
Teacher Planning				1,200	2	2,400				1,200	2	2,400	100	23	2,300
Small Group Seminar (20-30 seats)				500	2	1,000				500	2	1,000	500	2	1,000
Science Classroom / Lab (labs that are multi-functional to utalize all science rooms- typical MSBA)	1,200	8	9,600	1,440	6	8,640				1,440	6	8,640	1,440	6	8,640
Prep Room	280	5	1,400	280	6	1,680				280	6	1,680	200	6	1,200
Department Office	300	4	1,200												
Department Office	700	1	700												
Central Chemical Storage Rm				200	1	200				200	1	200	200	1	200
World Language Lab															
Health Classroom	800	1	800	850	1	850				850	1	850			
ESL Services: 1 CR (full size) @ 900 sf				900	1	900				900	1	900			
SPECIAL EDUCATION			**10,144**			**7,250**			**0**			**7,250**			**8,050**
(List classrooms of different sizes separately)															
Self-Contained SPED													950	5	4,750
Self-Contained SPED Toilet													60	5	300
Resource Room: 2 assessment centers (3-4 people) @150sf, 2General CR @900sf (divider)	4	710	2,840	2,100	1	2,100				2,100	1	2,100	500	3	1,500
Small Group Room	290	1	290										500	3	1,500
RISE Life Skills: 2 CR @ 900 sf, 150sf Toilet between RISE and STRIDE	785	1	785	1,950	1	1,950				1,950	1	1,950			
RISE Life Skills (Rise 1 & Rise 2)	1,234	1	1,234												
STRIDE Social Emotional Learning	265	1	265												
STRIDE SEL: 1 CR @ 900, (partition) 2 offices @ 150, (suite with common area connect to CR)	965	1	965	1,050	1	1,050				1,050	1	1,050			
STRIDE Office	265	1	265												
Central Office	1,180	1	1,180												
Speech and Language: 1 CR (half size) @ 450 sf, 1 Office @ 150 sf (near Rise)				600	1	600				600	1	600			
OT/PT: 1 CR @ 650 sf				650	1	650				650	1	650			
Common Planning Area	1,180	1	1,180												
Language Based: 2 CR (half size) @ 450 sf (operable wall between)	790	1	790	450	2	900				450	2	900			
ELL	350	1	350												
ART & MUSIC			**8,344**			**5,308**			**0**			**5,308**			**6,625**
Art Classroom - 25 seats with Ceramics	1,160	3	3,480	1,160	1	1,160				1,160	1	1,160	1,200	2	2,400
Art Workroom w/ Storage & kiln	2,025	1	2,025	150	2	300				150	2	300	150	2	300
Art Room with divider				1,500	1	1,500				1,500	1	1,500			
Art Dark Room	408	1	408												
Band - 50 - 100 seats	1,858	1	1,858	1,500	1	1,500				1,500	1	1,500	1,500	1	1,500
Chorus - 50 - 100 seats													1,500	1	1,500
Ensemble- Practice				200	1	200				200	1	200	200	1	200
Music Practice	74	4	296	74	2	148				74	2	148	75	3	225
Music Storage	277	1	277	500	1	500				500	1	500	500	1	500
VOCATIONS & TECHNOLOGY			**4,547**			**11,060**			**0**			**11,060**			**7,200**
Technology/Engineering Rooms: Computer -Draft													1,440	5	7,200
Engineer Lab (exist) New combine Maker, Eng, Robotics, Scene Shop (clean, dirty, fab lab)	950	1	950	2,800	1	2,800				2,800	1	2,800			
Engineering Rooms: Computer -Draft Project Lead the Way				1,380	1	1,380				1,380	1	1,380			
Technology Shop: Child Development															
Technology Shop: Fashion Lab / Child Development	1,547	1	1,547												
Technology Shop: Culinary	1,180	1	1,180	1,440	1	1,440				1,440	1	1,440			
Wood-Scene Shop/Theater Arts (in Engineer Lab line 52)															
Video Production (25 computers edit/ graphics, pod cast, studio with green screen, graphic art, stor.)				2,000	1	2,000				2,000	1	2,000			
Computer Science/ Bio-Medical- Project Lead the Way	870	1	870	1,440	1	1,440				1,440	1	1,440			
Interdisciplinary Project and Performance Room (2,000 sf)				2,000	1	2,000				2,000	1	2,000			
HEALTH & PHYSICAL EDUCATION			**35,560**			**29,810**			**0**			**29,810**			**20,092**
Gymnasium with Gymnastics (70' valut, beam, matt , uneven bars, track)	16,000	1	16,000	16,000	1	16,000				16,000	1	16,000	12,000	1	12,000
Gymnastics Storage	510	1	510	510	1	510				510	1	510			
PE Alternatives- Fitness, Conditioning, Strength	2,240	1	2,240	3,000	1	3,000				3,000	1	3,000	3,000	1	3,000
Athletics Storeroom (indoor track, high jump, BB Scoring, chairs)	280	1	280	500	1	500				500	1	500	300	1	300
PE Locker Rooms - 1 Male / 1 Female w/ Toilets (50-60 stud.)	2,420	2	4,840	1,210	2	2,420				1,210	2	2,420	3,892	1	3,892
Phys. Ed. Storage	200	2	400	200	2	400				200	2	400	500	1	500
Athletic Director's Office, Secretary, Conference Area	600	1	600	600	1	600				600	1	600	150	1	150

RENOVATIONS ONLY

Stoneham High School	Existing Conditions			PROPOSED: Existing to Remain/Renovated			PROPOSED: New			PROPOSED: Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)		
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals
Health Instructor's Office w/ Shower & Toilet													250	1	250
Team Room (male 170 large lockers w/ toilets showers)	2,650	1	2,650	1,400	1	1,400				1,400	1	1,400			
Team Room (female 180 regular lockers w/ toilets showers)	2,570	1	2,570	1,400	1	1,400				1,400	1	1,400			
PE Office Male and Female (2 staff each)	150	2	300	250	2	500				250	2	500			
Male Athletic Coaches (1 -off/ 8 coaches) shower+toilet	350	2	700	350	1	350				350	1	350			
Female Athletic Coaches (2 offices/ 3 coaches) toilet + Shower	120	1	120	470	1	470				470	1	470			
Training Room w/ storage	1,060	1	1,060	1,060	1	1,060				1,060	1	1,060			
Equiptment Room, laundry, store sports equipt. storage	860	1	860	1,200	1	1,200				1,200	1	1,200			
Team Meeting Rooms (60 students)	1,880	1	1,880												
Official's Room	250	2	500												
Ticketing	50	1	50												
MEDIA CENTER			**5,965**			**4,110**			**0**			**4,110**			**4,244**
Media Center / Reading Room *(cyber café, student help desk)*	3,710	1	3,710	3,710	1	3,710				3,710	1	3,710	4,244	1	4,244
Computer Lab	785	1	785												
Storage															
History Lab in Media Area (in media center)	240	1	240	400	1	400				400	1	400			
Media Center Meeting Room	220	1	220												
Media Center Office	270	1	270												
Technology Integration	740	1	740												
AUDITORIUM / DRAMA			**11,245**			**11,245**			**0**			**11,245**			**7,457**
Auditorium (600 seats)	8,820	1	8,820	8,070	1	8,070				8,070	1	8,070	4,633	1	4,633
Stage	1,975	1	1,975	1,975	1	1,975				1,975	1	1,975	1,600	1	1,600
Auditorium Storage	350	1	350	350	1	350				350	1	350	424	1	424
Make-up / Dressing Rooms				300	2	600				300	2	600	300	2	600
Sound room				150	1	150				150	1	150			
Controls / Lighting / Projection	100	1	100	100	1	100				100	1	100	200	1	200
DINING & FOOD SERVICE			**12,530**			**11,124**			**0**			**11,124**			**6,818**
Cafeteria / Student Lounge / Break-out	8,000	1	8,000	6,560	1	6,560				6,560	1	6,560	3,475	1	3,475
Chair / Table Storage	220	1	220	220	1	220				220	1	220	324	1	324
Scramble Serving Area			0	600	1	600				600	1	600	600	1	600
Kitchen: 394 Robin Hood/ 355 South/ 264 Colonial Park (1,013)	3,040	1	3,040	3,040	1	3,040				3,040	1	3,040	1,995	1	1,995
Staff Lunch Room	990	1	990	424	1	424				424	1	424	424	1	424
District External Freezer (28Lx10Wx9H)	280	1	280	280	1	280				280	1	280			
MEDICAL			**800**			**770**			**0**			**770**			**710**
Medical Suite Toilet				60	2	120				60	2	120	60	1	60
Nurses' Office / Waiting Room	400	1	400	250	1	250				250	1	250	250	1	250
Interview Room				100	1	100				100	1	100	100	1	100
Examination Room / Resting	400	1	400	100	3	300				100	3	300	100	3	300
ADMINISTRATION & GUIDANCE			**6,430**			**5,752**			**0**			**5,752**			**3,651**
General Office / Waiting Room / Toilet	855	1	855	348	1	348				348	1	348	348	1	348
Teachers' Mail and Time Room	140	1	140	100	1	100				100	1	100	100	1	100
Duplicating Room	400	1	400	200	1	200				200	1	200	200	1	200
Records Room				200	1	200				200	1	200	200	1	200
Principal's Office w/ Conference Area	290	1	290	375	1	375				375	1	375	375	1	375
Principal's Secretary / Waiting				125	1	125				125	1	125	125	1	125
Assistant Principal's Office - AP1	385	1	385	150	1	150				150	1	150	150	1	150
Assistant Principal's Office - AP2													150	0	-
Supervisory / Spare Office				120	1	120				120	1	120	120	1	120
Conference Room	250	3	750	450	1	450				450	1	450	450	1	450
Guidance Office	96	5	480	150	4	600				150	4	600	150	4	600
Guidance Waiting Room	910	1	910	100	1	100				100	1	100	100	1	100
Guidance Storeroom	90	1	90	100	1	100				100	1	100	100	1	100
Career Center				324	1	324				324	1	324	324	1	324
Records Room				112	1	112				112	1	112	112	1	112
Teachers' Work Room	360	1	360	348	1	348				348	1	348	348	1	348
Business Office	790	1	790												
Counselor Office	160	2	320												
Kitchenette	140	1	140												
Department Head Planning Area (Max 8)				700	1	700				700	1	700			
(ELA, Math, Science, World Lang, History, Fine Arts, Spec. Ed, technology															
Book Storage (6,000 books) near Department Head Planning Area				500	1	500				500	1	500			
Huddle Rooms for Quiet Space				50	6	300				50	6	300			
Offices: School Adjustment Counselor, School Psych., SPED Transition Coordinator/SPED Office	130	4	520	150	4	600				150	4	600			

RENOVATIONS ONLY

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)		
				Existing to Remain/Renovated			New			Total					
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals
CUSTODIAL & MAINTENANCE			**1,632**			**2,647**			**0**			**2,647**			**2,146**
Custodian's Office	120	1	120	150	1	150				150	1	150	150	1	150
Custodian's Workshop				250	1	250				250	1	250	250	1	250
Custodian's Storage	55	3		375	1	375				375	1	375	375	1	375
Recycling Room / Trash				400	1	400				400	1	400	400	1	400
Receiving and General Supply	612	1	612	324	1	324				324	1	324	324	1	324
Storeroom			0	448	1	448				448	1	448	448	1	448
Network / Telecom Room	180	1	180	200	1	200				200	1	200	200	1	200
Exterior general Storage	720	1	720	500	1	500				500	1	500			
OTHER			**8,850**			**14,695**			**0**			**14,695**			**0**
District Offices- Superintendent/PPS	8,300	1	8,300												
Pre School Classrooms w/ toilets changing (15 students)				1,200	8	9,600				1,200	8	9,600			
Observation Areas: Childcare Development Pathway				175	2	350				175	2	350			
Pre School OT/PT				400	1	400				400	1	400			
Pre School Director Office				150	1	150				150	1	150			
Pre School Speech/ Language				250	2	500				250	2	500			
Pre School Conference Room				350	1	350				350	1	350			
Reception Area with Secretary				275	1	275				275	1	275			
Teacher Work Room/Collaboration				300	1	300				300	1	300			
Student Lunch Room				600	1	600				600	1	600			
Indoor Play area															
Social Woker Office				150	1	150				150	1	150			
BCBA Office				150	1	150				150	1	150			
Nurse				350	1	350				350	1	350			
Conference Room				350	1	350				350	1	350			
Sensory Room				450	1	450				450	1	450			
School Store	550	1	550	600	1	600				600	1	600			
Mother's Room				60	2	120				60	2	120			
Total Building Net Floor Area (NFA)			**144,247**			**141,441**			**0**			**141,441**			**99,882**
Proposed Student Capacity / Enrollment															**695**
NON-PROGRAMMED SPACES					% of GFA	**66,672**		% of GFA	**0**		% of GFA	**66,672**			
Other Occupied Rooms (list separately)					0%						0%				
					0%						0%				
					0%						0%				
					0%						0%				
					0%						0%				
Unoccupied Closets, Supply Rooms & Storage Rooms					0%						0%				
Toilet Rooms					0%						0%				
Circulation (corridors, stairs, ramps & elevators)					0%						0%				
Remaining[3]					32%	**66,672**					32%	**66,672**			
Total Building Gross Floor Area (GFA)[2]			**208,113**			**208,113**						**208,113**			**150,120**
Grossing factor (GFA/NFA)			**1.44**			**1.47**						**1.47**			**1.50**

RENOVATIONS AND ADDITIONS

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)		
				Existing to Remain/Renovated			New			Total					
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals
CORE ACADEMIC SPACES			**38,200**			**850**			**37,940**			**38,790**			**32,890**
(List classrooms of different sizes separately)															
Classroom - General	800	19	15,200				900	23	20,700	900	23	20,700	850	23	19,550
Classroom - General	900	2	1,800												
Classroom - General	1,000	7	7,000												
Classroom - General	500	1	500												
Collaboration Space per neighborhood							500	6	3,000	500	6	3,000			
Teacher Planning							100	23	2,300	100	23	2,300	100	23	2,300
Small Group Seminar (20-30 seats)							500	2	1,000	500	2	1,000	500	2	1,000
Science Classroom / Lab (labs that are multi-functional to utalize all science rooms- typical MSBA)	1,200	8	9,600				1,440	6	8,640	1,440	6	8,640	1,440	6	8,640
Prep Room	280	5	1,400				200	6	1,200	200	6	1,200	200	6	1,200
Department Office	300	4	1,200												
Department Office	700	1	700												
Central Chemical Storage Rm							200	1	200	200	1	200	200	1	200
World Language Lab															
Health Classroom	800	1	800	850	1	850				0	1	850			
ESL Services: 1 CR (full size) @ 900 sf							900	1	900	900	1	900			
SPECIAL EDUCATION			**10,144**			**0**			**7,250**			**7,250**			**8,050**
(List classrooms of different sizes separately)															
Self-Contained SPED													950	5	4,750
Self-Contained SPED Toilet													60	5	300
Resource Room: 2 assessment centers (3-4 people) @150sf, 2General CR @900sf (divider)	4	710	2,840				2,100	1	2,100	2,100	1	2,100	500	3	1,500
Small Group Room	290	1	290										500	3	1,500
RISE Life Skills: 2 CR @ 900 sf, 150sf Toilet between RISE and STRIDE	785	1	785				1,950	1	1,950	1,950	1	1,950			
RISE Life Skills (Rise 1 & Rise 2)	1,234	1	1,234												
STRIDE Social Emotional Learning	265	1	265												
STRIDE SEL: 1 CR @ 900, (partition) 2 offices @ 150, (suite with common area connect to CR)	965	1	965				1,050	1	1,050	1,050	1	1,050			
STRIDE Office	265	1	265												
Central Office	1,180	1	1,180												
Speech and Language: 1 CR (half size) @ 450 sf, 1 Office @ 150 sf (near Rise)							600	1	600	600	1	600			
OT/PT: 1 CR @ 650 sf							650	1	650	650	1	650			
Common Planning Area	1,180	1	1,180												
Language Based: 2 CR (half size) @ 450 sf (operable wall between)	790	1	790				450	2	900	450	2	900			
ELL	350	1	350												
ART & MUSIC			**8,344**			**5,350**			**0**			**5,350**			**6,625**
Art Classroom - 25 seats with Ceramics	1,160	3	3,480	1,200	1	1,200				1,200	1	1,200	1,200	2	2,400
Art Workroom w/ Storage & kiln	2,025	1	2,025	150	2	300				150	2	300	150	2	300
Art Room with divider				1,500	1	1,500				1,500	1	1,500			
Art Dark Room	408	1	408												
Band - 50 - 100 seats	1,858	1	1,858	1,500	1	1,500				1,500	1	1,500	1,500	1	1,500
Chorus - 50 - 100 seats													1,500	1	1,500
Ensemble- Practice				200	1	200				200	1	200	200	1	200
Music Practice	74	4	296	75	2	150				75	2	150	75	3	225
Music Storage	277	1	277	500	1	500				500	1	500	500	1	500
VOCATIONS & TECHNOLOGY			**4,547**			**7,680**			**3,440**			**11,120**			**7,200**
Technology/Engineering Rooms: Computer -Draft													1,440	5	7,200
Engineer Lab (exist) New combine Maker, Eng, Robotics, Scene Shop (clean, dirty, fab lab)	950	1	950	2,800	1	2,800				2,800	1	2,800			
Engineering Rooms: Computer -Draft Project Lead the Way				1,440	1	1,440				1,440	1	1,440			
Technology Shop: Child Development															
Technology Shop: Fashion Lab / Child Development	1,547	1	1,547												
Technology Shop: Culinary	1,180	1	1,180				1,440	1	1,440	1,440	1	1,440			
Wood-Scene Shop/Theater Arts (in Engineer Lab line 52)															
Video Production (25 computers edit/ graphics, pod cast, studio with green screen, graphic art, stor.)				2,000	1	2,000				2,000	1	2,000			
Computer Science/ Bio-Medical- Project Lead the Way	870	1	870	1,440	1	1,440				1,440	1	1,440			
Interdisciplinary Project and Performance Room (2,000 sf)							2,000	1	2,000	2,000	1	2,000			
HEALTH & PHYSICAL EDUCATION			**35,560**			**28,100**			**0**			**28,100**			**20,092**
Gymnasium with Gymnastics (70' valut, beam, matt , uneven bars, track)	16,000	1	16,000	16,000	1	16,000				16,000	1	16,000	12,000	1	12,000
Gymnastics Storage	510	1	510	300	1	300				300	1	300			
PE Alternatives- Fitness, Conditioning, Strength	2,240	1	2,240	3,000	1	3,000				3,000	1	3,000	3,000	1	3,000
Athletics Storeroom (indoor track, high jump, BB Scoring, chairs)	280	1	280	500	1	500				500	1	500	300	1	300
PE Locker Rooms - 1 Male / 1 Female w/ Toilets (50-60 stud.)	2,420	2	4,840	1,100	2	2,200				1,100	2	2,200	3,892	1	3,892
Phys. Ed. Storage	200	2	400	400	1	400				400	1	400	500	1	500
Athletic Director's Office, Secretary, Conference Area	600	1	600	400	1	400				400	1	400	150	1	150

RENOVATION AND ADDITIONS

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)		
				Existing to Remain/Renovated			New			Total					
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals
Health Instructor's Office w/ Shower & Toilet													250	1	250
Team Room (male 170 large lockers w/ toilets showers)	2,650	1	2,650	1,150	1	1,150				1,150	1	1,150			
Team Room (female 180 regular lockers w/ toilets showers)	2,570	1	2,570	1,150	1	1,150				1,150	1	1,150			
PE Office Male and Female (2 staff each)	150	2	300	250	2	500				250	2	500			
Male Athletic Coaches (1 -off/ 8 coaches) shower+toilet	350	2	700	300	1	300				300	1	300			
Female Athletic Coaches (2 offices/ 3 coaches) toilet + Shower	120	1	120	300	1	300				300	1	300			
Training Room w/ storage	1,060	1	1,060	700	1	700				700	1	700			
Equiptment Room, laundry, store sports equipt. storage	860	1	860	1200	1	1,200				1,200	1	1,200			
Team Meeting Rooms (60 students)	1,880	1	1,880												
Official's Room	250	2	500												
Ticketing	50	1	50												
MEDIA CENTER			**5,965**			**0**			**4,644**			**4,644**			**4,244**
Media Center / Reading Room *(cyber café, student help desk)*	3,710	1	3,710				4,244	1	4,244	4,244	1	4,244	4,244	1	4,244
Computer Lab	785	1	785												
Storage															
History Lab in Media Area (in media center)	240	1	240				400	1	400	400	1	400			
Media Center Meeting Room	220	1	220												
Media Center Office	270	1	270												
Technology Integration	740	1	740												
AUDITORIUM / DRAMA			**11,245**			**0**			**9,850**			**9,850**			**7,457**
Auditorium (600 seats)	8,820	1	8,820				6,000	1	6,000	6,000	1	6,000	4,633	1	4,633
Stage	1,975	1	1,975				2,300	1	2,300	2,300	1	2,300	1,600	1	1,600
Auditorium Storage	350	1	350				600	1	600	600	1	600	424	1	424
Make-up / Dressing Rooms							300	2	600	300	2	600	300	2	600
Sound room							150	1	150	150	1	150			
Controls / Lighting / Projection	100	1	100				200	1	200	200	1	200	200	1	200
DINING & FOOD SERVICE			**12,530**			**0**			**7,103**			**7,103**			**6,818**
Cafeteria / Student Lounge / Break-out	8,000	1	8,000				3,475	1	3,475	3,475	1	3,475	3,475	1	3,475
Chair / Table Storage	220	1	220				324	1	324	324	1	324	324	1	324
Scramble Serving Area							600	1	600	600	1	600	600	1	600
Kitchen: 394 Robin Hood/ 355 South/ 264 Colonial Park (1,013)	3,040	1	3,040				2,000	1	2,000	2,000	1	2,000	1,995	1	1,995
Staff Lunch Room	990	1	990				424	1	424	424	1	424	424	1	424
District External Freezer (28Lx10Wx9H)	280	1	280				280	1	280	280	1	280			
MEDICAL			**800**			**0**			**770**			**770**			**710**
Medical Suite Toilet							60	2	120	60	2	120	60	1	60
Nurses' Office / Waiting Room	400	1	400				250	1	250	250	1	250	250	1	250
Interview Room							100	1	100	100	1	100	100	1	100
Examination Room / Resting	400	1	400				100	3	300	100	3	300	100	3	300
ADMINISTRATION & GUIDANCE			**6,430**			**0**			**5,752**			**5,752**			**3,651**
General Office / Waiting Room / Toilet	855	1	855				348	1	348		1	348	348	1	348
Teachers' Mail and Time Room	140	1	140				100	1	100		1	100	100	1	100
Duplicating Room	400	1	400				200	1	200		1	200	200	1	200
Records Room							200	1	200		1	200	200	1	200
Principal's Office w/ Conference Area	290	1	290				375	1	375		1	375	375	1	375
Principal's Secretary / Waiting							125	1	125		1	125	125	1	125
Assistant Principal's Office - AP1	385	1	385				150	1	150		1	150	150	1	150
Assistant Principal's Office - AP2													150	0	-
Supervisory / Spare Office							120	1	120		1	120	120	1	120
Conference Room	250	3	750				450	1	450		1	450	450	1	450
Guidance Office	96	5	480				150	4	600		4	600	150	4	600
Guidance Waiting Room	910	1	910				100	1	100		1	100	100	1	100
Guidance Storeroom	90	1	90				100	1	100		1	100	100	1	100
Career Center							324	1	324		1	324	324	1	324
Records Room							112	1	112		1	112	112	1	112
Teachers' Work Room	360	1	360				348	1	348		1	348	348	1	348
Business Office	790	1	790												
Counselor Office	160	2	320												
Kitchenette	140	1	140												
Department Head Planning Area (Max 8)							700	1	700	700	1	700			
(ELA, Math, Science, World Lang, History, Fine Arts, Spec. Ed, technology															
Book Storage (6,000 books) near Department Head Planning Area							500	1	500	500	1	500			
Huddle Rooms for Quiet Space							50	6	300	50	6	300			
Offices: School Adjustment Counselor, School Psych., SPED Transition Coordinator/SPED Office	130	4	520				150	4	600	150	4	600			

RENOVATION AND ADDITIONS

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)		
				Existing to Remain/Renovated			New			Total					
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals
CUSTODIAL & MAINTENANCE			**1,632**			**2,647**			**0**			**2,647**			**2,146**
Custodian's Office	120	1	120	150	1	150				150	1	150	150	1	150
Custodian's Workshop				250	1	250				250	1	250	250	1	250
Custodian's Storage	55	3		375	1	375				375	1	375	375	1	375
Recycling Room / Trash				400	1	400				400	1	400	400	1	400
Receiving and General Supply	612	1	612	324	1	324				324	1	324	324	1	324
Storeroom				448	1	448				448	1	448	448	1	448
Network / Telecom Room	180	1	180	200	1	200				200	1	200	200	1	200
Exterior general Storage	720	1	720	500	1	500				500	1	500			
OTHER			**8,850**			**0**			**14,695**			**14,695**			**0**
District Offices- Superintendent/PPS	8,300	1	8,300												
Pre School Classrooms w/ toilets changing (15 students)							1,200	8	9,600	1,200	8	9,600			
Observation Areas: Childcare Development Pathway							175	2	350	175	2	350			
Pre School OT/PT							400	1	400	400	1	400			
Pre School Director Office							150	1	150	150	1	150			
Pre School Speech/ Language							250	2	500	250	2	500			
Pre School Conference Room							350	1	350	350	1	350			
Reception Area with Secretary							275	1	275	275	1	275			
Teacher Work Room/Collaboration							300	1	300	300	1	300			
Student Lunch Room							600	1	600	600	1	600			
Indoor Play area															
Social Woker Office							150	1	150	150	1	150			
BCBA Office							150	1	150	150	1	150			
Nurse							350	1	350	350	1	350			
Conference Room							350	1	350	350	1	350			
Sensory Room							450	1	450	450	1	450			
School Store	550	1	550				600	1	600	600	1	600			
Mother's Room							60	2	120	60	2	120			
Total Building Net Floor Area (NFA)			**144,247**			**44,627**			**91,444**			**136,071**			**99,882**
Proposed Student Capacity / Enrollment															**695**
NON-PROGRAMMED SPACES					% of GFA	**-44,627**		% of GFA	**45,722**		% of GFA	**68,036**			
Other Occupied Rooms (list separately)					#DIV/0!			0%			0%				
					#DIV/0!			0%			0%				
					#DIV/0!			0%			0%				
					#DIV/0!			0%			0%				
					#DIV/0!			0%			0%				
Unoccupied Closets, Supply Rooms & Storage Rooms					#DIV/0!			0%			0%				
Toilet Rooms					#DIV/0!			0%			0%				
Circulation (corridors, stairs, ramps & elevators)					#DIV/0!			0%			0%				
Remaining[3]					#DIV/0!	**-44,627**		33%	**45,722**		33%	**68,036**			
Total Building Gross Floor Area (GFA)[2]			**208,113**			0			137,166			**204,107**			**150,120**
Grossing factor (GFA/NFA)			**1.44**			**0.00**			**1.50**			**1.50**			**1.50**

NEW CONSTRUCTION

Stoneham High School	Existing Conditions			PROPOSED: Existing to Remain/Renovated			PROPOSED: New			PROPOSED: Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)		
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals
CORE ACADEMIC SPACES			**38,200**			**0**			**38,790**			**38,790**			**32,890**
(List classrooms of different sizes separately)															
Classroom - General	800	19	15,200				900	23	20,700	900	23	20,700	850	23	19,550
Classroom - General	900	2	1,800												
Classroom - General	1,000	7	7,000												
Classroom - General	500	1	500												
Collaboration Space per neighborhood							500	6	3,000	500	6	3,000			
Teacher Planning							100	23	2,300	100	23	2,300	100	23	2,300
Small Group Seminar (20-30 seats)							500	2	1,000	500	2	1,000	500	2	1,000
Science Classroom / Lab (labs that are multi-functional to utalize all science rooms- typical MSBA)	1,200	8	9,600				1,440	6	8,640	1,440	6	8,640	1,440	6	8,640
Prep Room	280	5	1,400				200	6	1,200	200	6	1,200	200	6	1,200
Department Office	300	4	1,200												
Department Office	700	1	700												
Central Chemical Storage Rm							200	1	200	200	1	200	200	1	200
World Language Lab															
Health Classroom	800	1	800				850	1	850	850	1	850			
ESL Services: 1 CR (full size) @ 900 sf							900	1	900	900	1	900			
SPECIAL EDUCATION			**10,144**			**0**			**7,250**			**7,250**			**8,050**
(List classrooms of different sizes separately)															
Self-Contained SPED													950	5	4,750
Self-Contained SPED Toilet													60	5	300
Resource Room: 2 assessment centers (3-4 people) @150sf, 2General CR @900sf (divider)	4	710	2,840				2,100	1	2,100	2,100	1	2,100	500	3	1,500
Small Group Room	290	1	290										500	3	1,500
RISE Life Skills: 2 CR @ 900 sf, 150sf Toilet between RISE and STRIDE	785	1	785				1,950	1	1,950	1,950	1	1,950			
RISE Life Skills (Rise 1 & Rise 2)	1,234	1	1,234												
STRIDE Social Emotional Learning	265	1	265												
STRIDE SEL: 1 CR @ 900, (partition) 2 offices @ 150, (suite with common area connect to CR)	965	1	965				1,050	1	1,050	1,050	1	1,050			
STRIDE Office	265	1	265												
Central Office	1,180	1	1,180												
Speech and Language: 1 CR (half size) @ 450 sf, 1 Office @ 150 sf (near Rise)							600	1	600	600	1	600			
OT/PT: 1 CR @ 650 sf							650	1	650	650	1	650			
Common Planning Area	1,180	1	1,180												
Language Based: 2 CR (half size) @ 450 sf (operable wall between)	790	1	790				450	2	900	450	2	900			
ELL	350	1	350												
ART & MUSIC			**8,344**			**0**			**5,350**			**5,350**			**6,625**
Art Classroom - 25 seats with Ceramics	1,160	3	3,480				1,200	1	1,200	1,200	1	1,200	1,200	2	2,400
Art Workroom w/ Storage & kiln	2,025	1	2,025				150	2	300	150	2	300	150	2	300
Art Room with divider							1,500	1	1,500	1,500	1	1,500			
Art Dark Room	408	1	408												
Band - 50 - 100 seats	1,858	1	1,858				1,500	1	1,500	1,500	1	1,500	1,500	1	1,500
Chorus - 50 - 100 seats													1,500	1	1,500
Ensemble- Practice							200	1	200	200	1	200	200	1	200
Music Practice	74	4	296				75	2	150	75	2	150	75	3	225
Music Storage	277	1	277				500	1	500	500	1	500	500	1	500
VOCATIONS & TECHNOLOGY			**4,547**			**0**			**11,120**			**11,120**			**7,200**
Technology/Engineering Rooms: Computer -Draft													1,440	5	7,200
Engineer Lab (exist) New combine Maker, Eng, Robotics, Scene Shop (clean, dirty, fab lab)	950	1	950				2,800	1	2,800	2,800	1	2,800			
Engineering Rooms: Computer -Draft Project Lead the Way							1,440	1	1,440	1,440	1	1,440			
Technology Shop: Child Development															
Technology Shop: Fashion Lab / Child Development	1,547	1	1,547												
Technology Shop: Culinary	1,180	1	1,180				1,440	1	1,440	1,440	1	1,440			
Wood-Scene Shop/Theater Arts (in Engineer Lab line 52)															
Video Production (25 computers edit/ graphics, pod cast, studio with green screen, graphic art, stor.)							2,000	1	2,000	2,000	1	2,000			
Computer Science/ Bio-Medical- Project Lead the Way	870	1	870				1,440	1	1,440	1,440	1	1,440			
Interdisciplinary Project and Performance Room (2,000 sf)							2,000	1	2,000	2,000	1	2,000			
HEALTH & PHYSICAL EDUCATION			**35,560**			**0**			**28,100**			**28,100**			**20,092**
Gymnasium with Gymnastics (70' valut, beam, matt , uneven bars, track)	16,000	1	16,000				16,000	1	16,000	16,000	1	16,000	12,000	1	12,000
Gymnastics Storage	510	1	510				300	1	300	300	1	300			
PE Alternatives- Fitness, Conditioning, Strength	2,240	1	2,240				3,000	1	3,000	3,000	1	3,000	3,000	1	3,000
Athletics Storeroom (indoor track, high jump, BB Scoring, chairs)	280	1	280				500	1	500	500	1	500	300	1	300
PE Locker Rooms - 1 Male / 1 Female w/ Toilets (50-60 stud.)	2,420	2	4,840				1,100	2	2,200	1,100	2	2,200	3,892	1	3,892
Phys. Ed. Storage	200	2	400				400	1	400	400	1	400	500	1	500
Athletic Director's Office, Secretary, Conference Area	600	1	600				400	1	400	400	1	400	150	1	150

NEW CONSTRUCTION

Stoneham High School	Existing Conditions			PROPOSED: Existing to Remain/Renovated			PROPOSED: New			PROPOSED: Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)		
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals
Health Instructor's Office w/ Shower & Toilet													250	1	250
Team Room (male 170 large lockers w/ toilets showers)	2,650	1	2,650				1,150	1	1,150	1,150	1	1,150			
Team Room (female 180 regular lockers w/ toilets showers)	2,570	1	2,570				1,150	1	1,150	1,150	1	1,150			
PE Office Male and Female (2 staff each)	150	2	300				250	2	500	250	2	500			
Male Athletic Coaches (1 -off/ 8 coaches) shower+toilet	350	2	700				300	1	300	300	1	300			
Female Athletic Coaches (2 offices/ 3 coaches) toilet + Shower	120	1	120				300	1	300	300	1	300			
Training Room w/ storage	1,060	1	1,060				700	1	700	700	1	700			
Equiptment Room, laundry, store sports equipt. storage	860	1	860				1200	1	1,200	1,200	1	1,200			
Team Meeting Rooms (60 students)	1,880	1	1,880												
Official's Room	250	2	500												
Ticketing	50	1	50												
MEDIA CENTER			**5,965**			**0**			**4,644**			**4,644**			**4,244**
Media Center / Reading Room *(cyber café, student help desk)*	3,710	1	3,710				4,244	1	4,244	4,244	1	4,244	4,244	1	4,244
Computer Lab	785	1	785												
Storage															
History Lab in Media Area (in media center)	240	1	240				400	1	400	400	1	400			
Media Center Meeting Room	220	1	220												
Media Center Office	270	1	270												
Technology Integration	740	1	740												
AUDITORIUM / DRAMA			**11,245**			**0**			**9,850**			**9,850**			**7,457**
Auditorium (600 seats)	8,820	1	8,820				6,000	1	6,000	6,000	1	6,000	4,633	1	4,633
Stage	1,975	1	1,975				2,300	1	2,300	2,300	1	2,300	1,600	1	1,600
Auditorium Storage	350	1	350				600	1	600	600	1	600	424	1	424
Make-up / Dressing Rooms							300	2	600	300	2	600	300	2	600
Sound room							150	1	150	150	1	150			
Controls / Lighting / Projection	100	1	100				200	1	200	200	1	200	200	1	200
DINING & FOOD SERVICE			**12,530**			**0**			**7,103**			**7,103**			**6,818**
Cafeteria / Student Lounge / Break-out	8,000	1	8,000				3,475	1	3,475	3,475	1	3,475	3,475	1	3,475
Chair / Table Storage	220	1	220				324	1	324	324	1	324	324	1	324
Scramble Serving Area							600	1	600	600	1	600	600	1	600
Kitchen: 394 Robin Hood/ 355 South/ 264 Colonial Park (1,013)	3,040	1	3,040				2,000	1	2,000	2,000	1	2,000	1,995	1	1,995
Staff Lunch Room	990	1	990				424	1	424	424	1	424	424	1	424
District External Freezer (28Lx10Wx9H)	280	1	280				280	1	280	280	1	280			
MEDICAL			**800**			**0**			**770**			**770**			**710**
Medical Suite Toilet							60	2	120	60	2	120	60	1	60
Nurses' Office / Waiting Room	400	1	400				250	1	250	250	1	250	250	1	250
Interview Room							100	1	100	100	1	100	100	1	100
Examination Room / Resting	400	1	400				100	3	300	100	3	300	100	3	300
ADMINISTRATION & GUIDANCE			**5,910**			**0**			**5,752**			**5,752**			**3,651**
General Office / Waiting Room / Toilet	855	1	855				348	1	348	348	1	348	348	1	348
Teachers' Mail and Time Room	140	1	140				100	1	100	100	1	100	100	1	100
Duplicating Room	400	1	400				200	1	200	200	1	200	200	1	200
Records Room							200	1	200	200	1	200	200	1	200
Principal's Office w/ Conference Area	290	1	290				375	1	375	375	1	375	375	1	375
Principal's Secretary / Waiting							125	1	125	125	1	125	125	1	125
Assistant Principal's Office - AP1	385	1	385				150	1	150	150	1	150	150	1	150
Assistant Principal's Office - AP2													150	0	-
Supervisory / Spare Office							120	1	120	120	1	120	120	1	120
Conference Room	250	3	750				450	1	450	450	1	450	450	1	450
Guidance Office	96	5	480				150	4	600	150	4	600	150	4	600
Guidance Waiting Room	910	1	910				100	1	100	100	1	100	100	1	100
Guidance Storeroom	90	1	90				100	1	100	100	1	100	100	1	100
Career Center							324	1	324	324	1	324	324	1	324
Records Room							112	1	112	112	1	112	112	1	112
Teachers' Work Room	360	1	360				348	1	348	348	1	348	348	1	348
Business Office	790	1	790												
Counselor Office	160	2	320												
Kitchenette	140	1	140												
Department Head Planning Area (Max 8)							700	1	700	700	1	700			
(ELA, Math, Science, World Lang, History, Fine Arts, Spec. Ed, technology															
Book Storage (6,000 books) near Department Head Planning Area							500	1	500	500	1	500			
Huddle Rooms for Quiet Space							50	6	300	50	6	300			
Offices: School Adjustment Counselor, School Psych., SPED Transition Coordinator/SPED Office	130	4	520				150	4	600	150	4	600			

NEW CONSTRUCTION

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)		
				Existing to Remain/Renovated			New			Total					
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals
CUSTODIAL & MAINTENANCE			**1,632**			**0**			**2,647**			**2,647**			**2,146**
Custodian's Office	120	1	120				150	1	150	150	1	150	150	1	150
Custodian's Workshop							250	1	250	250	1	250	250	1	250
Custodian's Storage	55	3					375	1	375	375	1	375	375	1	375
Recycling Room / Trash							400	1	400	400	1	400	400	1	400
Receiving and General Supply	612	1	612				324	1	324	324	1	324	324	1	324
Storeroom							448	1	448	448	1	448	448	1	448
Network / Telecom Room	180	1	180				200	1	200	200	1	200	200	1	200
Exterior general Storage	720	1	720				500	1	500	500	1	500			
OTHER			**8,850**			**0**			**14,695**			**14,695**			**0**
District Offices- Superintendent/PPS	8,300	1	8,300												
Pre School Classrooms w/ toilets changing (15 students)							1,200	8	9,600	1,200	8	9,600			
Observation Areas: Childcare Development Pathway							175	2	350	175	2	350			
Pre School OT/PT							400	1	400	400	1	400			
Pre School Director Office							150	1	150	150	1	150			
Pre School Speech/ Language							250	2	500	250	2	500			
Pre School Conference Room							350	1	350	350	1	350			
Reception Area with Secretary							275	1	275	275	1	275			
Teacher Work Room/Collaboration							300	1	300	300	1	300			
Student Lunch Room							600	1	600	600	1	600			
Indoor Play area															
Social Woker Office							150	1	150	150	1	150			
BCBA Office							150	1	150	150	1	150			
Nurse							350	1	350	350	1	350			
Conference Room							350	1	350	350	1	350			
Sensory Room							450	1	450	450	1	450			
School Store	550	1	550				600	1	600	600	1	600			
Mother's Room							60	2	120	60	2	120			
Total Building Net Floor Area (NFA)			**143,727**			**0**			**136,071**			**136,071**			**99,882**
Proposed Student Capacity / Enrollment															**695**
NON-PROGRAMMED SPACES					% of GFA	**0**		% of GFA	**68,036**		% of GFA	**68,036**			
Other Occupied Rooms (list separately)					#DIV/0!			0%			0%				
					#DIV/0!			0%			0%				
					#DIV/0!			0%			0%				
					#DIV/0!			0%			0%				
					#DIV/0!			0%			0%				
Unoccupied Closets, Supply Rooms & Storage Rooms					#DIV/0!			0%			0%				
Toilet Rooms					#DIV/0!			0%			0%				
Circulation (corridors, stairs, ramps & elevators)					#DIV/0!			0%			0%				
Remaining[3]					#DIV/0!	**0**		33%	**68,036**		33%	**68,036**			
Total Building Gross Floor Area (GFA)[2]			**208,113**			0			204,107			**204,107**			**150,120**
Grossing factor (GFA/NFA)			**1.45**			**#DIV/0!**			**1.50**			**1.50**			**1.50**

Educational Program – Clean Copy

Stoneham High School
Educational Program

Angela Billings	Math Teacher
Rebekah Brooks	English Teacher
Danielle Catalano	Art Teacher
Jennifer Christopher	Spanish Teacher
Alison Connelly	Librarian/Media Specialist
Sarah Fitzpatrick	English Teacher
Jillian Goldstein	Special Education Teacher
Mary Haight	Science Teacher
Maya Ibrahim	Student
Maria La Terza	Student
Bryan Lombardi	Principal
Kim O'Connor	Family & Consumer Science Teacher
John Pagliarulo	Student
Sean Perry	Drama Club Director/Advisor
David Pignone	Athletic Director
Jonathan Pohorilak	Social Studies Teacher
Cynthia Shaw	Instructional Technology
Teresa Soccio	Science Teacher
Sara Swett-Zizzo	Physical Education Teacher
Celeste Vaughan	Guidance Counselor

Table of Contents

INTRODUCTION AND GRADE AND SCHOOL CONFIGURATION POLICIES

CLASS SIZE POLICIES

SCHOOL SCHEDULING

TEACHING METHODOLOGY AND STRUCTURE

TEACHER PLANNING

PRE-KINDERGARTEN

LUNCH PROGRAMS

TECHNOLOGY INSTRUCTION POLICIES AND PROGRAM REQUIREMENTS

ART PROGRAMS

MUSIC AND PERFORMING ARTS PROGRAMS

PHYSICAL EDUCATION PROGRAM
Athletic Program

LIBRARY / MEDIA CENTER

SPECIAL EDUCATION PROGRAMS

CTE PROGRAMS

TRANSPORTATION

FUNCTIONAL AND SPATIAL RELATIONSHIPS

SECURITY AND ACCESS

INTRODUCTION AND GRADE AND SCHOOL CONFIGURATION POLICIES

Rebekah Brooks and Angela Billings

Stoneham High School is located in the Town of Stoneham, Massachusetts, with a total area of 6.7 square miles. The Town of Stoneham is an inner-core suburb, located 10 miles north of Boston at the junction of Interstates 95 and 93. The community is home to many small businesses and is a short distance from many colleges and universities in the Boston area. Stoneham commercial property consists primarily of businesses, professional and semi-professional, and according to the 2010 U.S Census, the Town's population was 21,437. According to the 2014 Stoneham Town Center Strategic Action Plan, the median household income of $72, 938 and 5.5% of families have earned income below the poverty line. The ethnic demographics of the school mirror those of the community where 92% of the students identify as predominantly white; the remaining 8% of the student body identifies as 3% Hispanic, 2% African American, and 3% Asian. 14.6% of the school's population is low income. For most of the students at Stoneham High School, English is their first language with 1.2% of students enrolled in the ELL program.

The Stoneham Public School district comprises three elementary schools, one middle school, and one high school educating a total of 2,204 students. Two of the elementary schools, Robin Hood and Colonial Park, educate students from pre-K to fourth grade. South Elementary School holds grades kindergarten to four, the Central Middle School grades five through eight, and the High School grades nine through twelve. Stoneham High School serves a student body of 640 students in grades 9 through 12.

Core Values

All members of the school community:

- Support a safe, inclusive educational environment

- Foster and hold high expectations for student learning
- Share responsibility for the success of our students

Mission Statement

Anticipating the challenges and opportunities of a 21st century world, the Stoneham Public Schools develop students who:

- Are creative, critical, and independent thinkers
- Demonstrate respect for and acceptance of self and others
- Know and apply communication and information literacy skills
- Are responsible contributors to the local society

Stoneham High School offers all core subject areas (English, math, science, and social studies) at 5 different instructional levels: Advanced Placement (AP), Honors, Intensive, Comprehensive, and Transitional. 45.3% of 12th grade students take at least 1 of the 10 AP courses offered. Stoneham High School follows an inclusion model for students with IEPs. In order to graduate from Stoneham High School, there are several requirements that must be met. Students must pass four sequential English courses. In social studies, students must pass a minimum of fifteen credits including one year-long class in World History and two sequential year-long courses in U.S. History. In mathematics, students must pass four courses that involve four full years or eight semesters of study, including Algebra I and Geometry. In the science department, students need a minimum of 15 credits, including biology. Students are required to take health education class in tenth grade and one physical education class each year; these classes are heterogeneously grouped. Students must also earn 5 credits in art and/or music and 2.5 credits in an approved technology course.

Stoneham High School also offers three foreign languages: Spanish, Italian, and French. A variety of electives in Fine and Performing Arts, Business & Technology, and Family & Consumer Science disciplines are also available to students in all grade levels. Students are also able to take additional elective courses in the core subject areas. Stoneham High School also offers a Peer Leadership

Class for juniors and seniors. There are several local educational opportunities available to students and the community which include online learning for credit recovery and supplementation of course offerings, dual enrollment with community colleges, and a special grant given to the AP Spanish class that encourages service learning outside of the school.

Stoneham High School has a wide variety of programs and initiatives in place to support student success and engage students. The high school has two programs, Reaching Independence through Structured Environments (RISE) and Students Taking Responsibility in Developing Excellence (STRIDE) to address students with differing educational needs. The Stoneham High School Special Education Department provides the STRIDE program for students who require a structured, self-contained classroom with therapeutic support. The program supports students with emotional disabilities while providing curricula taught by teachers in a small-group setting. The RISE program is for students who require a highly modified academic curriculum with a focus on daily living skills, vocational skills and job skills. Services are provided as indicated on each student's Individualized Educational Plan (IEP). Additional resource courses are available to students with disabilities and an academic support course is available to first and second year ELL students.

Stoneham High School also offers both in-school and out-of-school internships and encourages students to become immersed in an occupation or career pathway of their interest. Students explore career interests and find a suitable internship with a local community employer. In addition, there is a work-study program offered to students who are seeking a credit to help in balancing school course loads and part-time work positions outside of school. This program supports students in successfully navigating the working world, managing the responsibilities of holding a job and improving upon transferable skills while strengthening their work-readiness.

Stoneham has a variety of co-curricular clubs including: Math Team, Science Club, Gay Straight Alliance, Substance Abuse Coalition, Foreign Language Club, Model United Nations, Drama Club, school newspaper, and Stoneham Peers Achieving Real Connections (SPARC). The athletic department

at the high school has 26 sports including soccer, field hockey, track, cheerleading, swimming, volleyball, golf, lacrosse, ice hockey, tennis, and gymnastics.

There are a number of student recognition programs at Stoneham High School. Academically, students can be selected for the National Honor Society, Student of the Month, High and Regular Honor roll. As seniors, students are awarded academic medals for high achievement in respective departments. Seniors who have been recognized as varsity scholars all four years are awarded a Lamp of Knowledge. At graduation, a male and female receive the Horton and Nadeau Awards for service to the school community. Stoneham High School also offers the Seal of Biliteracy, an award recognition of students who have studied and obtained proficiency in two or more languages by high school graduation. In its first year of implementation, 23 students were awarded the Seal of Biliteracy.

Annually, two juniors are awarded the Scholarship, Integrity, Leadership, Spirit (SILS) Award, as well as junior book awards for outstanding success in the subject areas. The English Department awards prizes for the Shakespeare Festival and for the Phil Riley Poetry Contest, while the Social Studies Department acknowledges students for National History Day Achievements. The school also recognizes its athletes by giving Varsity Scholar Awards, Freshman Athletic Awards, and Senior Athletic Awards. The school recognizes its musicians and actors with the Tri-M National Music Honor Society and Drama Awards.

Here is a summary of the makeup of the staff at Stoneham High School. The administration includes one principal, one assistant principal, one athletic director, and program supervisors of mathematics, science/health, social studies, and English. The number of full time teachers in each department is as follows:

English 7.8 (.2 is the supervisor)

Mathematics 8.0 (.2 is the supervisor)

Science/Health 10.6 (.2 is the supervisor)

Social Studies 7.2 (.2 is the supervisor)

Foreign Language 6.8

Physical Education 3.0

Business Education 1.0

Family & Consumer Science 2.0

Art 3.0

Music/Theater Arts 1.0

Instructional Technology 1.0

Instructional Technology Coach 1.0

Guidance 4.0

Adjustment Counselor 1.0

Library Media Specialist 1.0

Psychologist 1.0

Special Education 12.0

ELL 1.0

Nurse 1.0

Education Support Professionals (ESP's) 7.6

CLASS SIZE POLICIES - Kim O'Connor

There are currently no policies pertaining to class size at the high school. For most classes at Stoneham High School, class size ranges from 15-32 students, depending upon factors related to homogeneous grouping and content specialization. Some classes exceed this range such as physical education if it is co-taught that may have up to 40 students each. Other classes that service substantially separate special education programs are below this range, such as the RISE and STRIDE programs, which also house therapeutic spaces. Average class size in the core academic areas is approximately 22- 26 students. Classes that require the student to have their own station, such as the applied arts, are limited to the number of stations in their room/lab, which average 18 spaces.

SCHOOL SCHEDULING

Jon Pohorilak and Rebekah Brooks

		Day	1	2	3	4	5	6	7	8
Period 1	Start	8:15	A	C	B	A	B	A	B	A
	End	9:24								
Period 2	Start	9:28	B	A	C	B	C	C	G	C
	End	10:37								
First Lunch	Start	10:41								
	End	11:11								
Period 3	Start	10:41	D	G	D	D	G	D	D	G
	End	12:24								
Second Lunch	Start	11:54								
	End	12:24								
Period 4	Start	12:28	FLEX	E	E	FLEX	E	FLEX	FLEX	E
	End	1:37								
Period 5	Start	1:41	F	FLEX	F	G	F	E	F	F
	End	2:50								

The school day begins at 8:15 am and ends at 2:50 pm, with the exception of Day 2 when students are released 35 minutes early at 2:16 pm to allow for common planning time among faculty. The schedule consists of 7 periods plus a FLEX that rotate on an 8-day schedule with each period meeting 5 days per cycle. Within the school day, 5 periods meet. Since we moved from a 6-period day to a 5-period day, students have expressed that the new schedule feels less hectic and allows them more time to focus on the classes that meet within the school day.

Each period is 69-minutes long, allowing more time for students to apply practice of new skills, explore topics and discussions more in-depth, and increase time with peers and teachers to work on project-based activities which in turn build stronger student-teacher connections. There is one exception on Day 2, where the FLEX block meets for 35 minutes before students are released from school at 2:16 pm. This shortened FLEX on Day 2 acts as an advisory where students can check in with their advisors about their

progress throughout the school year. The goal of this 35-minute advisory is to foster relationships between students and faculty and to enhance connections to the school community.

In addition to this advisory, 4 69-minute FLEX blocks are scheduled throughout the 8-day rotation to address the needs of our students and faculty. Prior to the implementation of FLEX, we were faced with conflicts regarding science labs, enrichment opportunities, work-study and internship programs, counseling services, academic interventions and support, as well as overall stress and fatigue. The FLEX block provides opportunities for students to learn to be independent and interdependent, self-initiating learners who strive for excellence and who continue to pursue learning as a lifelong endeavor. This can be achieved when students are given the responsibility and freedom to choose what, how, and why they will learn and the time to practice these skills with the guidance of an advisor. When sufficient time is given, students go beyond initial relationships to create novel relationships, find patterns, and generate ideas for themselves. From the student perspective, "curriculum is almost more 'student-centered' - students are put at the center of their own learning and learn how to better prioritize their time. They may even pursue something new, allowing students to step outside of their comfort zone." A variety of educational enrichments offered during FLEX include extra help with a teacher or study group, explorations of different hobbies and interests, invitations for guest speakers, enhanced opportunities for clubs to meet and plan events, and physical activities such as yoga, table tennis, and walking clubs.

The lunch period is 103 minutes long, during which students attend class for 69 minutes and lunch for 30 minutes. Lunches have historically been organized by room location (first floor, second floor, gym, etc.).

Common planning is built into the schedule on Day 2 when students are dismissed at 2:16, allowing faculty 45 minutes of common planning time. This time is mostly teacher-directed to work with grade-alike colleagues, departmental planning, and cross-curricular collaboration.

The master schedule is developed mainly by administration with collaboration from school counseling. Counselors organize the course selection process, advise students about their choices, then "clean up" any holes created in the master schedule when classes run concurrently, do not have enough seats to meet demand, or do not run at all. Course offerings include full-year and semester classes. Students request courses for September beginning the preceding March. Course sections are based on the number of student requests in the course request phase.

The advantage of our current scheduling methodology is the involvement and leadership of the process by the guidance counselors. Our counselors have a very good understanding of the individual students and their unique needs, goals and aspirations. A disadvantage to the current scheduling methodology is the way in which classes are determined by the number of students who select a class or have interest in the specific class selection. Students have been faced with not being able to take their top selected course because there may not be enough students who select the class in order for the class to run. Other conflicts arise when classes run concurrently, do not run at all, or there are not enough seats to accommodate all student requests. In addition, the scheduling is managed solely by administration and the counseling department with limited opportunities for teacher input. In the future, it would be advantageous for us to

develop class scheduling teams that are integrated and inclusive of a cross section of departments who share students.

The vision for future collaboration includes opportunities for teachers in all disciplines (including unified arts, PE/ wellness) to continue common planning time and increased time and space for cross-disciplinary engagement and interaction.

Bryan Lombardi
TEACHING METHODOLOGY AND STRUCTURE

1. Curriculum Delivery Methods and Practices

    - Please describe the District's curriculum delivery

      methods and practices.

Stoneham High School is currently undergoing a major self assessment and professional development process as part of our Multi Tiered Systems of Support DESE sponsored grant, with a focus on Universal Design for Learning (UDL).

New and ongoing focus areas include the creation of several programmatic changes across both special education and general education, including academic, social emotional, mental health and life-skills supports.

Our driving vision is one in which all educators incorporate UDL practices and differentiated learning, interdisciplinary collaborative content and faculty engagement and Project Lead the Way (PLTW) / project based learning opportunities that best prepares students with 21st century skills. SHS strives with the following goals for delivery of curriculum delivery and instructional practices:

Instructional practices at SHS are designed to meet the learning needs of each student. Instructional practices include:

• strategically differentiating, individualizing, and/or personalizing based on student learning needs

• using formative assessment to adjust instruction

• purposefully organizing **group learning**

• providing **additional support** and alternative strategies within the regular classroom

• organizational, grouping, and **tiered intervention strategies** that meet the needs of each learner within the regular classroom

Students are active learners who have opportunities to lead their own learning. Active learning strategies include:

• learning that is personalized, relevant, and authentic

• project-based learning (PLTW), Family and Consumer SCiences, robust Fine Arts program

• student goal setting

• opportunities to learn in and out of school for application of knowledge and skills to authentic tasks (including internships and work study opportunities), dual enrollment partnerships (North Shore Community College)

• student choice, pursuit of personal interests, and opportunities for creative expression

SHS students regularly engage in inquiry, problem-solving, and higher order thinking skills. Inquiry, problem-solving, and higher order thinking skills require learners to engage in:

• questioning, analysis, and understanding impacts

• activities that prioritize deep understanding, analysis, synthesis, creativity, making connections, and understanding relationships

• critical and creative thinking skills

• dispositions, such as independence, flexible thinking, and persistence

Learners demonstrate their learning through a variety of assessment strategies that inform classroom instruction and curriculum. Effective assessment practices include:

• presentation of learning to authentic audiences, including students, families, community members, and professionals.

Learners have multiple opportunities to demonstrate their learning, receive corrective feedback, and use this feedback in meaningful ways to support their learning. Learners are provided with:

• multiple and varied opportunities over time to demonstrate their learning

• opportunities and time necessary to revise and improve their work

• teacher feedback as well as peer feedback and selfreflection to guide next steps in learning

Students use technology (1:1) across all curricular areas to support, enhance, and demonstrate their learning. Learners use technology in informed, effective, and ethical ways to:

• communicate clearly and creatively

• access, support, document, and supplement their learning

• construct knowledge, create, and problem-solve

• broaden their perspectives locally and globally

• engage in learning beyond the constraints of the school building and school day.

Administrative and academic organization/structure

Stoneham High School is a traditional college-preparatory school that is organized by department. Building layout, available classrooms and classroom assignments allow for all teachers to have their own classroom within proximity to their identified department.

As a result of a two year, grades 5 - 12, 1:1 ChromeBook Initiative Plan all students entering for the 2019-2020 school year were provided an individual device. While the first year of all

students having a chromebook resulted in a wide and inconsistent range of use within classrooms the ongoing pandemic has thrust teachers forward. Technology integration with instruction, student work production and assessment as well as classroom management and communication has vastly improved amongst teachers and faculty with raised levels of consistent practices and increasing use of advanced technological applications. We value responsible technology use and integration and view technology as an essential tool in meeting 21st Century College and Career Readiness Goals.

As we continue to provide students and teachers with innovative learning technologies and opportunities to best prepare students for these modern goals, we have initiated resources to expand our curricular offerings with a goal to allow students to explore various careers and build their 21st century skills with hands on engagement, problem based learning and community partnerships.

Through teacher creativity, innovation and commitment we have been able to continue our strong performance and provide rich learning opportunities. Students are provided a wide and diverse course selection supporting individual learning needs and student interests and passions that support their acceptance into postsecondary plans of education or career. However our current facility significantly inhibits our capacity to broaden our courses of study to include courses and programs that allow for project-based learning and career exploration.

Stoneham is currently involved in Project Lead The Way (PLTW) grants in attempt to provide continuity with the Stoneham Central Middle School PLTW and to enhance and support development of educational and career pathways. Though we have added and are in the first stages of establishing PLTW Computer Science, Engineering and Bio-Engineering pathways, our current facility, classroom use and structure inhibits the students learning experience and the full potential of these programs. Classrooms are limited in size for hands on and problem based learning. Building and classroom layout do not allow cohesion as a program or integration with other disciplines.

Teachers seek to provide students opportunities to engage in authentic learning experiences and student collaboration. Our history department has developed a history lab that provides students with hands-on and first person historical artifacts to assist with historical research. The department also engages in National History Day which promotes historical investigation, student collaboration and culminates with a final project. Our current facilities do not provide activities such as these with adequate space that utilizes technology as a means of presentation, space for collaboration and sharing of ideas and to effectively present and showcase work through a variety of mediums. Large interdisciplinary project-based learning rooms would provide the flexible spaces needed for students to develop and present their projects.

Stoneham students have a wide array of strengths and interests they are able to pursue and explore through our curriculum and courses with an emphasis on Humanities and the Arts, Science, Technology, Engineering and Mathematics. We provide a wide variety of offerings from our career elective programs such as culinary arts and child development to artistic pursuits in Music, drama and our general art, photography and ceramics programs. Students are provided many opportunities for rigorous college preparatory work through our thirteen distinct Advanced Preparatory and nineteen Honors level courses. The current facility and school structure do not foster the opportunity for interdisciplinary and collaborative teaching therefore most of our learning experiences and academic engagement occur within silos neglecting students the opportunity to connect the learning in a synergy as experienced in real world applications

In 2019 Stoneham High School introduced a new academic schedule to support students with

opportunities for enrichment as well as foster teacher collaboration through common planning time. Currently, there are no specific areas specified for teacher planning and collaboration. This is often done in a classroom and is limited due to size and locations. Therefore, it limits the depth of opportunity to collaborate and plan across departments.

The goal of a new Stoneham High school would be to plan a newly reorganized school that fosters innovation, collaboration and integration of academics and the arts and opportunities to support successful entry for post secondary education and / or career pursuits.

We envision a new school would provide:

- Flexible classroom space
- Spaces for student collaboration, group and independent study and the ability to showcase their work through variety of mediums
- Project rooms to support project-based learning
- Teacher planning rooms for the faculty and staff to collaborate with and across disciplines
- Quiet and private rooms to support the academic and social emotional needs of our students
- Flexible conference rooms to support both individual and small group meetings with students / parents / guardians as well as Team Meetings of various sizes.
- Interdisciplinary Project and Performance Room to support student performance, guest speakers, seminars, interdisciplinary collaborative activities and presentation and showcasing of student work

The new facility would need to support the district's mission statement as well as being reflective and adaptable to our core values:

Mission Statement

- Are creative, critical and independent thinkers
- Demonstrate respect for and acceptance of self and others
- Know and apply communication and information literacy skills
- Are responsible contributors to the local community

Core Values

- Support a safe, inclusive educational environment
- Foster and hold high expectations for student learning
- Share responsibility for the success of our students

Rebekah Brooks and Sara Fitzpatrick REMOVE NAMES FOR THE BOOK
English Language Arts/Literacy

The English Department follows the Massachusetts Curriculum Frameworks in teaching Reading, Writing, and Language which includes Speaking and Listening Standards. Thinking critically, communicating effectively, and working both independently and collaboratively are essential skills students require to be successful after high school. Understanding how texts are structured in conjunction with multiple learning strategies prepares students for standardized tests as well as accessing challenging work. Class reading lists include relevant and multicultural selections to build engagement and offer global perspectives. Our writing program has students craft a variety of writing for different purposes, including analytical responses to texts, creative narrative, and persuasive arguments. Students also enhance their speaking and listening skills through Socratic discussion, persuasive speeches and debates, and dramatic performances/read alouds of plays and poetry.

We offer full-year ELA courses in grade 9-12 at the college-prep, advanced college-prep, honors, and AP level. Our 12th grade students who opt not to take AP may choose from a variety of multi-level courses defined by theme and genre. These multi-level courses run the length of one semester and seniors are required to take two courses of their choice. In addition to full-year ELA classes we also offer semester long electives such as Film Study and Creative Writing.

We are in the process of revising our curriculum for more enhanced implementation of UDL practices. In the future, we would like to have more project-based learning, self-directed learning, and collaborative learning experiences in order to develop twenty-first century skills. In our current building we are limited with how we can collaborate and utilize technology and classes often have to spill out into hallways and other makeshift spaces. We need more open spaces that include flexible furniture and technology as well as spaces that support interdisciplinary learning opportunities. We also need to continue our independent reading program by providing shelves to display and store classroom libraries in addition to curriculum texts.

Last school year, we had 8 ELA teachers utilizing 7 ELA classrooms. The utilization rate of these classes was 81% over blocks A, B, C, D, E, F, G, and the flex block. We need to maintain these 7 classrooms in the new building. As we prepare for the future in education at Stoneham High School, we envision these 7 ELA classrooms to be inclusive, flexible, and collaborative. These ELA classrooms would include the following elements:

- Open shelving to display classroom libraries within each classroom to foster student engagement with our independent reading program, known as self-sustained reading (SSR)
- Adequate whiteboard space and bulletin board space to display student work and student-created resources such as anchor charts, graphics organizers, and word walls that are relevant to curriculum and learning standards
- Flexible technology that is seamlessly integrated and meaningful to the instruction in the form of interactive whiteboards and technology hubs for teacher- and student-directed instruction
- Open spaces that can be used as workspaces with possible moveable walls which supports creative and collaborative learning

- Furniture that is flexible and can be easily moved for project based learning, collaboration, and discussion

Additionally, our classrooms should include spaces that are reflective of the variety of courses within our department to increase student engagement and create a positive learning environment. We currently have classrooms with bulletin boards to display student created academic resources to enhance engagement and enduring understandings.

- Design response (TBD based on school design)
  - Access to library for extension activities such as research, access to technology, and space for interdisciplinary learning
  - Possible access to black box/theater space for speaking and performance activities
  - Adjacent to other ELA teachers for department collaboration

Angela Billings
Mathematics

The Mathematics Department aims to provide students with a solid foundation consistent with the principles and practices outlined in the Massachusetts Curriculum Framework for Mathematics. Through collaborative and independent learning, students will develop and use analytic thinking, critical reasoning skills, and technology to solve problems. Students will be prepared to address complex and challenging real-world problems and succeed in postsecondary education, careers, and everyday life.

In order to graduate from Stoneham High School, there is a requirement to pass four (4) mathematics courses that meet the following conditions: the courses involve four (4) full years or eight (8) semesters of study, including Algebra I and Geometry.

The department offers math classes at various levels including Advanced Placement, Honors, Advanced College Preparatory, and College Preparatory. Math teachers use various methods of instruction including whole group instruction, collaborative groups, and project-based learning. Math instructors use technology such as graphing calculators, document cameras, and SMART boards while presenting lessons.

When planning a new space for math instruction, classrooms should include flexible, large write-on walls where students and/or teachers could work simultaneously at multiple places in the room. In order to provide collaborative space for projects or small group discussion of math problems, the new space needs flexible, comfortable seating which can be moved if needed. Also, a breakout space for students to be able to use for small groups so as to not distract learning in the main classroom should be part of

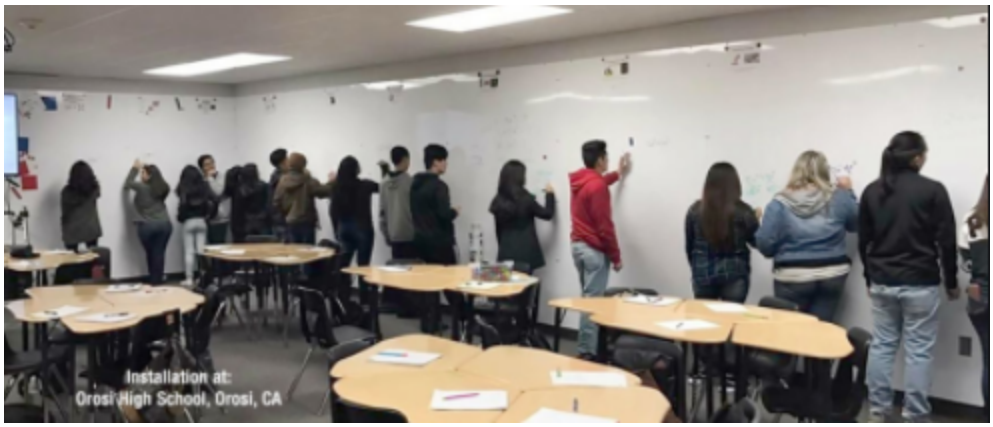
the new space. Classrooms should have storage closets for manipulatives and student supplies that are needed throughout the school year including graphing calculators, protractors, compasses, ruler, Cuisenaire rods, 3d figures used in Geometry class, etc.

Last school year, we had 8.2 math teachers utilizing 8 math classrooms. The utilization rate of these classes was 81.25% over blocks A, B, C, D, E, F, G, and the flex block. We need to maintain these 8 classrooms in the new building. Also, math classrooms that are adjacent/connecting with other math classrooms is most desirable as agreed upon by all of the math teachers to help with collaboration.

Other needs in the classrooms:

- Windows
- Phones that can call other classes, the office, the nurse, guidance, with an outside line, etc.
- Multiple electrical outlets for students' Chromebook chargers
- Adjustable temperature controls
- Clocks that are synced throughout the whole school building
- High quality white boards
- Lights that are NOT motion sensored
- Storage for all of the math textbooks that can handle the weight of the heavy textbooks

Below is a picture of a classroom that has large write-on whiteboards.



Lisa White and Teresa Socio
Science

The Science Department offers a comprehensive program designed to prepare all students for success as scientists and life-long global citizens. Our science curriculum is designed around relevant, real-world issues to increase student motivation, intellectual engagement and critical thinking. As students progress in their science education at SHS, they will build a solid

foundation of scientific and technological knowledge. Students will develop the ability to apply their knowledge to analyze and explain the world around them.

Our science courses will help to prepare students for civic life, postsecondary education and career success. Connections are made throughout a student's journey in their science education, starting with our ninth grade Earth and Space Science courses where students will learn about the Earth's place in the universe, Earth's Systems and the relationships between the Earth and human activity. Sophomore year, as students prepare for the Biology MCAS, they will continue their focus on the environment while adding the interrelationship between organisms and how they function. The standards expect students to understand the four core ideas of biology including; ecosystems, structure and function of organisms, heredity and biological evolution.

Junior year, students have a choice to continue the traditional science pathway to Chemistry, (where they will apply their scientific and mathematical skills and knowledge to focus on matter and its interactions, motion and stability as well as energy), and/or branch off to explore our diverse selection of electives, including AP and Project Lead the Way (PLTW) offerings. Senior year students can choose to continue with elective courses, or Physics. Our senior Physics course engages students with science and engineering practices of developing and using models, analyzing and interpreting data, using mathematics to solve problems and make predictions of a variety of phenomena such as motion, energy and waves.

The SHS Science curriculum is designed so that students develop an understanding of the science and engineering practices as outlined in the Massachusetts Science and Technology/Engineering Curriculum Framework.

Those practices include:

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating and communicating information

Stoneham High School is planning to offer a number of Project Lead The Way (PLTW) STEM courses to provide hands on, project based learning in three primary pathways, Biomedical

Science, Engineering, and Computer Science. The PLTW courses follow the same curriculum philosophy and methodology as our middle school PLTW STEM courses.

Biomedical Science - The Biomedical Pathway includes 4 courses. Stoneham High School began providing courses in this pathway in the 2017-2018 school year.
Principles of Biomedical Science, introduced in 2017, is the introductory course for our Biomedical Pathway. Plans to expand offerings in subsequent years are underway.

Engineering -The Pathway To Engineering curriculum includes 8 courses. Stoneham High School has begun by offering the following: Introduction to Engineering Principles, in 2019. This is the first course in the engineering pathway. This course is opened to all students in grades 9-12. Plans to expand offerings in subsequent years are underway.

We expect that our current science program will continue to evolve and be a place where students will voluntarily invest their time. In addition to expanding the STEM offerings from PLTW, we would like to include access to college courses, vocational training through collaboration, career exploration (internships/shadow days), along with the support and space for student-driven extracurricular activities such as robotics club and Science Olympiad. By reaching a larger audience of interested students through new opportunities, we hope to increase student engagement with the program.

As described above, the current science program at SHS offers both fundamental science courses and applied science/technology electives. Our core foundational courses are: **Earth Science** (8 sections no lab space), **Biology and Ecology** (11 sections with lab space), **Chemistry** (6 sections with lab space), and Physics (4 sections with work space). These courses are offered at multiple levels (CP, ACP and Honors) along with **AP Biology** (1 section every other year with lab space), **AP Chemistry** (1 section with lab space) and **AP Physics** (1 section with work space).

The scope of our elective courses is purposefully broad and includes: **Earth and Planetary Science - Astronomy** (1 section with work space), **Planetary Exploration** (.5 sections with work space), **Cartography + Geographic Information Systems** (.5 sections each, totaling 1 section with work space and computer extras), **Meteorology** (1 section with classroom space), **Oceanography** (2 sections with classroom space), **Geoscience** (.5 section with workspace), **AP Environmental Science** (1 section every other year with lab space), **Life Science - Anatomy and Physiology** (2 sections with lab space), **Genetics** (.5 section with lab space) and **Forensics** (1 section with lab space), **BioMedical Science - PLTW:Principles of Biomedical Science** (1 section with lab space), In addition, **Health** (4 sections with classroom space, **Health Careers (1 section with classroom space) and Current Health Issues** (1 section with classroom space) courses are offered to students at SHS. **Engineering - PLTW Introduction to Engineering Design** (1 section with work space).

The numbers of course sections being offered and the types of space required are summarized below. To accommodate the emerging programs at SHS, including Project Lead the Way, we would like to add an additional room into the design plan. Based on the projected student population, the new building should include eleven dedicated science and technology classrooms for the core and applied sciences. Please see the summary in the table below.

Science and Engineering Space Request

	Sections	Room-Type	Total
Life & PLTW Biomedical Sciences	17.5	Laboratory	4
Chemistry	7	Laboratory	2
Physics	5	Workspace	1
Earth and Planetary Science	13.5	Classroom and Work space with computer add ons	2
Health	6	Classroom	1
PLTW Engineering	1	Workspace	1

The current science program at SHS is accommodated in nine classrooms. Although the classrooms have been outfitted with the requisite equipment; the antiquated spaces provide varying levels of functionality. Improvements addressing safety, flexibility and student-usage will be requested in the new building.

On a daily basis, SHS science educators offer skill-building activities through their course curriculum. Technology is widely utilized in the science classroom for teaching fundamentals. Laboratory experiments with equipment are designed to complement and illustrate learning goals throughout the course with an emphasis placed on critical thinking and data analysis. Collaborative learning activities, including project-based assignments, are utilized to foster teamwork and provide a holistic view of a problem. Teachers model good laboratory practices for their students daily. Best practices are shared among our teaching community and innovative, new approaches are being discussed and employed regularly. Looking to the future, new instructional spaces that can be programmed to be flexible and better suit the needs of educators and students will benefit the school community as our science program continues to evolve.

In an effort to grow our program to meet current and future applications, the science department is requesting a total of eleven classrooms in the new building. Accessory spaces such as prep rooms, storage areas and educator collaboration areas should be programmed into the design as well. Each of the classroom's requirements will depend upon the type of science that is happening in that space and we have broken it down below:

Life Sciences and Chemistry: The six life science classrooms will need to be fitted with the following laboratory utilities: a dedicated laboratory space around the perimeter of each classroom complete with laboratory grade benches, sinks, plumbed for gas and electricity. Each bench will need to seat at least four students and should have its own local equipment storage area. To support the laboratory activities, the building will need associated prep rooms with fume hoods, a dishwasher for glassware as well as space for a specimen/reagent refrigerator and microwave. Prep space can be shared between 2 or more classrooms. All requisite safety equipment (shower, eye wash, fire blanket, proper ventilation, goggle UV cabinet, etc…) should be in each individual classroom/laboratory space. Note that the Chemistry laboratories may require additional design features.

Storage: flammable storage cabinet and chemical storage area. Glass disposal area,

The classroom portion of the room will have flexible seating - tables and chairs that can be moved and full technology set-ups including charging stations. The separation of laboratory benches from classroom activities is a safety and efficiency design feature that does not currently exist.

Physics and Engineering - These two classroom work spaces should be designed with ample bench and storage space to accommodate large pieces of equipment. In addition the layout should be flexible and allow for wide access to technology and electricity throughout the room.

Earth Sciences and Health - The remaining three classrooms will be designed with flexibility in mind. Movable tables for reconfiguration and full technology access are necessary.

A teacher space that can be dedicated or shared with other departments will be useful for common planning.

Jon Pohorilak

Social Studies

The core of the history department is the NHD day program which all sophomores and juniors complete. Around 300 sophomores and juniors participate in the project from the beginning of the year to January and in some cases into June. Stoneham is also working to incorporate state mandated civic action projects in Grade 10?. Economic students develop business plans and work with local entrepreneurs. As a result, the typical classroom space creates limitations for the project based learning already built into the social studies curriculum.

On a typical day in the social studies hallway students are spilling out into the hallways to record videos, work on projects, and do research. Social studies teachers also utilize the library consistently, though the distance between the classrooms and the library takes up class time. Locations close to the library would facilitate the indepth research that is required to complete NHD and other projects.

Social studies is about teaching democracy but currently the classroom set ups are undemocratic, without flexible space and focused on the teachers at the front of the room. Students need the ability to present from all areas of the classroom using technology and whiteboard.

As a result of the above curriculum needs the following spaces are needed.

- History Lab
- Storage space for the history lab and ability to bring at least a full class into the room to have space to bring two full classes to work on traveling parts of the exhibits - for all purpose room. House community panel for civic action projects.
- Classrooms need breakout space for NHD projects
- All purpose room for presentation of History Day work including about 100 annual exhibits and the view of many student documentaries and performances.

Jennifer Christopher

World Languages

The World Language Program at Stoneham High School offers three languages; Spanish, Italian and French. All three languages are offered at the Advanced Placement (AP), Honors, Advanced College Preparatory and College Preparatory levels. Although not currently a graduation requirement, the majority of students take World Language and the courses are considered core academic subjects. Additionally, Stoneham High School offers students the opportunity to earn the Seal of Biliteracy.

The World Language Department at SHS focuses on language acquisition through the specific skills of speaking, writing, reading and listening. The cultivation and advancement of those skills is promoted through various teaching methods, however, active learning is

paramount in our curriculum. Active learning in a typical World Language classroom at SHS includes: project-based learning, collaborative group work, student centered activities, independent/self directed skill building, utilization of numerous technologies, and daily partner/group work, to name a few. While delivering curriculum, it is imperative that our students have a safe, flexible and inclusive environment.

Our ability to deliver our interactive, dynamic lessons to students is impeded by our space (or lack thereof). Break-out, flexible, collaborative space is essential to advancing our curriculum and successful language acquisition for all our students. Our World Language classrooms and student centered approach fosters many other skills for students in both academic and real world spaces. Currently, our students use the hallways, floors, tops of stairwells and corners of classrooms for space.

Advancement in technology has allowed teachers and students to mirror the activities that occur in a traditional language laboratory. Virtual Language Lab software is available and students can speak, listen and record directly on their Chromebooks. Although newer labs are state of the art facilities, for our building, the square footage designated for a potential language lab would better serve the community in common areas. For example, space in a Media Center (where WL students record skits with green screens) or small conference areas (where WL students can practice AP and Seal of Biliteracy exams with authentic conversations). These types of spaces will be used by all students, across all disciplines.

Celeste Vaughan

School Counseling, Current Services and Programs:

Four school counselors provide academic advising, social emotional support, career exploration, and post-secondary planning services to all students at Stoneham High School. One of these counselors also serves as the school counseling department head. Because the department head is responsible for numerous administrative responsibilities and is also an active member of the high school leadership team, her student caseload is reduced. Counselors current caseloads range from 128 students to 183 students.

Upon entering grade nine, students are assigned to a counselor based alphabetically on their last name. This counselor assignment remains consistent from grade nine through grade twelve, to allow counselors and students to develop meaningful relationships, to assist in advising students through the annual course selection process, to counsel them through any academic or personal challenges which arise throughout their years in high school, and to facilitate the post-secondary planning process. The alphabetical split also enables counselors to build stronger relationships with parents and families, as counselors are likely to have siblings from the same families over the years.

In addition to individual support, school counselors provide services for students through the implementation of a developmental counseling program which is in alignment with MASCA (Massachusetts School Counselors Association) and ASCA (American School Counselor Association) standards. Guidance counselors implement this curriculum with all students through structured classroom lessons and individual 1:1 meetings, beginning with the eighth grade course selection process and continuing through students' high school graduation.

Classroom lesson topics include: mindfulness and stress reduction, goal setting, time management, study skills, annual course selection, understanding grade point average and the high school transcript, career exploration, and the post-secondary planning process (including standardized testing, the college application process, postsecondary alternatives to college, accessing financial aid and applying for scholarships). Because there are currently not adequate large group meeting spaces available, counselors frequently take time out of academic periods in order to meet with students in classroom settings. Counselors have attempted to utilize the cafeteria and the auditorium for these lessons; however, the acoustics and seating arrangements are not conducive to implementation. Counselors have also attempted to offer some of this curriculum to students during flex blocks; however with various enrichment programs and academic support offerings also offered during flex blocks, it has been a challenge to procure necessary meeting spaces.

To better support our students through the delivery of this developmental counseling curriculum, the department would benefit from a moderate to large sized multipurpose meeting space that contains flexible seating and allows for movement and discussion. It should be wired and equipped with presentation (and amplification?) equipment. Counselors could utilize this space for the implementation of curriculum, rather than taking away from students' academic instruction time, by scheduling these lessons in advance throughout the flex blocks. This would resolve the two current challenges of interfering with academic instructional time and not having sufficient time or space during flex blocks.

The counseling office also hosts approximately 80 college and university admission representatives each year. Representatives meet with as many as forty students at a time, or as few as two or three, depending on students' interest and their availability to participate). Currently, smaller meetings take place in the work/waiting area of the school counseling suite, and larger meetings take place in the lecture hall. The same multipurpose space that would be used for school counseling curriculum could also be used for these meetings.

Kim O'Connor

TEACHER PLANNING AND ROOM ASSIGNMENT POLICIES

Teachers teach 5 of 7 periods in a rotating schedule with at least one 69 minute planning period per day in our current schedule. Common planning time is also built into our schedule for all teachers once a cycle as an early release day to provide ample time for both department and interdisciplinary planning and collaboration.

The purpose of our current schedule is to support ongoing collaboration both departmental and interdisciplinary. The addition of teacher planning rooms and workspaces will enhance planning periods and common planning time for all teachers. We would like to implement more project-based learning and cross-curricular planning with spaces that are flexible and functional for both professional development and quiet planning time. These planning rooms should provide space for teacher materials and tools and be equipped with technology such as charging stations and copiers. These spaces should be located close to instructional classrooms to help facilitate the implementation of this planning within each department.

There are 4 program supervisors who serve grades 5-12 in the following departments: Math, English, Science, and Social Studies. Each program supervisor has an office at the high school building which is used to meet with small groups of teachers, store textbooks and relevant materials, and have confidential conversations and phone calls. These offices are essential for each program supervisor to have a space that supports their work such as planning and reviewing teacher evaluations.

Classrooms are assigned by a program supervisor. Rooms are assigned based upon the idea that rooms serve as the base for instruction and planning periods. Currently almost all teachers have their own classroom with the exception of a few shared spaces. When a teacher's room is being used during their planning period, work spaces are limited and are often not supportive to colleague collaboration or productive planning. Ideally we will continue with 1 teacher assigned to 1 room; however, in the event that a room must be shared, no more than 2 teachers will be assigned to a room and they will be within the same department. This is to foster a more student-centered, student-driven, student-created classroom environment specific to the course that takes place in that particular classroom and specific to nurturing the social and emotional needs of those students.

Space needed-

- **7** supervisor/lead teacher office space : Math, English, Science, Social Studies, Fine Arts/music, World Language, and CTE
    - This space should include square footage for book storage (i.e. the ELA department currently has over 6200 books)
- Teacher Planning/Lunch space

1) Teacher Planning – The District is proposing (23) 100 nsf Teacher Planning areas totaling 2,300 nsf, which meets the MSBA guidelines.
    - In response to these review comments, please provide information that describes the proposed location and adjacencies of the (23) Teacher Planning areas.

Response: While there are common teacher planning areas that may serve to meet some of the needs of teachers, these 23 smaller teacher planning areas will be necessary to accommodate a variety of needs not met in the common teacher planning spaces. Ideally, these 23 teacher planning spaces will be adjacent to the 23 classrooms planned for on the Space Summary. These spaces may be used for confidential virtual and telephone conferencing with parents and other specialists, since a more common teacher planning area would not allow for this level of privacy. Furthermore, a more quiet and private space would foster collaboration

among co-teachers and grade-alike teachers in the same subject without the disruptions and distractions that naturally occur in a common teacher planning area. Additionally, another benefit to these spaces if adjacent to classrooms would be to allow for quiet, small group instruction or testing to meet the needs of students on 504s and IEPs.

2) Collaboration Space per Neighborhood – The District is proposing (6) 500 nsf Collaboration Space per Neighborhood totaling 3,000 nsf in excess of the MSBA guidelines. Based on the information, and the proposed size of the General Classrooms compared to the square foot range allowed in the MSBA guidelines, the MSBA may participate in a portion of the overall proposed square footage associated with the Collaboration Space per Neighborhood.
    - In response to these review comments, please provide additional information that demonstrates how these spaces will be scheduled, staffed, and supervised.

    Response: There are 6 collaboration spaces of 500 nsf being allocated. If there were 6 neighborhoods each with a collaboration space of 500 nsf, we do not envision one entire space in the middle. We want the 500 nsf to be spread out to multiple collaboration spots next to multiple classrooms of different sizes and shapes, like an extension of the classrooms. Therefore, they would get the maximum use because multiple teachers and classes could use each at once with different amounts of privacy. We do not envision a Google form signout for each of these spaces. We anticipate these spaces to be saved and only used for current classes that might need them in that particular neighborhood at any teaching moment. This will foster organic extension of learning beyond the confines of classroom walls, promote collaboration among students and teachers, provide students space for self-directed learning (SDL), and enhance opportunities for universally designed learning (UDL). These collaboration spaces would be like real-world breakout rooms, allowing opportunities for diverse learning experiences all within the same “class.”

Kim O'Connor
PRE-KINDERGARTEN

Currently, the district provides special education services to our Preschool students in programs located in Colonial Park, Robin Hood and South Elementary Schools. Our integrated preschool classrooms are designed to educate children with a variety of disabilities as well as typically developing children. Within the integrated setting, students with disabilities are full participants in all program activities with supports and accommodations. Typically developing children are role models for language, fine and gross motor skills, and social and play activities. Together all children form a community whereby we learn from each other's strengths and differences. Diversity in our classrooms is appreciated, encouraged, and is an ongoing part of our everyday classroom life. Our preschool classrooms are multi-aged. Tuition students must be three or four years old on the first day of school.

Our preschool classrooms provide individualized programming designed from a developmental point of view and based upon the Massachusetts Curriculum Frameworks for Prekindergarten. The staff seeks to nurture the whole child by giving attention to all areas of development; physical, cognitive, language, social, and emotional. The curriculum emphasizes "hands-on" exploration and concrete experiences. Activities are often open-ended so each child can experience success at his or her own level of development. Play is considered an important aspect of our programming, and learning through play is encouraged through materials such as paint, blocks, sand, water, dramatic play, books, and manipulatives.

The average enrollment for our preschool program is 100 students per year and has been expanding over time. The district is seeking to relocate to the high school campus and provide additional space for its growing preschool program. Preschool services are mandated through state and federal law and are becoming a growing service that most schools provide. These spaces must also include room for role model peers as we seek to provide inclusionary options for our preschool population. These role model students are a vital function of our inclusionary vision for preschool that is currently restricted by our lack of space district-wide. Having all our preschool programs together will allow for shared resources (therapies, materials, curriculum, staff, etc.), as well as greater opportunities for collaboration as we expand and enrich our programs. We also envision greater curriculum development and alignment amongst the preschool team.

A component we envision adding to the preschool program is before and after school childcare. There is high demand for childcare and our current lack of childcare is a barrier to many families in Stoneham who would otherwise attend preschool. Along with offering childcare, a consolidated preschool space would allow for more programming options for preschool families.

Another important part of our vision for the new preschool space is a merging with the existing FACS Child Development Program at the high school. This program promotes early childhood education to students wishing to go into the vocation. An essential

component of the program is an opportunity for third-year students to co-op in the SPS preschool program. Having both programs in the same building will greatly enhance the experience of students in the FACS Child Development Program.

The ideal space for the preschool classrooms would be located on the outer edge of the building's footprint with an adjacent playground.

This space would include:

- 8 to 10 classrooms spaces designed to be age appropriate for preschool students with BATHROOMS
- Administrative office
- Reception area/ secretary space
- Teacher's collaborative space
- Teacher lunchroom
- Student lunchroom
- Outdoor Playscape
- Indoor Play area
- Speech and language office
- OT/PT Suite
- Social worker space
- BCBA space
- Nurse space with space for students
- Conference room
- Sensory Room
- Space for the high school child development class nearby.

  When designing the space, access for diverse student populations should be considered. This would also include ensuring any playground equipment is inclusive of different abilities, skills and needs. Access to the preschool space for parents/guardians along with convenient drop-off and pick-up spaces should be considered.

1) Pre-K Space requests:
   a) Preschool Program (13,975 nsf):
   b) (8) 1,200 nsf Pre-School Classrooms with toilets/changing (15 students)
   c) (2) 175 nsf (totaling 350 nsf) Observation Areas: Childcare Development
   d) Pathway
   e) (1) 400 nsf Pre-School OT/PT
   f) (1) 150 nsf Pre-School Director Office
   g) (2) 250 nsf (totaling 500 nsf) Pre-School Speech/Language
   h) (1) 350 nsf Pre-School Conference Room
   i) (1) 275 nsf Reception Area with Secretary
   j) (1) 300 nsf Teacher Work Room/ Collaboration
   k) (1) 600 nsf Student Lunch Room

l) (1) 150 nsf Social Worker Office
m) (1) 150 nsf BCBA Office
n) (1) 350 nsf Nurse
o) (1) 350 nsf Conference Room – In response to these review comments, please clarify the use of this conference room and how it differs from the proposed (1) 350 nsf Pre School Conference Room identified above.
(1) 450 nsf Sensory Room

Response:
The first Pre-School Conference Room is for holding the IEP and Progress meetings for the students in the preschool. The second Conference Room is for use by the staff to complete the required evaluations for incoming preschool students to determine eligibility for special education students.

2) The MSBA's participation will be limited to Preschool classrooms only, and potentially Pre-School spaces dedicated for special education, provided that the District submit additional information that further describes the proposed number of students, daily/weekly schedule,special education program, and space utilization impact on the schools in which these programs are currently housed. Please note that upon selection of a preferred schematic, the District may be required to adjust spaces/square footage that exceeds the MSBA guidelines and is not supported by the Educational Program provided.

Response:
We currently have 7 preschool classrooms (3 integrated half day classrooms each running a morning and afternoon program, 2 integrated full day classrooms, 1 hybrid full day classroom that is integrated for half the day, and 1 substantially separate full day classroom) across all three elementary schools in Stoneham.

School 20-21	**Schedule**
Colonial Park AM/PM Remote	5 Day/Week AM (M, T, W, TH, F 8:40-11:10) and 4 Day/Week PM (M, T, TH, F 12:10- 2:40)
Colonial Park Full Day	5 Days a Week (M,T,TH,F 8:40-2:10 and W 8:40 - 11:40)
Colonial Park AM/PM	5 Day/Week AM (M, T, W, TH, F 8:40-11:10) and 4 Day/Week PM (M, T, TH, F 12:10- 2:40)
South Full Day	5 Days a Week (M,T,TH,F 8:40-2:10 and W 8:30 - 11:40)
South Substantially Separate Full Day RISE	5 Days a Week (M,T,TH,F 8:40-2:10 and W 8:40 - 11:40)
Robin Hood AM/PM	5 Day/Week AM (M, T, W, TH, F 8:40-11:10) and 4 Day/Week PM (M, T, TH, F 12:10- 2:40)

Robin Hood Hybrid Full Day (½ Integrated, ½ Sub. Separate)	5 Days a Week (M,T,TH,F 8:40-2:10 and W 8:40 - 11:40)

Last year these classrooms serviced over 105 total students, including 57 students with special needs. In addition we have a significant number of additional students who come to the preschools for specific services including speech and language and occupational therapy.

The preschool program in Stoneham has grown and changed over the years as a response to an increase in the number and needs of the students it serves. The preschool has grown from five classrooms across two school buildings during the 2015/2016 school year to seven classrooms across three school buildings by the end of the 2019/2020 school year. Given the increasing complexity of the needs of the preschool special education students in the district we have eliminated the 2-3 day a week programs and all programs now are 4-5 days a week. In addition more special education students now require full day instead of half day programming. These changes required us to create more preschool classrooms to provide the services required by students' IEPs. Even with the current configuration of 7 classrooms, there are often times when we do not have enough space in a particular classroom during the year. Last year the district had to open a new integrated preschool classroom midyear. In addition, the growing number of students that require a preschool substantially separate classroom will likely require the district to add an additional classroom later this year or next year. We anticipate an enrollment next year of over 55 special education students and over 60 typical peers in the integrated preschools and 10 substantially separate students in the substantially separate program. Given guidelines from the department of education this enrollment would require at least 8 preschool classrooms.

Currently all of the town's three elementary schools house preschool classrooms. Moving the preschool classrooms out of the elementary schools will free up much needed space. Over the last five years, kindergarten to grade 4 enrollment has increased by 5% in schools which were already close to capacity. This has necessitated adding sections to some grades. Also, additional required special education programs and interventionists were added to the elementary schools. Moving the preschool program classrooms to a unified location at the High School helps to avoid overcrowding and the need for having to approach MSBA for funding for an additional construction project at the elementary level.

Kim O'Connor
LUNCH PROGRAMS

Stoneham High School has a full lunch program that serves the high school population during two to three lunch periods depending on capacity and scheduling serving over 200 plus students each lunch period. The district runs a contracted nutrition services program (currently managed by Aramark Corporation), and students have multiple options each day for lunch. There are hot lunch lines, pre-packaged salads and sandwiches, and an additional short option

line for a la carte options. Breakfast is also available for students in the morning.
The high school cafeteria kitchen also works additionally with the elementary schools to provide lunches for those students. The high cafeteria kitchen serves 394 students at Robin Hood Elementary School, 355 students at South Elementary School, and 264 students at Colonial Park Elementary School.

Currently the high school has a 30 x 10 foot freezer adjacent to the building that allows for frozen storage for all 5 schools when large quantities are purchased, as in the other schools there is not enough frozen food storage. This freezer storage needs to be accessible for van loading to be delivered to the other schools on a daily basis. THIS IS A MUST!
The school's cafeteria is in the main level, and is not surrounded by classrooms, it is on one of the far sides of the building. The proximity to the classrooms/lockers can have a negative effect on those students during lunch periods as it has students rushing too much, although it would also not be conducive to be too close to classes as to disrupt.The cafeteria's location also causes it to be under utilized during the remainder of the day, including before and after school. A more central location to the entrance would be more applicable.

Needs for Cafeteria:

- Space for large freezer
- Space for two walk-ins
- Locker and changing room with bathroom
- Laundry area
- Dry Storage area
- Director's office space
- Dishwashing station
- Current line and preparation space is adequate

Cynthia Shaw
TECHNOLOGY INSTRUCTION POLICIES AND PROGRAM REQUIREMENTS

At Stoneham High School we believe that all students, regardless of their future goals, will need a working knowledge of technology application and use in the world around them. With the implementation of the 1:1 program at the high school, technology is a tool that is embedded into much of the daily work of our students and staff. The district technology goals focus on the following areas:

- **Classroom** –Digital Citizenship, Creativity, Collaboration, Communication, Instruction, Assessment, Assistive Technology
- **Access**-Staff and students have access to current technology tools 24/7. Building based technical and instructional supports are available.
- **Skills**-We provide resources to staff and students in support of their use of technology. A variety of professional development opportunities are offered that are timely, focused, and on-going. Teachers are proficient in supporting student use of technology
- **Environment**-Policies, Culture, Finances, Security and Data Management

Our goal in how technology is used at SHS is consistent with the goals stated above, that technology is a necessity that holds the potential to enhance teaching and learning in profound ways.

Technology is managed through the Information Technology Department, which consists of one district network administrator, a Data Manager, one Data Specialist, a technical support staff of five, an Instructional Technology Coach at the Middle and High School, and technology teachers at each level. The Assistant Superintendent of Curriculum and Instruction oversees the Information Technology Department. We are a 1:1 district for K-12 students.

Currently, Stoneham High School is in its second year of its implementation of 1:1 access of mobile devices for all students and staff. All students in grades 9 through 12 have been issued Chromebooks. All teachers are issued a Windows desktop, laptop or Chromebook device. Students and teachers have limited access to loaner Chromebooks through the library and there are also a few Chromebook carts available for sharing within academic departments. (ipad availability, mac lab).

District-wide we have an upgraded infrastructure to handle up to 4000 wireless devices. The Technology Department has also installed UPS units at all schools and in all tech closets to minimize downtime during power outages and protect equipment. They have repurposed an old video server to host images for all models currently in use in the district and replaced the out-of-date server at HS with a newer version. Other items also need attention to bring our technology up to speed such as new servers and switches to replace older units and older desktops used by teachers need replacing.

Instructionally, the integration of technology and the promotion of best practices are supported by a 1.0 technology coach and the library teacher who are part of the district's Information Technology Department. Teachers use technology in a variety of ways throughout the high school. The 1:1 program has brought with it professional development, new software and apps, and resources to promote a more hands-on, differentiated, innovative environment in the classroom. The use of Google Suite for Education allows teachers to organize, store, and present class materials and assignments electronically, making best use of student access. Additionally, the promotion of digital forms of presentation, assessment, research, communication, and writing have all been emphasized with the 1:1 program. Although a new school schedule was adapted last year to include additional common planning time, more time for teachers to collaborate, share, and explore technologically is always needed.

Teachers participate in technology related professional development at the start of each school year as well as one PD day being set aside mid-year to further explore and practice both new and current technology. Additionally, teachers are encouraged to attend technology classes that are offered in-house or through outside agencies such as the Salem Collaborative Project.vo

Our proposed education objective in regards to technology is to expand course availability and to offer new and exciting courses and experiences for students. Currently, computer applications, computer science, film editing and photoshop courses are taught in various classrooms throughout the building without any cohesiveness and little collaboration. This layout was not created by design and intention but more by the constraints of our current structure. At this point in time, we are not able to expand these courses and programs due to our limited space capacity and limited technological capacity. Our vision for the future is one of connected technology spaces that can be used for multiple purposes that allow us to create various technology pathways for students and be able to support teachers in their need for Professional Development that is technology-centered. We envision a robust environment where teachers and students work collaboratively and have access to state of the art technology that includes topics such as AR/VR, gamification, and data security/analytics.

A cybercafe/student-run help desk area that students staff would integrate their CTE/computer science coursework with hands-on, real-world experience. This cyber cafe/help desk would best be suited to be near the library/commons area as well as in close proximity to the technology area where students can interact with the technology staff for support and continued help. Having updated equipment and classrooms to serve our special populations that offer them the newest assistive technologies are key to providing the highest level of access to the Rise, Stride and EL student populations. Our vision is to have a multipurpose technology area that can support various pathways to create an innovative, sustainable technology program.

Creating a Professional Development Lab/Technology Area for teachers to collaborate or

create and test technology for use in the classroom would improve their access to technology training. Having an area to create videos, use green screens, have access to better video and audio recording would help to promote remote readiness and online learning for them.

The current high school structure, with limitations on connectivity, power, storage, collaborative spaces, and open classrooms inhibits teacher creativity and student learning using technology. For technology to be more fully and effectively integrated, teachers need to have more reliable access in spaces that promote collaboration, creativity, and communication. Increased support through more robust professional development is also key. A new high school with a strong, scalable, and advanced infrastructure, would be beneficial for classroom instruction and teacher training and collaboration.

Danielle Catalano
ART PROGRAMS

Stoneham High School recognizes that the arts are a vital component of 21st century learning. The arts prepare our students with the skill set they will need to become successful, well-rounded thinkers. Our philosophy is aligned with the Massachusetts state standards which center around the principles of Creating, Presenting, Responding and Connecting. We offer a program of rigorous, relevant courses that support social and emotional growth, promote family and community engagement, are inclusive, make connections across disciplines, represent diverse cultures, and foster artistic literacy. Strong Arts = Strong Schools = Strong Towns.

Our vision for the Visual Arts Department in the new building is one of an expansive space with room to grow. We are lucky to have so many class offerings in our field, but the types of classes are limited by the physical space. We'd like to see a Fine and Performing Arts wing that also includes media and audio/visual spaces. We are fans of the CTE model for the arts, as it enables all stakeholders to see the value of a strong arts program.

Current classrooms in size and number are adequate for our current program enrollment. Our worry, as we visit these newer schools, is that we are going to lose this

important space. Art rooms are not like other classrooms - there is constant movement and activity, with students working on large pieces both in groups and independently - we need space to spread out. Our square footage requirements are more akin to a gym class as opposed to an academic classroom. We're not really happy with what we've seen at other schools so far.

Basic Needs for Art Rooms:

- Designated Ceramics room with proper ventilation (see notes on ceramics below)
- At least 3 art rooms
- North light would be lovely. But simply adding windows would be a major improvement
- Adequate storage space for large materials and large works - ie 24"x36" flat files and multiple shelving units
- Adequate classroom space for 28 students per course, unless our union negotiates smaller class sizes
- Space for SmartBoards or whatever the current technology will be
- Adequate storage space for supplies - ie a wall of shelving units
- Storage closets
- Adequate outlets and in logical places - maybe even in furniture
- At least 3 sinks per room
- Adequate counter space for things like paper cutters and power tools and such
- Kiln not in the basement

Notes on the Ceramics Room:

Right now our ceramics room is also used for Art 1 classes. This is tricky because clay dust gets everywhere, including on projects from other classes. Clay rooms are wet environments, and using them for other purposes is not ideal. Our ceramics program is hugely popular and growing every year, so a designated space just for these classes will allow us to expand appropriately. For example, right now we have 2 throwing wheels in class sizes where 8 wheels should be the norm. We would ideally like one wall of the classroom to be a designated throwing space, as it can get messy. We'd like the sinks to have clay traps and we'd like enough floor space to house our large equipment, such as our slab roller, pug mill, clay cages, and glaze buckets. A connecting outdoor space for raku / barrel firing would be great. The kiln should be in its own space with plenty of shelving for stilts and cones and clay carts. A closet for storing clay and molds is also necessary.

Sean Perry and Jack McShane

MUSIC AND PERFORMING ARTS PROGRAMS

Stoneham students are confident, creative, and balanced. The arts in our school are central to that developmental goal. The school has a sizable theater arts program and a thriving music program. Presently the performing arts program serves 23% of our student population, but each year that number continues to rise as interest in these programs and classroom numbers grow. Stoneham recognizes that the arts are a vital component of 21st century learning. The arts prepare our students with the skill set they need to become successful, well-rounded thinkers.

Stoneham High School students can currently take courses in art, music and theatre. After school, the students have multiple opportunities for artistic clubs and organizations. The most populated of these organizations is the drama club program. The club currently consists of 70 students annually between our technical theater and acting program. The Stoneham High School theater department consists of an acting ensemble and technical crew. The technical crew includes departments that specialize in theatrical lighting, hair and make-up, sound, construction, stage management, props, and house management. Some students have also assistant directed performances and written short pieces to be performed by students. Students involved in crews work collaboratively with their adult instructors to design and construct multiple uniform theatrical pieces throughout the year. These students plan, build, and take part in three productions a year under the supervision of a technical director, director, assistant director, music director, as well as countless adult volunteers. Productions include a fall play, a winter festival, and a Spring musical. During the winter festival the Stoneham High School Theater Department participates in a state-wide festival hosted by the Massachusetts Educational Theater Guilds (METG). Over the years the club has been very successful in this competition and has won multiple awards at the Semi-Final and State levels. Most recently in 2017 the Theater Department made it to the State Finals with their performance of Kindertransport. The METG presently considers us to be a “tier 2” school (scale is from 1-4). Many of our students who participate in the theater arts program go on to pursue the arts in colleges throughout the country.

Currently the school offers an introduction to theater arts course. This course enables students to develop acting skills through the study of improvisation, stage movement and character development. Students work on voice production, diction, script analysis and directing, using monologues and short scripted and unscripted scenes. The course may be repeated for more in-depth study and development. The Theater Department works closely with the visual art and music programs to collaborate on performances. During this past year’s METG festival, students from the concert band program created and won an award for their original score for the drama

club's production of The Veldt. Once a year the theater department and music department collaborate to offer students a musical theater cabaret.

The Stoneham High school Music department consists of three performing arts classes. Classes include jazz band, concert band, and the Spartan Chorale. All classes are offered at the College Prep, Advanced College Prep, and Honors Levels. The Music Department has been steadily growing in the past three years. Since 2018, the program has grown 231%. Individual music students have been accepted to the northeast district music ensemble for band and chorus. The jazz band, concert band, and Spartan Chorale were preparing to perform in their first competition since 2008 this past year, 2019-2020 school year. In the past, the program has performed at Disney, the Trills and Thrills music festival, MICCA, and the UNH Jazz Festival. Jazz band, concert band and chorus perform at the high school football games, Veterans Day Ceremony, Martin Luther King Jr. Celebration, Memorial Day Parade, Carnival Ball, May Arts festival, winter and spring concerts, as well as various school and town community events. All three performing arts groups are always looking for ways to become more involved in community events.

In addition to these performing arts classes there are two general music courses. These courses are music appreciation and 20th century pop. Music appreciation is a course that studies music from its first known creation by the Ancient Greeks to the music of the 1900's. This class focuses on a more "Classical" tradition of music as well as music from other areas of the world. 20th Century Pop is a course designed to continue instruction from the Music Appreciation course. 20th Century Pop starts with blues and jazz music of the early 1900's. The course discusses music's transformation throughout the decades as a result of historical, social, and cultural reforms.

The physical space inhabited by both the music and theater departments is severely outdated and in dire need of attention. These areas simply do not support the needs of either program adequately. Both programs continue to grow in numbers and enthusiasm, but are capable of much more than the physical space allows for. Currently the theater arts courses are held in the band room, which due to the tiered nature of the room offers no ability for movement, scene work, or performances. The auditorium is an important part of the work that is done by the theater department, but the space and technology are highly outdated. Lighting and sound equipment are extremely outdated and need to be improved in order to function for a 2020 space safety. The stages lighting electric lines and lighting fixtures are all stage pin extensions, which is outdated and doesn't offer the appropriate amount of yield or performance necessary for an impressive production. The present stage offers only three electric lines, however none of them work properly and lighting is often spotty and lacks color and form. Our current sound

system is currently analog and is outdated compared to most digital systems. Currently anyone who needs to focus or work on lights would need to climb a 20-foot completely vertical metal ladder to access the lighting loft. The other option is to access a cherry picker from another part of the building that is shared with the janitorial staff. The sound and light board is currently located in one singular space, rather than two separate areas of the auditorium. This booth includes little room for the massive amount of technology necessary for both departments. The lighting/sound boards placement at the far back of the auditorium and its open construction often makes for some distraction during performances. Acoustics within the auditorium and bandroom are not conducive to quality performances/rehearsals and the current heating system (when it functions) drowns out the performers. Due to the current placement of the Theater Departments construction workshop in the mostly-inaccessible basement, production crews must take place on the stage which could become a safety and cleanliness concern. The current workshop space is only for heavy construction and therefore there is no adequate space for other crew departments such as the costumes department or hair and make-up to conduct their work effectively. An increase in space is necessary for the lights, sound, and hair and make-up departments to succeed and thrive. A further struggle felt by the theater department is that there is not adequate storage space for technical theater technology and building materials. The program seeks to conduct its technical work in a safe environment. Presently not having a separate space to build sets and run rehearsals makes it impossible to hold both at the same time. Performers run the risk of stepping on a left behind nail or bumping into a partially built set piece. Currently students have no safe or secure place to change their costumes before, during, and after performances. Make-shift dressing rooms have been made available and this space is often difficult to come by. The current space does not offer students a restroom that is within close proximity. In order to move from stage right to stage left (which is often necessary during a performance) students must pass behind a crowded, dark, one foot channel between the cyc curtain and the auditorium wall. Despite glow tape this is unsafe. Many of the seats in the auditorium are broken and unable to be used for the public. The incline of the seating does not allow for adequate views of the stage, there is also a lack of handicap seating as well as an area for our pit band to play during performances without completely blocking the view of the audience and drowning out much of the action onstage.

The present auditorium and band room accommodates not only for music and theater rehearsals and performances, but also for classes and school/community events. It’s a busy and tired space. The addition of a Black Box performance space would drastically improve future performing arts programs by offering more room for alternate courses and more space for community and school usage. This space could also serve as a part time drama classroom during the school day. The theater arts and music departments hope that an alternate black box

space will help both programs continue to grow successfully with the option for new more intensive courses, new clubs focusing in music, theater, technical theater, improv, and dance. As the school grows it's important that the Performing Arts and the needs of its students also grows and is not only seen as a club but an actual professional area of study that can be pursued after high school. Not only could performing arts departments benefit from such a space, but it could be used by any department. For example the english department could use it during Shakespeare units and social studies during large group projects or guest speakers. It would be wonderful for debates, assemblies, school organization meetings, public speaking or presentations of any kind [see list below]. Theatre classes would have a more appropriate rehearsal space making their performances more professional. Community organizations could benefit from holding events in both the black box as well as the auditorium. Having an improved auditorium space would no doubt improve the safety of students when using the provided technology.

The new auditorium should have 3 to 4 dmx theater electric lines with a total of 30 channels. It is important that these electric lines be able to be manually dropped down to the floor using a fly system, allowing for students to work on lights rather than using a ladder or cherry picker. A set construction and storage room that is close to the auditorium as well as a loading dock for easy transportation of sets and materials. All theater riggins (curtains legs, Cyc, etc.) should be able to fly in and out using a fly system accessible from both backstage and in the back of house lighting board. Auditorium theater should be raised seating with entrances and exits on the first and second floor. Separate sound and lighting booths with up to date board technology should be located at the back of the house in a boxed in setting. The Band should have a lowered pit at the very front of the house in front of the stage for musical performances. The black box, band room, hair and make-up rooms, and dressing rooms should be located close to one another so that they can be used as green rooms for performances. Stage should include two stage right and stage left leg curtains as well as a mid stage full traveler and front proscenium curtain with a proper cyc curtain. A projector at the back of the auditorium should cover the whole cyc for visual effects.

The physical space inhabited by the music and theater department is severely outdated and in dire need of attention. The current band/chorus room does not have a heating system, mounted projector or smart board, limited wifi connection, no safe or functioning office space (the ceiling is missing and there is no ventilation or windows), lack of storage for large brass instruments (Tubas and Sousaphones), marching percussion (Marching Bass Drums, Snare Drums, Quad Drums), and percussion instruments (ex. Timpani, mallet percussion, etc…), lack of usable piano's as well as appropriate piano storage. In its current form the 1,936 square foot band/chorus room holds all the music equipment, sheet music, and is used for five different

curricular classes. If our current growth of 231% over the past 3 years continues, the performing music program would have 117 students annually in five years time assuming that this trend continues. Currently there are 67 students in the Middle School Concert Band and 50 students in the Middle School Chorus. In the upcoming 2021-2022 school year there is potential for the both the band and choral programs to double in size (26 students in Band and 20 students in Chorus). When designing rehearsal rooms, remember that music is a physical activity. Instrumentalists need space for their instrument and the elbow room to play it. Choir members need space for vocal exercises and choreography. The space must also accommodate equipment and traffic flow.

In addition to performing arts classes, the music room will also be utilized as a classroom. In order to maximize instruction times, the music room must be set up for Band, Jazz Band, Chorus, and elective activities (Theater Arts, Music Appreciation, and/or 20th Century Pop) at all times. General music class sizes range from 10-25 students per class. There are currently 50 students enrolled in these classes in the 2020-2021 school year. More space and appropriate storage would be needed to accommodate the needs of the music program.

Improvements need for music

- No adequate space for band growth
- Band room not appropriate for choral rehearsals
- Too many non functioning and outdated equipment pianos etc.
- Acoustics
- Placement of band room
- No risers or safe risers
- Band uniforms
- Storage

Community Involvement in new spaces				
Greater Boston Stage Company events and performances	Collaboration with Stoneham T.V.	Martin Luther King Jr. Celebration	School Assemblies	Band/Chorus Concerts

Open Mics	May Arts Festivals	METG Festival	Guest performers and speakers	Dance and Cheerleading competitions
Performance arts Summer camps	Middle school/elementary school engagements	Town Meetings	Town movie showings	Elections
New Clubs	Dances/shows/events for Senior Citizens	Adult Workshops	College technical theater internships	Carnival Ball
Sports Banquets	Honor Society Banquets	Senior Tea	Music and Chorus Competitions	Rained out Town Concerts
Fundraisers/Charity Events	Pageants "Ms. Stoneham, Mass."	Auctions	Senior All Night Party	Magic Shows/Hypnotist
Poetry Slams	Cabarets	Comedy Shows	Dance classes added to curriculum	

1) Interdisciplinary Project and Performance Room – The District is proposing (1) 2,000 nsf Interdisciplinary Project and Performance Room in excess of the MSBA guidelines. The information provided indicates this space is intended "to support student performance, guest speakers, seminars, interdisciplinary collaborative activities and presentation and showcasing of student work".
    - In response to these review comments,
      please provide additional information that demonstrates how this space will be scheduled, staffed, and supervised.

Response: This multi use and multi purpose room will be a vital component for interdisciplinary activities within a multimedia space. This space will support learning activities from core academics to music and theatre based courses currently offered at Stoneham High School. We see this space an essential component of our educational delivery to allow for midsize group activities, speakers and presentations as well as an enhancement of our English, Social Studies and Theatre Programs. Such programs include, Shakespeare presentations, National History Day and Science Fair.
In closing this space will also enhance opportunities for students involved in the tech theatre to develop their skills in the area of set design, lighting, costume, etc. The

Interdisciplinary and Performance room would be supervised and maintained by members of performing arts educators. The technical theater students under the direct supervision of educators will be responsible for maintaining lighting and sound equipment. House management students will be responsible for preparing the space for different groups. SHS envisions the space to be a collaborative space for teachers and students across all grades and disciplines. Afterschool community members will also have the opportunity to reserve the space for functions and activities.

Dave Pignone and Sara Swett
PHYSICAL EDUCATION PROGRAM

The Physical Education program is an integral part of the total educational experience at Stoneham High School. The curriculum is designed around the concept of fitness education. Healthy bodies are essential to healthy minds; in order to be ready to learn, students must have proper health, nutrition, and exercise. The learning experiences are developed to fulfill the growth, development, and behavior needs of each student, teach students the elements of physical fitness and how they can maintain physical fitness throughout their adult lives. The Physical Education department provides 45 classes over two semesters and are designed to meet the needs of all students.

The gymnasium is utilized year round through school and community use; All PE classes, large school gatherings such as the pep rally, call orientations and rain date graduation, varsity/sub varsity athletics as well as community youth sports' programs. The current gymnasium is very outdated and does not have air conditioning or good ventilation. There are four heaters, but only one works, with repairs being a consistent and temporary remedy. The space is outdated with regard to technology and sound and does not support integration of educational technology or appropriate acoustics.

It is very important to provide SHS students with adequate locker rooms to change into proper athletic wear for their Physical Education classes. Currently there is one large boys locker room that has a large open shower area in the middle splitting the locker room into two spaces. The women's physical education locker room is a large confusing maze. It is made up of lockers on the outside walls, while in the middle of the room is designed with multiple changing rooms attached to showers connecting to the next changing stall which connects to the next shower. Most of these spaces no longer have curtains or have a makeshift curtain to provide privacy. We currently have one office for staff in both locker rooms for teachers to share. This space is important as well. Teachers not only need a home base, but need an opportunity to monitor behaviors in the locker room without awkwardly standing in there making people uncomfortable.

As mentioned above our gymnasium is used for multiple sports programs. In the fall season it is the home to three levels of volleyball. We currently are able to have our varsity court align within the varsity basketball court, providing a great varsity court with bleachers for spectators. We set up two side courts, one for JV and the other for freshman. During inclement weather the

gym will then host every fall teams practice from football to soccer, field hockey and cross country.

Winter is when our gymnasium is at its peak use and capacity. The current space is utilized to provide safe and adequate training and practice space as well as that for competition and spectators The gym hosts practices for all of our boys and girls winter sports teams excluding boys and girls hockey, however, including our Indoor track teams, which run between both teams approximately one hundred and twenty athletes, and you have many athletes running and training up and down our hallways in the main building, doing whatever they can to find space.

Gymnastics is an essential component for a gymnasium beyond twelve thousand square feet. Our Gymnastics Team is an established program of over fifty years. Though a specific gymnasium room could be considered, our concern would be that it would be underutilized in times other than Gymnastics season. Therefore a setup similar to our current gymnasium where the gymnastics space is part of the overall space is recommended. It has a 42' x 42' spring floor that goes down and it becomes strictly the gymnastics space and area for all related gymnastic equipment. This arrangement allows us to safely run Gymnastics as well as support our other winter athletic programs. When the season is over we now have much needed extra space in our gymnasium for the other school and community programs, teams and entities that utilize this space for the remaining eight to nine months of the year.

Currently the one issue we have in our gym is that our gymnastics floor, once set up for the season, extends very close to our varsity basketball court. It lies about four - five feet from our out of bounds, and is a possible trip hazard for our athletes or game officials. Consideration for additional footage is required to remedy this concern.

In the spring the gym becomes an indoor practice facility for boys and girls lacrosse, outdoor track, baseball, softball and boys and girls tennis. Depending on the weather, this use of the gym is typically one to two weeks. We set up an indoor batting cage for basketball and softball in the gymnasium where gymnastics used to be. This cage is hung on cables that are attached from one end wall to the other. And slides in and out when used

A big concern with current and future space is making sure there is appropriate storage for both PE equipment and our athletic programs. Making sure there are locker rooms separate for physical education and athletics. We currently have beyond the boys and girls physical education locker rooms, 2 boys athletic locker rooms and 2 girls athletic locker rooms. These locker rooms function much differently than a physical education locker room as it houses many more students at one time and is utilized to hold individual athletic equipment for extended periods. We currently have 2 team meeting rooms where teams can hold large meetings, watch game film and review game plans, as well as 3 coaches offices shared amongst all of our coaches from one season to the next. Thoughtful placement of Athletic Team Locker Rooms, Team Meetings spaces, Trainers office and Coaches Offices to gymnasium and athletic fields

while also eliminating or significantly decreasing access to the Main building and academic classrooms is critical.

Our weight room is a great space, unfortunately, it is not user friendly. As it is now, it is a great strength and conditioning space. Which we need and do not want to lose, but we do think it is important for our PE classes as well as our school community to have a fitness center combined with strength and conditioning. A space that can have a circuit of machines along with cardio options such as treadmill, ellipticals and bikes. The foundation to what we teach in P.E. is the fitness component and having a user friendly room would be tremendously helpful.

In our new gym we hope to see not only these issues addressed, but other improvements as well. The new facility should include separate teaching areas for yoga/mobility exercises. With education leaning towards a universally designed approach as well as a push for social emotional needs, having separate spaces for students to access and exercise will be vital to their education and well being.

Physical Education Wish list

Gymnasium - main basketball court for varsity games. Bleachers to pull out for spectators fitting approx. 600-700 spectators or student body for large events such as Pep rally. Would like to have 3 side courts. If we build a 4th side court it would provide enough space for Gymnastics.

Suspended track - This is a great thing to have for many reasons. PE classes that have many students choose to walk for their activity or have a medical and can not participate in the class activity choose to walk (today they walk around the gym and are constantly benign careful not to interfere with the class. There are many PE activities with fitness as our foundation that would utilize this space. It provides space for many athletic teams to warm up or train while another group might be in the gymnasium, especially our indoor track team that has runners looking for space to safely run and are in our hallways now.

Gymnastics room - if the gymnasium is not big enough to add gymnastics space (which is our first preference) then this room would need to happen. large enough to fit a 42’ X 42’ spring floor as well as other gymnastics equipment, such as beams and uneven bars, along with a vault (with a runway approx. 70 feet long) and a small area for spectators 50-60 people.

Extra large storage area for all this gymnastics equipment. We would like to use this room as something else for the remaining 9 months so we need a very large storage space for gymnastics.

Fitness/strength and conditioning room - user friendly for all - large enough to service a team of about 60 kids at once

1 male PE locker room with Bathrooms - accommodate approx. 50-60 boys
1 female PE locker room with Bathrooms - accommodate approx 50-60 girls. Small lockers as it is just to change for the class. Would like to have changing stalls in both locker rooms. Do not need showers unless it is mandatory Kids do not shower in PE

1 male PE instructor office with bathroom - shared with 2 teachers
1 female PE instructor office with bathroom - share with 2 teachers

1 large PE storage

2 Extra large athletic storage (above and beyond what was mentioned above for gymnastics) for all indoor track equipment (hurdles, high jump matts, shot put , etc. basketball scorers table along with team chairs approx. 40 chairs. Basketball equipment, volleyball nets and poles as well as referee stand etc…)

Male Athletic locker room - enough to accommodate large lockers for individual sports equipment like shoulder pads and helmets. Large enough for during 1 season we have about 170 male athletes participating and needing a locker. Maybe we have 2 rooms. With showers athletes tend to shower after practice

Female Athletic locker room - enough to accommodate avg size lockers, not very big equipment mostly sticks such as lax and or field hockey. Large enough for approx 180 female athletes during 1 season needing a locker again maybe 2 locker rooms to accommodate this large number. Need showers as well

2 Male Athletic Coaches Offices -with bathroom and shower. 1 office needs to accommodate 3 coaches at once, and the other needs to accommodate 8 at one time

2 Female Athletic Coaches Offices - with bathroom and shower - both offices need to accommodate 3 coaches at once

1 Officials Room - with bathroom and shower - large enough to accommodate 5-6 refs at once

2 Team Meeting Rooms - large enough to accommodate, teams of 60 kids at once to meet as a team or watch films (this is a very important part for some sports)

1 Athletic Training room with storage

1 athletic Directors office - shared with a secretary (2 rooms or 1) would like to have a conference table as is in current space

1 equipment room with Laundry service - Need to store all sports equipment during their off season which is ¾ of a year.

Outdoor storage!

Outside Facilities
An assessment of our current athletic programs, student-athlete enrollment and community use indicate that three to four turf fields would be recommended. A minimum of three would allow SHS to provide equal opportunities for all teams and genders. Scheduling among the many sports teams we have including all sub varsity teams can force teams to have practices that go well into the evening, especially when you don't have the ability to practice on multiple fields. It would allow us to for the first time ever to bring many of our youth programs up to use our facilities. It also allows some revenue opportunities from outside organizations.

The three turf fields should be in as close proximity to each other as possible. Allowing them to be accessed by all and easily supervised. Current observations and public feedback indicate that the community as well as our students would take full advantage of a walking track around the perimeter of our athletic fields and overall school campus. This would allow people to use the facilities even during our HS events.

Outdoor Building
A field house to provide essential supports and needs for our student-athletes, spectators and other vital athletic program supports is necessary. This building would provide the following: **1) bathrooms 2) concessions 3) storage 4) Two team locker rooms/ meeting room 5) small officials space**. This building will enhance the ability to do many things to make the athletic experience much greater for all of our athletes male and female, Fall, spring and summer sports. It provides the ability to keep our school building safer with security by not needing to enter the school whether it is during school hours or outside of school hours.

Alison Connelly
LIBRARY / MEDIA CENTER

The Stoneham High School's library media center's physical space is currently located in one location close to the main entrance of the building and with thoughtful consideration given to layout, allows for maximum flexibility and is a hub of a variety of activities. The library is laid out to accommodate up to 3 individual classes or 80 or more students at a time for academic instruction by the librarian (via a large mobile screen) or for teacher instruction. Teachers can sign up in advance to use the library and can come in last minute if there is room. The library print book collection had been weeded so that books shelves are located only along the outer walls of the room, allowing for the maximum flexibility in the use of the space. EVERYTHING is currently movable with exception of 2 low bookcases that are used as room dividers. The library is also a space for students and teachers to relax with comfy seats, couches, and relaxing music when not being used for academic purposes. Up to 80 or more student's can have lunch in the library and also come to the library in the AM for breakfast, to print, do homework, and socialize with their friends. We also have puzzles, chess boards, legos, coloring books, and board games.

- The library is the space where the majority of National History Day work and exhibits are displayed for the week, Shakespeare day takes place in the library, the art department uses the library for displaying students' work and for art night. Once a month we hold “open mike in the morning” and students can come in in the AM and perform under the direction of the music department. We also have “teacher tuesday” once a month and the library is closed at lunch to students so teachers can gather and enjoy the space.
- We have created a “history learning lab” in one of the rooms off of the library that is an artifact museum filled with objects that are relevant to the curriculum. These object are on display and are used in classes and by students in independent study projects
- There is one classroom and 4 small meeting rooms off of the library .
- Unfortunately the library is closed for several days a year in order to accommodate large testing groups for MCAS and for AP. This has been an ongoing issue as no one else is allowed to use the space on these days.

The small rooms off the library were used many years ago for storage but have been cleaned out and are now constantly in use for a variety of activities. These are NOT STORAGE ROOMS.

- There is one full time licenced library media specialist and until this year a part time paraprofessional.
- Until this year the technology coach was also located in a room off the library and held classes there.
- The speech pathologist sees students in one of the small rooms off the library.
- Guidance holds individual student counseling sessions in one of the rooms off of the library.
- Teachers hold professional development meetings in one of the rooms off the library .
- VHS students use the rooms off of the library for quiet study.
- The rooms off of the library are also frequently used for “green screen’ filming by multiple groups of students as part of classroom assignments.

The Library is a constant hub of activity from 7:15AM until 4:00PM on school days and on some evenings for special events.

Jillian Goldstein
SPECIAL EDUCATION PROGRAMS

Special Education services at Stoneham High School are delivered in a multitude of ways through various programs designed to meet the needs of our diverse student population. These programs include Resource, STRIDE, RISE, Language Based, and ESL services (ESL is not special education). In addition to these programs, the areas of speech and language pathology, transition planning, counseling, occupational therapy, physical therapy, and adaptive P.E. all fall within this discipline. The district is committed to ensuring that students with disabilities receive

a quality education in the least restrictive environment. The spaces designated for special education programs in the new building should maintain the current space allocations for all classrooms currently in existence at a minimum. The spaces, while located amongst the school and academic areas, should also consider the students' auditory, visual, and other related sensitivities. The spaces for future special education students should also ensure easy access to service providers and instructional areas.

Resource Program:

The inclusion / partnerships program at Stoneham High School offers academic support and instruction in reading, written language, mathematics, study and organizational skills for students with a variety of disabilities. In addition, special education teachers co-teach in a number of general education classes. The inclusion program is for disabled students who require academic remediation through specially designed instruction and classroom accommodations. Classroom materials are used as the context to develop skills of reading comprehension, written expression, and mathematics, as well as study skills such as organizational skills, note taking, outlining, report writing and test preparation. Each student has a liaison who communicates with parents, teachers and counselors in order to meet specific student needs as described in the IEP, including, home-school communication and collaboration with general education teachers and related service providers. The majority of high school students receiving special education services are part of the inclusion program. All disability categories are served in the inclusion program including learning disabilities, physical impairments, emotional disabilities, health-related disabilities, autism spectrum disorders, physical and sensory disabilities. The students in the inclusion program receive most of their instruction in their general education classroom. They may also receive some academic explicit instruction in a small group setting or a related service outside their classroom to address underdeveloped skills. Specialized small group academic instruction occurs as frequently as other content classes. Given the needs and increased demands of high school students, if needed, instruction is also provided to improve executive functioning skills. Executive functioning instruction will target a student's needs to manage belongings, short and long term assignments, and organizational skills. In this educational model, the needs of all students are being met by educating learners with disabilities alongside their non-disabled peers. A critical component of inclusion is to provide students with disabilities access to the curriculum, regardless of the level. Curriculum may be modified as specified in the student's Individualized Education Plan. The mission of the program is to teach learning strategies to students to help them compensate for their area(s) of learning disability. Understanding their own strengths and weaknesses as learners and self-advocacy are components of this teaching model as well. Co-taught classrooms are an effective model of inclusive education. These classrooms are led by a certified content area high school teacher and a special education teacher. Students receiving support through the co-taught classrooms can have a variety of learning and social needs including language-based disabilities. Given direct instruction and with strategies embedded throughout the day, students are working towards meeting grade level benchmarks. Small group instruction outside the general education classroom is available for academic remediation or for related services.

At the present time, students enrolled in a full-inclusion program who receive specialized, direct instruction outside of the general education classroom are serviced through Resource. At the

present time, there are 3 classrooms designated for Resource services. These rooms vary in size, location, and proximity to primary academic areas of the school and other service providers. The 3 classroom spaces are shared between 4 educators who provide learning strategies as well as additional services for students with reading or hearing based disabilities. Students with widely varying levels of ability, age, and need are supported within the same space. 2 of these classrooms have, historically, been adjoining rooms for seamless communication/collaboration between educators in the short moments between classes.

Resource spaces have historically been very small, and unable to accommodate more than 8 students at a time. This proves challenging during periods when simultaneous resource blocks are held within shared spaces, as it is not conducive to providing services in a distraction-free environment. Academic testing for 3-year reevaluation meetings also takes place in these classrooms, which leads to overcrowding in the adjoining classrooms. This overcrowding also becomes a factor when students utilize a separate setting for assessments in their general education classrooms. Teachers then become responsible for not only monitoring their students scheduled for class but also monitoring students who are taking assessments. Teachers are also unable to utilize their prep times without distraction due to resource classes being utilized for separate setting accommodations. Students who take frequent breaks and are benefited by flexible seating are unable to utilize these accommodations in our classrooms effectively due to size constraints. Our space is also unsuitable for displaying the necessary resources/anchor charts for all subject levels/necessary supports across the four grades we support simultaneously. It is very challenging, in our current spaces, for students to de-escalate without distracting their peers. It is also noteworthy that 2 of the 3 classrooms do not have windows, all do not have adequate storage space for materials/manipulatives, and all do not have adequate storage space for general classroom materials. We are unable to effectively communicate with the teacher in the non-adjoining room due to our proximity to each other. We are also unable to effectively communicate with general educators due to our classrooms' locations. Our technology is inconsistent, which means collaboration is more difficult due to an inability to share presentations/materials. Our space is not conducive to effectively supporting these needs at the present time.

Future Suggestions for Resource:

- Windows to the outside.
- Adequate wall space to display anchor charts/resources for all courses and all grade levels
- Availability of an adjoining, common mutual space in order to facilitate large group direct instruction.
- Multiple, small designated quiet spaces for students receiving small-group instruction or students utilizing their separate setting accommodation for assessments.
- Break spaces in proximity to our rooms so not to distract from lessons currently going on would benefit us greatly.

Designated places for testing, outside of our classrooms, would provide a sufficient environment for students to focus and perform at the best of their ability.
- Technology that provides seamless access to lessons as well as meets the needs of students with visual/motor disabilities is essential to future Resource classes.
- Proximity to gym/weight room/track for quick movement breaks, a green room/garden for calming effects, bathrooms, and guidance/social emotional supports
- Design and creation of a sensory wall/hallway would benefit resource students and the general population.
- Flexible seating (e.g., hammocks/benches that can provide sensory support for dysregulated students) would provide students with an environment with which to attend to their work without discomfort.
- A Learning Center suite in a central location, with general education classes surrounding it, is ultimately our ideal design.
- A designated meeting room for IEP meetings and testing

STRIDE Program: Students Taking Responsibility in Developing Excellence
Students with social-emotional disabilities are serviced through the STRIDE program at Stoneham High School. In the STRIDE program, educators create an academically engaging, safe, and nurturing environment for their students. The 2 stride teachers and 2 clinicians who provide substantially separate services (e.g., academic and counseling services) collaborate with general educators in order to provide meaningful experiences that enhance a student's life skills and direction for their future goals (e.g., community engagement, core academics, volunteer work, etc.). These educators and clinicians communicate effectively with other service providers such as physical therapy, occupational therapy, reading specialists, and others.

All members of the program are part of a community grounded by four "cornerstones": respect (for yourself, others, and your environment), responsibility (for your actions), self-control (of your behavior), and repair (the ability to fix things when needed). It is the belief that these cornerstones and a sense of belonging to a caring smaller learning community will help each student build healthy relationships, communicate effectively and develop respect for differences in other people in order to be successful in school. The goal of the STRIDE program is to provide students with the support to build academic competencies, positive relationships, communication skills and a sense of responsibility and community that will foster their success in school. Understanding that learning disabilities often are present along with social/emotional challenges, there is a strong specialized academic component to the program. Most core subjects are co-taught by a content certified high school teacher and a special education teacher. Remedial strategies and instruction are provided in the same manner as students with specific learning disabilities and language-based learning disabilities. Specialized elective classes for the program are available and are supported by program staff. Students have inclusion opportunities to participate in mainstream classes and are supported by a program paraprofessional. In addition to a strong academic component, there is a high degree of therapeutic support. A positive behavior management system is part of the classroom structure. Individual positive behavioral supports are put in place for students who require additional incentives. A weekly group counseling session conducted by the school psychologist is an

important component to the program. Individual counseling is provided to students as needed to assist them in meeting their behavioral, social and emotional needs. Vocational instruction is provided weekly in the program by EMARC.

There is one classroom shared between teachers. This space has community access and office spaces for clinicians/teachers to separate grade levels and provide direct instruction in an individualized way. The classroom is on the first floor in close proximity to the musical arts, the auditorium, the guidance office, and has its own entrance/exit for emergency purposes. This set-up is ideal as it allows seamless transition to clinicians/service providers in the case of escalation and further support in the general education setting. While there are bathrooms near the STRIDE classroom presently, they are inoperable. However, in the future it would benefit students to be near a bathroom in order to assuage any anxieties or social concerns. The staff in STRIDE are met with challenges when faced with a student in crisis or a student who requires testing, due to a lack of private space that ensures confidentiality of the student. Many of the challenges in Resource are mirrored within STRIDE as they pertain to testing, separate setting accommodations, flexible seating, and other aforementioned struggles.

Future Suggestions for STRIDE:

+ Maintaining the proximity to service providers
+ Proximity to private bathrooms
+ Proximity to a room designed for movement breaks - treadmill/punching bag
+ Proximity to sensory hallway/room/lounge
+ Clinicians with private offices for confidentiality
+ Location to kitchen-like space/cafeteria
+ Private space for quiet lunch
+ Multiple classrooms for providing services to students with widely varying needs/levels
+ Proximity to gym/weight room/track for quick movement breaks
+ Proximity to a green room/garden/aquarium for calming effects and also to allow for career exploration
+ Proximity to a therapeutic/social/emotional support space
+ Location to hands on opportunities (garden, RISE, pre-K, shop, cosmetology, ATM, chef, etc.) to evoke and foster a sense of purpose and independence
+ A designated meeting room for IEP meetings and testing

RISE Program: Reaching Independence through Structured Environments

Currently, a substantially separate program exists for students with autism spectrum disorder (ASD), social- emotional disabilities, cognitive and/or neurological impairments, and students in transition (18-22). They are served in the RISE program.

The RISE Program offers a substantially separate program for students with more severe disabilities requiring a higher level of support and specialized instruction than in the integrated program. All the students in the RISE program require special education services. As developmentally appropriate, opportunities for inclusion with the integrated preschool are available for all students in the program. The program is staffed with a teacher certified in early childhood special education, a full time ABA specialist, and several paraprofessionals. In addition, a speech/language pathologist, occupational therapist, physical therapist, school psychologist, and Board Certified Behavior Analyst (BCBA) are part of the classroom interdisciplinary team. The BCBA consults with all program staff and provides ongoing training on ABA methodologies. The curriculum is child-centered and offers developmentally appropriate activity-based learning for preschool children. The range of direct services varies widely depending on a student's individualized needs. The type and frequency of service are decided at the child's IEP Team meeting. The school adjustment counselor and psychologist are available to families to provide support and community outreach.

This program was developed in order to service students who would historically have been placed out of district due to the intensity of service needs. Currently, this program is located in an inclusive placement in close proximity to the nurse, general use restrooms, and main office. The two classrooms and their respective teachers are designed in order to accommodate students with a high level of need, which includes flexible seating. One of the classrooms has a number of appliances that allow students to practice lifelong skills such as cooking, cleaning, and organization of materials. The classrooms do not have adequate built-in storage for the innumerous materials utilized by their students and staff. The classrooms also do not allow for appropriate spacing, given the high number of staff and practitioners who push-in in order to support students in the program.

Future Suggestions for RISE:

Due to the skills that students in this program are working on, they require a designated space to work on vocational skills and activities of daily living. A designated space for vocational purposes - including a copier, scanner, computer, printer, and materials to complete clerical tasks, etc would further improve the RISE program. This space could be used by both teachers and students.

A designated space that is set up similar to an apartment, including a kitchen area, bedroom area, and a dining area is essential for the success of the substantially separate population. Appliances would include a refrigerator, microwave, oven, sink dishwasher, washer and dryer. Within this space, all students can practice daily living skills such as cooking, making a bed, vacuuming, washing clothes, folding clothes, ironing, washing dishes, loading a dishwasher, etc. This multipurpose room should be linked to the RISE classroom although perhaps not necessarily adjoining. This space would foster inclusion and could be located near cooking/"restaurant"/design/fashion class.

This area would also be improved by the addition of an instructional bathroom used to teach RISE students hygiene and grooming skills (e.g. brushing teeth, washing face, wiping after bowel movements, showering, etc.). In an ideal situation, this would be a "Jack & Jill" bathroom

(in the middle of the classes), which would be less accessible to outside students to ensure privacy and reduce anxiety, educational and instructional bathroom. The bathroom should have 2 stalls, a shower, and a grooming area/dressing nook. The bathroom should seamlessly work with the apartment set up the RISE classrooms need.

+ Close to exit for fire drills/emergencies
+ First floor ideal: physical/mental needs of students
+ Wheelchair accessible room
+ Space that allows for an entrance/exit to the outdoors
+ Location near track/own outdoor space
+ Access to a gardening space in order to teach valuable life skills
+ Location near other support staff
+ Proximity away from gym/cafeteria/music space
+ Proximity to sensory room/hallway/quiet spaces
+ A sensory lounge or suite
+ Location that provides seamless transition to service providers/partnerships in the building (chef)
+ Preservation of inclusivity while still providing access to additional spaces
+ Resources/rooms that allow students to practice the skills/have valuable experiences in the community
+ Vocational opportunities; coffee shop, medical related, inventory tracking, hair salon, pre-K support, etc.
+ Sensory resources such as bungee chairs, swing, weighted blankets
+ Room/space for de-escalation that allows for confidentiality and safety of students
+ In order to continue to ensure an inclusive learning community for all students regardless of need and ability, the sub-separate program classrooms should be located within the primary academic areas of the school
+ A designated meeting room for IEP meetings and testing

Language Based Program

The language based program at Stoneham High School serves students within our population who require specially designed instruction pertaining to language based skills. This includes, but is not limited to, students with reading, listening, and writing based disabilities such as dyslexia and decoding challenges. Language based teachers provide specific, developmentally appropriate support and instruction which pertains to each student's need in a substantially separate setting. The program supports students in all grade levels, often simultaneously, which provides a challenge to educators when supporting students of widely varying ability. The current program is held within one classroom that supports a varying number of students where multiple teachers and paraprofessionals are giving instruction at once. There is no privacy, which creates challenges for confidentiality purposes. The language based program walks the line between special education and substantially separate.

Future Suggestions for Language Based:

- Space's ability to allow educators to differentiate instruction seamlessly
- Current space challenging for testing students in an environment that provides confidentiality/student ability to not be distracted
- Proximity to reading services/speech/suite
- Proximity away from loud places (gym/music/etc.)
- Space placement that reduces stigma
- One large room or two adjoining rooms
- Technology; phone, headphones, projector, etc.
- Designated space for testing and confidential phone calls
- Flexible seating arrangements/potential
- Frequent break space - sensory room/hallway (maybe near the gym?)
- A designated meeting room for IEP meetings and testing

English Language Learner (ELL) Program:
The English Language Learner (ELL) Program is designed to meet the linguistic, academic and social needs of English Language Learners who attend Stoneham High School. ELs are students who are learning English as a second or additional language and who are not yet proficient in English at their grade level. The ELL Program creates a welcoming and challenging learning community where students acquire proficiency in both conversational and academic English. Students are enrolled in rigorous ESL courses taught by certified ESL teachers, and learn English in the areas of listening, speaking, reading, and writing. Students are also enrolled in academic courses taught by educators with sheltered English immersion (SEI) endorsement, with methods of teaching that are responsive to the learning needs of students developing English language proficiency. Students are assessed annually using the WIDA-ACCESS test of English language proficiency. This assessment tool is used in many states nationwide which are members of the WIDA consortium. This program's enrollment has grown 100% since it's initial class and continues to grow. It's location has been moved as the students' enrollment exceeds the space capacity of the room. It is safe to assume that this program will continue to grow, with a minimum of 20 students by the 2021-2022 SY, as we foster an inclusive environment at Stoneham High School. While there is one teacher currently in the program, it is anticipated that there could be as many as three teachers required to fit the student need.

Future Suggestions for ESL Services:

- Inclusive, central room placement that allows ESL students to be part of the fabric of the school ideally in close proximity to the library
- Proximity to general education classes and reading specialists
- Flexible seating options (standing desks, yoga balls, couch, beanbags, etc)
- Flexible walls for grouping/cloth dividers if possible to allow students to speak/listen without bothering classmates (cloth or cork covered for sound absorption) which will allow for a multi-functional space

- Acoustics to allow for clear, concise language/instruction to be heard (e.g., carpet, wall tiles, etc)
- Language lab-like tech or proximity if one exists; green screen, listening tools, speaking tools, recording tools, smartboard etc.
- Adequate wall space/bulletin boards/white boards to display necessary anchor charts/resource materials in both English and other languages
- Non-negotiable proximity AWAY from high noise areas: gym/cafeteria/auditorium/musical arts

Speech and Language Services:
Speech and Language services are provided through district speech and language pathologists. At the present time, these individuals travel with the hopes of finding open space as it is available. In the past, they have used a shared office in the library at Stoneham High School. The speech and language pathologist provides instruction in regards to articulation, pragmatics, social skills, and other remedial skills for improving an individuals' expressive/receptive language. The speech/language pathologists should have a designated office in the school, preferably close to the RISE and LB programs.

Reading Services:
Reading services are provided through the district of Stoneham's reading specialist. The current space at the high school is a windowless room suited for a maximum of three people. It is located in proximity to general education classes, a high-traffic stairwell, and lacks the acoustics needed for students to attend to their work and reading skills effectively. The reading teacher should have an office or designated classroom space, preferably near the LB program.

Occupational Therapy Services:
Occupational therapists push-in to designated classrooms or spaces that are unoccupied to provide services for students with OT needs. The lack of designated space proves challenging for maintaining confidentiality.

Physical Therapy Services:
Very few students require this service and if needed, can utilize appropriate gymnasium equipment or work in a sub separate classroom space.

Adapted P.E. Services:
Stoneham High School does not have an adaptive physical education/wellness program. All students participate in a general physical education/wellness class. Accommodations and modifications are provided in the general education class for students who require this service. If required, instructional assistants or outside service providers assist students in their physical education class.

Transition Specialist:
IDEA 1997: 300.29 defines Transition Services as:

"a coordinated set of activities for a student with a disability that (a) is designed within an outcome-oriented process, that promotes movement from school to post-school activities, including postsecondary education, vocational training, integrated employment (including supported employment), continuing and adult education, adult services, independent living, and/or community participation, (b) is based on the individual student's needs, taking into account student's preferences and interests, and (c) includes instruction, related services, community experiences, the development of employment and other post-school adult living objectives, and if appropriate the acquisition of daily living skills and functional vocational evaluations."

All students, including students with disabilities, "deserve a world-class education that prepares them for postsecondary opportunities, career training options, economically viable careers, and healthy productive lives."[1] As the Board of Elementary and Secondary Education's Taskforce on Integrating College and Career Readiness recognized, "every child deserves an education that nurtures their dreams and lays out a navigable pathway to accomplish them. It is no longer viable for our businesses or our educators to under invest in career readiness education; we have a responsibility to provide our children with a well-rounded education that prepares them not just to begin post-secondary education, but access to viable, living-wage, family supporting careers, and lifelong prosperity."[2]

As the transition specialist, the roles and responsibilities are ever changing based upon student population and need. Much of the work completed is highly individualized for each student. The transition specialist plays an important role in the education of youth with disabilities and is the person that helps create a bridge to life after high school through assessing, planning and delivering individualized services and supports that prepare youth for their future. Transition specialists coordinate services with adult agencies and community providers to ensure students transition effectively to life after high school.

The transition specialist has a range of knowledge including, but not limited to: conducting individualized transition assessments, creating measurable postsecondary goals, fostering self-determination and self-advocacy skills, and creating and delivering appropriate transition systems/services including employment, community and post-secondary education opportunities, paid employment based on the student's identified interests, learning independent living skills such as utilizing public transit, or attending college classes or continuing/adult education.

At the present time, our transition specialist is located within the guidance suite in a room identified as a closet in the building plans. It does not include windows or adequate space in order to effectively provide assessments for more than one student at a time. A future space should have ample space in order to accommodate for testing, a large amount of materials/resources, and in order to involve small group sessions.

Social Emotional Supports, Current Services and Programs:

In addition to the four school counselors, the high school currently offers social emotional support and counseling via one school adjustment counselor and one school psychologist. Both

conduct individual and group counseling, including social skills groups which are held during lunch blocks and during flex blocks. In addition, they provide services to students enrolled in our RISE special education program and work closely with the teachers and staff of that program. For students who require more intensive counseling support in order to access their education or remain engaged in school, these counseling supports are available upon referral from their school counselor.

Both the school adjustment counselor and school psychologist are also important members of the special education process, and their direct services are frequently outlined as a required component of students' Individual Education Plans or 504 Plans. The school psychologist also spends a significant amount of time conducting confidential testing and assessments to determine students' eligibility for special education services. During the 2019-20 school year, the school adjustment counselor provided services to approximately 25 IEP and 10 non IEP/504 students, and the school psychologist had a caseload of 23 students for counseling and 40 students for assessment.

Both of these school support professionals currently have offices in the school counseling suite. These office locations are ideal for facilitating collaboration with the four school counselors, as well as providing the necessary discretion and confidentiality for engaging with students, families, and collateral supports such as therapists and social workers from the community. The proximity of these offices is also essential during crisis situations to facilitate clinical collaboration.

Given the frequency of meetings involving parent/guardian visitors that are facilitated by all members of the counseling suite, the current location of the counseling suite near the front of the building is ideal from a safety and security perspective. In addition to hosting parents, the school adjustment counselor and school psychologist will often invite community providers in the building (ex. outside therapists, MassRehab counselors, Department of Children & Families social workers, mentors, etc.) for collaboration and wrap around student care. Minimizing the travel of these guests throughout the building is a crucial component of student safety.

Small group counseling sessions facilitated by the school adjustment counselor and school psychologist are currently held in a conference room or small meeting space in the library. Frequently the location of these groups has to be changed at the last minute due to competing needs for the available spaces, such as other meetings in progress, which takes away from the group counseling time. The proposed multipurpose meeting space for the school counseling suite would be ideal for housing these group counseling sessions, in addition to providing a space for the implementation of counseling curriculum and college representative meetings.

A multipurpose space would also allow more flexibility in times of crisis (for crisis evaluations and de-escalation spaces). Additionally, this space could be used when peer social issues arise to conduct mediations (to separate students and then to bring them together in a neutral space/larger space for the actual mediation).

Design Response:

Resource Program:

- A learning suite (1 large common mutual space for large-group lessons with adjoining offices)
- (4) Offices for educators; utilized for prep, testing students, utilization by other practitioners as needed
- (4) Classrooms for educational instruction, location TBD
- (2) Small designated quiet spaces for students receiving small-group instruction or utilizing their separate setting accommodation for assessments that does not take away from students receiving Resource instruction/teachers utilizing their prep time

STRIDE Program:

- (2) Classrooms in close proximity to support staff/guidance/practitioners
- Private Bathroom
- (4) Offices for clinicians/educators to provide services with confidentiality
- (1) Large meeting room/mutual space/suite

RISE Program:

- (2) Classrooms for educational instruction; students with severe needs
- Private Jack & Jill bathroom/changing area/grooming station shared between the severe classrooms
- Studio apartment to include kitchenette (stove, sink, dishwasher, refrigerator), bed, dining, storage, stackable washer & dryer
- Vocational space; shared with others such as culinary cafe
- Therapeutic de-escalation room similar to sensory room

Language Based Program:

- (2) Classrooms for educational instruction, ideally connected/adjoining; equipped with features that benefit students acoustically
- (2) Offices for educators; utilized for prep, testing students, utilization by other practitioners as needed

ESL Program:

- (1) Classroom for educational instruction; equipped with features that benefit students acoustically
- (1) Office for educators; utilized for prep, testing students, utilization by other practitioners as needed
- Language lab with technology (e.g., green screen, projector, etc.) that allows for seamless integration of lessons to student activity

Speech and Language:

- (1) Half-sized classroom for educational instruction; equipped with features that benefit students acoustically
- (1) Office for educators; utilized for prep, testing students, utilization by other practitioners as needed

Reading Services:

- (1) Half-sized classroom for educational instruction; equipped with features that benefit students acoustically
- (1) Office for educators; utilized for prep, testing students, utilization by other practitioners as needed

OT/PT:

- (1) Room specifically designed for OT/PT needs to maintain confidentiality and instruction without distracting peers

Kim O'Connor
Career and Technical Education PROGRAMS

A current national trend and one that will continue for many years, is career and technical education, or CTE, which exposes students to real-life experiences more directly. These elective courses are where academics are applied. In order to enable students to become "well rounded" individuals, careful attention must be made to the design of the physical environment of these programs.The emergence of CTE is a recognition on the part of school districts that A.) not every high school student is going to college, and B.) students need earlier exposure to different professions so they can determine what they might like to do as an adult and get training for that job while in high school.

CTE is a pathway to success for high school students and offers each student opportunities to personalize his or her education based on their career interests and unique learning needs. CTE refers to courses and programs designed to prepare students for careers in current or emerging professions. At the high school level, CTE provides students with opportunities to explore a career theme of interest while learning a set of technical and employability skills that integrate into or complement their academic studies. High school CTE is meant to connect with and lead to postsecondary programs of study or additional training after high school, which may include more specialized technical instruction. These pathways can culminate in postsecondary degrees or certificates, apprenticeships, or employment. Currently the high school has a robust FACS program and has recently begun a Project Lead the Way program, that began at the Middle school.

During the previous comprehensive facilities study, one of the identified goals of design was to increase the quantity and quality of hands-on opportunities available to students at Stoneham High School. Although Stoneham High School does not currently offer any Chapter 74 vocational programs, an area of opportunity exists to create a Chapter 74 program in Early Education and Care, by creating greater coordination between our high school and the two elementary school preschool programs and merge them with the Child Development and Internship program already at the high school level.

Culinary/FACS location within the building: Family and consumer sciences, like other elective departments, allow students to apply academic skills, use creative thinking, practice problem solving, increase fine motor skills by working with their hands and develop communication tools which could lead to a future career, personal achievement and home and

family enrichment. Currently in the program we offer to 9th thru 12th graders: Food and Nutrition, Sports Nutrition, International Foods, Fundamentals of Baking, Culinary 1 &2, Adult skills, Fashion/Sewing 1,2,3 and Child Development 1 and 2. Class size in the Food and Fashion Labs are capped at 18 due to Safety and OSHA guidelines. The food lab individual kitchens are equipped for 3 people. We have a waitlist consistently for all food classes, with as many as 350 students signing up for Food and Nutrition alone. The kitchen labs are available for all seven periods of the day and can easily be filled to the maxim for both semesters. Locating the food lab part of the FACS department near the Cafeteria would assist with a possible "Sparty's Cafe" (that we currently run out of our classroom space) that is accessible to teachers during the day and events during the evening/weekends. It is the vision that the cafeteria kitchen be on one side of the open designed cafeteria and the Sparty Cafe be on the other side with not only an open space to the cafeteria but a small teacher/administration dining area adjacent, so that students can have more real world experience in the restaurant industry.
The FACS/Culinary foods lab must have easy access to a door to the outside of the building and parking space for the delivery of groceries and supplies. Storage Area with laundry centrally located with shelving for larger items and equipment being used in rotation, along with larger food product items. Laundry will also need a (short) vent to the outside .
Currently, there are 7 home kitchens within the lab space, 6 for students and one for teacher/student demonstrations. The ideal program would have commercial restaurant equipment in the 7th kitchen space as not only a part of the demonstration area but as part of the culinary students work space for the dining room/cafe, with room for a commercial dishwasher. The 6th student kitchen space should be handicap accessible and adaptable to those with special needs.
The kitchen space lacks storage as current storage is located in another classroom down the hall with the washer and dryer. The ideal plan would be that they are both located within the Food lab space in some capacity, especially the laundry area which is used several times within the day. This food lab space going forward could be used for Community Adult Education in the evening when possible for cooking classes. Going forward the space would need to be bigger than the 1400 sq ft suggested, as we need storage space, laundry, cafe, and special needs accommodations.

- Large kitchen space with 6 residential style kitchens
- One commercial demonstration kitchen towards the front of the room that has access to the cafe
- Laundry and storage area (add 150 sq ft)
- Student storage space for uniforms/bags
- Faculty Sparty Cafe (add _800____ sq ft) Ideally this space would be very similar to the project room space on the 2nd floor of the SPS middle school, a space that has room to accommodate guest for lunch, a copy room area, and be utilized for smaller district events
- Close proximity to the cafe and access to outside door or elevator

Child Development location within building: Currently both Child development classes, 1 and 2, are located in the FCS department right next to the food labs. They run 3 periods during

a semester as it is a shared space with fashion/sewing and adult skills. The classroom has adequate space for supplies and it would be ideal if that continues. The classes themselves are maxed out at 24, with most classes being filled each semester.
The ideal location would be closer to the new Pre-K space being suggested as it would be nice for high school students to have an observational lab within their room, and to bring back the Child Development 3 Internship program, which had a average number of ten students going out to the Pre-K classes throughout the district for work experience. Having work experience within the building would be ideal because of transportation issues in the past, getting students to their "job" if they didn't drive and their classroom teacher being able to easily observe them without leaving the building. Many students throughout the years have shown an interest in post secondary education, majoring in early childhood or elementary education and child psychology. This would give them a great opportunity to experience real-life scenarios. Having the classroom intermingled within the several early childhood classrooms planned would be a benefit, along with those teachers being used as mentors in the 3rd year program.

- Large classroom space adjacent to to the Pre-K Program
- Ability to split the classroom into different areas
- Sink area for project production
- Storage space
- 2-way glass mirror for observation of students

School Store/entrepreneurship location: In the past, our school store was a vibrant opportunity for the DECA program's entrepreneurial class, when curriculum and funding changed it left a hole which was filled recently with our RISE program within our special education department, using it as a vocational job training space. Now that the business department has merged with the economics classes there is a need for a robust store that can not only help to train those in the RISE program but also help students wishing to go into some type of business. It will act as an opportunity to learn more about product sales, accounting, purchasing, and marketing, along with a great collaboration with the special education students. The store is currently open 2 to 3 days a week and staffed by the RISE students only with very selective hours. In the past it was a store run by at least 30 or more students rotating in, consecutively each day before school and during lunch. The space allotment it has now is adequate for what is being taught, however it does not have storage space for items such as overflow merchandise. Preferably it would be adjacent to the Economic/business classroom which could be near the library or some other populated area giving access to all students throughout the day. However there needs to be added space allocated to storage for merchandise/products, as there is currently no storage at all and housed throughout our current building in various locations.

- 600 sq ft store
- Storage area needs to be added (150 sq ft)
- Near library or cafe for student access

Scene/wood shop: Currently there is no woodworking class of this kind, however, there was once a woodworking shop in the basement of our current building, where if classes were run,

were easily filled. The need for a real life skill such as woodworking is not only evident now with homeowners doing their own DIY, but it is an opportune time for students to show their creative thinking, problem solving, and fine motor skills by working with their hands and also using engineering skills. Not only would there need to be room for actual equipment, there would need to be a designated space for CAD and printer to print plans.
The ideal location would be between the engineering program for project based learning, and the auditorium as the class could be used for set design for the award winning drama department which used to use the woodworking space that was once located in the current basement of the building and has since been disassembled. The drama department now uses the parking lot, hallways, and student homes to build the items needed for their productions. The recommended class size for students would be to use OSHA guidelines for safety. This space could also be utilized for Adult education because so many people are DIYers now and looking for opportunities to learn within the community.

- Large space that allows for dual access
- Access to the auditorium
- Access to the outside with garage door for deliveries/project pick-up
- Dust machine will need a higher ceiling

Film Editing/Production: The film editing classroom currently utilizes a computer lab which is a shared space with art. This lab is actually only utilized 2 to 3 periods a day but in the past was used 4 to 5 times throughout the day. Stoneham has seen in the past decade many students go into film/video production along with electronic music production. The ideal opportunity would be to combine the classroom theory into the lab space in computer science and use the space allocated in the plan to a small soundproof studio that could be used for video production, tv/news studio, or recording studio for the music department. With the excellent opportunities in the Boston area to further their education in film, video, or music production it would be a great training opportunity. We would also like to expand our existing partnership with the local television station that was once housed in our building, to include more student produced material, such as sporting events and productions. Again, this would be utilizing the student's creativity, management, and business skills.

- Large space divided into film editing, green room area
- Small lockable storage area
- Part of this large area should have space for small studio for filming Stoneham TV

Maker Space/Robotics: This space better known as a Innovation Lab would be an open space wired for technology around the room so that it could serve multiple uses and be accessed by all departments for groups and large projects. This lab could also house robotics courses in the future as the school does not currently offer robotics but would like to add it into the PLTW program. We currently do not have an innovation lab but looking to the future and wanting to expand the Project Lead The Way (PLTW) program this would create a great opportunity and best use of shared space. PLTW is currently a very robust class within the 7th and 8th grade curriculum in the Middle School, and as a feeder school to the high school it is important to keep the momentum going in such a sought after career field. This space could also house the tech

leader program that has in their curriculum computer repair services. We see this as being utilized all periods of the day with the space having a sign-up sheet for open use areas with a possible waiting list to get in. The space will also be available for the open periods the students will have such as the FLEX period. Students will have the opportunity to sign up for a spot in the lab during the FLEX period. We

Engineering Lab: Currently our district is in the second year of implementing the PLTW program of Engineering, by offering 2 periods per semester. The space is located in a computer lab without adequate ventilation and no space for collaboration or possible assembly of project ideas. To accommodate our future expansion goals, a proposed CAD/engineering lab would be wired for various technologies including laptops with ethernet access points throughout the room and possibly a bank of 3D printers. The CAD lab would also have space with open counters and floor space so that students can assemble products and test design solutions. This space would be ideally located between the computer labs and the woodworking area, so that engineering students would be able to make some of their designs come to life in wood or 3-D. With many students going on to further their education in many different engineering programs, this opportunity has been long awaited. We need to advance ourselves into the 21st century and give students opportunities to participate in STEAM programs more. CAD lends itself to future landscape/home architects, innovators, product engineers, and urban planning.

- Expand one 1440 sq ft space to allow for all 3 labs to be merged together (possible 2000+)
- Divide the space into:
- Computer CAD space (Engineering PLTW)
- Work table space
- Robotic space w/storage
- Maker Space with access from hall area

Computer Science: Through the courses offered in our Technology Department, students have an opportunity to discover the vast career opportunities in the technology field, advance their knowledge of general productivity tools and how these tools may be used for collaboration, creativity, communication and problem solving. The current graduation requirements for all SHS students is one semester of Computer Applications.

For those students who are interested in a deeper understanding of how coding is used in the world around them, our Cybersecurity and Computer Science Essentials will provide them with hands-on development opportunities. Other vocation opportunities include the student Tech Leaders program for those students who want to explore help desk and support roles.
The rooms are adequate but the technology is aging and the ventilation is a problem because of the heat the computers give off with only one window air conditioner. It is not currently conducive to simulating a software programmer's project-based work environment, as there is a need for collaboration space. In planning for space for computer science, there needs to be a large, flexible space that can function as a computer lab but can also accommodate collaborative work among students. This would require large/multiscreen work stations throughout the room. As the computer science program continues to evolve in time it would be

nice to have it adjacent to the Innovation Lab and Bio-medical rooms as part of Project Lead the Way.

Kim O'Connor
TRANSPORTATION
The district's transportation policy provides bus transportation for those special needs students who fall within the guidelines of needing private transportation to their school.The district does not charge a transportation fee for these students. The district contracts the transportation out each year by putting out a bid for the best possible service and price.
Approximately 335 student parking spots are available on site, and currently there is now assigned parking for students. It is a first come first serve basis. The teacher's parking lot is closer to the entrance and students are barred from using that area.
The district also owns two of their own small (14 person) busses, which they use for the SPED program during the day and other small group field trips. These busses also allow smaller groups of athletes to be transported to their sporting events. Two or three larger spaces in a well lit area would be needed to accommodate them in the parking lot.
Needs:

- Ample parking for faculty and staff, currently not enough
- 2 or 3 large bus spaces
- Handicap accessible parking spaces
- Loading Docks

FUNCTIONAL AND SPATIAL RELATIONSHIPS
The school's cafeteria is in the main level, and is not surrounded by classrooms, it is on one of the far sides of the school. The proximity to the classrooms/lockers can have a negative effect on those students during lunch periods as it has students rushing too much.The cafeteria's location also causes it to be under utilized during the remainder of the day, including before and after school. A more central location to the entrance would be more applicable for the use of public gatherings and rental space for use of those organizations outside of the school district. Our current cafeteria because of age and location is not being used to its best possible ability, there is opportunity for so much more especially if easy accessibility to the theatre and gymnasium.

Kim O'Connor and Bryan Lombardi
SECURITY AND ACCESS
Despite the limits of the aging building, the Stoneham High School administration has made efforts to establish practices that ensure the highest level of safety and security for students and staff during the school day and for the community use of the facility after school hours. During the school day, all doors, except one main lobby door, are manually locked at 8:15AM. Visitors must sign in at the greeter's desk in the main lobby. Guests must wear a name badge while in the building and must verbally identify themselves and state their business when questioned. In cooperation with the Stoneham Police Department, emergency response plans and lockdown procedures have been established and practiced.

In the past few years the district has made efforts to upgrade by installing a small number of cameras in various places in the high school and installing a card reader system for high school employees. However still each classroom or labs lack some type of phone system to communicate with other parts of the building and administrators. Teachers are told to use their own cell phones when most of the time the wireless-provider does not work in the building. The current PA system is not installed in every classroom which is unacceptable in case there is an emergency or lock down.

In a newly renovated Stoneham High School, security cameras inside and outside the building would be installed. Proper lighting to ensure safety for evening events would be installed in all parking and public areas. A PA system would be upgraded so all students and faculty and staff are informed during the event of an emergency. All doors would have the capability to be electronically locked and unlocked and visitors would be required to gain access to the school by the use of a buzzer and enter through a security vestibule. A new school will have clearly-defined traffic patterns, entry/egress systems, lines of sight, cameras, and other features. Push button wall phones would be installed in each classroom or lab allowing teachers to communicate with administration/supervisor in case of an emergency.

Educational Program – Redlined Copy (Edits in blue)

Stoneham High School
Educational Program

Angela Billings	Math Teacher
Rebekah Brooks	English Teacher
Danielle Catalano	Art Teacher
Jennifer Christopher	Spanish Teacher
Alison Connelly	Librarian/Media Specialist
Sarah Fitzpatrick	English Teacher
Jillian Goldstein	Special Education Teacher
Mary Haight	Science Teacher
Maya Ibrahim	Student
Maria La Terza	Student
Bryan Lombardi	Principal
Kim O'Connor	Family & Consumer Science Teacher
John Pagliarulo	Student
Sean Perry	Drama Club Director/Advisor
David Pignone	Athletic Director
Jonathan Pohorilak	Social Studies Teacher
Cynthia Shaw	Instructional Technology
Teresa Soccio	Science Teacher
Sara Swett-Zizzo	Physical Education Teacher
Celeste Vaughan	Guidance Counselor

Table of Contents

INTRODUCTION AND GRADE AND SCHOOL CONFIGURATION POLICIES

CLASS SIZE POLICIES

SCHOOL SCHEDULING

TEACHING METHODOLOGY AND STRUCTURE

TEACHER PLANNING

PRE-KINDERGARTEN

LUNCH PROGRAMS

TECHNOLOGY INSTRUCTION POLICIES AND PROGRAM REQUIREMENTS

ART PROGRAMS

MUSIC AND PERFORMING ARTS PROGRAMS

PHYSICAL EDUCATION PROGRAM
Athletic Program

LIBRARY / MEDIA CENTER

SPECIAL EDUCATION PROGRAMS

CTE PROGRAMS

TRANSPORTATION

FUNCTIONAL AND SPATIAL RELATIONSHIPS

SECURITY AND ACCESS

INTRODUCTION AND GRADE AND SCHOOL CONFIGURATION POLICIES
Rebekah Brooks and Angela Billings

Stoneham High School is located in the Town of Stoneham, Massachusetts, with a total area of 6.7 square miles. The Town of Stoneham is an inner-core suburb, located 10 miles north of Boston at the junction of Interstates 95 and 93. The community is home to many small businesses and is a short distance from many colleges and universities in the Boston area. Stoneham commercial property consists primarily of businesses, professional and semi-professional, and according to the 2010 U.S Census, the Town's population was 21,437. According to the 2014 Stoneham Town Center Strategic Action Plan, the median household income of $72, 938 and 5.5% of families have earned income below the poverty line. The ethnic demographics of the school mirror those of the community where 92% of the students identify as predominantly white; the remaining 8% of the student body identifies as 3% Hispanic, 2% African American, and 3% Asian. 14.6% of the school's population is low income. For most of the students at Stoneham High School, English is their first language with 1.2% of students enrolled in the ELL program.

The Stoneham Public School district comprises three elementary schools, one middle school, and one high school educating a total of 2,204 students. Two of the elementary schools, Robin Hood and Colonial Park, educate students from pre-K to fourth grade. South Elementary School holds grades kindergarten to four, the Central Middle School grades five through eight, and the High School grades nine through twelve. Stoneham High School serves a student body of 640 students in grades 9 through 12.

Core Values

All members of the school community:

- Support a safe, inclusive educational environment
- Foster and hold high expectations for student learning
- Share responsibility for the success of our students

Mission Statement

Anticipating the challenges and opportunities of a 21st century world, the Stoneham Public Schools develop students who:

- Are creative, critical, and independent thinkers
- Demonstrate respect for and acceptance of self and others
- Know and apply communication and information literacy skills
- Are responsible contributors to the local society

Stoneham High School offers all core subject areas (English, math, science, and social studies) at 5 different instructional levels: Advanced Placement (AP), Honors, Intensive, Comprehensive, and Transitional. 45.3% of 12th grade students take at least 1 of the 10 AP courses offered. Stoneham High School follows an inclusion model for students with IEPs. In order to graduate from Stoneham High School, there are several requirements that must be met. Students must pass four sequential English courses. In social studies, students must pass a minimum of fifteen credits including one year-long class in World History and two sequential year-long courses in U.S. History. In mathematics, students must pass four courses that involve four full years or eight semesters of study, including Algebra I and Geometry. In the science department, students need a minimum of 15 credits, including biology. Students are required to take health education class in tenth grade and one physical education class each year; these classes are heterogeneously grouped. Students must also earn 5 credits in art and/or music and 2.5 credits in an approved technology course.

Stoneham High School also offers three foreign languages: Spanish, Italian, and French. A variety of electives in Fine and Performing Arts, Business & Technology, and Family & Consumer Science disciplines are also available to students in all grade levels. Students are also able to take additional elective courses in the core subject areas. Stoneham High School also offers a Peer Leadership Class for juniors and seniors. There are several local educational opportunities available to students and the community which include online learning for credit recovery and supplementation of course offerings, dual enrollment with community colleges, and a special grant given to the AP Spanish class that encourages service learning outside of the school.

Stoneham High School has a wide variety of programs and initiatives in place to support student success and engage students. The high school has two programs, Reaching Independence through Structured Environments (RISE) and Students Taking Responsibility in Developing Excellence (STRIDE) to address students with differing educational needs. The Stoneham High School Special Education Department provides the STRIDE program for students who require a structured, self-contained classroom with therapeutic support. The program supports students with emotional disabilities while providing curricula taught by teachers in a small-group setting. The RISE program is for students who require a highly modified academic curriculum with a

focus on daily living skills, vocational skills and job skills. Services are provided as indicated on each student's Individualized Educational Plan (IEP). Additional resource courses are available to students with disabilities and an academic support course is available to first and second year ELL students.

Stoneham High School also offers both in-school and out-of-school internships and encourages students to become immersed in an occupation or career pathway of their interest. Students explore career interests and find a suitable internship with a local community employer. In addition, there is a work-study program offered to students who are seeking a credit to help in balancing school course loads and part-time work positions outside of school. This program supports students in successfully navigating the working world, managing the responsibilities of holding a job and improving upon transferable skills while strengthening their work-readiness.

Stoneham has a variety of co-curricular clubs including: Math Team, Science Club, Gay Straight Alliance, Substance Abuse Coalition, Foreign Language Club, Model United Nations, Drama Club, school newspaper, and Stoneham Peers Achieving Real Connections (SPARC). The athletic department at the high school has 26 sports including soccer, field hockey, track, cheerleading, swimming, volleyball, golf, lacrosse, ice hockey, tennis, and gymnastics.

There are a number of student recognition programs at Stoneham High School. Academically, students can be selected for the National Honor Society, Student of the Month, High and Regular Honor roll. As seniors, students are awarded academic medals for high achievement in respective departments. Seniors who have been recognized as varsity scholars all four years are awarded a Lamp of Knowledge. At graduation, a male and female receive the Horton and Nadeau Awards for service to the school community. Stoneham High School also offers the Seal of Biliteracy, an award recognition of students who have studied and obtained proficiency in two or more languages by high school graduation. In its first year of implementation, 23 students were awarded the Seal of Biliteracy.

Annually, two juniors are awarded the Scholarship, Integrity, Leadership, Spirit (SILS) Award, as well as junior book awards for outstanding success in the subject areas. The English Department awards prizes for the Shakespeare Festival and for the Phil Riley Poetry Contest, while the Social Studies Department acknowledges students for National History Day Achievements. The school also recognizes its athletes by giving Varsity Scholar Awards, Freshman Athletic Awards, and Senior Athletic Awards. The school recognizes its musicians and actors with the Tri-M National Music Honor Society and Drama Awards.

Here is a summary of the makeup of the staff at Stoneham High School. The administration includes one principal, one assistant principal, one athletic director, and program supervisors of mathematics, science/health, social studies, and English. The number of full time teachers in each department is as follows:

English 7.8 (.2 is the supervisor)

Mathematics 8.0 (.2 is the supervisor)

Science/Health 10.6 (.2 is the supervisor)

Social Studies 7.2 (.2 is the supervisor)

Foreign Language 6.8

Physical Education 3.0

Business Education 1.0

Family & Consumer Science 2.0

Art 3.0

Music/Theater Arts 1.0

Instructional Technology 1.0

Instructional Technology Coach 1.0

Guidance 4.0

Adjustment Counselor 1.0

Library Media Specialist 1.0

Psychologist 1.0

Special Education 12.0

ELL 1.0

Nurse 1.0

Education Support Professionals (ESP's) 7.6

CLASS SIZE POLICIES - Kim O'Connor

There are currently no policies pertaining to class size at the high school. For most classes at Stoneham High School, class size ranges from 15-32 students, depending upon factors related to homogeneous grouping and content specialization. Some classes exceed this range such as physical education if it is co-taught that may have up to 40 students each. Other classes that service substantially separate special education programs are below this range, such as the RISE and STRIDE programs, which also house therapeutic spaces. Average class size in the core academic areas is approximately 22- 26 students. Classes that require the student to have their own station, such as the applied arts, are limited to the number of stations in their room/lab, which average 18 spaces.

SCHOOL SCHEDULING

Jon Pohorilak and Rebekah Brooks

		Day	1	2	3	4	5	6	7	8
Period 1	Start	8:15	**A**	**C**	**B**	**A**	**B**	**A**	**B**	**A**
	End	9:24								
Period 2	Start	9:28	**B**	**A**	**C**	**B**	**C**	**C**	**G**	**C**
	End	10:37								
First Lunch	Start	10:41								
	End	11:11								
Period 3	Start	10:41	**D**	**G**	**D**	**D**	**G**	**D**	**D**	**G**
	End	12:24								
Second Lunch	Start	11:54								
	End	12:24								
Period 4	Start	12:28	**FLEX**	**E**	**E**	**FLEX**	**E**	**FLEX**	**FLEX**	**E**
	End	1:37								
Period 5	Start	1:41	**F**	**FLEX**	**F**	**G**	**F**	**E**	**F**	**F**
	End	2:50								

The school day begins at 8:15 am and ends at 2:50 pm, with the exception of Day 2 when students are released 35 minutes early at 2:16 pm to allow for common planning time among faculty. The schedule consists of 7 periods plus a FLEX that rotate on an 8-day schedule with each period meeting 5 days per cycle. Within the school day, 5 periods meet. Since we moved from a 6-period day to a 5-period day, students have expressed that the new schedule feels less hectic and allows them more time to focus on the classes that meet within the school day.

Each period is 69-minutes long, allowing more time for students to apply practice of new skills, explore topics and discussions more in-depth, and increase time with peers and teachers to work on project-based activities which in turn build stronger student-teacher connections. There is one exception on Day 2, where the FLEX block meets for 35 minutes before students are released from school at 2:16 pm. This shortened FLEX on Day 2 acts as an advisory where students can check in with their advisors about their progress throughout the school year. The goal of this 35-minute advisory is to foster relationships between students and faculty and to enhance connections to the school community.

In addition to this advisory, 4 69-minute FLEX blocks are scheduled throughout the 8-day rotation to address the needs of our students and faculty. Prior to the implementation of FLEX, we were faced with conflicts regarding science labs, enrichment opportunities, work-study and internship programs, counseling services, academic interventions and support, as well as overall stress and fatigue. The FLEX block provides opportunities for students to learn to be independent and interdependent, self-initiating learners who strive for excellence and who continue to pursue learning as a lifelong endeavor. This can be achieved when students are given the responsibility and freedom to choose what, how, and why they will learn and the time to practice these skills with the guidance of an advisor. When sufficient time is given, students go beyond initial relationships to create novel relationships, find patterns, and generate ideas for themselves. From the student perspective, “curriculum is almost more ‘student-centered’ - students are put at the center of their own learning and learn how to better prioritize their time. They may even pursue something new, allowing students to step outside of their comfort zone.” A variety of educational enrichments offered during FLEX include extra help with a teacher or study group, explorations of different hobbies and interests, invitations for guest speakers, enhanced opportunities for clubs to meet and plan events, and physical activities such as yoga, table tennis, and walking clubs.

The lunch period is 103 minutes long, during which students attend class for 69 minutes and lunch for 30 minutes. Lunches have historically been organized by room location (first floor, second floor, gym, etc.).

Common planning is built into the schedule on Day 2 when students are dismissed at 2:16, allowing faculty 45 minutes of common planning time. This time is mostly teacher-directed to work with grade-alike colleagues, departmental planning, and cross-curricular collaboration.

The master schedule is developed mainly by administration with collaboration from school counseling. Counselors organize the course selection process, advise students about their choices, then “clean up” any holes created in the master schedule when classes run concurrently, do not have enough seats to meet demand, or do not run at all. Course offerings include full-year and semester classes. Students request courses for September beginning the preceding March. Course sections are based on the number of student requests in the course request phase.

The advantage of our current scheduling methodology is the involvement and leadership of the process by the guidance counselors. Our counselors have a very good understanding of the individual students and their unique needs, goals and aspirations. A disadvantage to the current scheduling methodology is the way in which classes are determined by the number of students who select a class or have interest in the specific class selection. Students have been faced with not being able to take their top selected course because there may not be enough students who select the class in order for the class to run. Other conflicts arise when classes run concurrently, do not run at all, or there are not enough seats to accommodate all student requests. In addition, the scheduling is managed solely by administration and the counseling department with limited opportunities for teacher input. In the future, it would be advantageous for us to develop class scheduling teams that are integrated and inclusive of a cross section of departments who share students.

The vision for future collaboration includes opportunities for teachers in all disciplines (including unified arts, PE/ wellness) to continue common planning time and increased time and space for cross-disciplinary engagement and interaction.

Bryan Lombardi
TEACHING METHODOLOGY AND STRUCTURE

1. Curriculum Delivery Methods and Practices

   - Please describe the District's curriculum delivery methods and practices.

Stoneham High School is currently undergoing a major self assessment and professional development process as part of our Multi Tiered Systems of Support DESE sponsored grant, with a focus on Universal Design for Learning (UDL).

New and ongoing focus areas include the creation of several programmatic changes across both special education and general education, including academic, social emotional, mental health and life-skills supports.

Our driving vision is one in which all educators incorporate UDL practices and differentiated learning, interdisciplinary collaborative content and faculty engagement and Project Lead the Way (PLTW) / project based learning opportunities that best prepares students with 21st century skills. SHS strives with the following goals for delivery of curriculum delivery and instructional practices:

Instructional practices at SHS are designed to meet the learning needs of each student. Instructional practices include:

• strategically differentiating, individualizing, and/or personalizing based on student learning needs

• using formative assessment to adjust instruction

• purposefully organizing **group learning**

• providing **additional support** and alternative strategies within the regular classroom

• organizational, grouping, and **tiered intervention strategies** that meet the needs of each learner within the regular classroom

Students are active learners who have opportunities to lead their own learning. Active learning strategies include:

• learning that is personalized, relevant, and authentic

• project-based learning (PLTW), Family and Consumer SCiences, robust Fine Arts program

• student goal setting

• opportunities to learn in and out of school for application of knowledge and skills to authentic tasks (including internships and work study opportunities), dual enrollment partnerships (North Shore Community College)

• student choice, pursuit of personal interests, and opportunities for creative expression

SHS students regularly engage in inquiry, problem-solving, and higher order thinking skills. Inquiry, problem-solving, and higher order thinking skills require learners to engage in:

• questioning, analysis, and understanding impacts

• activities that prioritize deep understanding, analysis, synthesis, creativity, making connections, and understanding relationships

• critical and creative thinking skills

• dispositions, such as independence, flexible thinking, and persistence

Learners demonstrate their learning through a variety of assessment strategies that inform classroom instruction and curriculum. Effective assessment practices include:

• presentation of learning to authentic audiences, including students, families, community members, and professionals.

Learners have multiple opportunities to demonstrate their learning, receive corrective feedback, and use this feedback in meaningful ways to support their learning. Learners are provided with:

• multiple and varied opportunities over time to demonstrate their learning

• opportunities and time necessary to revise and improve their work

• teacher feedback as well as peer feedback and selfreflection to guide next steps in learning

Students use technology (1:1) across all curricular areas to support, enhance, and demonstrate their learning. Learners use technology in informed, effective, and ethical ways to:

• communicate clearly and creatively

• access, support, document, and supplement their learning

• construct knowledge, create, and problem-solve

• broaden their perspectives locally and globally

• engage in learning beyond the constraints of the school building and school day.

Administrative and academic organization/structure

Stoneham High School is a traditional college-preparatory school that is organized by department. Building layout, available classrooms and classroom assignments allow for all teachers to have their own classroom within proximity to their identified department.

As a result of a two year, grades 5 - 12, 1:1 ChromeBook Initiative Plan all students entering for the 2019-2020 school year were provided an individual device. While the first year of all students having a chromebook resulted in a wide and inconsistent range of use within classrooms the ongoing pandemic has thrust teachers forward. Technology integration with instruction, student work production and assessment as well as classroom management and communication has vastly improved amongst teachers and faculty with raised levels of consistent practices and increasing use of advanced technological applications. We value responsible technology use and integration and view technology as an essential tool in meeting 21st Century College and Career Readiness Goals.

As we continue to provide students and teachers with innovative learning technologies and opportunities to best prepare students for these modern goals, we have initiated resources to expand our curricular offerings with a goal to allow students to explore various careers and build their 21st century skills with hands on engagement, problem based learning and community partnerships.

Through teacher creativity, innovation and commitment we have been able to continue our strong performance and provide rich learning opportunities. Students are provided a wide and diverse course selection supporting individual learning needs and student interests and passions that support their acceptance into postsecondary plans of education or career. However our current facility significantly inhibits our capacity to broaden our courses of study to include courses and programs that allow for project-based learning and career exploration.

Stoneham is currently involved in Project Lead The Way (PLTW) grants in attempt to provide continuity with the Stoneham Central Middle School PLTW and to enhance and support development of educational and career pathways. Though we have added and are in the first stages of establishing PLTW Computer Science, Engineering and Bio-Engineering pathways, our current facility, classroom use and structure inhibits the students learning experience and the full potential of these programs. Classrooms are limited in size for hands on and problem based learning. Building and classroom layout do not allow cohesion as a program or integration with other disciplines.

Teachers seek to provide students opportunities to engage in authentic learning experiences and student collaboration.

Our history department has developed a history lab that provides students with hands-on and first person historical artifacts to assist with historical research. The department also engages in National History Day which promotes historical investigation, student collaboration and culminates with a final project. Our current facilities do not provide activities such as these with adequate space that utilizes technology as a means of presentation, space for collaboration and sharing of ideas and to effectively present and showcase work through a variety of mediums. Large interdisciplinary project-based learning rooms would provide the flexible spaces needed for students to develop and present their projects.

Stoneham students have a wide array of strengths and interests they are able to pursue and explore through our curriculum and courses with an emphasis on Humanities and the Arts, Science, Technology, Engineering and Mathematics. We provide a wide variety of offerings from our career elective programs such as culinary arts and child development to artistic pursuits in Music, drama and our general art, photography and ceramics programs. Students are provided many opportunities for rigorous college preparatory work through our thirteen distinct Advanced Preparatory and nineteen Honors level courses. The current facility and school structure do not foster the opportunity for interdisciplinary and collaborative teaching therefore most of our learning experiences and academic engagement occur within silos neglecting students the opportunity to connect the learning in a synergy as experienced in real world applications

In 2019 Stoneham High School introduced a new academic schedule to support students with opportunities for enrichment as well as foster teacher collaboration through common planning time. Currently, there are no specific areas specified for teacher planning and collaboration. This is often done in a classroom and is limited due to size and locations. Therefore, it limits the depth of opportunity to collaborate and plan across departments.

The goal of a new Stoneham High school would be to plan a newly reorganized school that fosters innovation, collaboration and integration of academics and the arts and opportunities to support successful entry for post secondary education and / or career pursuits.

We envision a new school would provide:

- Flexible classroom space
- Spaces for student collaboration, group and independent study and the ability to showcase their work through variety of mediums
- Project rooms to support project-based learning
- Teacher planning rooms for the faculty and staff to collaborate with and across disciplines
- Quiet and private rooms to support the academic and social emotional needs of our students
- Flexible conference rooms to support both individual and small group meetings with students / parents / guardians as well as Team Meetings of various sizes.
- Interdisciplinary Project and Performance Room to support student performance, guest speakers, seminars, interdisciplinary collaborative activities and presentation and showcasing of student work

The new facility would need to support the district's mission statement as well as being reflective and adaptable to our core values:

Mission Statement

- Are creative, critical and independent thinkers
- Demonstrate respect for and acceptance of self and others
- Know and apply communication and information literacy skills
- Are responsible contributors to the local community

Core Values

- Support a safe, inclusive educational environment
- Foster and hold high expectations for student learning
- Share responsibility for the success of our students

Rebekah Brooks and Sara Fitzpatrick REMOVE NAMES FOR THE BOOK
English Language Arts/Literacy

The English Department follows the Massachusetts Curriculum Frameworks in teaching Reading, Writing, and Language which includes Speaking and Listening Standards. Thinking critically, communicating effectively, and working both independently and collaboratively are essential skills students require to be successful after high school. Understanding how texts are structured in conjunction with multiple learning strategies prepares students for standardized tests as well as accessing challenging work. Class reading lists include relevant and multicultural selections to build engagement and offer global perspectives. Our writing program has students craft a variety of writing for different purposes, including analytical responses to texts, creative narrative, and persuasive arguments. Students also enhance their speaking and listening skills through Socratic discussion, persuasive speeches and debates, and dramatic performances/read alouds of plays and poetry.

We offer full-year ELA courses in grade 9-12 at the college-prep, advanced college-prep, honors, and AP level. Our 12th grade students who opt not to take AP may choose from a variety of multi-level courses defined by theme and genre. These multi-level courses run the length of one semester and seniors are required to take two courses of their choice. In addition to full-year ELA classes we also offer semester long electives such as Film Study and Creative Writing.

We are in the process of revising our curriculum for more enhanced implementation of UDL practices. In the future, we would like to have more project-based learning, self-directed learning, and collaborative learning experiences in order to develop twenty-first century skills. In our current building we are limited with how we can collaborate and utilize technology and classes often have to spill out into hallways and other makeshift spaces. We need more open spaces that include flexible furniture and technology as well as spaces that support interdisciplinary learning opportunities. We also need to continue our independent reading program by providing shelves to display and store classroom libraries in addition to curriculum texts.

Last school year, we had 8 ELA teachers utilizing 7 ELA classrooms. The utilization rate of these classes was 81% over blocks A, B, C, D, E, F, G, and the flex block. We need to maintain these 7 classrooms in the new building. As we prepare for the future in education at Stoneham High School, we envision these 7 ELA classrooms to be inclusive, flexible, and collaborative. These ELA classrooms would include the following elements:

- Open shelving to display classroom libraries within each classroom to foster student engagement with our independent reading program, known as self-sustained reading (SSR)
- Adequate whiteboard space and bulletin board space to display student work and student-created resources such as anchor charts, graphics organizers, and word walls that are relevant to curriculum and learning standards
- Flexible technology that is seamlessly integrated and meaningful to the instruction in the form of interactive whiteboards and technology hubs for teacher- and student-directed instruction
- Open spaces that can be used as workspaces with possible moveable walls which supports creative and collaborative learning
- Furniture that is flexible and can be easily moved for project based learning, collaboration, and discussion

Additionally, our classrooms should include spaces that are reflective of the variety of courses within our department to increase student engagement and create a positive learning environment. We currently have classrooms with bulletin boards to display student created academic resources to enhance engagement and enduring understandings.

- Design response (TBD based on school design)
  - Access to library for extension activities such as research, access to technology, and space for interdisciplinary learning
  - Possible access to black box/theater space for speaking and performance activities
  - Adjacent to other ELA teachers for department collaboration

Angela Billings

Mathematics

The Mathematics Department aims to provide students with a solid foundation consistent with the principles and practices outlined in the Massachusetts Curriculum Framework for Mathematics. Through collaborative and independent learning, students will develop and use analytic thinking, critical reasoning skills, and technology to solve problems. Students will be prepared to address complex and challenging real-world problems and succeed in postsecondary education, careers, and everyday life.

In order to graduate from Stoneham High School, there is a requirement to pass four (4) mathematics courses that meet the following conditions: the courses involve four (4) full years or eight (8) semesters of study, including Algebra I and Geometry.

The department offers math classes at various levels including Advanced Placement, Honors, Advanced College Preparatory, and College Preparatory. Math teachers use various methods of instruction including whole group instruction, collaborative groups, and project-based learning. Math instructors use technology such as graphing calculators, document cameras, and SMART boards while presenting lessons.

When planning a new space for math instruction, classrooms should include flexible, large write-on walls where students and/or teachers could work simultaneously at multiple places in the room. In order to provide collaborative space for projects or small group discussion of math problems, the new space needs flexible, comfortable seating which can be moved if needed. Also, a breakout space for students to be able to use for small groups so as to not distract learning in the main classroom should be part of the new space. Classrooms should have storage closets for manipulatives and student supplies that are needed throughout the school year including graphing calculators, protractors, compasses, ruler, Cuisenaire rods, 3d figures used in Geometry class, etc.

Last school year, we had 8.2 math teachers utilizing 8 math classrooms. The utilization rate of these classes was 81.25% over blocks A, B, C, D, E, F, G, and the flex block. We need to maintain these 8 classrooms in the new building. Also, math classrooms that are adjacent/connecting with other math classrooms is most desirable as agreed upon by all of the math teachers to help with collaboration.

Other needs in the classrooms:

- Windows
- Phones that can call other classes, the office, the nurse, guidance, with an outside line, etc.
- Multiple electrical outlets for students' Chromebook chargers
- Adjustable temperature controls
- Clocks that are synced throughout the whole school building
- High quality white boards
- Lights that are NOT motion sensored
- Storage for all of the math textbooks that can handle the weight of the heavy textbooks

Below is a picture of a classroom that has large write-on whiteboards.

Lisa White and Teresa Socio
Science

The Science Department offers a comprehensive program designed to prepare all students for success as scientists and life-long global citizens. Our science curriculum is designed around relevant, real-world issues to increase student motivation, intellectual engagement and critical thinking. As students progress in their science education at SHS, they will build a solid foundation of scientific and technological knowledge. Students will develop the ability to apply their knowledge to analyze and explain the world around them.

Our science courses will help to prepare students for civic life, postsecondary education and career success. Connections are made throughout a student's journey in their science education, starting with our ninth grade Earth and Space Science courses where students will learn about the Earth's place in the universe, Earth's Systems and the relationships between the Earth and human activity. Sophomore year, as students prepare for the Biology MCAS, they will continue their focus on the environment while adding the interrelationship between organisms and how they function. The standards expect students to understand the four core ideas of biology including; ecosystems, structure and function of organisms, heredity and biological evolution.

Junior year, students have a choice to continue the traditional science pathway to Chemistry, (where they will apply their scientific and mathematical skills and knowledge to focus on matter and its interactions, motion and stability as well as energy), and/or branch off to explore our diverse selection of electives, including AP and Project Lead the Way

(PLTW) offerings. Senior year students can choose to continue with elective courses, or Physics. Our senior Physics course engages students with science and engineering practices of developing and using models, analyzing and interpreting data, using mathematics to solve problems and make predictions of a variety of phenomena such as motion, energy and waves.

The SHS Science curriculum is designed so that students develop an understanding of the science and engineering practices as outlined in the Massachusetts Science and Technology/Engineering Curriculum Framework.

Those practices include:

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating and communicating information

Stoneham High School is planning to offer a number of Project Lead The Way (PLTW) STEM courses to provide hands on, project based learning in three primary pathways, Biomedical Science, Engineering, and Computer Science. The PLTW courses follow the same curriculum philosophy and methodology as our middle school PLTW STEM courses.

Biomedical Science - The Biomedical Pathway includes 4 courses. Stoneham High School began providing courses in this pathway in the 2017-2018 school year.
Principles of Biomedical Science, introduced in 2017, is the introductory course for our Biomedical Pathway. Plans to expand offerings in subsequent years are underway.

Engineering -The Pathway To Engineering curriculum includes 8 courses. Stoneham High School has begun by offering the following: Introduction to Engineering Principles, in 2019. This is the first course in the engineering pathway. This course is opened to all students in grades 9-12. Plans to expand offerings in subsequent years are underway.

We expect that our current science program will continue to evolve and be a place where students will voluntarily invest their time. In addition to expanding the STEM offerings from PLTW, we would like to include access to college courses, vocational training through collaboration, career exploration (internships/shadow days), along with the support and space for student-driven extracurricular activities such as robotics club and Science Olympiad. By reaching a larger audience of interested students through new opportunities, we hope to increase student engagement with the program.

As described above, the current science program at SHS offers both fundamental science courses and applied science/technology electives. Our core foundational courses are: **Earth Science** (8 sections no lab space), **Biology and Ecology** (11 sections with lab space), **Chemistry** (6 sections with lab space), and Physics (4 sections with work space). These courses are offered at multiple levels (CP, ACP and Honors) along with **AP Biology** (1 section every other year with lab space), **AP Chemistry** (1 section with lab space) and **AP Physics** (1 section with work space).

The scope of our elective courses is purposefully broad and includes: **Earth and Planetary Science - Astronomy** (1 section with work space), **Planetary Exploration** (.5 sections with work space), **Cartography + Geographic Information Systems** (.5 sections each, totaling 1 section with work space and computer extras), **Meteorology** (1 section with classroom space), **Oceanography** (2 sections with classroom space), **Geoscience** (.5 section with workspace), **AP Environmental Science** (1 section every other year with lab space), **Life Science - Anatomy and Physiology** (2 sections with lab space), **Genetics** (.5 section with lab space) and **Forensics** (1 section with lab space), **BioMedical Science - PLTW:Principles of Biomedical Science** (1 section with lab space), In addition, **Health** (4 sections with classroom space, **Health Careers (1 section with classroom space) and Current Health Issues** (1 section with classroom space) courses are offered to students at SHS. **Engineering - PLTW Introduction to Engineering Design** (1 section with work space).

The numbers of course sections being offered and the types of space required are summarized below. To accommodate the emerging programs at SHS, including Project Lead the Way, we would like to add an additional room into the design plan. Based on the projected student population, the new building should include eleven dedicated science and technology classrooms for the core and applied sciences. Please see the summary in the table below.

Science and Engineering Space Request

	Sections	Room-Type	Total
Life & PLTW Biomedical Sciences	17.5	Laboratory	4
Chemistry	7	Laboratory	2
Physics	5	Workspace	1
Earth and Planetary Science	13.5	Classroom and Work space with computer add ons	2
Health	6	Classroom	1
PLTW Engineering	1	Workspace	1

The current science program at SHS is accommodated in nine classrooms. Although the classrooms have been outfitted with the requisite equipment; the antiquated spaces provide varying levels of functionality. Improvements addressing safety, flexibility and student-usage will be requested in the new building.

On a daily basis, SHS science educators offer skill-building activities through their course curriculum. Technology is widely utilized in the science classroom for teaching fundamentals. Laboratory experiments with equipment are designed to complement and illustrate learning goals throughout the course with an emphasis placed on critical thinking and data analysis. Collaborative learning activities, including project-based assignments, are utilized to foster teamwork and provide a holistic view of a problem. Teachers model good laboratory practices for their students daily. Best practices are shared among our teaching community and innovative, new approaches are being discussed and employed regularly. Looking to the future, new instructional spaces that can be programmed to be flexible and better suit the needs of educators and students will benefit the school community as our science program continues to evolve.

In an effort to grow our program to meet current and future applications, the science department is requesting a total of eleven classrooms in the new building. Accessory spaces such as prep rooms, storage areas and educator collaboration areas should be programmed into the design as well. Each of the classroom's requirements will depend upon the type of science that is happening in that space and we have broken it down below:

Life Sciences and Chemistry: The six life science classrooms will need to be fitted with the following laboratory utilities: a dedicated laboratory space around the perimeter of each classroom complete with laboratory grade benches, sinks, plumbed for gas and electricity. Each bench will need to seat at least four students and should have its own local equipment storage area. To support the laboratory activities, the building will need associated prep rooms with fume hoods, a dishwasher for glassware as well as space for a specimen/reagent refrigerator and microwave. Prep space can be shared between 2 or more classrooms. All requisite safety equipment (shower, eye wash, fire blanket, proper ventilation, goggle UV cabinet, etc…) should be in each individual classroom/laboratory space. Note that the Chemistry laboratories may require additional design features.

Storage: flammable storage cabinet and chemical storage area. Glass disposal area,

The classroom portion of the room will have flexible seating - tables and chairs that can be moved and full technology set-ups including charging stations. The separation of laboratory benches from classroom activities is a safety and efficiency design feature that does not currently exist.

Physics and Engineering - These two classroom work spaces should be designed with ample bench and storage space to accommodate large pieces of equipment. In addition the layout should be flexible and allow for wide access to technology and electricity throughout the room.

Earth Sciences and Health - The remaining three classrooms will be designed with flexibility in mind. Movable tables for reconfiguration and full technology access are necessary.

A teacher space that can be dedicated or shared with other departments will be useful for common planning.

Jon Pohorilak
Social Studies

The core of the history department is the NHD day program which all sophomores and juniors complete. Around 300 sophomores and juniors participate in the project from the beginning of the year to January and in some cases into June. Stoneham is also working to incorporate state mandated civic action projects in Grade 10?. Economic students develop business plans and work with local entrepreneurs. As a result, the typical classroom space creates limitations for the project based learning already built into the social studies curriculum.

On a typical day in the social studies hallway students are spilling out into the hallways to record videos, work on projects, and do research. Social studies teachers also utilize the library consistently, though the distance between the classrooms and the library takes up class time. Locations close to the library would facilitate the indepth research that is required to complete NHD and other projects.

Social studies is about teaching democracy but currently the classroom set ups are undemocratic, without flexible space and focused on the teachers at the front of the room. Students need the ability to present from all areas of the classroom using technology and whiteboard.

As a result of the above curriculum needs the following spaces are needed.

- History Lab
- Storage space for the history lab and ability to bring at least a full class into the room to have space to bring two full classes to work on traveling parts of the exhibits - for all purpose room. House community panel for civic action projects.
- Classrooms need breakout space for NHD projects
- All purpose room for presentation of History Day work including about 100 annual exhibits and the view of many student documentaries and performances.

Jennifer Christopher
World Languages

The World Language Program at Stoneham High School offers three languages; Spanish, Italian and French. All three languages are offered at the Advanced Placement (AP), Honors, Advanced College Preparatory and College Preparatory levels. Although not currently a graduation requirement, the majority of students take World Language and the courses are considered core academic subjects. Additionally, Stoneham High School offers students the opportunity to earn the Seal of Biliteracy.

The World Language Department at SHS focuses on language acquisition through the specific skills of speaking, writing, reading and listening. The cultivation and advancement of those skills is promoted through various teaching methods, however, active learning is paramount in our curriculum. Active learning in a typical World Language classroom at SHS includes: project-based learning, collaborative group work, student centered activities, independent/self directed skill building, utilization of numerous technologies, and daily partner/group work, to name a few. While delivering curriculum, it is imperative that our students have a safe, flexible and inclusive environment.

Our ability to deliver our interactive, dynamic lessons to students is impeded by our space (or lack thereof). Break-out, flexible, collaborative space is essential to advancing our curriculum and successful language acquisition for all our students. Our World Language classrooms and student centered approach fosters many other skills for students in both academic and real world spaces. Currently, our students use the hallways, floors, tops of stairwells and corners of classrooms for space.

Advancement in technology has allowed teachers and students to mirror the activities that occur in a traditional language laboratory. Virtual Language Lab software is available and students can speak, listen and record directly on their Chromebooks. Although newer labs are state of the art facilities, for our building, the square footage designated for a potential language lab would better serve the community in common areas. For example, space in a Media Center (where WL students record skits with green screens) or small conference areas (where WL students can practice AP and Seal of Biliteracy exams with authentic conversations). These types of spaces will be used by all students, across all disciplines.

Celeste Vaughan

School Counseling, Current Services and Programs:

Four school counselors provide academic advising, social emotional support, career exploration, and post-secondary planning services to all students at Stoneham High School. One of these counselors also serves as the school counseling department head. Because the department head is responsible for numerous administrative responsibilities and is also an active member of the high school leadership team, her student caseload is reduced. Counselors current caseloads range from 128 students to 183 students.

Upon entering grade nine, students are assigned to a counselor based alphabetically on their last name. This counselor assignment remains consistent from grade nine through grade twelve, to allow counselors and students to develop meaningful relationships, to assist in advising students through the annual course selection process, to counsel them through any academic or personal challenges which arise throughout their years in high school, and to facilitate the post-secondary planning process. The alphabetical split also enables counselors to build stronger relationships with parents and families, as counselors are likely to have siblings from the same families over the years.

In addition to individual support, school counselors provide services for students through the implementation of a developmental counseling program which is in alignment with MASCA (Massachusetts School Counselors Association) and ASCA (American School Counselor Association) standards. Guidance counselors implement this curriculum with all students through structured classroom lessons and individual 1:1 meetings, beginning with the eighth grade course selection process and continuing through students' high school graduation.

Classroom lesson topics include: mindfulness and stress reduction, goal setting, time management, study skills, annual course selection, understanding grade point average and the high school transcript, career exploration, and the post-secondary planning process (including standardized testing, the college application process, postsecondary alternatives to college, accessing financial aid and applying for scholarships). Because there are currently not adequate large group meeting spaces available, counselors frequently take time out of academic periods in order to meet with students in classroom settings. Counselors have attempted to utilize the cafeteria and the auditorium for these lessons; however, the acoustics and seating arrangements are not conducive to implementation. Counselors have also attempted to offer some of this curriculum to students during flex blocks; however with various enrichment

programs and academic support offerings also offered during flex blocks, it has been a challenge to procure necessary meeting spaces.

To better support our students through the delivery of this developmental counseling curriculum, the department would benefit from a moderate to large sized multipurpose meeting space that contains flexible seating and allows for movement and discussion. It should be wired and equipped with presentation (and amplification?) equipment. Counselors could utilize this space for the implementation of curriculum, rather than taking away from students' academic instruction time, by scheduling these lessons in advance throughout the flex blocks. This would resolve the two current challenges of interfering with academic instructional time and not having sufficient time or space during flex blocks.

The counseling office also hosts approximately 80 college and university admission representatives each year. Representatives meet with as many as forty students at a time, or as few as two or three, depending on students' interest and their availability to participate). Currently, smaller meetings take place in the work/waiting area of the school counseling suite, and larger meetings take place in the lecture hall. The same multipurpose space that would be used for school counseling curriculum could also be used for these meetings.

Kim O'Connor
TEACHER PLANNING AND ROOM ASSIGNMENT POLICIES

Teachers teach 5 of 7 periods in a rotating schedule with at least one 69 minute planning period per day in our current schedule. Common planning time is also built into our schedule for all teachers once a cycle as an early release day to provide ample time for both department and interdisciplinary planning and collaboration.

The purpose of our current schedule is to support ongoing collaboration both departmental and interdisciplinary. The addition of teacher planning rooms and workspaces will enhance planning periods and common planning time for all teachers. We would like to implement more project-based learning and cross-curricular planning with spaces that are flexible and functional for both professional development and quiet planning time. These planning rooms should provide space for teacher materials and tools and be equipped with technology such as charging stations and copiers. These spaces should be located close to instructional classrooms to help facilitate the implementation of this planning within each department.

There are 4 program supervisors who serve grades 5-12 in the following departments: Math, English, Science, and Social Studies. Each program supervisor has an office at the high school building which is used to meet with small groups of teachers, store textbooks and relevant materials, and have confidential conversations and phone calls. These offices are essential for each program supervisor to have a space that supports their work such as planning and reviewing teacher evaluations.

Classrooms are assigned by a program supervisor. Rooms are assigned based upon the idea that rooms serve as the base for instruction and planning periods. Currently almost all teachers have their own classroom with the exception of a few shared spaces. When a teacher's room is being used during their planning period, work spaces are limited and are often not supportive to colleague collaboration or productive planning. Ideally we will continue with 1 teacher assigned to 1 room; however, in the event that a room must be shared, no more than 2 teachers will be assigned to a room and they will be within the same department. This is to foster a more student-centered, student-driven, student-created classroom environment specific to the course that takes place in that particular classroom and specific to nurturing the social and emotional needs of those students.

Space needed-

- **7** supervisor/lead teacher office space : Math, English, Science, Social Studies, Fine Arts/music, World Language, and CTE
    - This space should include square footage for book storage (i.e. the ELA department currently has over 6200 books)
- Teacher Planning/Lunch space

1) Teacher Planning – The District is proposing (23) 100 nsf Teacher Planning areas totaling 2,300 nsf, which meets the MSBA guidelines.
    - In response to these review comments, please provide information that describes the proposed location and adjacencies of the (23) Teacher Planning areas.

Response: While there are common teacher planning areas that may serve to meet some of the needs of teachers, these 23 smaller teacher planning areas will be necessary to accommodate a variety of needs not met in the common teacher planning spaces. Ideally, these 23 teacher planning spaces will be adjacent to the 23 classrooms planned for on the Space Summary. These spaces may be used for confidential virtual and telephone conferencing with parents and other specialists, since a more common teacher planning area would not allow for this level of privacy. Furthermore, a more quiet and private space would foster collaboration among co-teachers and grade-alike teachers in the same subject without the disruptions and distractions that naturally occur in a common teacher planning area. Additionally, another benefit to these spaces if adjacent to classrooms would be to allow for quiet, small group instruction or testing to meet the needs of students on 504s and IEPs.

2) Collaboration Space per Neighborhood – The District is proposing (6) 500 nsf Collaboration Space per Neighborhood totaling 3,000 nsf in excess of the MSBA guidelines. Based on the information, and the proposed size of the General Classrooms compared to the square foot range allowed in the MSBA guidelines, the MSBA may participate in a portion of the overall proposed square footage associated with the Collaboration Space per Neighborhood.
    - In response to these review comments, please provide additional information that demonstrates how these spaces will be scheduled, staffed, and supervised.

Response: There are 6 collaboration spaces of 500 nsf being allocated. If there were 6 neighborhoods each with a collaboration space of 500 nsf, we do not envision one entire space in the middle. We want the 500 nsf to be spread out to multiple collaboration spots next to multiple classrooms of different sizes and shapes, like an extension of the classrooms. Therefore, they would get the maximum use because multiple teachers and classes could use each at once with different amounts of privacy. We do not envision a Google form signout for each of these spaces. We anticipate these spaces to be saved and only used for current classes that might need them in that particular neighborhood at any teaching moment. This will foster organic extension of learning beyond the confines of classroom walls, promote collaboration among students and teachers, provide students space for self-directed learning (SDL), and enhance opportunities for universally designed learning (UDL). These collaboration spaces would be like real-world breakout rooms, allowing opportunities for diverse learning experiences all within the same “class.”

Kim O'Connor
PRE-KINDERGARTEN

Currently, the district provides special education services to our Preschool students in programs located in Colonial Park, Robin Hood and South Elementary Schools. Our integrated preschool classrooms are designed to educate children with a variety of disabilities as well as typically developing children. Within the integrated setting, students with disabilities are full participants in all program activities with supports and accommodations. Typically developing children are role models for language, fine and gross motor skills, and social and play activities. Together all children form a community whereby we learn from each other's strengths and differences. Diversity in our classrooms is appreciated, encouraged, and is an ongoing part of our everyday classroom life. Our preschool classrooms are multi-aged. Tuition students must be three or four years old on the first day of school.

Our preschool classrooms provide individualized programming designed from a developmental point of view and based upon the Massachusetts Curriculum Frameworks for Prekindergarten. The staff seeks to nurture the whole child by giving attention to all areas of development; physical, cognitive, language, social, and emotional. The curriculum emphasizes "hands-on" exploration and concrete experiences. Activities are often open-ended so each child can experience success at his or her own level of development. Play is considered an important aspect of our programming, and learning through play is encouraged through materials such as paint, blocks, sand, water, dramatic play, books, and manipulatives.

The average enrollment for our preschool program is 100 students per year and has been expanding over time. The district is seeking to relocate to the high school campus and provide additional space for its growing preschool program. Preschool services are mandated through state and federal law and are becoming a growing service that most schools provide. These spaces must also include room for role model peers as we seek to provide inclusionary options for our preschool population. These role model students are a vital function of our inclusionary vision for preschool that is currently restricted by our lack of space district-wide. Having all our preschool programs together will allow for shared resources (therapies, materials, curriculum, staff, etc.), as well as greater opportunities for collaboration as we expand and enrich our programs. We also envision greater curriculum development and alignment amongst the preschool team.

A component we envision adding to the preschool program is before and after school childcare. There is high demand for childcare and our current lack of childcare is a barrier to many families in Stoneham who would otherwise attend preschool. Along with offering childcare, a consolidated preschool space would allow for more programming options for preschool families.

Another important part of our vision for the new preschool space is a merging with the existing FACS Child Development Program at the high school. This program promotes early childhood education to students wishing to go into the vocation. An essential component of the program is an opportunity for third-year students to co-op in the SPS preschool program. Having both programs in the same building will greatly enhance the experience of students in the FACS Child Development Program.

The ideal space for the preschool classrooms would be located on the outer edge of the building's footprint with an adjacent playground.

This space would include:

- 8 to 10 classrooms spaces designed to be age appropriate for preschool students with BATHROOMS
- Administrative office
- Reception area/ secretary space
- Teacher's collaborative space

- Teacher lunchroom
- Student lunchroom
- Outdoor Playscape
- Indoor Play area
- Speech and language office
- OT/PT Suite
- Social worker space
- BCBA space
- Nurse space with space for students
- Conference room
- Sensory Room
- Space for the high school child development class nearby.

When designing the space, access for diverse student populations should be considered. This would also include ensuring any playground equipment is inclusive of different abilities, skills and needs. Access to the preschool space for parents/guardians along with convenient drop-off and pick-up spaces should be considered.

1) Pre-K Space requests:
   a) Preschool Program (13,975 nsf):
   b) (8) 1,200 nsf Pre-School Classrooms with toilets/changing (15 students)
   c) (2) 175 nsf (totaling 350 nsf) Observation Areas: Childcare Development
   d) Pathway
   e) (1) 400 nsf Pre-School OT/PT
   f) (1) 150 nsf Pre-School Director Office
   g) (2) 250 nsf (totaling 500 nsf) Pre-School Speech/Language
   h) (1) 350 nsf Pre-School Conference Room
   i) (1) 275 nsf Reception Area with Secretary
   j) (1) 300 nsf Teacher Work Room/ Collaboration
   k) (1) 600 nsf Student Lunch Room
   l) (1) 150 nsf Social Worker Office
   m) (1) 150 nsf BCBA Office
   n) (1) 350 nsf Nurse
   o) (1) 350 nsf Conference Room – In response to these review comments, please clarify the use of this conference room and how it differs from the proposed (1) 350 nsf Pre School Conference Room identified above.
   (1) 450 nsf Sensory Room

Response:
The first Pre-School Conference Room is for holding the IEP and Progress meetings for the students in the preschool. The second Conference Room is for use by the staff to complete the required evaluations for incoming preschool students to determine eligibility for special education students.

2) The MSBA's participation will be limited to Preschool classrooms only, and potentially Pre-School spaces dedicated for special education, provided that the District submit additional information that further describes the proposed number of students, daily/weekly schedule,special education program, and space utilization

impact on the schools in which these programs are currently housed. Please note that upon selection of a preferred schematic, the District may be required to adjust spaces/square footage that exceeds the MSBA guidelines and is not supported by the Educational Program provided.

Response:
We currently have 7 preschool classrooms (3 integrated half day classrooms each running a morning and afternoon program, 2 integrated full day classrooms, 1 hybrid full day classroom that is integrated for half the day, and 1 substantially separate full day classroom) across all three elementary schools in Stoneham.

School 20-21	**Schedule**
Colonial Park AM/PM Remote	5 Day/Week AM (M, T, W, TH, F 8:40-11:10) and 4 Day/Week PM (M, T, TH, F 12:10- 2:40)
Colonial Park Full Day	5 Days a Week (M,T,TH,F 8:40-2:10 and W 8:40 - 11:40)
Colonial Park AM/PM	5 Day/Week AM (M, T, W, TH, F 8:40-11:10) and 4 Day/Week PM (M, T, TH, F 12:10- 2:40)
South Full Day	5 Days a Week (M,T,TH,F 8:40-2:10 and W 8:30 - 11:40)
South Substantially Separate Full Day RISE	5 Days a Week (M,T,TH,F 8:40-2:10 and W 8:40 - 11:40)
Robin Hood AM/PM	5 Day/Week AM (M, T, W, TH, F 8:40-11:10) and 4 Day/Week PM (M, T, TH, F 12:10- 2:40)
Robin Hood Hybrid Full Day (½ Integrated, ½ Sub. Separate)	5 Days a Week (M,T,TH,F 8:40-2:10 and W 8:40 - 11:40)

Last year these classrooms serviced over 105 total students, including 57 students with special needs. In addition we have a significant number of additional students who come to the preschools for specific services including speech and language and occupational therapy.

The preschool program in Stoneham has grown and changed over the years as a response to an increase in the number and needs of the students it serves. The preschool has grown from five classrooms across two school buildings during the 2015/2016 school year to seven classrooms across three school buildings by the end of the 2019/2020 school year. Given the increasing complexity of the needs of the preschool special education students in the district we have eliminated the 2-3 day a week programs and all programs now are 4-5 days a week. In addition more special education students now require full day instead of half day programming. These changes required us to create more preschool classrooms to provide the services required by students' IEPs. Even with the current configuration of 7 classrooms, there are often times when we do not have enough space in a particular classroom during the year. Last year the district had to open a new integrated preschool classroom midyear. In addition, the growing number of students that require a preschool substantially separate classroom will likely require the district to add an additional classroom later this year or next year. We anticipate an enrollment next year of over 55 special education students and over 60 typical peers in the integrated preschools and 10 substantially separate students in the substantially separate program. Given guidelines from the department of education this enrollment would require at least 8 preschool classrooms.

Currently all of the town's three elementary schools house preschool classrooms. Moving the preschool classrooms out of the elementary schools will free up much needed space. Over the last five years, kindergarten to grade 4 enrollment has increased by 5% in schools which were already close to capacity. This has necessitated adding sections to some grades. Also, additional required special education programs and interventionists were added to the elementary schools. Moving the preschool program classrooms to a unified location at the High School helps to avoid overcrowding and the need for having to approach MSBA for funding for an additional construction project at the elementary level.

Kim O'Connor
LUNCH PROGRAMS

Stoneham High School has a full lunch program that serves the high school population during two to three lunch periods depending on capacity and scheduling serving over 200 plus students each lunch period. The district runs a contracted nutrition services program (currently managed by Aramark Corporation), and students have multiple options each day for lunch. There are hot lunch lines, pre-packaged salads and sandwiches, and an additional short option line for a la carte options. Breakfast is also available for students in the morning.
The high school cafeteria kitchen also works additionally with the elementary schools to provide lunches for those students. The high cafeteria kitchen serves 394 students at Robin Hood Elementary School, 355 students at South Elementary School, and 264 students at Colonial Park Elementary School.

Currently the high school has a 30 x 10 foot freezer adjacent to the building that allows for frozen storage for all 5 schools when large quantities are purchased, as in the other schools there is not enough frozen food storage. This freezer storage needs to be accessible for van loading to be delivered to the other schools on a daily basis. THIS IS A MUST!
The school's cafeteria is in the main level, and is not surrounded by classrooms, it is on one of the far sides of the building. The proximity to the classrooms/lockers can have a negative effect on those students during lunch periods as it has students rushing too much, although it would also not be conducive to be too close to classes as to disrupt.The cafeteria's location also causes it to be under utilized during the remainder of the day, including before and after school. A more central location to the entrance would be more applicable.

Needs for Cafeteria:

- Space for large freezer
- Space for two walk-ins
- Locker and changing room with bathroom
- Laundry area
- Dry Storage area
- Director's office space
- Dishwashing station
- Current line and preparation space is adequate

Cynthia Shaw
TECHNOLOGY INSTRUCTION POLICIES AND PROGRAM REQUIREMENTS

At Stoneham High School we believe that all students, regardless of their future goals, will need a working knowledge of technology application and use in the world around them. With the implementation of the 1:1 program at the high school, technology is a tool that is embedded into much of the daily work of our students and staff. The district technology goals focus on the following areas:

- **Classroom** –Digital Citizenship, Creativity, Collaboration, Communication, Instruction, Assessment, Assistive Technology
- **Access**-Staff and students have access to current technology tools 24/7. Building based technical and instructional supports are available.
- **Skills**-We provide resources to staff and students in support of their use of technology. A variety of professional development opportunities are offered that are timely, focused, and on-going. Teachers are proficient in supporting student use of technology
- **Environment**-Policies, Culture, Finances, Security and Data Management

Our goal in how technology is used at SHS is consistent with the goals stated above, that technology is a necessity that holds the potential to enhance teaching and learning in profound ways.

Technology is managed through the Information Technology Department, which consists of one district network administrator, a Data Manager, one Data Specialist, a technical support staff of five, an Instructional Technology Coach at the Middle and High School, and technology teachers at each level. The Assistant Superintendent of Curriculum and Instruction oversees the Information Technology Department. We are a 1:1 district for K-12 students.

Currently, Stoneham High School is in its second year of its implementation of 1:1 access of mobile devices for all students and staff. All students in grades 9 through 12 have been issued Chromebooks. All teachers are issued a Windows desktop, laptop or Chromebook device. Students and teachers have limited access to loaner Chromebooks through the library and there are also a few Chromebook carts available for sharing within academic departments. (ipad availability, mac lab).

District-wide we have an upgraded infrastructure to handle up to 4000 wireless devices. The Technology Department has also installed UPS units at all schools and in all tech closets to minimize downtime during power outages and protect equipment. They have repurposed an old video server to host images for all models currently in use in the district and replaced the out-of-date server at HS with a newer version. Other items also need attention to bring our technology up to speed such as new servers and switches to replace older units and older desktops used by teachers need replacing.

Instructionally, the integration of technology and the promotion of best practices are supported by a 1.0 technology coach and the library teacher who are part of the district's Information Technology Department. Teachers use technology in a variety of ways throughout the high school. The 1:1 program has brought with it professional development, new software and apps, and resources to promote a more hands-on, differentiated, innovative environment in the classroom. The use of Google Suite for Education allows teachers to organize, store, and present class materials and assignments electronically, making best use of student access. Additionally, the promotion of digital forms of presentation, assessment, research, communication, and writing have all been emphasized with the 1:1 program. Although a new school schedule was adapted last year to

include additional common planning time, more time for teachers to collaborate, share, and explore technologically is always needed.

Teachers participate in technology related professional development at the start of each school year as well as one PD day being set aside mid-year to further explore and practice both new and current technology. Additionally, teachers are encouraged to attend technology classes that are offered in-house or through outside agencies such as the Salem Collaborative Project.vo

Our proposed education objective in regards to technology is to expand course availability and to offer new and exciting courses and experiences for students. Currently, computer applications, computer science, film editing and photoshop courses are taught in various classrooms throughout the building without any cohesiveness and little collaboration. This layout was not created by design and intention but more by the constraints of our current structure. At this point in time, we are not able to expand these courses and programs due to our limited space capacity and limited technological capacity. Our vision for the future is one of connected technology spaces that can be used for multiple purposes that allow us to create various technology pathways for students and be able to support teachers in their need for Professional Development that is technology-centered. We envision a robust environment where teachers and students work collaboratively and have access to state of the art technology that includes topics such as AR/VR, gamification, and data security/analytics.

A cybercafe/student-run help desk area that students staff would integrate their CTE/computer science coursework with hands-on, real-world experience. This cyber cafe/help desk would best be suited to be near the library/commons area as well as in close proximity to the technology area where students can interact with the technology staff for support and continued help. Having updated equipment and classrooms to serve our special populations that offer them the newest assistive technologies are key to providing the highest level of access to the Rise, Stride and EL student populations. Our vision is to have a multipurpose technology area that can support various pathways to create an innovative, sustainable technology program.

Creating a Professional Development Lab/Technology Area for teachers to collaborate or create and test technology for use in the classroom would improve their access to technology training. Having an area to create videos, use green screens, have access to better video and audio recording would help to promote remote readiness and online learning for them.

The current high school structure, with limitations on connectivity, power, storage, collaborative spaces, and open classrooms inhibits teacher creativity and student learning using technology. For technology to be more fully and effectively integrated, teachers need to have more reliable access in spaces that promote collaboration, creativity, and communication. Increased support through more robust professional development is also key. A new high school with a strong, scalable, and advanced infrastructure, would be beneficial for classroom instruction and teacher training and collaboration.

Danielle Catalano
ART PROGRAMS

Stoneham High School recognizes that the arts are a vital component of 21st century learning. The arts prepare our students with the skill set they will need to become successful, well-rounded thinkers. Our philosophy is aligned with the Massachusetts state standards which center around the principles of Creating, Presenting, Responding and Connecting. We offer a program of rigorous, relevant courses that support social and emotional growth, promote family and community engagement, are inclusive, make connections across disciplines, represent diverse cultures, and foster artistic literacy. Strong Arts = Strong Schools = Strong Towns.

Our vision for the Visual Arts Department in the new building is one of an expansive space with room to grow. We are lucky to have so many class offerings in our field, but the types of classes are limited by the physical space. We'd like to see a Fine and Performing Arts wing that also includes media and audio/visual spaces. We are fans of the CTE model for the arts, as it enables all stakeholders to see the value of a strong arts program.

Current classrooms in size and number are adequate for our current program enrollment. Our worry, as we visit these newer schools, is that we are going to lose this important space. Art rooms are not like other classrooms - there is constant movement and activity, with students working on large pieces both in groups and independently - we need space to spread out. Our square footage requirements are more akin to a gym class as opposed to an academic classroom. We're not really happy with what we've seen at other schools so far.

Basic Needs for Art Rooms:

- Designated Ceramics room with proper ventilation (see notes on ceramics below)
- At least 3 art rooms
- North light would be lovely. But simply adding windows would be a major improvement
- Adequate storage space for large materials and large works - ie 24"x36" flat files and multiple shelving units
- Adequate classroom space for 28 students per course, unless our union negotiates smaller class sizes
- Space for SmartBoards or whatever the current technology will be
- Adequate storage space for supplies - ie a wall of shelving units
- Storage closets
- Adequate outlets and in logical places - maybe even in furniture
- At least 3 sinks per room
- Adequate counter space for things like paper cutters and power tools and such
- Kiln not in the basement

Notes on the Ceramics Room:

Right now our ceramics room is also used for Art 1 classes. This is tricky because clay dust gets everywhere, including on projects from other classes. Clay rooms are wet environments, and using them for other purposes is not ideal. Our ceramics program is hugely popular and growing every year, so a designated space just for these classes will allow us to expand appropriately. For example, right now we have 2 throwing wheels in class sizes where 8 wheels should be the norm. We would ideally like one wall of the classroom to be a designated throwing space, as it can get messy. We'd like the sinks to have clay traps and we'd like enough floor space to house our large equipment, such as our slab roller, pug mill, clay cages, and glaze buckets. A connecting outdoor space for raku / barrel firing would be great. The kiln should be in its own space with plenty of shelving for stilts and cones and clay carts. A closet for storing clay and molds is also necessary.

Sean Perry and Jack McShane
MUSIC AND PERFORMING ARTS PROGRAMS

Stoneham students are confident, creative, and balanced. The arts in our school are central to that developmental goal. The school has a sizable theater arts program and a thriving music program. Presently the performing arts program serves 23% of our student population, but each year that number continues to rise as interest in these programs and classroom numbers grow. Stoneham recognizes that the arts are a vital component of 21st century learning. The arts prepare our students with the skill set they need to become successful, well-rounded thinkers.

Stoneham High School students can currently take courses in art, music and theatre. After school, the students have multiple opportunities for artistic clubs and organizations. The most populated of these organizations is the drama club program. The club currently consists of 70 students annually between our technical theater and acting program. The Stoneham High School theater department consists of an acting ensemble and technical crew. The technical crew includes departments that specialize in theatrical lighting, hair and make-up, sound, construction, stage management, props, and house management. Some students have also assistant directed performances and written short pieces to be performed by students. Students involved in crews work collaboratively with their adult instructors to design and construct multiple uniform theatrical pieces throughout the year. These students plan, build, and take part in three productions a year under the supervision of a technical director, director, assistant director, music director, as well as countless adult volunteers. Productions include a fall play, a winter festival, and a Spring musical. During the winter festival the Stoneham High School Theater Department participates in a state-wide festival hosted by the Massachusetts Educational Theater Guilds (METG). Over the years the club has been very successful in this competition and has won multiple awards at the Semi-Final and State levels. Most recently in 2017 the Theater Department made it to the State Finals with their performance of Kindertransport. The METG presently considers us to be a "tier 2" school (scale is from 1-4). Many of our students who participate in the theater arts program go on to pursue the arts in colleges throughout the country.

Currently the school offers an introduction to theater arts course. This course enables students to develop acting skills through the study of improvisation, stage movement and character development. Students work on voice production, diction, script analysis and directing, using monologues and short scripted and unscripted scenes. The course may be repeated for more in-depth study and development. The Theater Department works closely with the visual art and music programs to collaborate on performances. During this past year's METG festival, students from the concert

band program created and won an award for their original score for the drama club's production of The Veldt. Once a year the theater department and music department collaborate to offer students a musical theater cabaret.

The Stoneham High school Music department consists of three performing arts classes. Classes include jazz band, concert band, and the Spartan Chorale. All classes are offered at the College Prep, Advanced College Prep, and Honors Levels. The Music Department has been steadily growing in the past three years. Since 2018, the program has grown 231%. Individual music students have been accepted to the northeast district music ensemble for band and chorus. The jazz band, concert band, and Spartan Chorale were preparing to perform in their first competition since 2008 this past year, 2019-2020 school year. In the past, the program has performed at Disney, the Trills and Thrills music festival, MICCA, and the UNH Jazz Festival. Jazz band, concert band and chorus perform at the high school football games, Veterans Day Ceremony, Martin Luther King Jr. Celebration, Memorial Day Parade, Carnival Ball, May Arts festival, winter and spring concerts, as well as various school and town community events. All three performing arts groups are always looking for ways to become more involved in community events.

In addition to these performing arts classes there are two general music courses. These courses are music appreciation and 20th century pop. Music appreciation is a course that studies music from its first known creation by the Ancient Greeks to the music of the 1900's. This class focuses on a more "Classical" tradition of music as well as music from other areas of the world. 20th Century Pop is a course designed to continue instruction from the Music Appreciation course. 20th Century Pop starts with blues and jazz music of the early 1900's. The course discusses music's transformation throughout the decades as a result of historical, social, and cultural reforms.

The physical space inhabited by both the music and theater departments is severely outdated and in dire need of attention. These areas simply do not support the needs of either program adequately. Both programs continue to grow in numbers and enthusiasm, but are capable of much more than the physical space allows for. Currently the theater arts courses are held in the band room, which due to the tiered nature of the room offers no ability for movement, scene work, or performances. The auditorium is an important part of the work that is done by the theater department, but the space and technology are highly outdated. Lighting and sound equipment are extremely outdated and need to be improved in order to function for a 2020 space safety. The stages lighting electric lines and lighting fixtures are all stage pin extensions, which is outdated and doesn't offer the appropriate amount of yield or performance necessary for an impressive production. The present stage offers only three electric lines, however none of them work properly and lighting is often spotty and lacks color and form. Our current sound system is currently analog and is outdated compared to most digital systems. Currently anyone who needs to focus or work on lights would need to climb a 20-foot completely vertical metal ladder to access the lighting loft. The other option is to access a cherry picker from another part of the building that is shared with the janitorial staff. The sound and light board is currently located in one singular space, rather than two separate areas of the auditorium. This booth includes little room for the massive amount of technology necessary for both departments. The lighting/sound boards placement at the far back of the auditorium and its open construction often makes for some distraction during performances. Acoustics within the auditorium and bandroom are not conducive to quality performances/rehearsals and the current heating system (when it functions) drowns out the performers. Due to the current placement of the Theater Departments construction workshop in the mostly-inaccessible basement, production crews must take place on the stage which could become a

safety and cleanliness concern. The current workshop space is only for heavy construction and therefore there is no adequate space for other crew departments such as the costumes department or hair and make-up to conduct their work effectively. An increase in space is necessary for the lights, sound, and hair and make-up departments to succeed and thrive. A further struggle felt by the theater department is that there is not adequate storage space for technical theater technology and building materials. The program seeks to conduct its technical work in a safe environment. Presently not having a separate space to build sets and run rehearsals makes it impossible to hold both at the same time. Performers run the risk of stepping on a left behind nail or bumping into a partially built set piece. Currently students have no safe or secure place to change their costumes before, during, and after performances. Make-shift dressing rooms have been made available and this space is often difficult to come by. The current space does not offer students a restroom that is within close proximity. In order to move from stage right to stage left (which is often necessary during a performance) students must pass behind a crowded, dark, one foot channel between the cyc curtain and the auditorium wall. Despite glow tape this is unsafe. Many of the seats in the auditorium are broken and unable to be used for the public. The incline of the seating does not allow for adequate views of the stage, there is also a lack of handicap seating as well as an area for our pit band to play during performances without completely blocking the view of the audience and drowning out much of the action onstage.

The present auditorium and band room accommodates not only for music and theater rehearsals and performances, but also for classes and school/community events. It’s a busy and tired space. The addition of a Black Box performance space would drastically improve future performing arts programs by offering more room for alternate courses and more space for community and school usage. This space could also serve as a part time drama classroom during the school day. The theater arts and music departments hope that an alternate black box space will help both programs continue to grow successfully with the option for new more intensive courses, new clubs focusing in music, theater, technical theater, improv, and dance. As the school grows it’s important that the Performing Arts and the needs of its students also grows and is not only seen as a club but an actual professional area of study that can be pursued after high school. Not only could performing arts departments benefit from such a space, but it could be used by any department. For example the english department could use it during Shakespeare units and social studies during large group projects or guest speakers. It would be wonderful for debates, assemblies, school organization meetings, public speaking or presentations of any kind [see list below]. Theatre classes would have a more appropriate rehearsal space making their performances more professional. Community organizations could benefit from holding events in both the black box as well as the auditorium. Having an improved auditorium space would no doubt improve the safety of students when using the provided technology.

The new auditorium should have 3 to 4 dmx theater electric lines with a total of 30 channels. It is important that these electric lines be able to be manually dropped down to the floor using a fly system, allowing for students to work on lights rather than using a ladder or cherry picker. A set construction and storage room that is close to the auditorium as well as a loading dock for easy transportation of sets and materials. All theater riggins (curtains legs, Cyc, etc.) should be able to fly in and out using a fly system accessible from both backstage and in the back of house lighting board. Auditorium theater should be raised seating with entrances and exits on the first and second floor. Separate sound and lighting booths with up to date board technology should be located at the back of the house in a boxed in setting. The Band should have a lowered pit at the very front of the house in front of the stage for musical

performances. The black box, band room, hair and make-up rooms, and dressing rooms should be located close to one another so that they can be used as green rooms for performances. Stage should include two stage right and stage left leg curtains as well as a mid stage full traveler and front proscenium curtain with a proper cyc curtain. A projector at the back of the auditorium should cover the whole cyc for visual effects.

The physical space inhabited by the music and theater department is severely outdated and in dire need of attention. The current band/chorus room does not have a heating system, mounted projector or smart board, limited wifi connection, no safe or functioning office space (the ceiling is missing and there is no ventilation or windows), lack of storage for large brass instruments (Tubas and Sousaphones), marching percussion (Marching Bass Drums, Snare Drums, Quad Drums), and percussion instruments (ex. Timpani, mallet percussion, etc…), lack of usable piano's as well as appropriate piano storage. In its current form the 1,936 square foot band/chorus room holds all the music equipment, sheet music, and is used for five different curricular classes. If our current growth of 231% over the past 3 years continues, the performing music program would have 117 students annually in five years time assuming that this trend continues. Currently there are 67 students in the Middle School Concert Band and 50 students in the Middle School Chorus. In the upcoming 2021-2022 school year there is potential for the both the band and choral programs to double in size (26 students in Band and 20 students in Chorus). When designing rehearsal rooms, remember that music is a physical activity. Instrumentalists need space for their instrument and the elbow room to play it. Choir members need space for vocal exercises and choreography. The space must also accommodate equipment and traffic flow.

In addition to performing arts classes, the music room will also be utilized as a classroom. In order to maximize instruction times, the music room must be set up for Band, Jazz Band, Chorus, and elective activities (Theater Arts, Music Appreciation, and/or 20th Century Pop) at all times. General music class sizes range from 10-25 students per class. There are currently 50 students enrolled in these classes in the 2020-2021 school year. More space and appropriate storage would be needed to accommodate the needs of the music program.

Improvements need for music

- No adequate space for band growth
- Band room not appropriate for choral rehearsals
- Too many non functioning and outdated equipment pianos etc.
- Acoustics
- Placement of band room
- No risers or safe risers
- Band uniforms
- Storage

Community Involvement in new spaces				
Greater Boston Stage Company events and performances	Collaboration with Stoneham T.V.	Martin Luther King Jr. Celebration	School Assemblies	Band/Chorus Concerts
Open Mics	May Arts Festivals	METG Festival	Guest performers and speakers	Dance and Cheerleading competitions
Performance arts Summer camps	Middle school/elementary school engagements	Town Meetings	Town movie showings	Elections
New Clubs	Dances/shows/events for Senior Citizens	Adult Workshops	College technical theater internships	Carnival Ball
Sports Banquets	Honor Society Banquets	Senior Tea	Music and Chorus Competitions	Rained out Town Concerts
Fundraisers/Charity Events	Pageants "Ms. Stoneham, Mass."	Auctions	Senior All Night Party	Magic Shows/Hypnotist
Poetry Slams	Cabarets	Comedy Shows	Dance classes added to curriculum	

1) Interdisciplinary Project and Performance Room – The District is proposing (1) 2,000 nsf Interdisciplinary Project and Performance Room in excess of the MSBA guidelines. The information provided indicates this space is intended "to support student performance, guest speakers, seminars, interdisciplinary collaborative activities and presentation and showcasing of student work".
    - In response to these review comments, please provide additional information that demonstrates how this space will be scheduled, staffed, and supervised.

Response: This multi use and multi purpose room will be a vital component for interdisciplinary activities within a multimedia space. This space will support learning activities from core academics to music and theatre based courses currently offered at Stoneham High School. We see this space an essential component of our

educational delivery to allow for midsize group activities, speakers and presentations as well as an enhancement of our English, Social Studies and Theatre Programs. Such programs include, Shakespeare presentations, National History Day and Science Fair.
In closing this space will also enhance opportunities for students involved in the tech theatre to develop their skills in the area of set design, lighting, costume, etc. The Interdisciplinary and Performance room would be supervised and maintained by members of performing arts educators. The technical theater students under the direct supervision of educators will be responsible for maintaining lighting and sound equipment. House management students will be responsible for preparing the space for different groups. SHS envisions the space to be a collaborative space for teachers and students across all grades and disciplines. Afterschool community members will also have the opportunity to reserve the space for functions and activities.

Dave Pignone and Sara Swett
PHYSICAL EDUCATION PROGRAM

The Physical Education program is an integral part of the total educational experience at Stoneham High School. The curriculum is designed around the concept of fitness education. Healthy bodies are essential to healthy minds; in order to be ready to learn, students must have proper health, nutrition, and exercise. The learning experiences are developed to fulfill the growth, development, and behavior needs of each student, teach students the elements of physical fitness and how they can maintain physical fitness throughout their adult lives. The Physical Education department provides 45 classes over two semesters and are designed to meet the needs of all students.

The gymnasium is utilized year round through school and community use; All PE classes, large school gatherings such as the pep rally, call orientations and rain date graduation, varsity/sub varsity athletics as well as community youth sports' programs. The current gymnasium is very outdated and does not have air conditioning or good ventilation. There are four heaters, but only one works, with repairs being a consistent and temporary remedy. The space is outdated with regard to technology and sound and does not support integration of educational technology or appropriate acoustics.

It is very important to provide SHS students with adequate locker rooms to change into proper athletic wear for their Physical Education classes. Currently there is one large boys locker room that has a large open shower area in the middle splitting the locker room into two spaces. The women's physical education locker room is a large confusing maze. It is made up of lockers on the outside walls, while in the middle of the room is designed with multiple changing rooms attached to showers connecting to the next changing stall which connects to the next shower. Most of these spaces no longer have curtains or have a makeshift curtain to provide privacy. We currently have one office for staff in both locker rooms for teachers to share. This space is important as well. Teachers not only need a home base, but need an opportunity to monitor behaviors in the locker room without awkwardly standing in there making people uncomfortable.

As mentioned above our gymnasium is used for multiple sports programs. In the fall season it is the home to three levels of volleyball. We currently are able to have our varsity court align within the varsity basketball court, providing a great varsity court with bleachers for spectators. We set up two side courts, one for JV and the other for freshman. During inclement weather the gym will then host every fall teams practice from football to soccer, field hockey and cross country.

Winter is when our gymnasium is at its peak use and capacity. The current space is utilized to provide safe and adequate training and practice space as well as that for competition and spectators The gym hosts practices for all of our boys and girls winter sports teams excluding boys and girls hockey, however, including our Indoor track teams, which run between both teams approximately one hundred and twenty athletes, and you have many athletes running and training up and down our hallways in the main building, doing whatever they can to find space.

Gymnastics is an essential component for a gymnasium beyond twelve thousand square feet. Our Gymnastics Team is an established program of over fifty years. Though a specific gymnasium room could be considered, our concern would be that it would be underutilized in times other than Gymnastics season. Therefore a setup similar to our current gymnasium where the gymnastics space is part of the overall space is recommended. It has a 42' x 42' spring floor that goes down and it becomes strictly the gymnastics space and area for all related gymnastic equipment. This arrangement allows us to safely run Gymnastics as well as support our other winter athletic programs. When the season is over we now have much needed extra space in our gymnasium for the other school and community programs, teams and entities that utilize this space for the remaining eight to nine months of the year.

Currently the one issue we have in our gym is that our gymnastics floor, once set up for the season, extends very close to our varsity basketball court. It lies about four - five feet from our out of bounds, and is a possible trip hazard for our athletes or game officials. Consideration for additional footage is required to remedy this concern.

In the spring the gym becomes an indoor practice facility for boys and girls lacrosse, outdoor track, baseball, softball and boys and girls tennis. Depending on the weather, this use of the gym is typically one to two weeks. We set up an indoor batting cage for basketball and softball in the gymnasium where gymnastics used to be. This cage is hung on cables that are attached from one end wall to the other. And slides in and out when used

A big concern with current and future space is making sure there is appropriate storage for both PE equipment and our athletic programs. Making sure there are locker rooms separate for physical education and athletics. We currently have beyond the boys and girls physical education locker rooms, 2 boys athletic locker rooms and 2 girls athletic locker rooms. These locker rooms function much differently than a physical education locker room as it houses many more students at one time and is utilized to hold individual athletic equipment for extended periods. We currently have 2 team meeting rooms where teams can hold large meetings, watch game film and review game plans, as well as 3 coaches offices shared amongst all of our coaches from one season to the next. Thoughtful placement of Athletic Team Locker Rooms, Team Meetings spaces, Trainers office and Coaches Offices to gymnasium and athletic fields while also eliminating or significantly decreasing access to the Main building and academic classrooms is critical.

Our weight room is a great space, unfortunately, it is not user friendly. As it is now, it is a great strength and conditioning space. Which we need and do not want to lose, but we do think it is important for our PE classes as well as our school community to have a fitness center combined with strength and conditioning. A space that can have a circuit of machines along with cardio options such as treadmill, ellipticals and bikes. The foundation to what we teach in P.E. is the fitness component and having a user friendly room would be tremendously helpful.

In our new gym we hope to see not only these issues addressed, but other improvements as well. The new facility should include separate teaching areas for yoga/mobility exercises. With education leaning towards a universally designed approach as well as a push for social emotional needs, having separate spaces for students to access and exercise will be vital to their education and well being.

Physical Education Wish list

Gymnasium - main basketball court for varsity games. Bleachers to pull out for spectators fitting approx. 600-700 spectators or student body for large events such as Pep rally. Would like to have 3 side courts. If we build a 4th side court it would provide enough space for Gymnastics.

Suspended track - This is a great thing to have for many reasons. PE classes that have many students choose to walk for their activity or have a medical and can not participate in the class activity choose to walk (today they walk around the gym and are constantly benign careful not to interfere with the class. There are many PE activities with fitness as our foundation that would utilize this space. It provides space for many athletic teams to warm up or train while another group might be in the gymnasium, especially our indoor track team that has runners looking for space to safely run and are in our hallways now.

Gymnastics room - if the gymnasium is not big enough to add gymnastics space (which is our first preference) then this room would need to happen. large enough to fit a 42' X 42' spring floor as well as other gymnastics equipment, such as beams and uneven bars, along with a vault (with a runway approx. 70 feet long) and a small area for spectators 50-60 people.

Extra large storage area for all this gymnastics equipment. We would like to use this room as something else for the remaining 9 months so we need a very large storage space for gymnastics.

Fitness/strength and conditioning room - user friendly for all - large enough to service a team of about 60 kids at once

1 male PE locker room with Bathrooms - accommodate approx. 50-60 boys
1 female PE locker room with Bathrooms - accommodate approx 50-60 girls. Small lockers as it is just to change for the class. Would like to have changing stalls in both locker rooms. Do not need showers unless it is mandatory Kids do not shower in PE

1 male PE instructor office with bathroom - shared with 2 teachers
1 female PE instructor office with bathroom - share with 2 teachers

1 large PE storage

2 Extra large athletic storage (above and beyond what was mentioned above for gymnastics) for all indoor track equipment (hurdles, high jump matts, shot put , etc. basketball scorers table along with team chairs approx. 40 chairs. Basketball equipment, volleyball nets and poles as well as referee stand etc…)

Male Athletic locker room - enough to accommodate large lockers for individual sports equipment like shoulder pads and helmets. Large enough for during 1 season we have about 170 male athletes participating and needing a locker. Maybe we have 2 rooms. With showers athletes tend to shower after practice

Female Athletic locker room - enough to accommodate avg size lockers, not very big equipment mostly sticks such as lax and or field hockey. Large enough for approx 180 female athletes during 1 season needing a locker again maybe 2 locker rooms to accommodate this large number. Need showers as well

2 Male Athletic Coaches Offices -with bathroom and shower. 1 office needs to accommodate 3 coaches at once, and the other needs to accommodate 8 at one time

2 Female Athletic Coaches Offices - with bathroom and shower - both offices need to accommodate 3 coaches at once

1 Officials Room - with bathroom and shower - large enough to accommodate 5-6 refs at once

2 Team Meeting Rooms - large enough to accommodate, teams of 60 kids at once to meet as a team or watch films (this is a very important part for some sports)

1 Athletic Training room with storage

1 athletic Directors office - shared with a secretary (2 rooms or 1) would like to have a conference table as is in current space

1 equipment room with Laundry service - Need to store all sports equipment during their off season which is ¾ of a year.

Outdoor storage!

Outside Facilities
An assessment of our current athletic programs, student-athlete enrollment and community use indicate that three to four turf fields would be recommended. A minimum of three would allow SHS to provide equal opportunities for all teams and genders. Scheduling among the many sports teams we have including all sub varsity teams can force teams to have practices that go well into the evening, especially when you don't have the ability to practice on multiple fields. It would allow us to for the first time ever to bring many of our youth programs up to use our facilities. It also allows some revenue opportunities from outside organizations.

The three turf fields should be in as close proximity to each other as possible. Allowing them to be accessed by all and easily supervised. Current observations and public feedback indicate that the community as well as our students would take full advantage of a walking track around the perimeter of our athletic fields and overall school campus. This would allow people to use the facilities even during our HS events.

Outdoor Building
A field house to provide essential supports and needs for our student-athletes, spectators and other vital athletic program supports is necessary. This building would provide the following: **1) bathrooms 2) concessions 3) storage 4) Two team locker rooms/ meeting room 5) small officials space**. This building will enhance the ability to do many things to make the athletic experience much greater for all of our athletes male and female, Fall, spring and summer sports. It provides the ability to keep our school building safer with security by not needing to enter the school whether it is during school hours or outside of school hours.

Alison Connelly
LIBRARY / MEDIA CENTER

The Stoneham High School's library media center's physical space is currently located in one location close to the main entrance of the building and with thoughtful consideration given to layout, allows for maximum flexibility and is a hub of a variety of activities. The library is laid out to accommodate up to 3 individual classes or 80 or more students at

a time for academic instruction by the librarian (via a large mobile screen) or for teacher instruction. Teachers can sign up in advance to use the library and can come in last minute if there is room. The library print book collection had been weeded so that books shelves are located only along the outer walls of the room, allowing for the maximum flexibility in the use of the space. EVERYTHING is currently movable with exception of 2 low bookcases that are used as room dividers. The library is also a space for students and teachers to relax with comfy seats, couches, and relaxing music when not being used for academic purposes. Up to 80 or more student's can have lunch in the library and also come to the library in the AM for breakfast, to print, do homework, and socialize with their friends. We also have puzzles, chess boards, legos, coloring books, and board games.

- The library is the space where the majority of National History Day work and exhibits are displayed for the week, Shakespeare day takes place in the library, the art department uses the library for displaying students' work and for art night. Once a month we hold “open mike in the morning” and students can come in in the AM and perform under the direction of the music department. We also have “teacher tuesday” once a month and the library is closed at lunch to students so teachers can gather and enjoy the space.
- We have created a “history learning lab” in one of the rooms off of the library that is an artifact museum filled with objects that are relevant to the curriculum. These object are on display and are used in classes and by students in independent study projects
- There is one classroom and 4 small meeting rooms off of the library .
- Unfortunately the library is closed for several days a year in order to accommodate large testing groups for MCAS and for AP. This has been an ongoing issue as no one else is allowed to use the space on these days.

The small rooms off the library were used many years ago for storage but have been cleaned out and are now constantly in use for a variety of activities. These are NOT STORAGE ROOMS.

- There is one full time licenced library media specialist and until this year a part time paraprofessional.
- Until this year the technology coach was also located in a room off the library and held classes there.
- The speech pathologist sees students in one of the small rooms off the library.
- Guidance holds individual student counseling sessions in one of the rooms off of the library.
- Teachers hold professional development meetings in one of the rooms off the library .
- VHS students use the rooms off of the library for quiet study.
- The rooms off of the library are also frequently used for “green screen’ filming by multiple groups of students as part of classroom assignments.

The Library is a constant hub of activity from 7:15AM until 4:00PM on school days and on some evenings for special events.

Jillian Goldstein
SPECIAL EDUCATION PROGRAMS

Special Education services at Stoneham High School are delivered in a multitude of ways through various programs designed to meet the needs of our diverse student population. These programs include Resource, STRIDE, RISE, Language Based, and ESL services (ESL is not special education). In addition to these programs, the areas of speech and language pathology, transition planning, counseling, occupational therapy, physical therapy, and adaptive P.E. all fall within this discipline. The district is committed to ensuring that students with disabilities receive a quality education in the least restrictive environment. The spaces designated for special education programs in the new building should maintain the current space allocations for all classrooms currently in existence at a minimum. The spaces, while

located amongst the school and academic areas, should also consider the students' auditory, visual, and other related sensitivities. The spaces for future special education students should also ensure easy access to service providers and instructional areas.

Resource Program:

The inclusion / partnerships program at Stoneham High School offers academic support and instruction in reading, written language, mathematics, study and organizational skills for students with a variety of disabilities. In addition, special education teachers co-teach in a number of general education classes. The inclusion program is for disabled students who require academic remediation through specially designed instruction and classroom accommodations. Classroom materials are used as the context to develop skills of reading comprehension, written expression, and mathematics, as well as study skills such as organizational skills, note taking, outlining, report writing and test preparation. Each student has a liaison who communicates with parents, teachers and counselors in order to meet specific student needs as described in the IEP, including, home-school communication and collaboration with general education teachers and related service providers. The majority of high school students receiving special education services are part of the inclusion program. All disability categories are served in the inclusion program including learning disabilities, physical impairments, emotional disabilities, health-related disabilities, autism spectrum disorders, physical and sensory disabilities. The students in the inclusion program receive most of their instruction in their general education classroom. They may also receive some academic explicit instruction in a small group setting or a related service outside their classroom to address underdeveloped skills. Specialized small group academic instruction occurs as frequently as other content classes. Given the needs and increased demands of high school students, if needed, instruction is also provided to improve executive functioning skills. Executive functioning instruction will target a student's needs to manage belongings, short and long term assignments, and organizational skills. In this educational model, the needs of all students are being met by educating learners with disabilities alongside their non-disabled peers. A critical component of inclusion is to provide students with disabilities access to the curriculum, regardless of the level. Curriculum may be modified as specified in the student's Individualized Education Plan. The mission of the program is to teach learning strategies to students to help them compensate for their area(s) of learning disability. Understanding their own strengths and weaknesses as learners and self-advocacy are components of this teaching model as well. Co-taught classrooms are an effective model of inclusive education. These classrooms are led by a certified content area high school teacher and a special education teacher. Students receiving support through the co-taught classrooms can have a variety of learning and social needs including language-based disabilities. Given direct instruction and with strategies embedded throughout the day, students are working towards meeting grade level benchmarks. Small group instruction outside the general education classroom is available for academic remediation or for related services.

At the present time, students enrolled in a full-inclusion program who receive specialized, direct instruction outside of the general education classroom are serviced through Resource. At the present time, there are 3 classrooms designated for Resource services. These rooms vary in size, location, and proximity to primary academic areas of the school and other service providers. The 3 classroom spaces are shared between 4 educators who provide learning strategies as well as additional services for students with reading or hearing based disabilities. Students with widely varying levels of ability, age, and need are supported within the same space. 2 of these classrooms have, historically, been adjoining rooms for seamless communication/collaboration between educators in the short moments between classes.

Resource spaces have historically been very small, and unable to accommodate more than 8 students at a time. This proves challenging during periods when simultaneous resource blocks are held within shared spaces, as it is not conducive to providing services in a distraction-free environment. Academic testing for 3-year reevaluation meetings also takes place in these classrooms, which leads to overcrowding in the adjoining classrooms. This overcrowding also becomes a factor when students utilize a separate setting for assessments in their general education classrooms.

Teachers then become responsible for not only monitoring their students scheduled for class but also monitoring students who are taking assessments. Teachers are also unable to utilize their prep times without distraction due to resource classes being utilized for separate setting accommodations. Students who take frequent breaks and are benefited by flexible seating are unable to utilize these accommodations in our classrooms effectively due to size constraints. Our space is also unsuitable for displaying the necessary resources/anchor charts for all subject levels/necessary supports across the four grades we support simultaneously. It is very challenging, in our current spaces, for students to de-escalate without distracting their peers. It is also noteworthy that 2 of the 3 classrooms do not have windows, all do not have adequate storage space for materials/manipulatives, and all do not have adequate storage space for general classroom materials. We are unable to effectively communicate with the teacher in the non-adjoining room due to our proximity to each other. We are also unable to effectively communicate with general educators due to our classrooms' locations. Our technology is inconsistent, which means collaboration is more difficult due to an inability to share presentations/materials. Our space is not conducive to effectively supporting these needs at the present time.

Future Suggestions for Resource:

- Windows to the outside.
- Adequate wall space to display anchor charts/resources for all courses and all grade levels
- Availability of an adjoining, common mutual space in order to facilitate large group direct instruction.
- Multiple, small designated quiet spaces for students receiving small-group instruction or students utilizing their separate setting accommodation for assessments.
- Break spaces in proximity to our rooms so not to distract from lessons currently going on would benefit us greatly.
  Designated places for testing, outside of our classrooms, would provide a sufficient environment for students to focus and perform at the best of their ability.
- Technology that provides seamless access to lessons as well as meets the needs of students with visual/motor disabilities is essential to future Resource classes.
- Proximity to gym/weight room/track for quick movement breaks, a green room/garden for calming effects, bathrooms, and guidance/social emotional supports
- Design and creation of a sensory wall/hallway would benefit resource students and the general population.
- Flexible seating (e.g., hammocks/benches that can provide sensory support for dysregulated students) would provide students with an environment with which to attend to their work without discomfort.
- A Learning Center suite in a central location, with general education classes surrounding it, is ultimately our ideal design.
- A designated meeting room for IEP meetings and testing

STRIDE Program: Students Taking Responsibility in Developing Excellence

Students with social-emotional disabilities are serviced through the STRIDE program at Stoneham High School. In the STRIDE program, educators create an academically engaging, safe, and nurturing environment for their students. The 2 stride teachers and 2 clinicians who provide substantially separate services (e.g., academic and counseling services) collaborate with general educators in order to provide meaningful experiences that enhance a student's life skills and direction for their future goals (e.g., community engagement, core academics, volunteer work, etc.). These educators and clinicians communicate effectively with other service providers such as physical therapy, occupational therapy, reading specialists, and others.

All members of the program are part of a community grounded by four “cornerstones”: respect (for yourself, others, and your environment), responsibility (for your actions), self-control (of your behavior), and repair (the ability to fix things when needed). It is the belief that these cornerstones and a sense of belonging to a caring smaller learning community will help each student build healthy relationships, communicate effectively and develop respect for differences in other people in order to be successful in school. The goal of the STRIDE program is to provide students with the support to build academic competencies, positive relationships, communication skills and a sense of responsibility and community that will foster their success in school. Understanding that learning disabilities often are present along with social/emotional challenges, there is a strong specialized academic component to the program. Most core subjects are co-taught by a content certified high school teacher and a special education teacher. Remedial strategies and instruction are provided in the same manner as students with specific learning disabilities and language-based learning disabilities. Specialized elective classes for the program are available and are supported by program staff. Students have inclusion opportunities to participate in mainstream classes and are supported by a program paraprofessional. In addition to a strong academic component, there is a high degree of therapeutic support. A positive behavior management system is part of the classroom structure. Individual positive behavioral supports are put in place for students who require additional incentives. A weekly group counseling session conducted by the school psychologist is an important component to the program. Individual counseling is provided to students as needed to assist them in meeting their behavioral, social and emotional needs. Vocational instruction is provided weekly in the program by EMARC.

There is one classroom shared between teachers. This space has community access and office spaces for clinicians/teachers to separate grade levels and provide direct instruction in an individualized way. The classroom is on the first floor in close proximity to the musical arts, the auditorium, the guidance office, and has its own entrance/exit for emergency purposes. This set-up is ideal as it allows seamless transition to clinicians/service providers in the case of escalation and further support in the general education setting. While there are bathrooms near the STRIDE classroom presently, they are inoperable. However, in the future it would benefit students to be near a bathroom in order to assuage any anxieties or social concerns. The staff in STRIDE are met with challenges when faced with a student in crisis or a student who requires testing, due to a lack of private space that ensures confidentiality of the student. Many of the challenges in Resource are mirrored within STRIDE as they pertain to testing, separate setting accommodations, flexible seating, and other aforementioned struggles.

Future Suggestions for STRIDE:

+ Maintaining the proximity to service providers
+ Proximity to private bathrooms
+ Proximity to a room designed for movement breaks - treadmill/punching bag
+ Proximity to sensory hallway/room/lounge
+ Clinicians with private offices for confidentiality
+ Location to kitchen-like space/cafeteria
+ Private space for quiet lunch
+ Multiple classrooms for providing services to students with widely varying needs/levels
+ Proximity to gym/weight room/track for quick movement breaks
+ Proximity to a green room/garden/aquarium for calming effects and also to allow for career exploration
+ Proximity to a therapeutic/social/emotional support space
+ Location to hands on opportunities (garden, RISE, pre-K, shop, cosmetology, ATM, chef, etc.) to evoke and foster a sense of purpose and independence
+ A designated meeting room for IEP meetings and testing

RISE Program: Reaching Independence through Structured Environments

Currently, a substantially separate program exists for students with autism spectrum disorder (ASD), social- emotional disabilities, cognitive and/or neurological impairments, and students in transition (18-22). They are served in the RISE program.

The RISE Program offers a substantially separate program for students with more severe disabilities requiring a higher level of support and specialized instruction than in the integrated program. All the students in the RISE program require special education services. As developmentally appropriate, opportunities for inclusion with the integrated preschool are available for all students in the program. The program is staffed with a teacher certified in early childhood special education, a full time ABA specialist, and several paraprofessionals. In addition, a speech/language pathologist, occupational therapist, physical therapist, school psychologist, and Board Certified Behavior Analyst (BCBA) are part of the classroom interdisciplinary team. The BCBA consults with all program staff and provides ongoing training on ABA methodologies. The curriculum is child-centered and offers developmentally appropriate activity-based learning for preschool children. The range of direct services varies widely depending on a student's individualized needs. The type and frequency of service are decided at the child's IEP Team meeting. The school adjustment counselor and psychologist are available to families to provide support and community outreach.

This program was developed in order to service students who would historically have been placed out of district due to the intensity of service needs. Currently, this program is located in an inclusive placement in close proximity to the nurse, general use restrooms, and main office. The two classrooms and their respective teachers are designed in order to accommodate students with a high level of need, which includes flexible seating. One of the classrooms has a number of appliances that allow students to practice lifelong skills such as cooking, cleaning, and organization of materials. The classrooms do not have adequate built-in storage for the innumerous materials utilized by their students and staff. The classrooms also do not allow for appropriate spacing, given the high number of staff and practitioners who push-in in order to support students in the program.

Future Suggestions for RISE:

Due to the skills that students in this program are working on, they require a designated space to work on vocational skills and activities of daily living. A designated space for vocational purposes - including a copier, scanner, computer, printer, and materials to complete clerical tasks, etc would further improve the RISE program. This space could be used by both teachers and students.

A designated space that is set up similar to an apartment, including a kitchen area, bedroom area, and a dining area is essential for the success of the substantially separate population. Appliances would include a refrigerator, microwave, oven, sink dishwasher, washer and dryer. Within this space, all students can practice daily living skills such as cooking, making a bed, vacuuming, washing clothes, folding clothes, ironing, washing dishes, loading a dishwasher, etc. This multipurpose room should be linked to the RISE classroom although perhaps not necessarily adjoining. This space would foster inclusion and could be located near cooking/"restaurant"/design/fashion class.

This area would also be improved by the addition of an instructional bathroom used to teach RISE students hygiene and grooming skills (e.g. brushing teeth, washing face, wiping after bowel movements, showering, etc.). In an ideal situation, this would be a "Jack & Jill" bathroom (in the middle of the classes), which would be less accessible to outside students to ensure privacy and reduce anxiety, educational and instructional bathroom. The bathroom should have 2 stalls, a shower, and a grooming area/dressing nook. The bathroom should seamlessly work with the apartment set up the RISE classrooms need.

+ Close to exit for fire drills/emergencies
+ First floor ideal: physical/mental needs of students

+ Wheelchair accessible room
+ Space that allows for an entrance/exit to the outdoors
+ Location near track/own outdoor space
+ Access to a gardening space in order to teach valuable life skills
+ Location near other support staff
+ Proximity away from gym/cafeteria/music space
+ Proximity to sensory room/hallway/quiet spaces
+ A sensory lounge or suite
+ Location that provides seamless transition to service providers/partnerships in the building (chef)
+ Preservation of inclusivity while still providing access to additional spaces
+ Resources/rooms that allow students to practice the skills/have valuable experiences in the community
+ Vocational opportunities; coffee shop, medical related, inventory tracking, hair salon, pre-K support, etc.
+ Sensory resources such as bungee chairs, swing, weighted blankets
+ Room/space for de-escalation that allows for confidentiality and safety of students
+ In order to continue to ensure an inclusive learning community for all students regardless of need and ability, the sub-separate program classrooms should be located within the primary academic areas of the school
+ A designated meeting room for IEP meetings and testing

Language Based Program

The language based program at Stoneham High School serves students within our population who require specially designed instruction pertaining to language based skills. This includes, but is not limited to, students with reading, listening, and writing based disabilities such as dyslexia and decoding challenges. Language based teachers provide specific, developmentally appropriate support and instruction which pertains to each student's need in a substantially separate setting. The program supports students in all grade levels, often simultaneously, which provides a challenge to educators when supporting students of widely varying ability. The current program is held within one classroom that supports a varying number of students where multiple teachers and paraprofessionals are giving instruction at once. There is no privacy, which creates challenges for confidentiality purposes. The language based program walks the line between special education and substantially separate.

Future Suggestions for Language Based:

- Space's ability to allow educators to differentiate instruction seamlessly
- Current space challenging for testing students in an environment that provides confidentiality/student ability to not be distracted
- Proximity to reading services/speech/suite
- Proximity away from loud places (gym/music/etc.)
- Space placement that reduces stigma
- One large room or two adjoining rooms
- Technology; phone, headphones, projector, etc.
- Designated space for testing and confidential phone calls
- Flexible seating arrangements/potential
- Frequent break space - sensory room/hallway (maybe near the gym?)
- A designated meeting room for IEP meetings and testing

English Language Learner (ELL) Program:

The English Language Learner (ELL) Program is designed to meet the linguistic, academic and social needs of English Language Learners who attend Stoneham High School. ELs are students who are learning English as a second or additional language and who are not yet proficient in English at their grade level. The ELL Program creates a welcoming and challenging learning community where students acquire proficiency in both conversational and academic English. Students are enrolled in rigorous ESL courses taught by certified ESL teachers, and learn English in the areas of listening, speaking, reading, and writing. Students are also enrolled in academic courses taught by educators with sheltered English immersion (SEI) endorsement, with methods of teaching that are responsive to the learning needs of students developing English language proficiency. Students are assessed annually using the WIDA-ACCESS test of English language proficiency. This assessment tool is used in many states nationwide which are members of the WIDA consortium. This program's enrollment has grown 100% since it's initial class and continues to grow. It's location has been moved as the students' enrollment exceeds the space capacity of the room. It is safe to assume that this program will continue to grow, with a minimum of 20 students by the 2021-2022 SY, as we foster an inclusive environment at Stoneham High School. While there is one teacher currently in the program, it is anticipated that there could be as many as three teachers required to fit the student need.

Future Suggestions for ESL Services:

- Inclusive, central room placement that allows ESL students to be part of the fabric of the school ideally in close proximity to the library
- Proximity to general education classes and reading specialists
- Flexible seating options (standing desks, yoga balls, couch, beanbags, etc)
- Flexible walls for grouping/cloth dividers if possible to allow students to speak/listen without bothering classmates (cloth or cork covered for sound absorption) which will allow for a multi-functional space
- Acoustics to allow for clear, concise language/instruction to be heard (e.g., carpet, wall tiles, etc)
- Language lab-like tech or proximity if one exists; green screen, listening tools, speaking tools, recording tools, smartboard etc.
- Adequate wall space/bulletin boards/white boards to display necessary anchor charts/resource materials in both English and other languages
- Non-negotiable proximity AWAY from high noise areas: gym/cafeteria/auditorium/musical arts

Speech and Language Services:
Speech and Language services are provided through district speech and language pathologists. At the present time, these individuals travel with the hopes of finding open space as it is available. In the past, they have used a shared office in the library at Stoneham High School. The speech and language pathologist provides instruction in regards to articulation, pragmatics, social skills, and other remedial skills for improving an individuals' expressive/receptive language. The speech/language pathologists should have a designated office in the school, preferably close to the RISE and LB programs.

Reading Services:
Reading services are provided through the district of Stoneham's reading specialist. The current space at the high school is a windowless room suited for a maximum of three people. It is located in proximity to general education classes, a high-traffic stairwell, and lacks the acoustics needed for students to attend to their work and reading skills effectively. The reading teacher should have an office or designated classroom space, preferably near the LB program.

Occupational Therapy Services:

Occupational therapists push-in to designated classrooms or spaces that are unoccupied to provide services for students with OT needs. The lack of designated space proves challenging for maintaining confidentiality.

Physical Therapy Services:
Very few students require this service and if needed, can utilize appropriate gymnasium equipment or work in a sub separate classroom space.

Adapted P.E. Services:
Stoneham High School does not have an adaptive physical education/wellness program. All students participate in a general physical education/wellness class. Accommodations and modifications are provided in the general education class for students who require this service. If required, instructional assistants or outside service providers assist students in their physical education class.

Transition Specialist:
IDEA 1997: 300.29 defines Transition Services as:

"a coordinated set of activities for a student with a disability that (a) is designed within an outcome-oriented process, that promotes movement from school to post-school activities, including postsecondary education, vocational training, integrated employment (including supported employment), continuing and adult education, adult services, independent living, and/or community participation, (b) is based on the individual student's needs, taking into account student's preferences and interests, and (c) includes instruction, related services, community experiences, the development of employment and other post-school adult living objectives, and if appropriate the acquisition of daily living skills and functional vocational evaluations."

All students, including students with disabilities, "deserve a world-class education that prepares them for postsecondary opportunities, career training options, economically viable careers, and healthy productive lives."[1] As the Board of Elementary and Secondary Education's Taskforce on Integrating College and Career Readiness recognized, "every child deserves an education that nurtures their dreams and lays out a navigable pathway to accomplish them. It is no longer viable for our businesses or our educators to under invest in career readiness education; we have a responsibility to provide our children with a well-rounded education that prepares them not just to begin post-secondary education, but access to viable, living-wage, family supporting careers, and lifelong prosperity."[2]

As the transition specialist, the roles and responsibilities are ever changing based upon student population and need. Much of the work completed is highly individualized for each student. The transition specialist plays an important role in the education of youth with disabilities and is the person that helps create a bridge to life after high school through assessing, planning and delivering individualized services and supports that prepare youth for their future. Transition specialists coordinate services with adult agencies and community providers to ensure students transition effectively to life after high school.

The transition specialist has a range of knowledge including, but not limited to: conducting individualized transition assessments, creating measurable postsecondary goals, fostering self-determination and self-advocacy skills, and creating and delivering appropriate transition systems/services including employment, community and post-secondary education opportunities, paid employment based on the student's identified interests, learning independent living skills such as utilizing public transit, or attending college classes or continuing/adult education.

At the present time, our transition specialist is located within the guidance suite in a room identified as a closet in the building plans. It does not include windows or adequate space in order to effectively provide assessments for more than one student at a time. A future space should have ample space in order to accommodate for testing, a large amount of materials/resources, and in order to involve small group sessions.

Social Emotional Supports, Current Services and Programs:
In addition to the four school counselors, the high school currently offers social emotional support and counseling via one school adjustment counselor and one school psychologist. Both conduct individual and group counseling, including social skills groups which are held during lunch blocks and during flex blocks. In addition, they provide services to students enrolled in our RISE special education program and work closely with the teachers and staff of that program. For students who require more intensive counseling support in order to access their education or remain engaged in school, these counseling supports are available upon referral from their school counselor.

Both the school adjustment counselor and school psychologist are also important members of the special education process, and their direct services are frequently outlined as a required component of students' Individual Education Plans or 504 Plans. The school psychologist also spends a significant amount of time conducting confidential testing and assessments to determine students' eligibility for special education services. During the 2019-20 school year, the school adjustment counselor provided services to approximately 25 IEP and 10 non IEP/504 students, and the school psychologist had a caseload of 23 students for counseling and 40 students for assessment.

Both of these school support professionals currently have offices in the school counseling suite. These office locations are ideal for facilitating collaboration with the four school counselors, as well as providing the necessary discretion and confidentiality for engaging with students, families, and collateral supports such as therapists and social workers from the community. The proximity of these offices is also essential during crisis situations to facilitate clinical collaboration.

Given the frequency of meetings involving parent/guardian visitors that are facilitated by all members of the counseling suite, the current location of the counseling suite near the front of the building is ideal from a safety and security perspective. In addition to hosting parents, the school adjustment counselor and school psychologist will often invite community providers in the building (ex. outside therapists, MassRehab counselors, Department of Children & Families social workers, mentors, etc.) for collaboration and wrap around student care. Minimizing the travel of these guests throughout the building is a crucial component of student safety.

Small group counseling sessions facilitated by the school adjustment counselor and school psychologist are currently held in a conference room or small meeting space in the library. Frequently the location of these groups has to be changed at the last minute due to competing needs for the available spaces, such as other meetings in progress, which takes away from the group counseling time. The proposed multipurpose meeting space for the school counseling suite would be ideal for housing these group counseling sessions, in addition to providing a space for the implementation of counseling curriculum and college representative meetings.

A multipurpose space would also allow more flexibility in times of crisis (for crisis evaluations and de-escalation spaces). Additionally, this space could be used when peer social issues arise to conduct mediations (to separate students and then to bring them together in a neutral space/larger space for the actual mediation).

Design Response:

Resource Program:

- A learning suite (1 large common mutual space for large-group lessons with adjoining offices)
- (4) Offices for educators; utilized for prep, testing students, utilization by other practitioners as needed
- (4) Classrooms for educational instruction, location TBD

- (2) Small designated quiet spaces for students receiving small-group instruction or utilizing their separate setting accommodation for assessments that does not take away from students receiving Resource instruction/teachers utilizing their prep time

STRIDE Program:

- (2) Classrooms in close proximity to support staff/guidance/practitioners
- Private Bathroom
- (4) Offices for clinicians/educators to provide services with confidentiality
- (1) Large meeting room/mutual space/suite

RISE Program:

- (2) Classrooms for educational instruction; students with severe needs
- Private Jack & Jill bathroom/changing area/grooming station shared between the severe classrooms
- Studio apartment to include kitchenette (stove, sink, dishwasher, refrigerator), bed, dining, storage, stackable washer & dryer
- Vocational space; shared with others such as culinary cafe
- Therapeutic de-escalation room similar to sensory room

Language Based Program:

- (2) Classrooms for educational instruction, ideally connected/adjoining; equipped with features that benefit students acoustically
- (2) Offices for educators; utilized for prep, testing students, utilization by other practitioners as needed

ESL Program:

- (1) Classroom for educational instruction; equipped with features that benefit students acoustically
- (1) Office for educators; utilized for prep, testing students, utilization by other practitioners as needed
- Language lab with technology (e.g., green screen, projector, etc.) that allows for seamless integration of lessons to student activity

Speech and Language:

- (1) Half-sized classroom for educational instruction; equipped with features that benefit students acoustically
- (1) Office for educators; utilized for prep, testing students, utilization by other practitioners as needed

Reading Services:

- (1) Half-sized classroom for educational instruction; equipped with features that benefit students acoustically
- (1) Office for educators; utilized for prep, testing students, utilization by other practitioners as needed

OT/PT:

- (1) Room specifically designed for OT/PT needs to maintain confidentiality and instruction without distracting peers

Kim O'Connor

Career and Technical Education PROGRAMS

A current national trend and one that will continue for many years, is career and technical education, or CTE, which exposes students to real-life experiences more directly. These elective courses are where academics are applied. In order to enable students to become "well rounded" individuals, careful attention must be made to the design of the physical environment of these programs.The emergence of CTE is a recognition on the part of school districts that A.) not every high school student is going to college, and B.) students need earlier exposure to different professions so they can determine what they might like to do as an adult and get training for that job while in high school.

CTE is a pathway to success for high school students and offers each student opportunities to personalize his or her education based on their career interests and unique learning needs. CTE refers to courses and programs

designed to prepare students for careers in current or emerging professions. At the high school level, CTE provides students with opportunities to explore a career theme of interest while learning a set of technical and employability skills that integrate into or complement their academic studies. High school CTE is meant to connect with and lead to postsecondary programs of study or additional training after high school, which may include more specialized technical instruction. These pathways can culminate in postsecondary degrees or certificates, apprenticeships, or employment. Currently the high school has a robust FACS program and has recently begun a Project Lead the Way program, that began at the Middle school.

During the previous comprehensive facilities study, one of the identified goals of design was to increase the quantity and quality of hands-on opportunities available to students at Stoneham High School. Although Stoneham High School does not currently offer any Chapter 74 vocational programs, an area of opportunity exists to create a Chapter 74 program in Early Education and Care, by creating greater coordination between our high school and the two elementary school preschool programs and merge them with the Child Development and Internship program already at the high school level.

Culinary/FACS location within the building: Family and consumer sciences, like other elective departments, allow students to apply academic skills, use creative thinking, practice problem solving, increase fine motor skills by working with their hands and develop communication tools which could lead to a future career, personal achievement and home and family enrichment. Currently in the program we offer to 9th thru 12th graders: Food and Nutrition, Sports Nutrition, International Foods, Fundamentals of Baking, Culinary 1 &2, Adult skills, Fashion/Sewing 1,2,3 and Child Development 1 and 2. Class size in the Food and Fashion Labs are capped at 18 due to Safety and OSHA guidelines. The food lab individual kitchens are equipped for 3 people. We have a waitlist consistently for all food classes, with as many as 350 students signing up for Food and Nutrition alone. The kitchen labs are available for all seven periods of the day and can easily be filled to the maxim for both semesters. Locating the food lab part of the FACS department near the Cafeteria would assist with a possible “Sparty’s Cafe” (that we currently run out of our classroom space) that is accessible to teachers during the day and events during the evening/weekends. It is the vision that the cafeteria kitchen be on one side of the open designed cafeteria and the Sparty Cafe be on the other side with not only an open space to the cafeteria but a small teacher/administration dining area adjacent, so that students can have more real world experience in the restaurant industry.
The FACS/Culinary foods lab must have easy access to a door to the outside of the building and parking space for the delivery of groceries and supplies. Storage Area with laundry centrally located with shelving for larger items and equipment being used in rotation, along with larger food product items. Laundry will also need a (short) vent to the outside .
Currently, there are 7 home kitchens within the lab space, 6 for students and one for teacher/student demonstrations. The ideal program would have commercial restaurant equipment in the 7th kitchen space as not only a part of the demonstration area but as part of the culinary students work space for the dining room/cafe, with room for a commercial dishwasher. The 6th student kitchen space should be handicap accessible and adaptable to those with special needs.
The kitchen space lacks storage as current storage is located in another classroom down the hall with the washer and dryer. The ideal plan would be that they are both located within the Food lab space in some capacity, especially the laundry area which is used several times within the day. This food lab space going forward could be used for Community Adult Education in the evening when possible for cooking classes. Going forward the space would need to be bigger than the 1400 sq ft suggested, as we need storage space, laundry, cafe, and special needs accommodations.

- Large kitchen space with 6 residential style kitchens

- One commercial demonstration kitchen towards the front of the room that has access to the cafe
- Laundry and storage area (add 150 sq ft)
- Student storage space for uniforms/bags
- Faculty Sparty Cafe (add _800____ sq ft) Ideally this space would be very similar to the project room space on the 2nd floor of the SPS middle school, a space that has room to accommodate guest for lunch, a copy room area, and be utilized for smaller district events
- Close proximity to the cafe and access to outside door or elevator

Child Development location within building: Currently both Child development classes, 1 and 2, are located in the FCS department right next to the food labs. They run 3 periods during a semester as it is a shared space with fashion/sewing and adult skills. The classroom has adequate space for supplies and it would be ideal if that continues. The classes themselves are maxed out at 24, with most classes being filled each semester.
The ideal location would be closer to the new Pre-K space being suggested as it would be nice for high school students to have an observational lab within their room, and to bring back the Child Development 3 Internship program, which had a average number of ten students going out to the Pre-K classes throughout the district for work experience. Having work experience within the building would be ideal because of transportation issues in the past, getting students to their "job" if they didn't drive and their classroom teacher being able to easily observe them without leaving the building. Many students throughout the years have shown an interest in post secondary education, majoring in early childhood or elementary education and child psychology. This would give them a great opportunity to experience real-life scenarios. Having the classroom intermingled within the several early childhood classrooms planned would be a benefit, along with those teachers being used as mentors in the 3rd year program.

- Large classroom space adjacent to to the Pre-K Program
- Ability to split the classroom into different areas
- Sink area for project production
- Storage space
- 2-way glass mirror for observation of students

School Store/entrepreneurship location: In the past, our school store was a vibrant opportunity for the DECA program's entrepreneurial class, when curriculum and funding changed it left a hole which was filled recently with our RISE program within our special education department, using it as a vocational job training space. Now that the business department has merged with the economics classes there is a need for a robust store that can not only help to train those in the RISE program but also help students wishing to go into some type of business. It will act as an opportunity to learn more about product sales, accounting, purchasing, and marketing, along with a great collaboration with the special education students.
The store is currently open 2 to 3 days a week and staffed by the RISE students only with very selective hours. In the past it was a store run by at least 30 or more students rotating in, consecutively each day before school and during lunch. The space allotment it has now is adequate for what is being taught, however it does not have storage space for items such as overflow merchandise. Preferably it would be adjacent to the Economic/business classroom which could be near the library or some other populated area giving access to all students throughout the day. However there needs to be added space allocated to storage for merchandise/products, as there is currently no storage at all and housed throughout our current building in various locations.

- 600 sq ft store
- Storage area needs to be added (150 sq ft)
- Near library or cafe for student access

Scene/wood shop: Currently there is no woodworking class of this kind, however, there was once a woodworking shop in the basement of our current building, where if classes were run, were easily filled. The need for a real life skill such as woodworking is not only evident now with homeowners doing their own DIY, but it is an opportune time for students to show their creative thinking, problem solving, and fine motor skills by working with their hands and also using engineering skills. Not only would there need to be room for actual equipment, there would need to be a designated space for CAD and printer to print plans.
The ideal location would be between the engineering program for project based learning, and the auditorium as the class could be used for set design for the award winning drama department which used to use the woodworking space that was once located in the current basement of the building and has since been disassembled. The drama department now uses the parking lot, hallways, and student homes to build the items needed for their productions. The recommended class size for students would be to use OSHA guidelines for safety. This space could also be utilized for Adult education because so many people are DIYers now and looking for opportunities to learn within the community.

- Large space that allows for dual access
- Access to the auditorium
- Access to the outside with garage door for deliveries/project pick-up
- Dust machine will need a higher ceiling

Film Editing/Production: The film editing classroom currently utilizes a computer lab which is a shared space with art. This lab is actually only utilized 2 to 3 periods a day but in the past was used 4 to 5 times throughout the day. Stoneham has seen in the past decade many students go into film/video production along with electronic music production. The ideal opportunity would be to combine the classroom theory into the lab space in computer science and use the space allocated in the plan to a small soundproof studio that could be used for video production, tv/news studio, or recording studio for the music department. With the excellent opportunities in the Boston area to further their education in film, video, or music production it would be a great training opportunity. We would also like to expand our existing partnership with the local television station that was once housed in our building, to include more student produced material, such as sporting events and productions. Again, this would be utilizing the student's creativity, management, and business skills.

- Large space divided into film editing, green room area
- Small lockable storage area
- Part of this large area should have space for small studio for filming Stoneham TV

Maker Space/Robotics: This space better known as a Innovation Lab would be an open space wired for technology around the room so that it could serve multiple uses and be accessed by all departments for groups and large projects. This lab could also house robotics courses in the future as the school does not currently offer robotics but would like to add it into the PLTW program. We currently do not have an innovation lab but looking to the future and wanting to expand the Project Lead The Way (PLTW) program this would create a great opportunity and best use of shared space. PLTW is currently a very robust class within the 7th and 8th grade curriculum in the Middle School, and as a feeder school to the high school it is important to keep the momentum going in such a sought after career field. This space could also house the tech leader program that has in their curriculum computer repair services. We see this as being utilized all periods of the day with the space having a sign-up sheet for open use areas with a possible waiting list to get in. The space will also be available for the open periods the students will have such as the FLEX period. Students will have the opportunity to sign up for a spot in the lab during the FLEX period. We
Engineering Lab: Currently our district is in the second year of implementing the PLTW program of Engineering, by offering 2 periods per semester. The space is located in a computer lab without adequate ventilation and no space for collaboration or possible assembly of project ideas. To accommodate our future expansion goals, a proposed

CAD/engineering lab would be wired for various technologies including laptops with ethernet access points throughout the room and possibly a bank of 3D printers. The CAD lab would also have space with open counters and floor space so that students can assemble products and test design solutions. This space would be ideally located between the computer labs and the woodworking area, so that engineering students would be able to make some of their designs come to life in wood or 3-D. With many students going on to further their education in many different engineering programs, this opportunity has been long awaited. We need to advance ourselves into the 21st century and give students opportunities to participate in STEAM programs more. CAD lends itself to future landscape/home architects, innovators, product engineers, and urban planning.

- Expand one 1440 sq ft space to allow for all 3 labs to be merged together (possible 2000+)
- Divide the space into:
- Computer CAD space (Engineering PLTW)
- Work table space
- Robotic space w/storage
- Maker Space with access from hall area

Computer Science: Through the courses offered in our Technology Department, students have an opportunity to discover the vast career opportunities in the technology field, advance their knowledge of general productivity tools and how these tools may be used for collaboration, creativity, communication and problem solving. The current graduation requirements for all SHS students is one semester of Computer Applications.

For those students who are interested in a deeper understanding of how coding is used in the world around them, our Cybersecurity and Computer Science Essentials will provide them with hands-on development opportunities. Other vocation opportunities include the student Tech Leaders program for those students who want to explore help desk and support roles.
The rooms are adequate but the technology is aging and the ventilation is a problem because of the heat the computers give off with only one window air conditioner. It is not currently conducive to simulating a software programmer's project-based work environment, as there is a need for collaboration space. In planning for space for computer science, there needs to be a large, flexible space that can function as a computer lab but can also accommodate collaborative work among students. This would require large/multiscreen work stations throughout the room. As the computer science program continues to evolve in time it would be nice to have it adjacent to the Innovation Lab and Bio-medical rooms as part of Project Lead the Way.

Kim O'Connor
TRANSPORTATION
The district's transportation policy provides bus transportation for those special needs students who fall within the guidelines of needing private transportation to their school.The district does not charge a transportation fee for these students. The district contracts the transportation out each year by putting out a bid for the best possible service and price. Approximately 335 student parking spots are available on site, and currently there is now assigned parking for students. It is a first come first serve basis. The teacher's parking lot is closer to the entrance and students are barred from using that area.
The district also owns two of their own small (14 person) busses, which they use for the SPED program during the day and other small group field trips. These busses also allow smaller groups of athletes to be transported to their sporting events. Two or three larger spaces in a well lit area would be needed to accommodate them in the parking lot.
Needs:

- Ample parking for faculty and staff, currently not enough

- 2 or 3 large bus spaces
- Handicap accessible parking spaces
- Loading Docks

FUNCTIONAL AND SPATIAL RELATIONSHIPS

The school's cafeteria is in the main level, and is not surrounded by classrooms, it is on one of the far sides of the school. The proximity to the classrooms/lockers can have a negative effect on those students during lunch periods as it has students rushing too much. The cafeteria's location also causes it to be under utilized during the remainder of the day, including before and after school. A more central location to the entrance would be more applicable for the use of public gatherings and rental space for use of those organizations outside of the school district. Our current cafeteria because of age and location is not being used to its best possible ability, there is opportunity for so much more especially if easy accessibility to the theatre and gymnasium.

Kim O'Connor and Bryan Lombardi

SECURITY AND ACCESS

Despite the limits of the aging building, the Stoneham High School administration has made efforts to establish practices that ensure the highest level of safety and security for students and staff during the school day and for the community use of the facility after school hours. During the school day, all doors, except one main lobby door, are manually locked at 8:15AM. Visitors must sign in at the greeter's desk in the main lobby. Guests must wear a name badge while in the building and must verbally identify themselves and state their business when questioned. In cooperation with the Stoneham Police Department, emergency response plans and lockdown procedures have been established and practiced.

In the past few years the district has made efforts to upgrade by installing a small number of cameras in various places in the high school and installing a card reader system for high school employees. However still each classroom or labs lack some type of phone system to communicate with other parts of the building and administrators. Teachers are told to use their own cell phones when most of the time the wireless-provider does not work in the building. The current PA system is not installed in every classroom which is unacceptable in case there is an emergency or lock down.

In a newly renovated Stoneham High School, security cameras inside and outside the building would be installed. Proper lighting to ensure safety for evening events would be installed in all parking and public areas. A PA system would be upgraded so all students and faculty and staff are informed during the event of an emergency. All doors would have the capability to be electronically locked and unlocked and visitors would be required to gain access to the school by the use of a buzzer and enter through a security vestibule. A new school will have clearly-defined traffic patterns, entry/egress systems, lines of sight, cameras, and other features. Push button wall phones would be installed in each classroom or lab allowing teachers to communicate with administration/supervisor in case of an emergency.

Preliminary Design Study by HMFH

VOLUME 1

HMFH

Stoneham High School

Preliminary Design Study

VOLUME 1

MARCH 12, 2018

HMFH ARCHITECTS

130 Bishop Allen Drive Cambridge, MA 02139 617 492 2200 hmfh.com

HM
FH

Ask.
Design.
Learn.

Contents

Volume 1 of 2

01. Introduction

02. Planning Process

- 02.1 Existing Conditions
- 02.2 Facility Assessment
- 02.3 Educational Program
- 02.4 Building Options
  - 1. Renovation
  - 2. Renovation with Addition
  - 3. New Build
- 02.5 Estimates
- 02.6 Option Analysis

03. Conclusion

Volume 2 of 2

04. Appendices

- Appendix A - Hazardous Material Report
- Appendix B - Warner Larson Field Turf Investigations
- Appendix C - Teacher Interviews
- Appendix D - School Committee Meeting Minutes
- Appendix E - Mechanical Electrical Plumbing and Fire Protection Option Narratives
- Appendix F - Structurtal Option Narratives

01. Introduction

HMFH was hired by the Town of Stoneham to complete a Facility Assessment of the existing High School and determine solutions to the problems identified in this study.

The study includes Existing Conditions drawings, reports of MEP FP systems, a report of the Structural systems and an architectural facilities report. The findings show that the mechanical, electrical, and plumbing systems have outlived their useful life despite the best efforts of the district to maintain them. The one exception is the recently replaced boilers which could be reused in a renovation option. There are no sprinklers in the building. The structure of the building is sound and could support a full-scale renovation if the committee chooses. The structure does not meet today's seismic codes so wide spread reconfiguration of existing walls should be avoided to reduce the need for additional bracing and foundation reconfiguration which will be costly. The building has many ADA deficiencies along with programmatic and security deficiencies.

Programming Meetings were conducted with: department heads, teachers and staff, the High School Principal, Superintendent Macero, the School Committee and the Building Committee. These meetings underscored the lack of available space to support critical programs such as SPED and STEAM within the existing school.

An MSBA Space Summary comparison of program spaces has been completed for each of the options analyzed in the study. The Space Summary illustrates the current high school programs and related square footages. It also details what MSBA would participate in if the District chooses to proceed with an SOI as well as appropriate square footages for the various options from renovation to new.

A draft of the report and the options was reviewed with Building Committee on September 27th, 2017. The options that were studied are as follows:

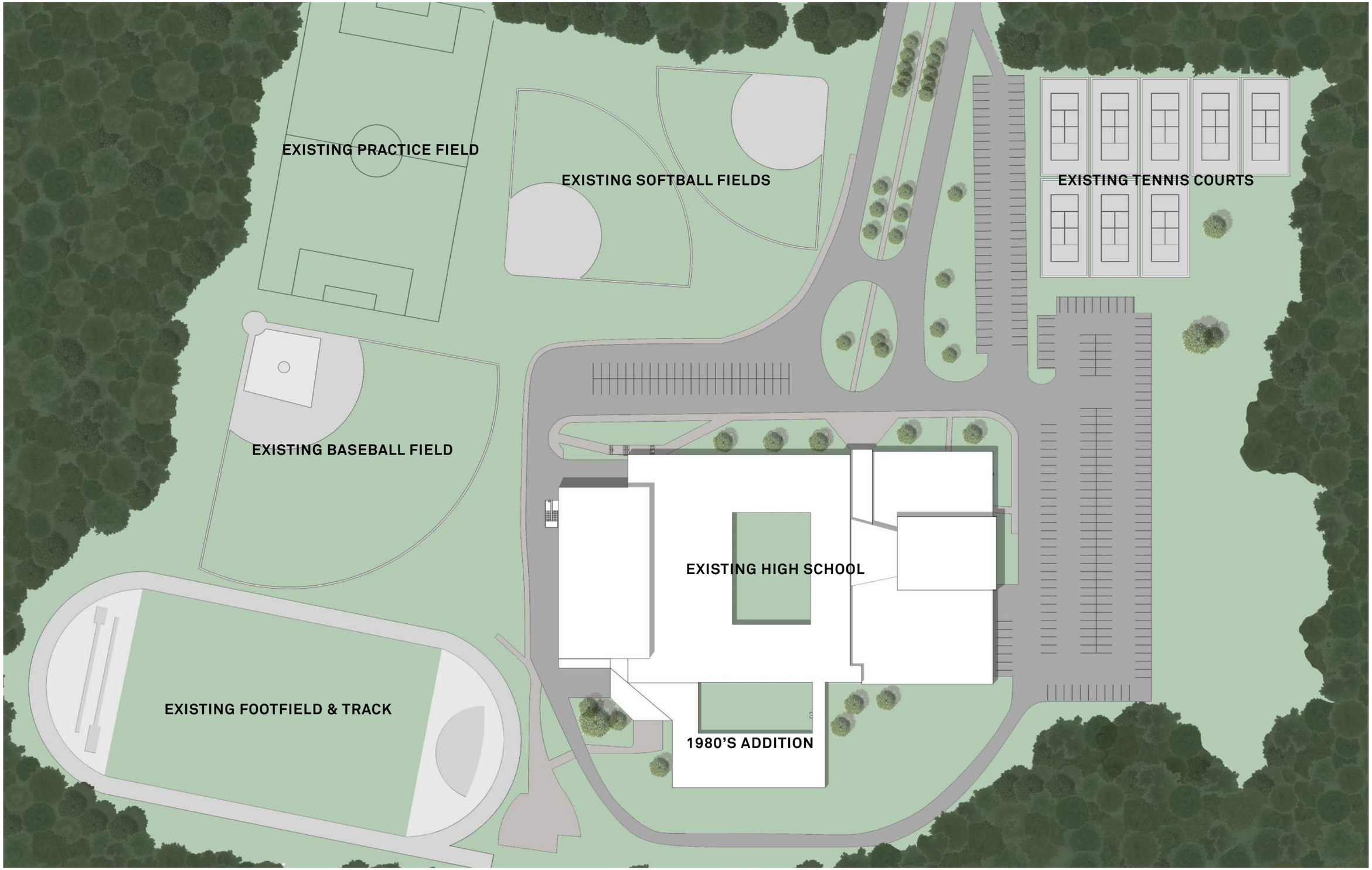
oOption 1 is a full renovation of the existing school. Classrooms and Science Labs will be slightly smaller than MSBA minimum required square footages, District Offices will need to be relocated, construction will be phased and require a minimum of 24 modular classrooms for students, construction will take approximately 4 years.

oOption 2 renovates the Gymnasium and builds a new school in front of the existing school. No modular classrooms are required in this option because the existing school can remain in place and functioning during construction. This option requires two phases of construction. The first phase would be the new construction and the second phase would be the demolition of existing building and the construction of the new Pre-School wing. Construction would take two years for phase one with the new high school and one year for the second phase of the Pre-School construction. This option maintains and renovates the large Gym and maintains the main entrance location directly in front of the entry roadway.

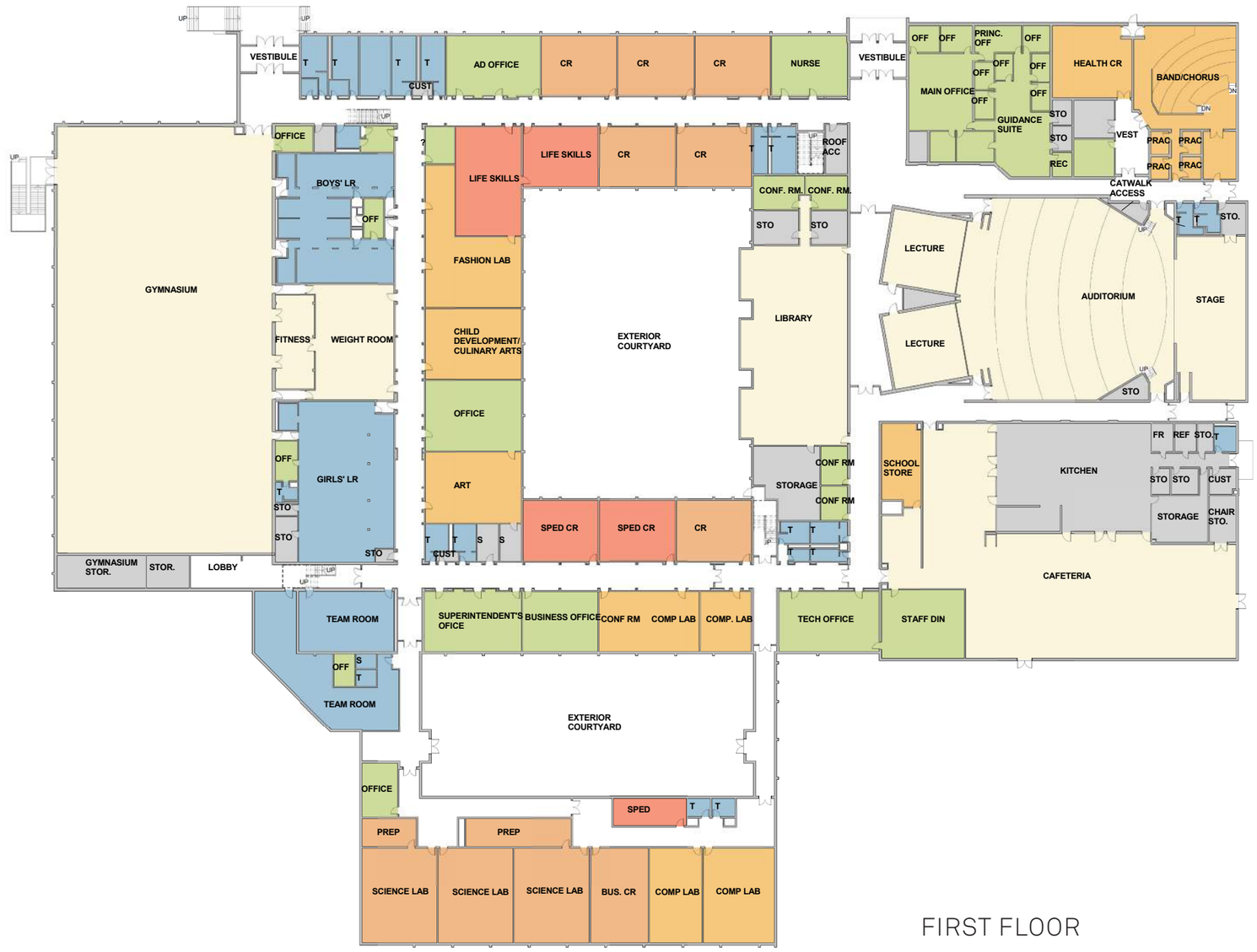
oOption 2 is construction of a completely new building on the parking lot beside the existing school on the East side. No modular classrooms would be needed, and the building would take approximately 2 years to construct. This is the most straight forward option and the quickest to construct however the location of the new building will be alongside the entrance road. This means that you don't see the main entrance as you approach on the entry roadway.

MEP FP systems, civil and structural narratives were produced for the various options listed above. The three options were given to the estimators for pricing. The estimates concluded that the cost for each of the options is very similar at approximately $89-$91 million dollars. The options were analyzed and compared to the programmatic goals of the committees and staff and that analysis is included in this report.

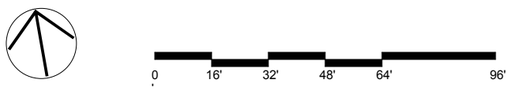
02.1 Existing Conditions


EXISTING PRACTICE FIELD
EXISTING SOFTBALL FIELDS
EXISTING TENNIS COURTS
EXISTING BASEBALL FIELD
EXISTING HIGH SCHOOL
EXISTING FOOTFIELD & TRACK
1980'S ADDITION

BASEMENT



FIRST FLOOR



Administration
Mechanical
Custodial & Maintenance
Circulation
Community
Media Center
Core Academic Spaces
Special Education
Art & Music
Health & Physical Education
Toilet / Locker Room
Laboratory
Dining & Food Service
Pre-School
Special Education / Science

SECOND FLOOR

0 16' 32' 48' 64' 96'

02.2 Facilities Assessment

Site and Organization

Stoneham High School is a 211,000-square foot building composed of a two and three-story sprawling structure located centrally within the Town. The original, main school building was constructed in 1968 and houses the school administration, auditorium, cafeteria, four double-loaded corridor classroom wings, and a gymnasium/locker room wing with shops below. The facility was expanded in 1981 with a science and business classroom wing. The building was originally designed as the middle school but was converted to a high school after the 1981 addition work.

The facility houses 700 students in grades 9-12. The school accommodates a life skills program for students up to 18 years old. Additionally, the Town's District offices are in the facility.

The school is located at 149 Franklin Street on 35 acres with multiple large parking lots and multiple play fields and courts including soccer, baseball, softball, football, track, and tennis. The property is approximately one third wetlands and is not suitable for development. The property is bordered by residential neighborhoods or ledge along all edges. The fields appear to be in very good condition but sidewalks, roadways and parking areas are worn. There are 318 striped and numbered parking spaces, 4 designated accessible spaces, and a drop off loop at the front of the school. An ancillary parking lot with xx mostly numbered parking spaces is located to the east along the side of the school near the receiving area. There is a fire truck access lane around the perimeter of the building. The paved parking lot and drives are in fair condition. Any full renovation of the facility would include an improved layout, repaving, and striping. The concrete entry area sidewalks are in fair condition for their age and would require repair to ensure accessible paths of travel.

There are softball, baseball, soccer and football fields and a track to the east and northeast of the school and tennis courts to the northwest of the school. All the fields appear to be in good condition. The District has completed a study to install turf play surfaces at the football and baseball fields which will be referenced in the high school study.

Currently there is only one possible site entry for vehicular traffic at Franklin Street. Franklin Street is a major east-west roadway in Stoneham, connecting to Melrose and Saugus via the Lynnfells Parkway. There is a traffic signal at this intersection and the entrance roadway is significantly long enough to que any drop-off and pick-up traffic on the site.

Exterior

Walls: The building is a reinforced concrete frame with brick infill. The exposed exterior concrete frame is spalling in many locations and requires some patching and repairs. The brick infill appears to be in average condition. The aluminum window system single-pane glazing which should be replaced to meet the new energy code. The single pane windows that are operable do not have screens and open to a width not allowable by code. The windows in the 1981 addition appear to have water infiltration issues and the caulking at all doors and windows is deteriorated, contains asbestos, and should be removed. The rubber roof is older and has outlived its warranty period but appears to be in average condition on most of the school. There are many leaks at rising wall conditions on the roof. These leaks have been especially prevailing at the main entrance lobby.

Windows: All windows are original to the time of construction. Most are metal framed and all have single-pane glazing that is not thermally broken. The windows are fixed or awning type. All windows require replacement to meet the Energy Code. Existing curtainwalls do not meet the Energy Code and are rotting and will need to be replaced with all new. The gymnasium has Kalwall window system which is original to the building and has yellowed significantly. This system is worn and is broken in many areas and should be replaced.

Doors: There are approximately 15 pairs and 4 roll up doors. Many doors have damaged and bent frames so they do not close properly. Because the doors are not on an alarm system it is a constant challenge to keep the building secure. The hollow metal doors and panic hardware are of varying vintages and while operable, they are aging, worn, and should be replaced.

Roofs: According to a previous report all rubber roofing membrane was replaced in approximately 2004, except for roofs over the auditorium, cafeteria and gymnasium which are original to the building. The original roof is well past its 25-year warranty and should be replaced. Maintenance personnel report ponding at the replaced roofing and there is evidence of this with moss growth in these areas-see photographs. There is also significant springiness to the roof that can be felt when walking on it. There are reported leaks in many areas from possible loose seams below the new roofing allowing water to infiltrate into the building; therefore, it is recommended that the entire roof be replaced. There is also significant leaking at rising wall conditions such as in the main lobby. This may be from areas of damaged flashing at the rising walls-see photographs.

In the event of a full renovation, all new roofing, gutters, downspouts, and roof drains are to be installed.

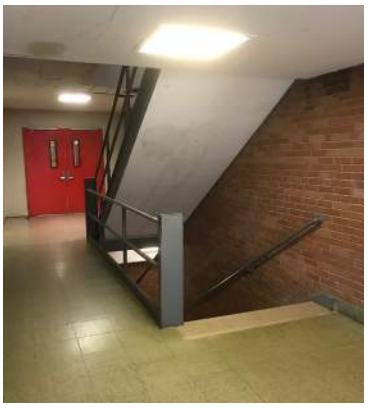
Steps/ Ramps: Curb cuts allow for accessible circulation at the front of the school. There are many exterior doors that exit directly to grade but the site has many grade changes which makes an accessible route difficult. Sidewalks, curbs, and steps are in poor condition and need repair as well as the asphalt paving at drives and parking areas. Some parking areas have asphalt curbs and sidewalks adjacent to them and are in poor condition in need of repair or replacement.

Interior

Walls: Most of the building interior has painted concrete masonry (CMU) units, typical in corridors and classrooms. Most corridors cafeteria and classrooms have ceramic wall tile which is in fair shape except for tile base which is cracked and damaged in many areas and should be replaced. There are areas in the corridors with exposed brick which is in good condition. The main lobby has an interesting large format ceramic tile with a circle pattern which is in good condition. Classrooms also have painted drywall, wood paneling, and operable walls. The walls have been maintained and are in fair condition for their age. Areas of wood paneling in the auditorium and cafeteria are in poor condition and should be replaced.

Flooring: The flooring is a combination of vinyl composition tile (VCT) and 9 x 9 vinyl asbestos tile (VAT)- see Hazmat Report in Appendix A. There may be instances where the VCT has been installed over the VAT, this should be investigated. The toilet rooms have mosaic ceramic tile, the locker rooms have a combination of mosaic tile and concrete. The kitchen has quarry tile flooring and the basement level shop wing has exposed concrete floors. Carpeting is found in the band room, library, and most offices. The auditorium has exposed concrete at the aisles and under the seating. The wood flooring of the stage has large areas where it has been patched numerous times over the years due to general ware. The gym wood floor is in good condition on the surface, but its makeup does not provide the appropriate shock absorption.

Ceilings: Most of the ceilings are acoustic ceiling tile (ACT), some are adhered, and others are lay-in tiles within a grid system which is not manufactured anymore and is therefore difficult to replace when damaged, all are in fair to poor condition. Many tiles show signs of water damage, and/or are missing, loose and sagging. The gym has exposed structure. Locker and toilet rooms have painted plaster ceilings. The auditorium has a plaster ceiling which is in fair condition but does not provide good acoustic qualities in the space. The Principal stated that there is a dead zone in the middle of seating where it is very difficult to hear the performance. The catwalk system in the area between the ceiling and the roof is accessed via a ladder in the adjacent electrical closet and from which



they can access the light fixtures. The catwalk is bouncy and should be checked for structural stability and repaired.

Doors: Interior doors are solid wood, most with non-compliant hardware, some with lights or vents. Roughly three quarters of the door entries do not comply with the required push-pull clearances and because the walls are of CMU, will require destructive work to make them compliant- see photos for more information. The doors are worn and in fair condition.

Stairs/ Ramps: The stair treads are rubber and the risers are metal. The nosing does not meet code requirements and should be replaced. The guardrails and handrails do not comply with accessibility requirements. There are two sets of stairs that are "open" to the corridor, and connect three stories. These stairs will need to be enclosed to meet the current building code requirements. There is a ramp that allows access into the library which is a half flight of stairs below the first-floor level. The ramp slope is non-compliant and is constructed of concrete which would require destructive work to make the slopes compliant.

Elevator/ Lift: There is one elevator added in the 1981 addition. The elevator has a non-compliant cab and door size. Because there is only one elevator on the Southeastern corner of the building, a person requiring an accessible route would be required to travel a very long distance to access the spaces on the second floor or basement.

Auditorium accessibility: The auditorium is large with a capacity of 1100 seats. The aisles are sloped down to the stage, but the slope exceeds the ADA compliant 1:20. The floor would need to be reconfigured to meet the ADA code. The stage is accessible from the surrounding corridors but is not accessible from within the house. The only access up to the stage level is via stairs on both sides. A ramp should be added on one side of the stage to allow for an accessible route from within the house.

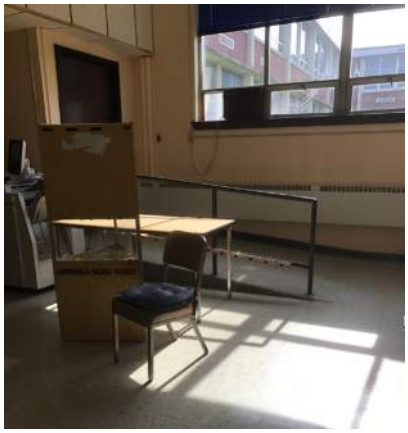
Water infiltration: The numerous roof leaks that have occurred over the last 40 years have allowed water infiltration in the building and possible mold above ceilings. This condition occurs over a good part of the building and requires further investigation.

SPED Needs:

Stoneham High School currently houses two special education programs for specialized populations. There are two RISE programs that service students with autism spectrum disorders or other developmental disabilities. Students are in these programs during their four years in high school and often during their post graduate years or until they turn 22 years old. These students require access to small group and individual spaces for learning as well as access to areas geared toward appropriate vocational and transitional learning situations. The staff works to ensure that these students have sufficient opportunities to learn and practice daily living and job skills, but the current high school building has significantly limited the options for these students on site. The high school lack access to updated kitchen facilities to practice meal preparation, accessible bathrooms to practice all aspects of self-care and other dedicated spaces for vocational practice for activities that resemble current job opportunities for students including hotel, culinary, and office work.

The high school also houses 2 STRIDE alternative programs for special and regular education students with significant social emotional challenges. Many of these students have a variety of mental health challenges including anxiety disorders, depression, school phobia, and addiction. These students need private spaces where they can work with therapists or counselors when they are dysregulated or upset. These spaces need to be sound proof and attached or nearby the classroom to provide quick access when students are agitated. Unfortunately, in the current building private smaller spaces are hard to find and often too far away from classrooms to be useful for students and staff to access quickly.

In addition, the high school is ill equipped to provide students with physical disabilities access to all academic and extracurricular activities. The entrance to the school as well as parking areas do not meet current ADA guidelines for easy independent access for students in wheelchairs or other physical challenges. Due to the topography of the site, the slope of the parking area and sidewalks is too great to negotiate in a wheelchair. There are several school wide spaces including the library and auditorium, locker rooms, stage and music rooms that are only accessible via stairs and either have no handicapped access or have access only from doors that are not wide enough and do not have accessible hardware. While a few bathrooms have been updated to allow access to someone using a wheelchair many of the bathrooms remain inaccessible - often with doorways and interior walls that are simply too narrow to allow entrance. The only elevator to the building does not meet Life Safety code due to its small dimensions. It is also located in the very back of the building making travel distances to and from academic



areas excruciatingly long. A student with a larger wheelchair or one with customized additions would not be able to use the elevator.

The school lacks proper acoustically sound learning environments for all students and the large population of Deaf and Hard of Hearing students are impacted in a very negative way. The district has equipped some classrooms with acoustic sound panels, but only a certain number of rooms are able to be equipped and even with these panels it is difficult, and sometimes impossible, to bring the rooms to the appropriate sound and vibration level that is effective for students with significant hearing loss.

Unfortunately, without more appropriate options students with special needs the District may be forced to place students in programs or schools outside our district at both significant increased financial cost and the added disadvantage of having students attend school and vocational opportunities outside of their home communities.

MAAB/ADA Regulations

There are many MAAB violations that will require upgrades. The MAAB requires full compliance of the regulations for any public building undergoing renovation work that is worth more than 30% of the assessed value of the building. Maintenance related work is exempt from the calculation, but only if the value of the work is below $500,000. The cost of bringing this building up to current code and to replace deteriorated finishes and systems would exceed that value and will require that the renovation meet full compliance with MAAB regulations. Because it is a public-school building, it would also need to meet full Federal ADA regulations.

Accessible Route - Exterior: There is no fully accessible route from the parking lot to the building entrance. There are a total of 318 parking spaces and 5 spaces are marked for accessible parking. Curb cuts are needed to provide access to the sidewalk at all of the school entrances. Currently there is not an accessible route to the playfields from any exit because the fields are approximately 10-12' below the finished first floor of the school.

Accessible Route – Interior: The interior sloped walkways are too steep to meet accessible requirements and there are no handrails provided. A 5'-0" wide minimum path with no protruding objects and with a slope of no more than 1:20 (1:12 with handrails) will need to be provided. There is an elevator, but it was installed in 1981 and does not meet all of the current requirements and will need to be replaced.

Stairs: The stairs (4 in total) require upgrades to the stair nosing profile to comply, and new handrails and guardrails. Two sets of stairs connect three levels and are not enclosed per the Life Safety Code. These stairs will need to be demolished and rebuilt in a one hour rated enclosure.

Door Hardware: All door hardware must be upgraded or replaced to meet MAAB/ADA regulations including, but not limited to, door handles, closers and panic devices.

Toilet Rooms: Currently, just one pair of boys' and girls' toilet rooms is accessible. All toilet rooms must be upgraded to have at least one accessible stall and one accessible sink. This would reduce the number of toilets in some of the toilet rooms, but the building has a high quantity of toilet rooms to ensure meeting the required fixture counts per the plumbing code. The staff toilet rooms in the building are not currently accessible. The nurse's toilet facilities are not accessible. All locations would need to be updated with new fixtures and revised room layouts.

Locker Rooms: In addition to the new fixtures and revised layouts noted above to meet accessibility, accessible showers are required at each of the locker rooms (currently there are two sets of locker rooms in the school). The locker configuration needs to allow for clearances and the required proportion of accessible lockers. The locker room has gang showers with 6" high curbs at the entrances which are non-compliant. Shower hardware is non-compliant.

Student and Staff Lockers: Currently the facility has various width lockers and none that are designated for accessible use. All lockers are original and are in poor condition. It is recommended that all lockers are replaced with wider (12-15" in width) lockers that meet the accessibility requirements. Assume 710 lockers.

Built-in Casework: All built-in casework is original to the building and is in fair condition, but they do not meet the accessibility requirements. The science classroom casework in particular does not meet today's standards and the sink counters and work spaces do not have required height or clearances.

Drinking Fountains: The quantity and distribution of drinking fountains does not comply and further there needs to an accessible drinking fountain at every location there is a drinking fountain. The current fountains do not comply with accessibility requirements for height and clearance and some are located in such a way to create an obstruction for those that are visually impaired.

Auditorium:

Gymnasium Bleachers: The bleachers in the gym are original to the building, are worn, and in fair condition. The bleachers do not accommodate for accessible seating and will need to be replaced.

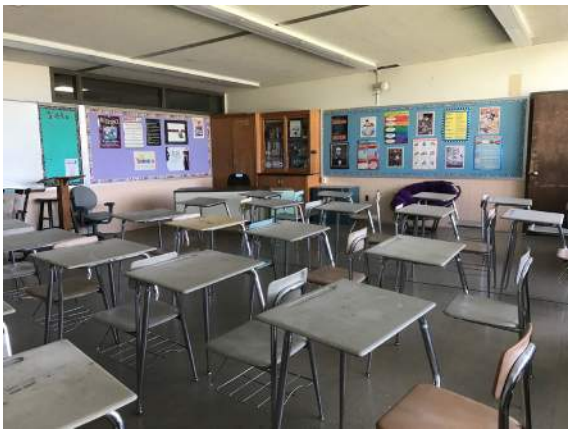
Other major MAAB/ADA requirements include:

Doors that do not provide a 32" clear opening at 90 degrees must be replaced with wider doors. This condition occurs at 25% of the doorways.

Doors that do not provide the required push/ pull clearances must be replaced or relocated to meet the MAAB/ADA requirements. This condition occurs at 50% of the doorways.

Signage throughout the building must meet MAAB/ADA requirements.

Space Standards



The majority of the general classrooms at Stoneham High School (SHS) are slightly undersized as compared to state standards as shown in the attached MSBA Space Summary spreadsheet. Existing general classrooms range in size but are approximately 800 square feet. All eight (8) of the science classrooms are undersized, ranging in size approximately 1,200 square feet. Additionally, they do not comply with accessibility and plumbing code requirements, the built-in casework is worn and outdated, the fume hoods do not work, and there are insufficient eyewash and emergency shower locations. There is no separate chemical storage room.

As with most schools, the special education spaces vary greatly from those listed in the state guidelines. SHS has seven (7) special education classrooms, none of which are "self-contained", meaning having toilet facilities within. In addition to these classrooms, there are two distinct programs offered, a life skills program for 18-22-year old's.

The performing and fine arts program is very strong and in demand at the middle and elementary schools but are only beginning to take hold at the high school. The drama program is very popular, but it is only offered as an afterschool class currently. There are two large art classrooms where drawing, painting, and much-loved pottery are accommodated, however the kiln is in the basement nowhere near the art rooms. There is a band classroom with storage for instruments, uniforms, and sheet music. There is no acoustic separation between the Band and adjacent classrooms so surrounding spaces cannot be used simultaneously. Adjacent to the band room is a small office and two small practice rooms. Ideally the school would have more practice and ensemble rooms.

There are no vocational/technology spaces now; the educational vision is to accommodate hands-on learning, with a maker space and project areas in a new school.

The existing school building has a large gymnasium which is approximately 16,100 SF which is slightly larger than the MSBA allowable 12,000SF. Physical education, health and wellness, and athletics are all highly valued by the school and community. The school does not have an Alternative PE space, adaptive PE space or fitness room.

The SHS learning commons is slightly larger than MSBA guidelines and is the hub of the school. Students and faculty are able to drop in during free periods throughout the day and afterschool. There are banks of computers, areas for soft/ lounge seating, and a "classroom" set up of table and chairs.

The SHS auditorium and stage are larger than MSBA guidelines and speaks to the strong dramatic arts program that has blossomed over the years. The auditorium seats 1100 with both additional lecture areas opened.

The cafeteria is greatly oversized compared to MSBA guidelines; at 5,500 square feet it is nearly double the size noted in the guidelines (3,600 square feet). Currently there are two lunch periods.

The nurse's suite is undersized. The administration and guidance spaces in total are larger than MSBA guidelines because SHS currently includes all of the District offices.

Overall the existing school building is slightly larger than MSBA guidelines for a student population of 710. The guidelines allow for a 152,640-square foot program and existing SHS is 211,000 square feet. Much of this overage is due to inefficiencies in the building's sprawling layout, but, generally speaking the school is large and has an entire basement wing that is not used by the school because of its remote location and security issues. See the SHS space summary for total existing program square footage.

Environmental Analysis

Refer to the Hazardous Material Report in Appendix A.

Life Safety

The current high school has many Life Safety violations. The building is over 200,000 SF and does not have any approved sprinkler system installed. The fire alarm system is an original FCI FC72 Conventional system. The system is obsolete. The fire alarm notification devices do not meet code and detection is limited. The fire alarm system is an immediate need of replacement. The combination of both of these deficiencies is a serious threat to life safety. To exacerbate this issue the building structure is unprotected reinforced concrete. Although considered non-combustible, the shallow depth between the concrete tees and precast flanges provides little to no fire-rating. The overall size of the building combined with no fire proofing or sprinkler systems puts it in violation of the current building code for height and area calculations. A building of this size built today would have sprinklers, and fire proofing or fire walls to divide up the areas of the building into smaller sections. The building also has two sets of stairs that are not enclosed and traverse three-stories of the building. Unenclosed stairs are only allowed for two stories under the current building code.

Security

The current high school has many security issues. The current main entrance is not visible from the Main Office. Due to the architectural design, the staff that would be answering the door buzzer cannot easily see the parking lot or a visitor approaching the entrance doors. This does not allow a quick response time to a potential incident. Once the visitor is buzzed into the school, there is not a locking vestibule to allow processing of an ID before the person has access to the entire school. You can easily by-pass the main office and move quickly throughout the school. The vestibule and main office should be reconfigured to address these issues in a renovation option. The Superintendent's office is at the opposite end of the school from the main entrance. Visitors going to that office wander through the entire school to reach their destination. There is no signage to direct a visitor and no way to keep that person segregated from the students. Signage should be added to improve security. In a renovation option, the Superintendent and District offices will have to be relocated elsewhere within the town. The corridors are dimly lit due to out dated and failing lighting systems. The dim light adds to a sense of poor security at the school. All lighting will need to be replaced in a renovation option-see electrical narrative for more information. The overall layout of the facility with the science wing addition and basement level vocational shops leaves teachers and students feeling isolated and unsecure when they are in these remote zones. Teachers in the remote science wing do not feel safe working after school hours because of the isolation. Science labs will be relocated into a STEAM wing in the renovation option. The building does not have any security cameras on the interior or exterior. A security system will need to be added in a renovation-see Security narrative for more information. There are a number of exterior doors that do not close properly because the frames are damaged, and the locksets have outlived their useful life. These doors could allow visitors inside without any staff members knowledge.

List of Renovations:

- Repair, repoint, and clean all masonry exterior walls
- Repair brick chimney, assume add lining, repair crack, and repoint masonry
- Insulate all exterior walls to meet the Energy Code, assume blown-in insulation
- Repair cracks and resurface exposed concrete foundation walls
- Replace all roofing material, roof edge, and provide new insulation to meet the Energy Code, gutters, and downspouts, assume all new mechanical supports, pads, and framed openings
- Replace all windows/ window wall systems
- Add new windows along a 90'-0" length of wall, assume 40% glazing
- Replace all exterior doors and hardware
- Abate all VAT floor tile-see Haz Mat Report Appendix A; provide all new linoleum flooring throughout, unless noted otherwise
- Replace carpeting at library and Auditorium; (band room, and administrative offices to have linoleum flooring)
- Replace all ACT with new 2'x2' ACT
- Install acoustical panels in the gymnasium
- Paint all interior wall surfaces
- Replace wood paneling with painted gypsum wall board/paint (assume 5% of all surfaces)
- Upgrade each student toilet room to meet MAAB/ADA regulations and have the following:
    - Accessible entrance width of 32" clear opening at 90 degrees
    - Replace door hardware with MAAB/ADA compliant hardware
    - 1 accessible stall with correct clearances and mounting heights of fixture and accessories
    - 1 accessible sink
    - Accessible accessories such as soap dispenser and paper towel holder
- Upgrade staff and individual toilet rooms at nurse's suite to have the following:
    - Accessible entrance width of 32" clear opening at 90 degrees
    - Replace door hardware with MAAB/ADA compliant hardware
    - 1 accessible stall with correct clearances and mounting heights of fixture and accessories
    - 1 accessible sink
    - Accessible accessories such as soap dispenser and paper towel holder
- Upgrade athletic locker rooms, specifically reconfigure showers to provide accessible shower stalls at each locker room
- All door hardware must be replaced to meet MAAB/ADA regulations including, but not limited to, door handles, closers and panic devices
- All doorways need to be reconfigured to provide 18" on the pull side and 12" on the push side. All walls in these areas are CMU with lockers abutting them-see typical photos for more information
- Replace 100% of interior doors that do not have a code compliant clearance (including destructive work); replace all other interior doors with new
- Replace sinks, countertops, casework in classrooms with units that have required clearances
- Provide all new casework in eight science classrooms, inclusive of eyewash and emergency shower stations and four fume hoods
- Replace drinking fountains with units that meet accessibility requirements for height and clearances
- Replace all handrails with code compliant rails and guardrails
- Replace stair floor finish with rubber and add compliant stair nosing and tactile indicator strips
- Add wall and one pair of doors at two stair locations to create a fire-rated vertical circulation path of travel
- Reconstruct interior (concrete) ramps (2 locations) to have the required 1:12 slope, provide new floor finish and handrails
- Floor over two existing stairs that travel through three stories. Build two new one hour rated stair enclosures as shown in the drawings.

- Replace existing elevator, provide one new elevator to access the auditorium balcony, and provide one new lift or ramp at the auditorium stage
- Resolve leaking issues at all rising wall roof conditions
- Refurbish auditorium, inclusive of seating (assume 1100 seats), revise floor slope by pouring new concrete ADA accessible slope, carpeting at aisles, and create accessible seating areas
- Replace existing movable partitions at the Auditorium (2 locations)
- Replace existing ceiling system at auditorium, provide new catwalk, remove old mechanical equipment
- Demolish existing stage; rebuild new 50' high stage to accommodate new rigging.
- Provide new auditorium and stage lighting system, new stage rigging and curtains
- Provide new stage wood flooring
- Provide all new student and staff lockers, assume 720 full-height lockers
- Add new, code compliant signage at all occupied spaces
- Provide new and accessible bleachers (seating 900) at the gym
- Provide new, shock-absorbing wood gym flooring
- Upgrade emergency egress lighting and exit signs
- Provide accessible curb cuts at entrances
- Repair all site sidewalks, curbs, ramps, and steps; provide new railings
- Revise layout, repave and restripe parking areas and repave all drives
- Abate hazardous materials as listed in the attached Hazmat Report
- See Engineers' Reports for Structural, Mechanical, Electrical, Security, Plumbing, and Fire Protection renovation scope required

Fire Protection

The building does not have an automatic sprinkler system.

In general, Massachusetts General Law M.G.L. c.148, s.26G requires that any existing building over 7,500 square feet that undergoes major alterations or building addition must be sprinklered. Examples of major alterations are demolition or reconstruction of existing ceilings or installation of suspended ceilings; removal of sub flooring; demolition and/or reconstruction of walls, doors, or stairways; or removal or relocation of a significant portion of the building's mechanical or electrical systems. Alterations are considered major when such work affects 33% or more of the building area or when total work (excluding sprinkler installation) is equal to 33% or more of the assessed value of the building.

If the proposed project scope exceeds these thresholds then the existing building, and its additions if applicable, will require installation of an automatic sprinkler system.

Existing Conditions:

- The building is not protected with an automatic sprinkler system.
- There is a dry standpipe system supplied from a Siamese connection located on the exterior of the building adjacent to the Mechanical Room.

Recommendations:

- Perform a new hydrant flow test to confirm Municipal water supply capacity.
- Remove existing dry standpipe system, and provide an automatic sprinkler system.
- New automatic sprinkler system shall be installed in accordance with MBC and NFPA 13-2013. System to include new 8 inch fire service, double check valve assembly, wet alarm valve complete with electric bell, and fire department connection meeting local thread standards. Sprinkler control valve assemblies shall be provided to limit the sprinkler area controlled to less than 52,000 s.f. as required by NFPA 13-2013.

Plumbing

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary, waste and vent system, storm drain piping, special waste and vent system, and natural gas. Municipal sewer and municipal water service the Building.

The building was constructed in 1968. The majority of the plumbing systems are original to the building. Portions of the system have been updated as part of building renovation project in 1980.

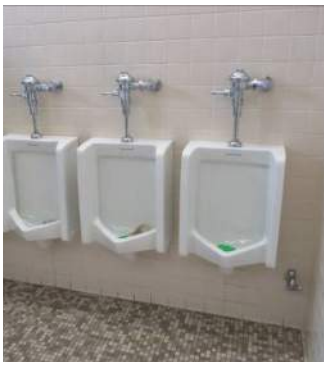
The plumbing systems, while continuing to function, have served their useful life. The school plumbing systems could continue to be used with maintenance and replacement of failed components. The plumbing fixtures are in fair condition. Attempts have been made to make bathroom fixtures accessible, however, the majority of fixtures do not meet current accessibility codes. In general, the fixtures appear to have served their useful life. Cast iron is used for sanitary and storm drainage. Rainwater from flat roof areas is collected by roof drains and interior rain leaders which discharge to a below grade drainage system. Where visible, the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper. In general, the drainage piping can be reused where adequately sized for the intended new use.

Fixtures:

The water closets are predominately wall hung vitreous china with manually operated flush valves.

Urinals are wall hung vitreous china with manually operated flush valves.

Lavatories are wall hung vitreous china. The majority of lavatories have individual hot and cold water handle mixing faucets. The faucets do not have mixing valves. Lavatories near cafeteria have been renovated and are under mount sinks with metering type faucets.



Drinking fountains near Gym/Locker Rooms are recessed vitreous china with adjacent cuspidor.

Electric water coolers are mixed vintage. All are wall hung with stainless steel bowls. One unit is barrier free hi-low with sensor activated bottle filler.

Mop receptors are floor mounted, stone bases. Wall faucets have been removed and replaced with a single cold water hose bibb which supplies soap dispensers.

In Mechanical Room, there is a trap standard Janitor's enamels sink. Faucet is mounted on backsplash and is equipped with vacuum breaker.

Home Economics sinks are counter mounted, single bowl, stainless steel with gooseneck faucets.

Art room sinks are integral counter, stainless steel, single bow sinks with gooseneck faucets.

Science classroom sinks are resin type with cold and hot water faucets. Faucets are equipped with vacuum breakers. Classrooms contain an emergency shower fixture fed by the cold water system. Sinks are piped to an exterior lime stone chip acid neutralization system located in the courtyard. Discharge connects to building sanitary system in corridor.

Kitchen area fixtures are in fair condition. The pot washing sink is fitted with grease interceptor. The dishwasher does not discharge through a grease interceptor.

Water Systems:

The main domestic water service is located in the Basement Mechanical Room. Service is original to the building. The service is 6" in size and includes a 4" compound water meter. The main domestic cold-water distribution is 4" in size.

Piping, where exposed, appears to be copper with sweat joints. The majority of the piping is insulated. Due to the lack of accessibility, a major renovation should include all new domestic water piping.

Domestic hot water for the building is generated through a gas fired boiler connected to a horizontal storage tank. Heater and storage tank appear to be original. Storage tank has a storage capacity of 2,820 gallons. The hot water systems are recirculated. There is an antiquated thermostatic mixing valve. System has reached its life expectancy.

Domestic hot water for the kitchen is generated through a gas fired boiler connected to a vertical storage tank. Water heater is standard efficiency and has a natural gas input of 200,000 BTUH. Storage tank has a storage capacity of 119 gallons. The hot water system is not recirculated. There is no thermostatic mixing valve. System appears to be near it life expectancy.

Gas:

An intermediate pressure natural gas is supplied to the building. Gas meter is located on the exterior of the building adjacent to the Mechanical Room. The service is equipped with a regulator to lower the gas pressure prior to entering the building.

Natural gas in the building is supplied to the heating boilers, domestic water heaters, Kitchen cooking equipment, one rooftop HVAC unit, and Science Classrooms.

Gas piping is black steel with a combination of screwed and welded joints and fittings depending on the time of installation. Gas piping which supplied the original heating boilers is abandoned in the Mechanical Room. Where visible gas piping is in good condition.

Natural gas is provided in the science classrooms. Classrooms are equipped with emergency shutoff valves located in teacher's instruction benches.

Natural gas is provided for kitchen cooking equipment. Kitchen supply is not equipped with an emergency shutoff valve.

Drainage Systems:

Cast iron is used for sanitary and storm drainage. Original cast iron piping is hub and spigot with lead and oakum joints. Where modifications have been made to the drainage system, no-hub cast iron has been utilized. Where visible, the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper.

In general, the below slab cast iron drainage piping can be reused even in a major renovation where adequately sized for the intended new use.

Flat roof areas appear to be in good condition. In general, roof drains appear to be in fair to good condition. Some roof replacement drains have been installed. Replacement drains are no longer MA approved.

Acid waste and vent piping in Science rooms appears to be glass piping.

Recommendations:

- Provide new high efficiency plumbing fixtures throughout building.
- Provide accessible fixtures where required.
- Provide high efficiency gas fired domestic water heater in Mechanical Room and Kitchen area.
- Provide emergency eyewash and shower fixtures in Science Classrooms supplied with tempered water.
- Provide new acid resistant piping in classrooms with central acid neutralization system to treat Science waste prior to discharge to sanitary drainage system.
- Provide new reduced pressure backflow preventer on Science classroom water supply.
- Provide dedicated non-potable water heater for Science classroom sinks.
- Provide emergency gas shutoff valve on gas supply to Kitchen cooking equipment. Shutoff valve shall be interlocked with new CO monitors installed at kitchen exhaust hood.
- Existing drainage systems should be video inspected to confirm integrity and slope.

Electrical

In general, the Electrical systems range from original vintage 1966 to 1980 as part of an addition/renovation project to more recent upgrades, such as, the main switch-board. The service size is adequate for the current usage; however, would not be adequate from both a voltage standpoint and capacity in any renovation program. Beyond the upgraded main switchboard, the building's feeders and sub-panels are original to the 1966 and 1980 construction projects. Reuse of existing wiring and distribution equipment becomes impractical and not cost effective as panels and equipment ultimately are housed in different locations due to updated programs and require extensive splicing and extensions. Life safety lighting, exit signs, and the fire alarm system are not compliant with current codes and are in need of immediate replacement.

It is our recommendation, taking into consideration the age and general condition of the existing equipment, that all systems be replaced with new energy efficient, code compliant systems.

Electrical Distribution System:

There is one service present at the facility. The service is rated at 120/208 Volt, 3 Phase, 4 Wire. The existing main switchboard has a 2,000 amp rated electronic trip main circuit breaker. The switchboard is manufactured by Square D and is in good condition. The main switchboard has been recently upgraded.

The utility company transformer is located in a vault adjacent to the Main Electric Room. The site is on one secondary meter located indoors within the Main Electric Room. The service is underground to the building.

There are electrical sub-panels located throughout the building, both in closets and exposed in public areas. The panels are circuit breaker type; however, the majority of them are obsolete and in poor condition. The panels are manufactured by Federal Pacific. Federal Pacific no longer produces electrical distribution equipment.

Branch Circuits:

In general, the quantity of receptacles is minimal throughout the facility resulting in the excessive use of extension cords and plug strips.

Computer labs have had power poles installed to accommodate the computer equipment.

Kitchen receptacles are not GFI type.

Interior Lighting System:

Lighting in corridors consists of 2x2 recessed fluorescent acrylic troffers installed in a spline ceiling.

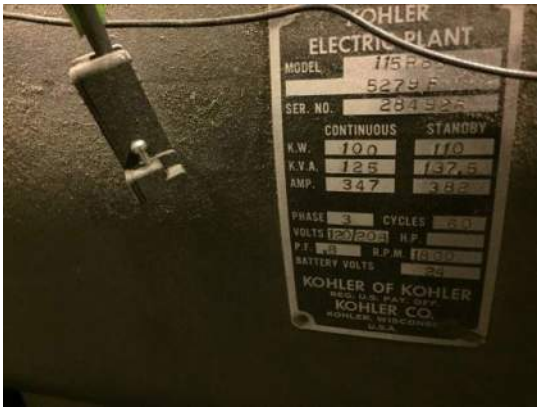
Classroom lighting consists of surface fluorescent wrap-around fixtures. Light levels appear adequate; however, the fixtures contribute a substantial amount of glare.

Cafeteria lighting consists of surface fluorescent wraparound fixtures. Light levels appear adequate; however, the fixtures are in poor condition and contribute a substantial amount of glare.

The majority of the remaining spaces consist of surface fluorescent wraparound fixtures similar to the classroom and cafeteria lighting. The condition of the fixtures varies from fair to poor.

Lighting controls are of the manual type. In any renovation program, lighting controls that comply with the latest energy code shall be provided throughout and all lighting should be replaced with high efficiency LED fixtures.

Emergency Lighting System:



There is an emergency generator present that services the 1966 original construction. There is only a single automatic transfer switch and no separation of normal/power and life safety, this does not comply with current Electric Code. The 1980 addition contains emergency battery units and self-contained exit signs.

The generator is rated at 100KW, 120/208V, 3 Phase, 4 Wire, natural-gas fired and is manufactured by Kohler. The transfer switch and generator are in poor condition and in immediate need of replacement.

Site Lighting System:

The lighting at the site consists of perimeter lighting which lights the area walkways from the exterior walls of the building, and pole lighting lights the driveway and parking. The site lighting is in poor condition and inadequate.

Fire Alarm System:

The fire alarm system is an original FCI FC72 Conventional system. The system is obsolete. The fire alarm

notification devices do not meet code and detection is limited. The fire alarm system is an immediate need of replacement.

Data/ Classroom Intercom/ Clock System/Security System:

The clock system is a Simplex time controller. The secondary clocks are failing and most are not operable and have been replaced with stand-alone battery clocks.

The classroom intercom system has been upgraded to a Bogen Multicom-2000 and utilized original vintage cabling speakers and handsets.

The telephone system has been upgraded to an NEC Univerge SV9300 which is IP capable; however, may not be able to expand to meet the entire district needs.

There is a local sound system present in the Cafeteria that is in poor condition.

The building network consists of CAT5 and CAT5e cabling to IDF closets and fiber and 625 micron vintage fiber to an MDR in a star topology. The IDF racks/equipment has been installed within classroom closets and utility closets. Wireless access data cabling and Aruba wireless access points have been added in all classrooms and large areas for near 100% coverage.

The Middle school is the district hub and there is currently fiber between the school buildings. This allows for consolidation of systems in the future.

The security system consists of an intrusion system and an access control system.

The intrusion system consists of motion sensors, door contacts, and keypads. The intrusion system is manufactured by Guardware and is in fair condition and seems to be functional.

The access control system consists of proximity readers and door controllers. The system is manufactured by Kantech.

Recommendations:

- Upgrade service to 277/480 volt, 3 phase, 4 wire, sized to accommodate new mechanical systems and building system needs.
- New secondary panelboards and feeders should be installed and segregated to serve specific loads such as power, lighting and mechanical. Panelboards should be installed in dedicated electrical rooms.
- Receptacles should be added to accommodate technology devices and A/V devices used in 21st century learning. The branch circuits should be wired to dedicated power panels with TVSS protection and 200% neutrals to protect sensitive electronics.
- Lighting should be upgraded to high efficiency LED lighting to reduce the overall light power density and improve light levels. An automated lighting control system should be provided in the facility that communicates with occupancy sensors, daylight dimming sensors, and low voltage light switches. This will allow for an energy code compliant lighting control system that will further reduce energy usage.
- A new code compliant emergency standby system should be provided which consists of a new exterior pad mounted emergency generator installed in a weatherproof sound attenuated enclosure and physically separated emergency distribution systems for optional standby loads and life safety loads. Life safety distribution systems shall be installed in dedicated 2 HR rated rooms.
- A new code compliant addressable fire alarm system with voice evacuation notification appliances throughout the facility.
- A new wireless master clock system should be provided.
- A new IP based intercom system should be provided and integrated to the VOIP telephone system.
- New tel/data closets designed to accommodate telecommunications equipment including grounding and air conditioning should be provided. CAT6 cabling should be installed throughout and a 10 gig fiber optic backbone should be installed between closets in a star topology.
- The existing Kantech access control system can be expanded to provide electronic access control to key entry points and partition doors within the building.
- A new addressable intrusion system should be provided and door contacts integrated into the Kantech access control system.
- IP CCTV cameras should be provided to cover the perimeter, access controlled entries, and interior corridors, stairwells and assembly spaces. A new video management system capable of expansion to other school buildings should be provided.

Existing Conditions Structural Report

August 7, 2017

INTRODUCTION

Foley Buhl Roberts & Associates, Inc. (FBRA) is collaborating with HMFH Architects, Inc. (HMFH) in the review and evaluation of structural issues/conditions at the Stoneham High School in Stoneham, MA. The purpose of this report is to identify and describe the various structural systems and to comment on the structural issues/conditions observed. The anticipated scope of structural work required in a full renovation of the building is summarized as well. Potential Renovation/Addition and New Construction options will be addressed in a separate narrative.

Stoneham High School is located at 149 Franklin Street in Stoneham. The original one and two-story building, designed as a Junior High school, was constructed on a steeply sloping site in 1968. The original building was renovated in 1981 and re-opened as the High School. A one-story academic addition (designed by HMFH) was constructed to the south of the original building at that time; the Gymnasium was also expanded to the south by approximately 40 feet. A new elevator, serving the Ground, First and Second Floors of the building was also constructed.

The combined, gross floor area of the original building and the 1981 additions is approximately 211,000 square feet. The current enrollment is approximately 695 students in Grades 9-12.

The 35+/- acre site is bordered by Franklin Street to the north and by residential developments on the other three sides. In addition to the High School building, the site includes various playing fields, tennis courts, parking lots and a system of access/drop-off roadways.

The original school building includes a central, two-story Classroom Wing ("B" Wing; First Floor Elevation 192.0') which surrounds an open Courtyard. The Auditorium and Kitchen/Cafeteria spaces ("A" Wing; First Floor Elevation 192.0') and a two-story, Gymnasium/Shop Wing ("C" Wing; Ground Floor Elevation 176'-8") flank the Classroom Wing on the east and west sides, respectively. The Library is located on the east side of the Classroom (B) Wing, at the First Floor level. An additional five (5) classrooms were provided in the 1981 academic addition.

Exterior walls in the original building are brick veneer, with an (unreinforced) masonry backup wall. Exterior walls of the 1981 addition are brick veneer with a steel stud backup. Beginning in 2004, sections of the original roof were replaced with a new membrane roofing system. However, certain sections of the original tar and gravel roof have not been replaced (e.g. the Auditorium, Kitchen/Cafeteria and Gymnasium),

Structural conditions at the Stoneham High School were reviewed at the site by FBRA on July 6, 2017. Our observations were limited to those areas which were not obscured by finishes.

The following documents were reviewed in the preparation of this report:

Junior High School, Stoneham Mass.: Architectural Drawings A-1 to A-31, Site Drawings G-1 to G-3 and Structural Drawings S-1 through S-12, prepared by Korslund, LeNormand & Quann, Inc. (KLQ), dated January 10, 1966.

New Senior High School: Architectural Drawings A-1 to A-28, prepared by Hill Miller Friedlaender and Hollander, Inc.(HMFH), Cambridge, MA, dated May 20,1980.

New Senior High School: Structural Drawings S-1 to S-8, prepared by Souza and True, Inc. Cambridge, MA, dated May 20, 1980.

Stoneham High School - Synthetic Turf Study, prepared by Warner Larsen Landscape Architects, Boston, MA, dated December 23, 2014 (limited subsurface soils information included in the study).

MSBA Statement of Interest (SOI), prepared by the Town of Stoneham, dated March 22, 2017.

No exploratory building demolition or structural materials testing was conducted in conjunction with the preparation of this report. Only limited subsurface soils information was available, as noted above.

I. STRUCTURAL SYSTEMS DESCRIPTION

Original (1968) Building

The original building consists of a central, two-story Classroom Wing surrounding an open Courtyard, with the Auditorium and Kitchen/Cafeteria spaces and the two-story, Shop/Gymnasium Wing flanking the Classroom Wing on the east and west sides, respectively. Original Structural Drawings for this building were available for preparation of this report. The information presented below is based on the original Structural Drawings and conditions observed on site by FBRA.

Structural Materials: Material strengths were noted on the original Structural Drawings, as summarized below.

Concrete: 3,000 psi compressive strength typically; 4,000 psi at certain, noted columns

Steel Reinforcing (deformed bars): ASTM A15; Fy = 50 ksi

Structural Steel: ASTM A36; Fy = 36 ksi

High Strength Bolts: ASTM A325

Design Live Loads: Design Live Loads were noted on the original Structural Drawings, as listed below.

Roof: 40 psf (No apparent provisions for snow drift)

Classrooms: 50 psf

Laboratories and Corridors: 100 psf

Wind: 20 psf

Representative structural calculations generally confirm these design live loads. Floor design loads are appropriate and meet present Building Code requirements. The current, minimum flat roof snow load required by the 8th Edition of the Massachusetts State Building Code for a school building in Stoneham is 31 psf; typical (non-drift) roof areas will meet this requirement. Snow drifting areas require further review. Design live loads for other structured floors such as the Gymnasium, the Catwalks in the Auditorium, etc. are not noted on the original Structural Drawings, but could be determined by calculation, based on the information included on the Drawings.

The original building was designed for a 20 psf wind load. As the design and construction of this facility preceded the introduction of the Massachusetts State Building Code, it was not designed for seismic loads and does not meet current Code requirements in that regard.

Story Heights: Story Heights are as follows:

`First Floor to Roof (Auditorium - A): 29'- 1"

First Floor to Roof (Kitchen/Cafeteria - A): 15'- 6⅜"

First Floor to Second Floor (Classroom Wing - B): 11'- 6⅜"

Second Floor to Roof (Classroom Wing - B): 11'- 6⅜

Ground Floor to First Floor (Gym/Shop Wing - C): 15'- 4"

First Floor to Roof (Gym/Shop Wing - C): 27'- 7⅜"

Expansion Joints: The original Structural Drawings indicate that the building has four internal expansion joints (confirmed at the site). The northern, section of the Classroom (B) Wing has a ½" wide expansion/shrinkage joint at each end. Similar expansion joints are located at the southern section of this wing as well.

Roof Construction - Auditorium and Kitchen/Cafeteria (A) Wing: Flat roof construction over the Auditorium consists of 36" deep precast, prestressed concrete single tees, clear spanning approximately 85 feet in the north-south direction. There is no fly space over the Stage. Roof construction at the one story section to the north of the Auditorium, is similar, with 18" deep tees spanning 27 to 33 feet in the east-west direction. Roof construction over the Kitchen and Cafeteria spaces consists of 18" deep tees spanning in the north-south direction (approximately 47.5 feet and 53 feet, respectively). Precast tees are typically supported on (unreinforced) masonry exterior and interior bearing walls; elsewhere, cast-in-place, reinforced concrete beams and columns support the tees at openings in exterior and interior bearing walls. Lightweight concrete fill (80 pcf density) of varying thickness was placed on top of the roof structure to create pitch to the internal roof drains.

Roof Construction - Classroom (B) Wing: Typical flat roof construction at the Classroom Wing consists of a cast-in-place, reinforced concrete, one-way joist (rib) slab spanning over the classroom spaces to the central corridor. Typical joists are 5" wide and are spaced at 2'-1" on centers. Pans are 10" or 14" deep with a 2½" thick integral topping slab (12½" or 16½" overall slab thicknesses, respectively). Forms were cambered (½") at spans exceeding 26 feet. The slab is typically supported by integrally cast, reinforced concrete beams, which span to reinforced concrete columns. Columns are arranged in a double-loaded corridor fashion in the north and south sections of this wing, with columns on each side of the corridor and in the exterior walls (including the Courtyard walls). Elsewhere, slabs in the

east and west sections of this wing are supported by unreinforced masonry bearing walls and reinforced concrete columns. Lightweight concrete fill (80 pcf density) of varying thickness was placed on top of the roof structure to create pitch to the internal roof drains.

The one-way concrete joist slab system does not readily lend itself to structural reinforcing or modification. Openings can be cut in the topping slab (between) ribs, without reducing capacity significantly, as long as they are carefully located to minimize cutting top reinforcing (near supports) or loss of the compression flange (near mid-span). Cores for piping and conduit can also be made in the topping slab. Openings and cores in the solid/integral beams that occur along column lines (typically in one direction) should be minimized or avoided, to the extent possible. Major alterations to this structure would require that supplemental supports (steel beams, steel columns, etc.) be installed.

Roof Construction - Gymnasium/Shop (C) Wing: Flat roof construction over the Gymnasium consists of 36" deep precast, prestressed concrete single tees (8 feet wide), clear spanning approximately 91.5 feet in the east-west direction. Precast tees are supported by cast-in-place, reinforced concrete beams and columns along the east and west edges of the Gymnasium. Lightweight concrete fill (80 pcf density) of varying thickness was placed on top of the roof structure to create pitch to the internal roof drains.

The details of the precast tee design are not known; structurally acceptable openings and cores in these elements would be somewhat restricted. Openings in the tee flanges, near the supports and cores through the webs of the tees could likely be accommodated; however, field investigations of the as-built reinforcing details would need to be conducted to make such determinations.

Second Floor Construction - Classroom (B) Wing: Typical Second Floor construction at the Classroom Wing consists of a cast-in-place, reinforced concrete, one-way joist (rib) slab spanning over the classroom spaces to the central corridor. Typical joists are 5" wide and are spaced at 2'-1" on centers. Pans in the north and south sections are 14" deep; a 3" thick integral topping slab has been provided (17" overall slab thicknesses). Elsewhere in this wing, pans are 10" deep and a 2½" thick integral topping slab has been provided (12½" overall slab thicknesses). Forms were cambered (½" typically, or 1" at longer spans) at spans exceeding 26 feet. The slab is typically supported by integrally cast, reinforced concrete beams, which span to reinforced concrete columns. Columns are arranged in a double-loaded corridor fashion in the north and south sections of this wing, with columns on each side of the corridor and in the exterior walls (including the Courtyard Walls). Elsewhere, slabs in the east and west sections of this wing are supported by unreinforced masonry bearing walls and reinforced concrete columns.

Again, this system does not readily lend itself to structural reinforcing or modification; refer to the previous comments above.

Typical First Floor Construction: Typical First Floor construction is a 4" thick, concrete slab on grade, reinforced with welded wire mesh and placed on a 6" thick layer of compacted gravel. The slab was depressed 1½" at the Kitchen (A Wing) to accommodate quarry tile. The floor in the Auditorium slopes downwards (approximately 3 feet) towards the Stage (east end).

First Floor Construction - Gymnasium (C Wing): First Floor construction at the Gymnasium is a cast-in-place, reinforced concrete, two-way waffle (dome) slab, supported by reinforced concrete columns. Slab construction consists of 5" wide concrete joists (ribs) in each direction spaced at 2'-0" on centers. Domes are 12" deep; a 2½" thick integral topping slab has been provided (14½" overall slab thickness). The slab was depressed 1¼" to accommodate wood flooring.

The two-way concrete waffle slab system does not readily lend itself to structural reinforcing or modification. Openings can be cut in the topping slab (between) ribs, without reducing capacity significantly, as long as they are carefully located to minimize cutting top reinforcing (near the columns) or loss of the compression flange (near mid-span). Cores for piping and conduit can also be made in the topping slab. Openings and cores in the local, solid slab sections that occur at the columns should be minimized or avoided, to the extent possible. Major alterations to this structure would require that supplemental supports (steel beams, steel columns, etc.) be installed.

Exterior Wall Construction is a mixture of (unreinforced) load bearing concrete masonry unit (CMU) walls and (unreinforced) non-load bearing CMU backup walls, with a 4" brick veneer.

Interior Partitions are typically (unreinforced) non-load bearing, CMU walls.

Subsurface Soils/Foundations: Limited subsurface explorations were conducted for the 2014 Synthetic Turf Study. Eight (8) test pits and seven (7) test borings were taken in the area of the present fields, to the north and west of the school building. Generally speaking, refusal was encountered in the borings and test pits at relatively shallow depths (2.7 feet to 12.0 feet below the ground surface in the borings and .9 feet to 3.0 below the ground surface in the test pits). Rock outcroppings are visible in a number of locations. A comprehensive evaluation of ledge conditions/elevations (borings, test pits, probes, ground penetrating radar, etc.) should be undertaken, if new construction is proposed in these areas in the future.

The original building is supported on conventional spread footing foundations. Columns are supported on individual spread footings and perimeter foundation walls are supported on continuous wall footings. The design allowable bearing pressure is noted on the Drawings to be 5 tons per square foot on natural soils or on ledge. The Drawings suggest that a considerable amount of ledge removal was required to level the side and prepare the pad for the building.

Drainage: It does not appear that perimeter foundation drains or underslab drains were typically provided. Footing drains are shown at the perimeter of the First Floor Courtyard; however, none are indicated at the Ground Floor in the Gymnasium/Shop (C) Wing. This is the lowest part of the building and foundations appear to be resting on ledge. Infiltration of perched water would potentially be a concern; however, there are no reports of significant groundwater issues.

Fire Resistance: The unprotected, reinforced concrete and precast concrete floor and roof construction is considered to be non-combustible; however, the fire resistance rating is relatively low (less than 1 hour); governed by the thicknesses of the joist and waffle slab topping slabs and the minimum thicknesses of the precast tee flanges (2½" to 3" in each case). There are no sprinklers in the building. Further evaluation of fire rating/fire resistance issues is recommended in the event the building is renovated in the future.

Lateral Load Resistance: The original building was presumably designed under the Massachusetts Building Regulations for Schoolhouses, which required consideration of wind loads (20 psf), as noted above. Lateral force resistance for this building is likely achieved by the unreinforced interior and exterior masonry walls and by the frame action of the cast-in-place, reinforced concrete construction.

1981 Addition

As noted above, a one-story academic addition was constructed to the south of the original building in 1981; the Gymnasium was also expanded to the south by 40+/- feet. The academic addition connects to the original building by a corridor at the northwest corner. A new elevator, serving the Ground, First and Second Floors of the building was installed in a new core structure as well.

Original Structural Drawings were available for this addition; the information presented below is based on the original Structural Drawings and on conditions observed on site by FBRA.

Structural Materials: Material strengths are listed on the original Structural Drawings as summarized below:

Concrete: 3,000 psi compressive strength, except 4,000 psi at exterior slabs

Steel Reinforcing: 40,000 psi, except 60,000 psi for column verticals

Structural Steel: ASTM A-36; Fy = 36 ksi

Design Live Loads: Design Live Loads were noted on the original Structural Drawings, as listed below.

Roof: 35 psf

Classrooms: 50 psf

Corridors: 100 psf

Gymnasium/Open Plan Areas: 100 psf

Wind Load (Zone 3, Exposure B): 21 psf

Seismic Loads: Massachusetts State Building Code (2nd Edition)

Representative structural calculations generally confirm these design live loads. Floor design loads are appropriate and meet present Building Code requirements. The current, minimum flat roof snow load required by the 8th Edition of the Massachusetts State Building Code for a school building in Stoneham is 31 psf; typical (non-drift) roof areas will meet this requirement. Snow drifting areas at the additions (limited locations) require further review.

The additions were designed for a 20 psf wind load. Structural design for Earthquake (seismic) loads was required by the 2nd Edition of the Massachusetts State Building Code; accordingly, steel bracing was provided in each direction. The addition was designed for a future, second floor of classrooms; however, it is likely that the existing bracing system would require reinforcing to comply with current seismic load requirements, in the event the building is expanded vertically.

Story Heights: The top of roof deck at the academic addition and at the low roof of the Gymnasium addition is 12'-3⅜" +/- above the First Floor (Elevation 192.0'). The roof of the elevator/core structure is 15'- 4⅜" +/- above the academic addition roof. The top of the precast tees at the high roof of the Gymnasium addition matches the elevation of the original precast tees.

Expansion Joints: There are no internal expansion joints in the academic addition. It does not appear that the addition was structurally separated from the original construction.

Main Roof (Future Floor) High Roof and Gymnasium Low Roof Construction: Main roof construction at the academic addition consists of a 1½" deep steel roof deck, spanning 2'-4" to 26" deep open web steel bar joists. Steel joists typically span 32 feet in the east-west direction and are supported by 21" deep steel girders and HSS (tube) steel columns. The steel roof structure pitches (5") to internal roof drains. The main roof was designed as a future Second Floor, with classroom and corridors loading; however, the slab was apparently not placed during the original construction. High roof construction over the elevator/core structure and low roof construction at the Gymnasium addition is similar, with 1½" deep steel deck supported by open web steel joists (5+/- feet spacing), wide flange steel girders and HSS (tube) steel columns.

High Roof Construction - Gymnasium Addition: High roof construction over the Gymnasium addition consists of 36" deep precast, prestressed concrete single tees (8 feet wide), clear spanning approximately 91.5 feet in the east-west direction, matching the original structure. Precast tees are supported by cast-in-place, reinforced concrete beams and columns along the east and west edges of the addition. Lightweight concrete fill of varying thickness was placed on top of the roof structure to create pitch to the roof drains.

Second Floor Construction at the elevator/core structure consists of a 4" deep, regular weight concrete topping slab reinforced with welded wire fabric on 9/16" deep steel form deck, supported by open web steel joists, wide flange steel girders and HSS (tube) steel columns.

First Floor Construction: First Floor construction over Ground Floor areas below consists of 10" deep, precast, prestressed hollow core concrete plank with a 2½" thick (minimum) concrete topping. Concrete plank is typically supported by reinforced masonry walls and reinforced concrete foundation walls. Elsewhere, in the academic addition, First Floor construction is a 4" thick concrete slab on grade, reinforced with welded wire fabric.

Exterior Wall Construction at the Gymnasium addition is a reinforced CMU bearing/backup wall, with a 4" brick veneer. The exterior walls of the academic addition consist of a 4" brick veneer with a steel stud backup.

Interior Partitions at the Gymnasium addition are typically (unreinforced) non-load bearing, CMU walls. Partitions in the academic addition are steel stud/drywall construction.

Foundations: The design soil bearing value listed on the original Structural Drawings is 2 TSF on compacted structural fill and 5 TSF for footings placed on ledge.

Drainage: It does not appear that perimeter foundation drains or underslab drains are present.

Fire Resistance: The unprotected, steel framed Second Floor and roof construction has no fire rating (Type IIB Construction; Non-combustible, Unprotected). There are no sprinklers in the addition. Further evaluation of fire rating/fire resistance issues is recommended in the event the building is renovated in the future.

Lateral Load Resistance: As previously noted, lateral force resistance (wind and seismic loads) in the academic addition is provided by steel bracing in each direction.

II. STRUCTURAL CONDITION/COMMENTS

Structural Conditions at the Stoneham High School were reviewed at the site (to the extent possible) on July 6, 2017. Generally speaking, floor and roof construction appear to be in satisfactory condition; there is no evidence of structural distress that would indicate significantly overstressed, deteriorated or failed structural members.

There are no reported groundwater related issues.

Foundations appear to be performing adequately; there are no signs of significant, total or differential settlements.

Floors and roofs appear to have been constructed in general accordance with the original Structural Drawings.

Structural/structurally related conditions observed during our site visit are summarized below:

1. Cracks were observed in certain interior non-bearing CMU walls (limited locations). These cracks appear to be shrinkage related and typically are not a structural concern. .

2. Damaged floor tiles were observed in several locations. These conditions may be due to moisture transmission through the concrete slabs on grade. Conditions observed in the Cafeteria floor may be related to a slab on grade construction joint. Floor tiles should be removed and the conditions investigated/repaired, to prevent further damage and potential tripping hazards.

3. Cracking was observed in the Ground Floor concrete slab on grade in the Gymnasium/Shop (C) Wing. These cracks are shrinkage related and are not a structural concern.

4. Conditions at the expansion joints in the Classroom (B) Wing should be further evaluated. Although they appear to be functioning properly, the execution of the expansion joint details during construction (observed at the roof level) appears questionable.

5. Older roof areas (tar and gravel; possibly original) are leaking in various locations (Gymnasium, Cafeteria/Kitchen and Auditorium). In particular, it appears that there are issues with the flashing along the west rising wall of the Auditorium and Kitchen/Cafeteria (A) Wing. Replacement of the older roofs and repair/reinstallation of flashing is required.

6. Open control joints were observed in the brick veneer, the concrete foundation walls and concrete window sills; caulking is required. Preliminary cost estimates should include costs to re-caulk all exterior control joints.

7. The condition of the masonry chimney (boiler flue) was not determined. An investigation of the chimney by a qualified inspector is recommended, in conjunction with future renovations.

8. Concrete site paving has spalled and deteriorated in several locations. These locations should be repaired to prevent further deterioration and to eliminate a potential tripping hazard.

9. Mortar joints in the exterior brick veneer are generally in satisfactory condition; however, preliminary cost estimates should carry an allowance for limited repointing (approximately 5%).

10. Loose lintels for the masonry veneer generally appear to be in satisfactory condition; no significant deterioration or rust-jacking was observed. However, preliminary cost estimates should carry an allowance for cleaning and coating all loose lintels in conjunction with a future window replacement (original windows in the 1968 building are single glazed).

11. Foundation walls generally appear to be in satisfactory condition; however, damage has occurred at building corners in several locations. These conditions do not present a structural concern; however, repair is recommended.

12. There is a significant vertical crack in the site retaining wall along the north side of the loading area (to the north of the Gymnasium). While this is not an immediate structural concern (the wall spans vertically), repair is recommended to prevent further deterioration.

13. Exterior railings at both the original (1968) building and the 1981 addition have rusted and have damaged the concrete in some locations. Railings installed during the construction of the 1968 building do not appear to be code compliant and should be replaced.

14. Exposed concrete columns exhibit surficial spalling in certain locations; in particular at the south exterior wall of the Cafeteria and the west exterior wall of the Gymnasium. Elsewhere, there are minor, localized spalls, where reinforcing was placed too close to the surface and has corroded. None of the conditions observed represent an immediate structural concern; however, repair is recommended to prevent further deterioration.

15. The reinforced concrete exterior (structured) stair on the west side of the Gymnasium shows signs of deterioration. Concrete on the underside of the landing has spalled in several locations and the bases of the steel support columns have rusted. These conditions do not represent an immediate structural concern; however, repair is recommended.

III. RENOVATIONS AND ADDITIONS - MEBC REQUIREMENTS

General comments relating to potential renovations, alterations and additions to the Stoneham High School are presented in this section. Renovations, alterations, repairs and additions to existing buildings in Massachusetts are governed by the provisions of the Massachusetts State Building Code (MSBC - 8th Edition) and the Massachusetts Existing Building Code (MEBC). These documents are based on amended versions of the 2009 International Building Code (IBC) and the 2009 International Existing Building Code (IEBC), respectively.

The MEBC defines three (3) compliance methods for the repair, alteration, change of occupancy, addition or relocation of an existing building. The method of compliance is chosen by the Design Team (based on the project scope and cost considerations) and cannot be combined with other methods.

The Prescriptive Compliance Method (IEBC Chapter 3) duplicates Sections 3403 through 3411 of Chapter 34 in the IBC and prescribes specific minimum requirements for construction related to additions, alterations, repairs, fire escapes, glass replacement, change of occupancy, historic buildings, moved buildings and accessibility. A complete structural evaluation of the building is required by the Massachusetts Amendments. If the impact of the proposed alterations and additions to structural elements carrying gravity loads and lateral loads is minimal (less than 5% and 10% respectively), seismic upgrades to an existing building are generally not required.

The Work Area Compliance Method (IEBC Chapters 4 through 12) is based on a proportional approach to compliance, where upgrades to an existing building are triggered by the type and extent of work. The Work Area Compliance Method includes requirements for three levels of alterations, in addition to requirements for repairs, changes in occupancy, additions, historic buildings or moved buildings. A complete seismic evaluation of the existing building is required under the following conditions: Level 2 alterations where the demand to capacity ratio of lateral load resisting elements has been increased by more than 10%, all Level 3 alterations, a change in occupancy to

a higher category and where structurally attached additions (vertical or horizontal) are planned.

The Performance Compliance Method (IEBC Chapter13) duplicates Section 3412 of Chapter 34 in the IBC and provides for evaluating a building based on fire safety, means of egress and general safety (19 parameters total). This method allows for the evaluation of the existing building to demonstrate that proposed alterations, while not meeting new construction requirements, will maintain existing conditions to at their current levels (at a minimum) or improve conditions, as required. A structural investigation and analysis of the existing building is required to determine the adequacy of the structural systems for the proposed alteration, addition or change of occupancy. A report of the investigation and evaluation, along with proposed compliance alternatives must be submitted to the code official for approval.

Additions - General Comments - MEBC

The design and construction of any addition to the Stoneham High School would be conducted in accordance with the Code for new construction. Additions should be structurally separated from the existing, adjacent construction by an expansion (seismic) joint to avoid an increase in gravity loads or lateral loads to existing structural elements. No additions are proposed in the full renovation scheme.

Renovations/Alterations - General Comments - MEBC

Where proposed alterations to existing structural elements carrying gravity loads result in a stress increase of over 5%, the affected element will need to be reinforced or replaced to comply with the Code for new construction. Proposed alterations to existing structural elements that are resisting lateral loads (i.e. masonry bearing walls or full height, non-bearing masonry walls on column lines in the 1968 building), which result in an increase in the lateral force demand (seismic load) to capacity (seismic resistance) ratio of over 10% should be avoided, if possible. Essentially this means that removal of, or major alterations to the existing, to the key masonry walls in the original (1968) building should be minimized, otherwise seismic strengthening of the building as well as additional seismic upgrades may be triggered.

IV. FULL RENOVATION/REPAIR - ANTICIPATED SCOPE OF STRUCTURAL WORK

The Work Area Compliance Method would likely be the most appropriate method of compliance, if the full renovation of the Stoneham High School is ultimately undertaken. There would be no change in use. In the event the existing building undergoes a full renovation/upgrade, it appears that the project could be classified as a Level 2 Alteration. This conclusion is based on the assumption that the Work Area (i.e. reconfigured spaces) would be less than 50% of the gross building area. If this limitation cannot be achieved, the project would be classified as a Level 3 Alteration; additional, (mandatory) seismic upgrades would be triggered (see below). If the lateral force demand to capacity ratio is increased by more than 10% (see comments above) seismic strengthening of the building may be triggered.

Proposed renovations to the Stoneham High School will not add significant mass. In addition major modifications to existing masonry walls in the original building (providing lateral stability) will be minimized to the extent possible. Based on these assumptions, the anticipated scope of structural/structurally related work for a Level 2 Alteration would include the following:

1. Address all building and envelope conditions/deficiencies noted in Section II of this report.

2. Evaluate all low roof conditions of the original (1968) building and the 1981 additions, which are adjacent to high roofs. It appears that the low roofs of the original building were not designed for snow drift loading. It is possible that reinforcing of the existing low roof structure in these drift areas will be required (the entire, adjacent structural bay); however, as the low roof construction is either cast-in-place or prestressed concrete construction, sufficient reserve strength may be present.

3. Anchor the top of all interior masonry partitions scheduled to remain, to the underside of the floor or roof structure above. Not all masonry partition extend to the floor/roof structure above; additional effort will be required to properly brace these conditions. Note that this work is not required for a Level 2 Alteration (mandatory for a Level 3 Alteration); however, FBRA recommends that it be done on a voluntary basis.

4. Anchor floor and roof diaphragms to masonry bearing wall construction in the original (1968) building. Note that this work is not required for a Level 2 Alteration (mandatory for a Level 3 Alteration); however, FBRA recommends that it be done on a voluntary basis.

5. Evaluate the roof diaphragm capacity at the precast tee roof sections (Auditorium and Kitchen/Cafeteria (A) Wing and Gymnasium/Shop (C) Wing); supplement tee to tee connections if required.

6. Provide miscellaneous structural supports and/or reinforcing to support new MEP equipment.

7. Provide new floor and roof openings as required to accommodate new MEP/FP work.

8. Provide racks, hangers, etc. for new plumbing and fire protection work, as recommended by the Architect and MEP/FP Engineers.

9. Review and evaluate the existing Construction Type (Type IIB; Non Combustible, Unprotected) and required fire resistance ratings; locally protect structural elements supporting rated enclosures, as may be required.

02.3 Education Program

Enrollment

Currently the school has 700 students and that number is increasing steadily each year. Stoneham has over 250 additional High School Age students that choose not to attend the schools. When asked why it is apparent that the building is not competitively appetizing as some other buildings in the geographical region are.

Currently there are three housing developments permitted and underway. These developments have a total of 353 two-bedroom units. Statistically studies show that 30% of housing units have at least one school aged child. This would increase the population by 106 students in addition to the current increase that we are seeing at the middle school.

Another factor that is affecting the utilization of classroom space in the current high school is the growing SPED program. Six years ago, the District changed the SPED policy and have been trying to keep most students with needs in district. Every year space needs for the SPED program increase as well as the varied types of spaces are required to meet the specific needs of this population. Please see the section on SPED programs for more details. Because the school was slightly oversized the staff have been able to creatively meet the needs each year but as of 2016, they are running out of space. SPED spaces are being created out of space that was currently a storage room. There is currently no space for OT/PT and Guidance is struggling to find meeting and testing space every day. Although there is a lower level below the Gymnasium that houses outdated shop space, it is underutilized because of its remote location and security risks associated with that.

Special Education

Stoneham High School currently houses two special education programs for specialized populations. There are two RISE programs that service students with autism spectrum disorders or other developmental disabilities. The District services students in these programs during their fifth years in high school and often during their post graduate years or until they turn 22 years old. These students require access to small group and individual spaces for learning as well as access to areas geared toward appropriate vocational and transitional learning situations. While the District works to ensure that these students have sufficient opportunities to learn and practice daily living and job skills, the current high school building has significantly limited the options for the students on site. We lack access to updated kitchen facilities to practice meal preparation, accessible bathrooms to practice all aspects of self-care and other dedicated spaces for vocational practice for activities that resemble current job opportunities for students including hotel, culinary, and office work.

The high school also houses 2 STRIDE alternative programs for special and regular education students with significant social emotional challenges. Many of these students have a variety of mental health challenges including anxiety disorders, depression, school phobia, and addiction. These students need private spaces where they can work with therapists or counselors when they are dysregulated or upset. These spaces need to be sound proof and attached or nearby the classroom in order to provide quick access when students are agitated. Unfortunately, in the current building private smaller spaces are hard to find and often too far away from classrooms to be useful for students and staff to access quickly. Physical conditions in the building also make keeping this population in district difficult. Many of the learning spaces are over heated when the temperature is warm outside, and the mechanical systems cannot keep up with ventilation needs.

In addition, the high school is ill equipped to provide students with physical disabilities access to all academic and extracurricular activities. The entrance to the school as well as parking areas do not meet current ADA guidelines for easy independent access for students in wheelchairs or other physical challenges. Due to the topography of the site, the slope of the parking area and sidewalks is too great to negotiate in a wheelchair. There are several school wide spaces including the library and auditorium, locker rooms, stage and music rooms that are only accessible via stairs and either have no handicapped access or have access only from doors that are not wide enough and do not have accessible hardware. While we have updated a few bathrooms to allow access to someone using a wheelchair many of the bathrooms still remain inaccessible - often with doorways and interior walls that are simply too narrow to allow entrance. The only elevator to the building does not meet Life Safety code due to its small dimensions. It is also located in the very back of the building making travel distances to and from academic areas excruciatingly long. A student with a larger wheelchair or one with customized additions would not be able to use the elevator.

The school lacks proper acoustically sound learning environments for all students, but this particularly affects the Deaf and Hard of Hearing students in a very negative way. The district has equipped some classrooms with acoustic sound panels, but only a certain number of rooms are able to be equipped and even with these panels it is difficult, and sometimes impossible, to bring the rooms to the appropriate sound and vibration level that is effective for students with significant hearing loss.

Pre-School

The District currently has 8 preschool classrooms (6 integrated half day programs, 1 integrated full day program and 1 substantially separate full day program) across two elementary schools in Stoneham. These classrooms service over 110 total students, including 57 students with special needs. In addition there are a significant number of students who come to the preschools for specific services including speech and language and occupational therapy. The elementary schools in Stoneham do not have enough space to house the number of

special education and regular education classrooms that are needed in the next few years. In order to avoid having to return to the MSBA to ask for an additional elementary school, the District proposes moving the entire preschool program into a new high school building.

Housing the preschool in a single building would vastly improve the quality of professional development for, and collaboration among, preschool staff. It would also allow us to develop preschool specific equipment, programs and services that could be used by both the school and the community. For instance, preschool students would have access to classrooms with changing facilities, appropriate size bathrooms, and playgroup equipment designed to meet the needs of this young population. The District may also be able to offer after school or enrichment programs for these students. An added benefit to housing the preschool at the high school would be using the preschool as a site for child development classes and internship/volunteer opportunities for the high school students. Students could have supervised real life experiences working with both typical and special needs preschoolers.

STEM

With the opening of Stoneham Central Middle School in 2014, Stoneham Public Schools joined other districts in offering the Project Lead the Way STEM program. All students in grades 6-8 receive instruction in The Science of Technology, Design and Modeling, Medical Detectives, Automation and Robotics and Flight and Space. We introduced formal Computer Science instruction in grades 6-8 starting the following year. Stoneham is one of a few districts with a formal computer science program beginning at this grade level.

The district has supported this program through STEM labs providing mobile tables and chairs, state of the art computers, storage space for parts ranging from a single bolt to an entire robotics kit. Materials are readily available to hold robot competitions on the “mars surface” complete with rocks, sand, and hills. Electricity is available for multiple groups of students to work on manufacturing items in a safe environment. Natural light from large windows allow for close work on circuit boards.

Teachers have traveled around the country to attend PLTW training in each of the past 3 summers. Stoneham Schools have supported this training through the budget planning. Having teachers attend hands on training in the current STEM capabilities is vital to the student’s success.

The PLTW program has become a showplace for Mass STEM Hub. Last spring Stoneham hosted seven districts for a day of observation and conversation, to share the processes and planning that have supported the teacher and student success in STEM.

During the 2017 summer, Stoneham held STEM camps in grades 1-8. These summer camps were held at the Central Middle School where the workspace and materials were readily available.Stoneham has not been able to provide the same level of instruction or extra-curricular opportunities at the high school because there are no workspaces, materials, computers, or power necessary to provide the variety of activities required for students to engage in a variety of STEM activities.

The district is committed to providing the students with knowledge of STEM fields so that they can take advantage of internships and employment opportunities here in Stoneham and in the surrounding communities. They have been contacted by Lincoln Labs, MIT, and Waters Corporation to talk about the goals and how these organizations can help Stoneham develop the employees that they will need in the future. Stoneham could be a STEM leader in the area.

Arts/Humanities/STEAM

When it comes to the Arts, Stoneham High School could be at the forefront. Drama, Music and Art through the years, continues to deal with multiple obstacles. Art classrooms are spread throughout the building and are currently over crowed with enrollments of 28-30 students per class. The Kiln is located in the lower basement not in the Art classes and creates additional issues because dozens and dozens of projects need to be moved, This movement jeopardizes student work and sadly states to the students that their work is not important.

The Theater/Auditorium is a seventies style stage that has an inverted apron making it difficult to perform proscenium style theatre. There is no fly space and the cat walk is completely dysfunctional. Wing space is non-existent on stage right due to the fact the stage has been cut up into storage spaces. The stage may work for the performer but for the individual who desires a career in tech theatre, it does not. Colleges today require students who wish to enter into Technical Theatre a portfolio of their work. Having no technical connections puts them at a disadvantage.

Music classrooms are poorly ventilated and have no natural lighting.

As for Humanities, Stoneham is uniquely known for its Annual National History Day Program. Every student in grades 10 and 11 at Stoneham High School participate in a National History Day research project. All sophomores and juniors choose a topic of their choice, focused around the annual theme. Throughout the process, students learn to manage multiple, long-term deadlines, access academic databases, use primary documents, weigh conflicting points of view, and translate their research into a final exhibit, documentary, website, or performance. A program such as this needs a space to highlight its true appreciation. Currently these projects are confined to hallways and areas that poorly show the creative work of the students.

See Appendix C and D for Teacher Programming Meetings and Meeting Minutes from School Committee Meetings.

02.4 Building Options

Preliminary Evaluation of Alternatives

After understanding the Districts Educational Program Goals and the deficiencies of the existing facility, HMFH Architects has proposed three distinct options for the Stoneham High School. These options were designed to provide the District with the most cost effective and educationally appropriate solution for the town of Stoneham. The options range from a full phased renovation, renovation/additions, and new construction on the existing Stoneham High School site. All options include adding turf fields at the existing football field and the existing baseball field. The cost estimate also includes the optional cost to rebuild the football field with new stadium, bleachers and outbuildings with toilet facilities, team rooms, press box and storage.

Option 1: Renovation

Scheduled Duration 48 Months spread over 4 – 5 years

Renovate the Stoneham High School through multiple phased construction efforts.

Phase one would include installing 28 modular classrooms for general classrooms, SPED classrooms and life skills. These modular classrooms would be installed in the parking lot to the east of the school and adjacent to the existing cafeteria. These classrooms would be connected to the main building by stick built vestibules and covered walkways which would require permeant foundations and fire protection systems. There would also need to be modular toilet facilities for 700 students- 12 WC's and 6 sinks for each male and female. The science wing addition would remain usable during this phase for chemistry and biology classes. The Gymnasium and the shop space below it would remain operable during the first phase but would be renovated and offline during the two summers. Students would have to walk outside to gain access to the Gymnasium. The shops on the lower level would be renovated into locker rooms and alternative PE space during summers of the four-year construction schedule.

Interior work: The first phase of construction would abate and renovate all the academic spaces, corridors and toilet rooms in the main building highlighted in the phasing plan. These repairs and upgrades would correct the ADA and life safety deficiencies which are described in detail in the existing conditions reports, and replace all the major MEP systems in the building. Finishes including flooring, walls and ceiling would be replaced. Classrooms and Science Labs will remain slightly undersized by MSBA standards in this option. The locker rooms on the first floor adjacent to the Gymnasium would be renovated into a STEAM Zone. This renovation will move the science labs from the remote wing to this area, and build Art Classrooms, Computer Lab, Maker Space and open project areas with skylights. Some structural reconfiguration will need to occur to relocate Science Labs on the first Floor-see structural narrative for more information on this work. All toilet rooms will need to be reconfigured to add HCP stalls. All existing classroom and other entrances will need to be reconfigured to allow for 18" of space on the pull-side of the door. This will be labor intensive because the corridor walls are CMU construction.

The Cafeteria, Kitchen, Gymnasium and shops will be renovated over multiple summers so they can remain online during school sessions.

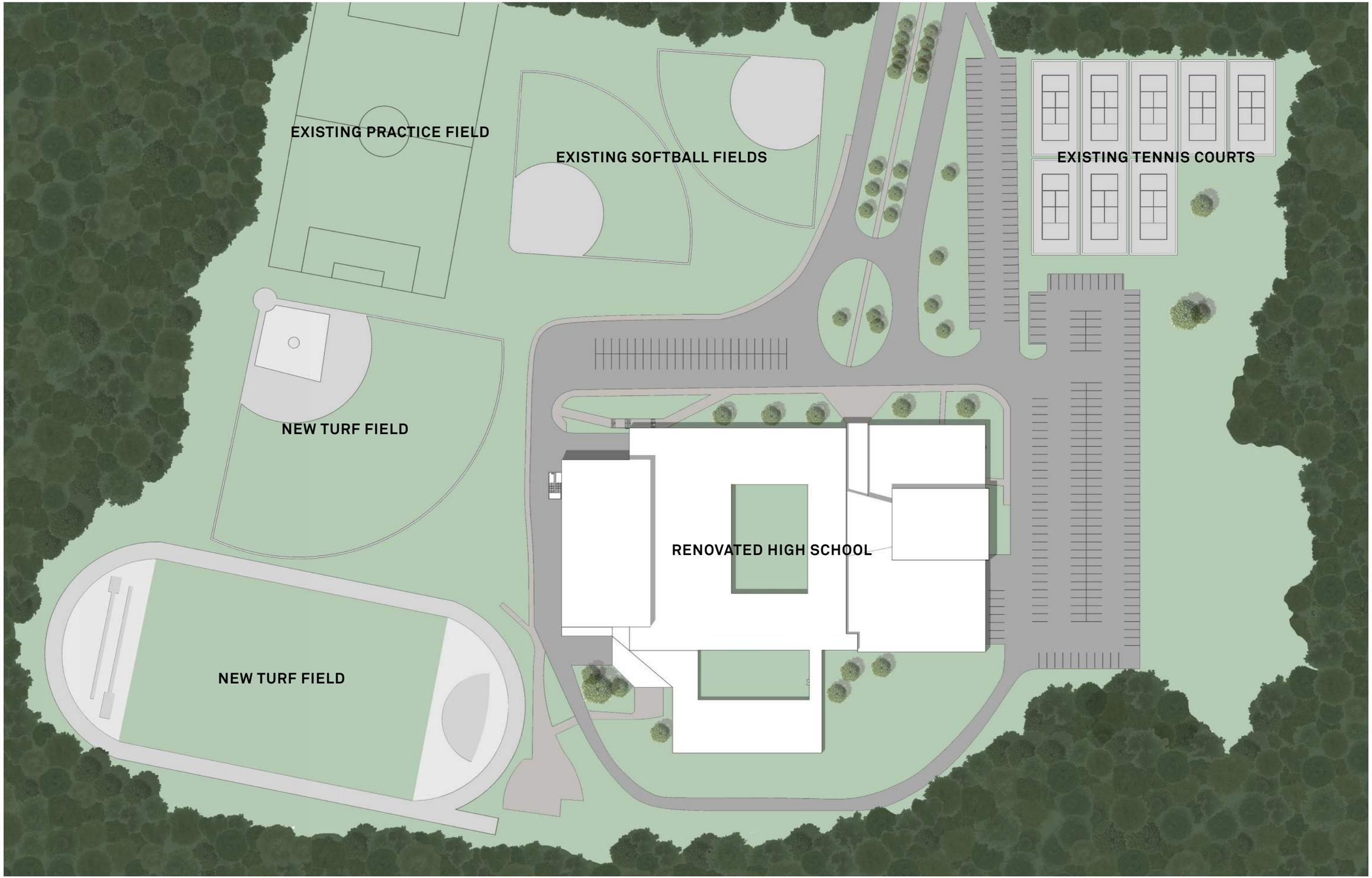
Exterior façade work: All windows and doors will be replaced with energy efficient models. Front brick façade will be replaced with energy efficient curtain wall system. Masonry walls will need to be repointed.

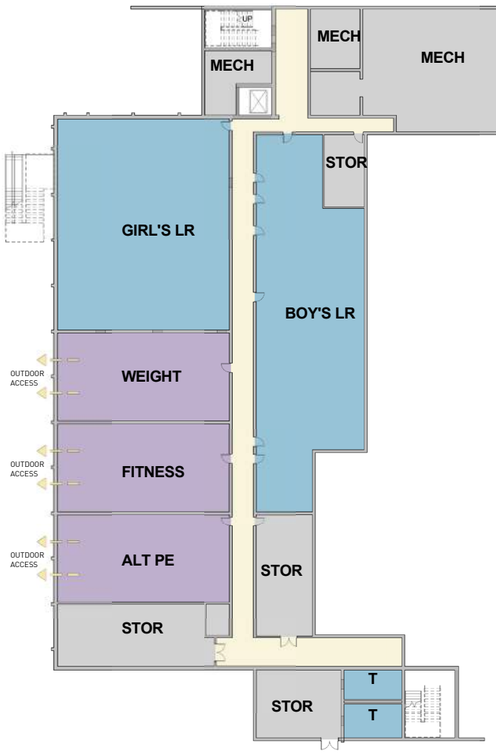
Phase two will begin with removing the modular classrooms and relocating two to act as administration areas for the second phase of construction. The Stage will be demolished and a new one will be constructed with a fly loft, stage lighting, automatic rigging system and smoke control system. The Auditorium will be renovated including HCP access to the stage, new finishes, and new MEP FP systems. The Administrative office suite will be renovated including finishes and MEP FP systems. The Band/ Chorus suite will be renovated including finishes and MEP FP systems. The existing science wing will be renovated into 7 Pre-K classrooms with support spaces. Site work will also take place during this phase. New turf fields will be installed-see Warner Larson report for a description and estimate of this work. Other site work includes installation of storm water management filtration system, repaving of existing drives and parking areas and HCP accessible parking sidewalks paths and curb cuts. The courtyard between the Pre-K wing and the High School will be renovated into a Pre-K playground and exterior classroom. The courtyard in the center of the academic high school wings will be renovated into usable exterior classroom space. Doors should be added to the Library to create access to this courtyard.

This option maintains the same number of existing athletic playing fields.

This option does not include the District Offices due to lack of available square footage in the existing building.

Building should be solar ready no PV Array.

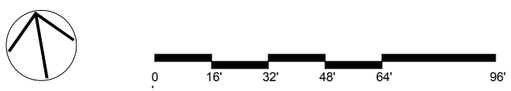

EXISTING PRACTICE FIELD
EXISTING SOFTBALL FIELDS
EXISTING TENNIS COURTS
NEW TURF FIELD
RENOVATED HIGH SCHOOL
NEW TURF FIELD



BASEMENT

FIRST FLOOR

- Administration
- Mechanical
- Custodial & Maintenance
- Circulation
- Community
- Media Center
- Core Academic Spaces
- Special Education
- Art & Music
- Health & Physical Education
- Toilet / Locker Room
- Laboratory
- Dining & Food Service
- Pre-School
- Special Education / Science



Administration
Mechanical
Custodial & Maintenance
Circulation
Community
Media Center
Core Academic Spaces
Special Education
Art & Music
Health & Physical Education
Toilet / Locker Room
Laboratory
Dining & Food Service
Pre-School
Special Education / Science

SECOND FLOOR

0 16' 32' 48' 64' 96'

Proposed Space Summary - High Schools- Renovation Option

11/17/2017

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
				Existing to Remain/Renovated			New			Total						
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
CORE ACADEMIC SPACES		54 total	**43,536**			**37,040**						**0**			**35,480**	
(List classrooms of different sizes separately)																
Classroom - General	780	26	20,280	780	23	17,940										
Classroom - General	840	2	1,680			-										
Classroom - General	900	6	5,400	900	4	3,600							850	24	20,400	825 SF min - 950 SF max
Classroom - General	1,000	2	2,000													
Teacher Planning		0	-	700	4	2,800							100	24	2,400	
Small Group Seminar (20-30 seats)		0	-	600	1	600							500	2	1,000	
Science Classroom / Lab	1,200	8	9,600	1,200	8	9,600							1,440	7	10,080	3 x85% ut=20 Seats-1 per /day/student
Prep Room	150	6	900	300	4	1,200							200	7	1,400	
Department Offices	300	4	1,200	300	4	1,200										
Department Offices	1,160	1	1,160													
Department Offices	1,216	1	1,216													
Central Chemical Storage Rm	100	1	100	100	1	100							200	1	200	
SPECIAL EDUCATION			**5,390**			**7,170**						**0**			**8,050**	
(List classrooms of different sizes separately)																
Self-Contained SPED	800	2	1,600										950	5	4,750	assumed 8% of pop. in self-contained SPED
Self-Contained SPED Toilet		0	-										60	5	300	
Resource Room	800	3	2,400	840	1	840										
Resource Room				900	4	3,600							500	3	1,500	1/2 size Genl. Clrm.
Small Group Room	330	1	330	330	1	330							500	3	1,500	1/2 size Genl. Clrm.
Life Skills	1,060	1	1,060	1,200	2	2,400										
ART & MUSIC			**7,404**			**6,624**						**0**			**6,625**	
Art Classroom - 25 seats	1,100	2	2,200	1,200	2	2,400							1,200	2	2,400	Assumed use - 25% Population - 5 times/week
Art Workroom w/ Storage & kiln	1,280	1	1,280	300	1	300							150	2	300	
Band - 50 - 100 seats	1,840	1	1,840	1,840	1	1,840							1,500	1	1,500	Assumed use - 25% Population - 5 times/week
Chorus - 50 - 100 seats	970	1	970	970	1	970							1,500	1	1,500	
Ensemble	270	2	540	270	2	540							200	1	200	
Music Practice	70	4	280	70	4	280							75	3	225	
Music Storage	294	1	294	294	1	294							500	1	500	
VOCATIONS & TECHNOLOGY			**7,316**			**8,400**						**0**			**6,400**	
Tech Clrm. - (Computer Labs-drafting etc)	600	2	1,200	1,200	2	2,400							1,200	2	2,400	Assumed use - 50% Population - 5 times/week
Tech Clrm. - (Computer Labs-drafting etc)	1,100	1	1,100			-										
Tech Clrm. - (Computer Labs-drafting etc)	936	1	936			-										
Tech Shop - (E.G. Consumer, Wood)Maker Spac	1,160	1	1,160	1,800	1	1,800										
Tech Shop - (E.G. Consumer, Wood)Fashion La	1,160	1	1,160	1,800	1	1,800										
Tech Shop - (E.G. Consumer, Wood)Culinary	1,160	1	1,160	1,800	1	1,800							2,000	2	4,000	Assumed use - 50% Population - 5 times/week
School Store	600	1	600	600	1	600										

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
				Existing to Remain/Renovated			New			Total						
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
HEALTH & PHYSICAL EDUCATION			**34,448**			**26,100**						**0**			**20,232**	
Gymnasium	16,000	1	16,000	16,000	1	16,000							12,000	1	12,000	
PE Alternatives- Weight Room	2,200	1	2,200	2,200	2	4,400							3,000	1	3,000	
Gym Storeroom	924	1	924	300	1	300							300	1	300	
Locker Rooms - Boys / Girls w/ Toilets	6,000	1	6,000	4,500	1	4,500							4,032	1	4,032	5.6 sf/student total
Phys. Ed. Storage	864	1	864	500	1	500							500	1	500	
Athletic Director's Office	1,000	1	1,000	150	1	150							150	1	150	
Health Instructor's Office w/ Shower & Toilet	250	2	500	250	1	250							250	1	250	
Team Rooms	1,790	2	3,580													
Team Rooms	1,140	2	2,280													
Health Classroom	1,100	1	1,100													
MEDIA CENTER			**5,900**			**5,040**						**0**			**4,400**	
Media Center / Reading Room	3,440	1	3,440	3,440	1	3,440							4,400	1	4,400	
Computer Lab	800	2	1,600	800	2	1,600										
Storage	860	1	860													
AUDITORIUM / DRAMA			**11,634**			**11,634**						**0**			**7,630**	
Auditorium	8,820	1	8,820	8,820	1	8,820							4,800	1	4,800	2/3 Enrollment @ 10 SF/Seat - 750 seats MAX
Stage	1,914	1	1,914	1,914	1	1,914							1,600	1	1,600	
Auditorium Storage	600	1	600	600	1	600							430	1	430	
Make-up / Dressing Rooms	200	1	200	200	1	200							300	2	600	
Controls / Lighting / Projection	100	1	100	100	1	100							200	1	200	
DINING & FOOD SERVICE			**9,050**			**9,050**						**0**			**6,980**	
Cafeteria / Student Lounge / Break-out	5,500	1	5,500	5,500	1	5,500							3,600	1	3,600	3 seatings - 15SF per seat
Chair / Table Storage	260	1	260	260	1	260							330	1	330	
Scramble Serving Area	200	1	200	200	1	200							600	1	600	
Kitchen	2,030	1	2,030	2,030	1	2,030							2,020	1	2,020	1600 SF for first 300 + 1 SF/student Add'l
Staff Lunch Room	1,060	1	1,060	1,060	1	1,060							430	1	430	20 SF/Occupant
MEDICAL			**960**			**960**						**0**			**710**	
Medical Suite Toilet	80	2	160	80	2	160							60	1	60	
Nurses' Office / Waiting Room	400	1	400	400	1	400							250	1	250	
Interview Room			-			-							100	1	100	
Examination Room / Resting	400	1	400	400	1	400							100	3	300	

Stoneham High School	Existing Conditions			PROPOSED: Existing to Remain/Renovated			PROPOSED: New			PROPOSED: Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
ADMINISTRATION & GUIDANCE			**4,027**			**4,027**						**0**			**3,685**	
General Office / Waiting Room / Toilet	884	1	884	884	1	884							360	1	360	
Teachers' Mail and Time Room	200	1	200	200	1	200							100	1	100	
Duplicating Room	132	1	132	132	1	132							200	1	200	
Records Room	192	1	192	192	1	192							200	1	200	
Principal's Office w/ Conference Area	215	1	215	215	1	215							375	1	375	
Principal's Secretary / Waiting			-			-							125	1	125	
Assistant Principal's Office - AP1	156	1	156	156	1	156							150	1	150	
Assistant Principal's Office - AP2	156	1	156	156	1	156							150	0	-	
Supervisory / Spare Office	160	1	160	160	1	160							120	1	120	
Conference Room	132	1	132	132	1	132							450	1	450	
Guidance Office	96	5	480	96	5	480							150	4	600	
Guidance Waiting Room	880	1	880	880	1	880							100	1	100	
Guidance Storeroom	80	2	160	80	2	160							100	1	100	
Career Center			-			-							330	1	330	
Records Room	80	1	80	80	1	80							115	1	115	
Teachers' Work Room	200	1	200	200	1	200							360	1	360	
CUSTODIAL & MAINTENANCE			**2,212**			**2,212**						**0**			**2,165**	
Custodian's Office	120	1	120	120	1	120							150	1	150	
Custodian's Workshop			-			-							250	1	250	
Custodian's Storage			-			-							375	1	375	
Recycling Room / Trash			-			-							400	1	400	
Receiving and General Supply	612	1	612	612	1	612							330	1	330	
Storeroom	480	1	480	480	1	480							460	1	460	
Network / Telecom Room	1,000	1	1,000	1,000	1	1,000							200	1	200	
OTHER			**2,200**			**10,200**						**0**			**0**	
District Offices-Superintendent/PPS	2,200	1	2,200													
Pre School Classrooms				1,200	7	8,400										
Pre School OT/PT				400	1	400										
Pre School Director Office				350	1	350										
Pre School Speech				350	2	700										
Pre School Coference Room			-	350	1	350										
Total Building Net Floor Area (NFA)			**134,077**			**128,457**						**0**			**102,357**	
Proposed Student Capacity / Enrollment			710			710									**720**	212
Total Building Gross Floor Area (GFA)[2]			211,000			211,000									**152,640**	
Grossing factor (GFA/NFA)			**1.57**			**1.64**						**#DIV/0!**			**1.49**	

[1] **Individual Room Net Floor Area (NFA)** Includes the net square footage measured from the inside face of the perimeter walls and includes all specific spaces assigned to a particular program area including such spaces as non-communal toilets and storage rooms.

[2] **Total Building Gross Floor Area (GFA)** Includes the entire building gross square footage measured from the outside face of exterior walls

Option 2: Addition and Renovation - Re-Use the Existing Gymnasium

Scheduled Duration Phase 1: Addition 24 Months- renovate Gym over two summers

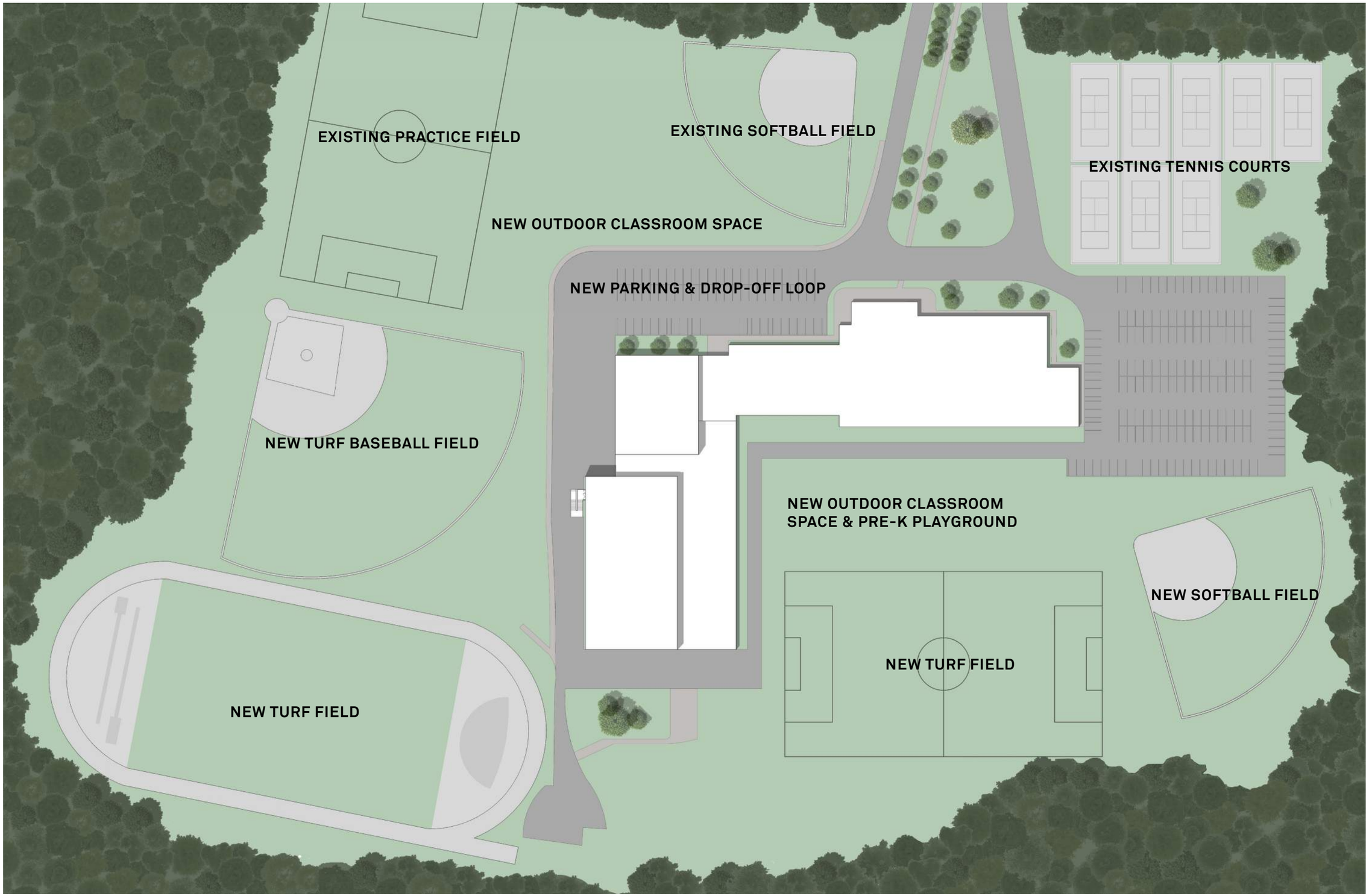
Scheduled Duration Phase 2: 15 -18 Months – demo existing building and construct Pre-K wing

Option 2 would be a phased renovation addition to the existing high school to create a new High School. In Phase 1, a large new three-story addition would be constructed directly in front of the existing high school building. The addition would include all spaces except for the Gymnasium, Alt PE spaces and locker room space. The addition would include the District Offices. The existing Gymnasium, and shops would be renovated over the two summers. Renovations would include new curtain wall, wood floor, finishes, systems and bleachers. The existing shops would be renovated into new locker rooms, an alternate PE space with sheet good rubber floor, and a weight room. The existing school would remain operational while the large addition is constructed. The pick up and drop off loop would be relocated to the parking lot to the East of the school. The main entrance would also be relocated to the doors near the auditorium and cafeteria. When phase one is completed, the High School students would occupy this new addition. Part of the existing lower level mechanical room will remain along with the two newer boilers. Utilities entering the existing building on the North façade will need to be relocated before construction of the new addition.

Phase 2 of construction would begin with the abatement and demolition of the existing building. After the building is demolished a new Pre-K wing with seven classrooms and support space would be built adjacent to the renovated Gymnasium. Site work will be extensive with this option. One of the softball fields will be taken during construction of the addition. Fill will need to be imported to regrade the softball field and new retaining walls will need to be added in this area. The grade differential appears to be 10' +/-. A new drop off loop with parking will be created in the front of the new addition. The softball field can be recreated to the west and south of the new school. 1-2 new soccer fields can be created where the existing building stood. New turf fields should be added per the Warner Larson report. New storm water management system should be installed like Option 1.

An allowance should be carried for removal of potential ledge for the new addition.

This option recreates a softball field, adds outdoor dining area and classroom space and adds two new athletic playing fields and an outdoor Pre-K playground.


EXISTING PRACTICE FIELD
EXISTING SOFTBALL FIELD
EXISTING TENNIS COURTS
NEW OUTDOOR CLASSROOM SPACE
NEW PARKING & DROP-OFF LOOP
NEW TURF BASEBALL FIELD
NEW OUTDOOR CLASSROOM SPACE & PRE-K PLAYGROUND
NEW SOFTBALL FIELD
NEW TURF FIELD
NEW TURF FIELD

BASEMENT

FIRST FLOOR

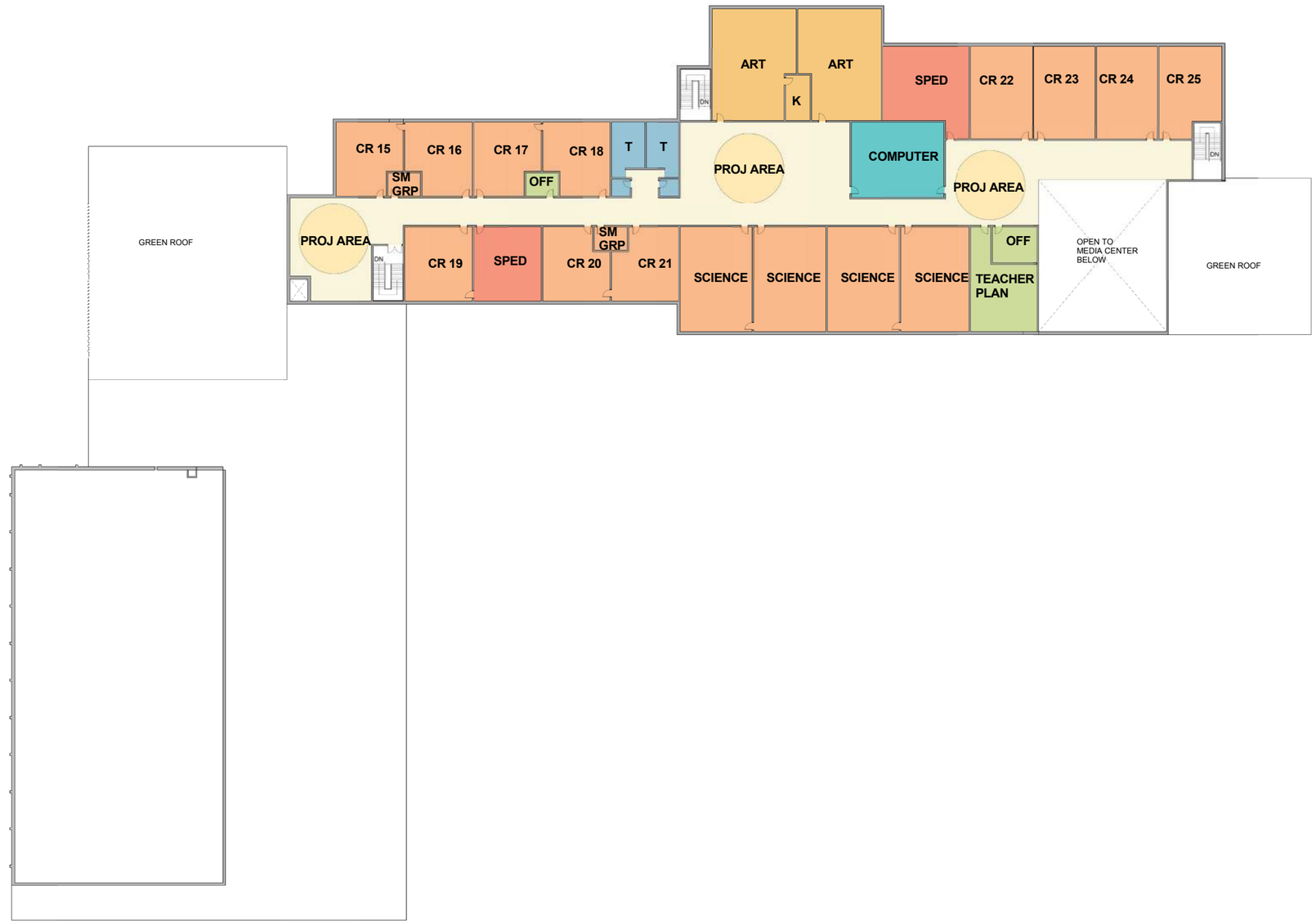
- Administration
- Mechanical
- Custodial & Maintenance
- Circulation
- Community
- Media Center
- Core Academic Spaces
- Special Education
- Art & Music
- Health & Physical Education
- Toilet / Locker Room
- Laboratory
- Dining & Food Service
- Pre-School
- Special Education / Science

0 16' 32' 48' 64' 96'

SECOND FLOOR

- Administration
- Mechanical
- Custodial & Maintenance
- Circulation
- Community
- Media Center
- Core Academic Spaces
- Special Education
- Art & Music
- Health & Physical Education
- Toilet / Locker Room
- Laboratory
- Dining & Food Service
- Pre-School
- Special Education / Science

0 16' 32' 48' 64' 96'



Administration
Mechanical
Custodial & Maintenance
Circulation
Community
Media Center
Core Academic Spaces
Special Education
Art & Music
Health & Physical Education
Toilet / Locker Room
Laboratory
Dining & Food Service
Pre-School
Special Education / Science

THIRD FLOOR

0 16' 32' 48' 64' 96'

Proposed Space Summary - High Schools- Renovation Addition Option

11/17/2017

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
				Existing to Remain/Renovated			New			Total						
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
CORE ACADEMIC SPACES		54 total	**35,716**			**0**			**36,670**			**0**			**35,480**	
(List classrooms of different sizes separately)																
Classroom - General	780	23	17,940				850	21	17,850				850	24	20,400	825 SF min - 950 SF max
Classroom - General	900	4	3,600				900	4	3,600							
Teacher Planning		0	-				600	4	2,400				100	24	2,400	
Small Group Seminar (20-30 seats)		0	-						-				500	2	1,000	
Science Classroom / Lab	1,200	8	9,600				1,440	8	11,520				1,440	7	10,080	3 x85% ut=20 Seats-1 per /day/student
Prep Room	150	6	900						-				200	7	1,400	
Department Offices	300	4	1,200				300	4	1,200							
Department Offices	1,160	1	1,160						-							
Department Offices	1,216	1	1,216						-							
Central Chemical Storage Rm	100	1	100				100	1	100				200	1	200	
									-							
SPECIAL EDUCATION			**5,390**			**0**			**7,900**			**0**			**8,050**	
(List classrooms of different sizes separately)									-							
Self-Contained SPED	800	2	1,600				2	950	1,900				950	5	4,750	assumed 8% of pop. in self-contained SPED
Self-Contained SPED Toilet		0	-						-				60	5	300	
Resource Room	800	3	2,400				3	850	2,550				500	3	1,500	1/2 size Genl. Clrm.
Small Group Room	330	1	330				3	350	1,050				500	3	1,500	1/2 size Genl. Clrm.
Life Skills	1,060	1	1,060				2	1200	2,400							
ART & MUSIC			**6,370**			**0**			**6,425**			**0**			**6,625**	
Art Classroom - 25 seats	1,100	2	2,200				1,200	2	2,400				1,200	2	2,400	Assumed use - 25% Population - 5 times/week
Art Workroom w/ Storage & kiln	1,280	1	1,280				300	1	300				150	2	300	
Band - 50 - 100 seats	1,936	1	1,936				1,500	1	1,500				1,500	1	1,500	Assumed use - 25% Population - 5 times/week
Chorus - 50 - 100 seats		0	-				1,500	1	1,500				1,500	1	1,500	
Ensemble	300	1	300				200	1	200				200	1	200	
Music Practice	90	4	360				75	3	225				75	3	225	
Music Storage	294	1	294				300	1	300				500	1	500	
									-							
VOCATIONS & TECHNOLOGY			**7,316**			**0**			**6,600**			**0**			**6,400**	
Tech Clrm. - (Computer Labs-drafting etc)	600	2	1,200				1,200	2	2,400				1,200	2	2,400	Assumed use - 50% Population - 5 times/week
Tech Clrm. - (Computer Labs-drafting etc)	1,100	1	1,100						-							
Tech Clrm. - (Computer Labs-drafting etc)	936	1	936						-							
Tech Shop - (E.G. Consumer, Wood)Child Dev. Lab	1,160	1	1,160				1,200	1	1,200							
Tech Shop - (E.G. Consumer, Wood)Fashion Lab	1,160	1	1,160				1,200	1	1,200							
Tech Shop - (E.G. Consumer, Wood)Culinary	1,160	1	1,160				1,200	1	1,200				2,000	2	4,000	Assumed use - 50% Population - 5 times/week
School Store	600	1	600				600	1	600							

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
				Existing to Remain/Renovated			New			Total						
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
HEALTH & PHYSICAL EDUCATION			**34,448**			**23,900**			**0**			**0**			**20,232**	
Gymnasium	16,000	1	16,000	16,000	1	16,000							12,000	1	12,000	
PE Alternatives- Weight Room	2,200	1	2,200	2,200	1	2,200							3,000	1	3,000	
Gym Storeroom	924	1	924	300	1	300							300	1	300	
Locker Rooms - Boys / Girls w/ Toilets	6,000	1	6,000	4,500	1	4,500							4,032	1	4,032	5.6 sf/student total
Phys. Ed. Storage	864	1	864	500	1	500							500	1	500	
Athletic Director's Office	1,000	1	1,000	150	1	150							150	1	150	
Health Instructor's Office w/ Shower & Toilet	250	2	500	250	1	250							250	1	250	
Team Rooms	1,790	2	3,580													
Team Rooms	1,140	2	2,280													
Health Classroom	1,100	1	1,100													
MEDIA CENTER			**5,900**			**0**			**5,040**			**0**			**4,400**	
Media Center / Reading Room	3,440	1	3,440				3,440	1	3,440				4,400	1	4,400	
Computer Lab	800	2	1,600				800	2	1,600							
Storage	860	1	860													
AUDITORIUM / DRAMA			**11,634**			**0**			**11,900**			**0**			**7,630**	
Auditorium	8,820	1	8,820				8,800	1	8,800				4,800	1	4,800	2/3 Enrollment @ 10 SF/Seat - 750 seats MAX
Stage	1,914	1	1,914				1,900	1	1,900				1,600	1	1,600	
Auditorium Storage	600	1	600				600	1	600				430	1	430	
Make-up / Dressing Rooms	200	1	200				200	2	400				300	2	600	
Controls / Lighting / Projection	100	1	100				200	1	200				200	1	200	
									-							
DINING & FOOD SERVICE			**9,050**			**0**			**8,930**			**0**			**6,980**	
Cafeteria / Student Lounge / Break-out	5,500	1	5,500				5,500	1	5,500				3,600	1	3,600	3 seatings - 15SF per seat
Chair / Table Storage	260	1	260				330	1	330				330	1	330	
Scramble Serving Area	200	1	200				600	1	600				600	1	600	
Kitchen	2,030	1	2,030				2,000	1	2,000				2,020	1	2,020	1600 SF for first 300 + 1 SF/student Add'l
Staff Lunch Room	1,060	1	1,060				500	1	500				430	1	430	20 SF/Occupant
MEDICAL			**960**			**0**			**710**			**0**			**710**	
Medical Suite Toilet	80	2	160				60	1	60				60	1	60	
Nurses' Office / Waiting Room	400	1	400				250	1	250				250	1	250	
Interview Room			-				100	1	100				100	1	100	
Examination Room / Resting	400	1	400				300	1	300				100	3	300	

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
				Existing to Remain/Renovated			New			Total						
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
ADMINISTRATION & GUIDANCE			**4,027**			**0**			**3,821**			**0**			**3,685**	
General Office / Waiting Room / Toilet	884	1	884				355	1	355				360	1	360	
Teachers' Mail and Time Room	200	1	200				100	1	100				100	1	100	
Duplicating Room	132	1	132				200	1	200				200	1	200	
Records Room	192	1	192				200	1	200				200	1	200	
Principal's Office w/ Conference Area	215	1	215				375	1	375				375	1	375	
Principal's Secretary / Waiting			-				125	1	125				125	1	125	
Assistant Principal's Office - AP1	156	1	156				150	1	150				150	1	150	
Assistant Principal's Office - AP2	156	1	156				150	1	150				150	0	-	
Supervisory / Spare Office	160	1	160				120	1	120				120	1	120	
Conference Room	132	1	132				450	1	450				450	1	450	
Guidance Office	96	5	480				150	4	600				150	4	600	
Guidance Waiting Room	880	1	880				100	1	100				100	1	100	
Guidance Storeroom	80	2	160				100	1	100				100	1	100	
Career Center			-				328	1	328				330	1	330	
Records Room	80	1	80				114	1	114				115	1	115	
Teachers' Work Room	200	1	200				355	1	355				360	1	360	
CUSTODIAL & MAINTENANCE			**2,212**			**0**			**2,100**			**0**			**2,165**	
Custodian's Office	120	1	120				2,100	1	2,100				150	1	150	
Custodian's Workshop			-										250	1	250	
Custodian's Storage			-										375	1	375	
Recycling Room / Trash			-										400	1	400	
Receiving and General Supply	612	1	612										330	1	330	
Storeroom	480	1	480										460	1	460	
Network / Telecom Room	1,000	1	1,000										200	1	200	
OTHER			**2,200**			**0**			**12,400**			**0**			**0**	
District Offices-Superintendent/PPS	2,200	1	2,200				2,200	1	2,200							
Pre School Classrooms							1,200	7	8,400							
Pre School OT/PT							400	1	400							
Pre School Director Office							350	1	350							
Pre School Speech							350	2	700							
Pre School Coference Room			-				350	1	350							
Total Building Net Floor Area (NFA)			**125,223**			**23,900**			**102,496**			**0**			**102,357**	
Proposed Student Capacity / Enrollment			710						710						**720**	212
Total Building Gross Floor Area (GFA)[2]			211,000						189,594						**152,640**	
Grossing factor (GFA/NFA)			**1.68**						1.5			**#DIV/0!**			**1.49**	

[1] **Individual Room Net Floor Area (NFA)** Includes the net square footage measured from the inside face of the perimeter walls and includes all specific spaces assigned to a particular program area including such spaces as non-communal toilets and storage rooms.

[2] **Total Building Gross Floor Area (GFA)** Includes the entire building gross square footage measured from the outside face of exterior walls

Option 3: New High School in the East Parking Lot

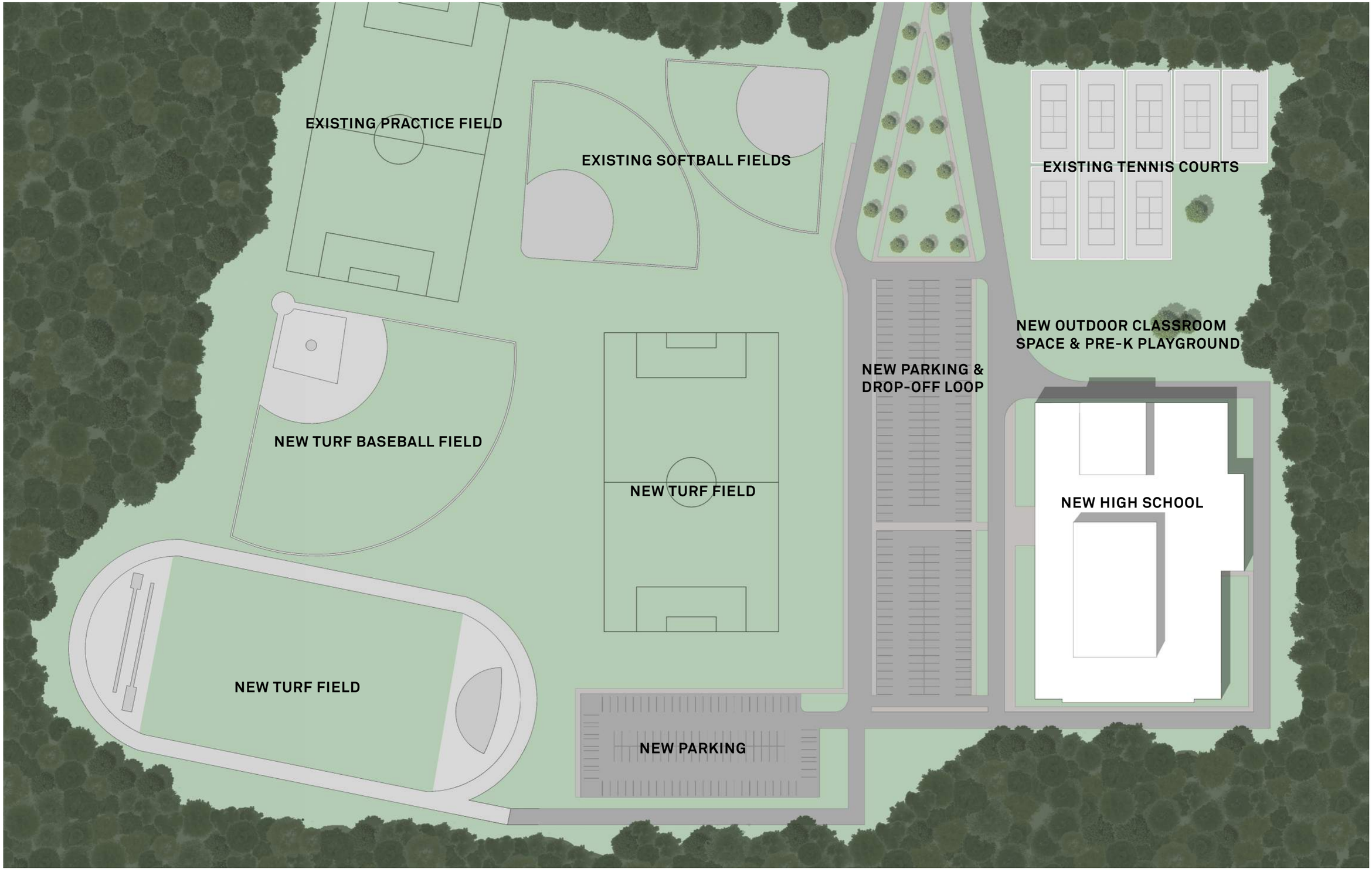
Scheduled Duration: 24 Months for new construction; 9 months for demolition and sitework

Option 3 builds a three-story new building on the existing parking lot to the east of the school. be located on the West side of the new building. Spaces such as the District Offices, Main Office, Cafeteria, Gymnasium, Auditorium and Maker Space would be located on the ground floor and would be accessible to the community and zoned in a way to close off the academic areas of the building. Pre-K Classrooms would also be located on the first floor and would have access to a new exterior playground. All other academic spaces would be located on the upper two floors.

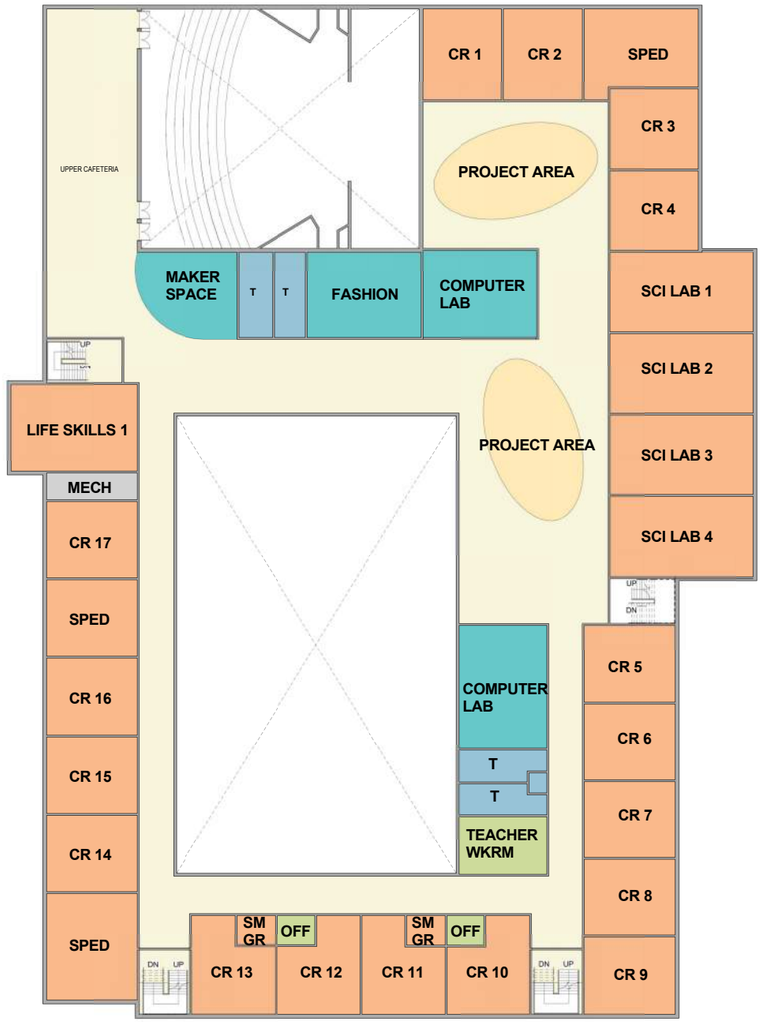
A new drop off loop with parking will be created in the front of the new school. 1-2 new soccer fields can be created where the existing building stood. New turf fields should be added per the Warner Larson report. New storm water management system should be installed like Option 1.

An allowance should be carried for removal of potential ledge for the new addition.

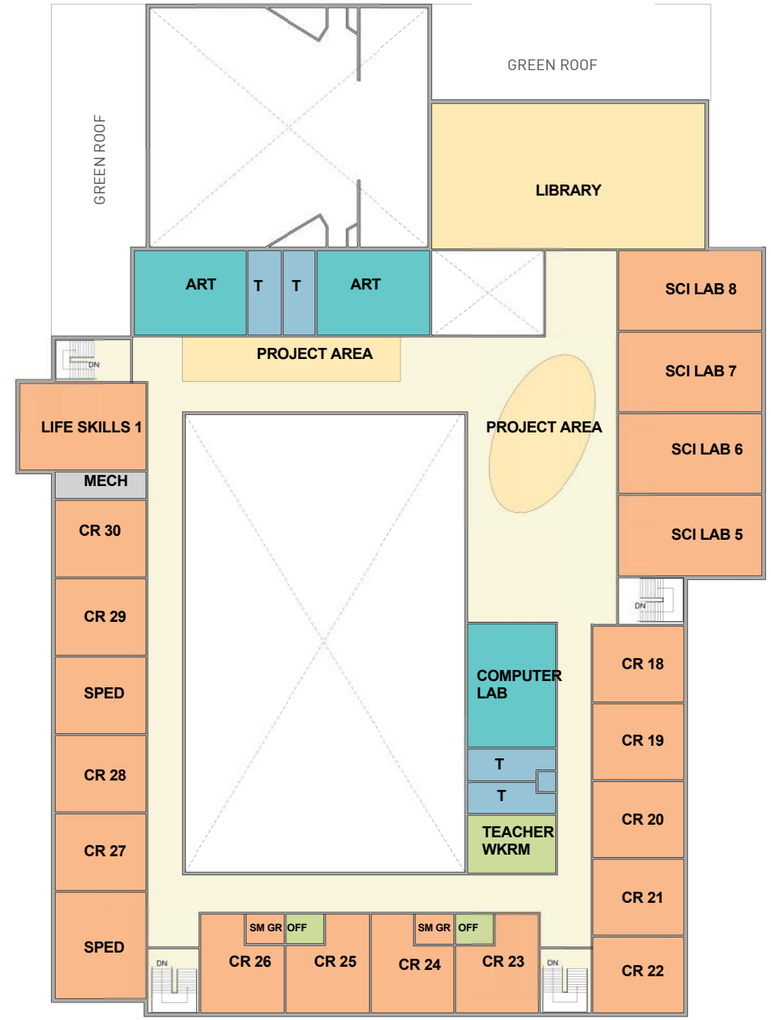
This option adds outdoor dining area, two new athletic playing fields and an outdoor Pre-K playground.


EXISTING PRACTICE FIELD
EXISTING SOFTBALL FIELDS
EXISTING TENNIS COURTS
NEW OUTDOOR CLASSROOM SPACE & PRE-K PLAYGROUND
NEW PARKING & DROP-OFF LOOP
NEW TURF BASEBALL FIELD
NEW TURF FIELD
NEW HIGH SCHOOL
NEW TURF FIELD
NEW PARKING

EXISTING BUILDING
TO BE DEMOLISHED
MAIN
ENTRANCE
DISTRICT
OFFICE
ENTRANCE
PRE-K ENTRANCE
AUDITORIUM
BAND
MAKER
SPACE
CHORUS
REC/ MECH
CAFE
KITCHEN
T
T
PRE K 7
PRE K 6
PRE-K 5
PRE-K 4
WEIGHT
ADMIN
NURSE
GUIDANCE
GYM
FITNESS
OT/PT
PRE-K 3
T
T
OFF
PRE-K 2
DISTRICT
OFFICES
LR
LR
PRE-K 1
UP
Administration
Mechanical
Custodial & Maintenance
Circulation
Community
Media Center
Core Academic Spaces
Special Education
Art & Music
Health & Physical Education
Toilet / Locker Room
Laboratory
Dining & Food Service
Pre-School
Special Education / Science
0
16'
32'
48'
64'
96'

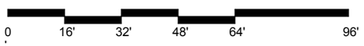


SECOND FLOOR



THIRD FLOOR

- Administration
- Mechanical
- Custodial & Maintenance
- Circulation
- Community
- Media Center
- Core Academic Spaces
- Special Education
- Art & Music
- Health & Physical Education
- Toilet / Locker Room
- Laboratory
- Dining & Food Service
- Pre-School
- Special Education / Science



Proposed Space Summary - High Schools- New Option

11/17/2017

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
				Existing to Remain/Renovated			New			Total						
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
CORE ACADEMIC SPACES		54 total	**32,576**			**0**			**36,670**			**0**			**35,480**	
(List classrooms of different sizes separately)																
Classroom - General	800	23	18,400				850	21	17,850				850	24	20,400	825 SF min - 950 SF max
			-				900	4	3,600							
Teacher Planning		0	-				600	4	2,400				100	24	2,400	
Small Group Seminar (20-30 seats)		0	-						-				500	2	1,000	
Science Classroom / Lab	1,200	8	9,600				1,440	8	11,520				1,440	7	10,080	3 x85% ut=20 Seats-1 per /day/student
Prep Room	150	6	900						-				200	7	1,400	
Department Offices	300	4	1,200				300	4	1,200							
Department Offices	1,160	1	1,160						-							
Department Offices	1,216	1	1,216						-							
Central Chemical Storage Rm	100	1	100				100	1	100				200	1	200	
									-							
SPECIAL EDUCATION			**5,390**			**0**			**7,900**			**0**			**8,050**	
(List classrooms of different sizes separately)									-							
Self-Contained SPED	800	2	1,600				2	950	1,900				950	5	4,750	assumed 8% of pop. in self-contained SPED
Self-Contained SPED Toilet		0	-						-				60	5	300	
Resource Room	800	3	2,400				3	850	2,550				500	3	1,500	1/2 size Genl. Clrm.
Small Group Room	330	1	330				3	350	1,050				500	3	1,500	1/2 size Genl. Clrm.
Life Skills	1,060	1	1,060				2	1200	2,400							
ART & MUSIC			**6,370**			**0**			**6,425**			**0**			**6,625**	
Art Classroom - 25 seats	1,100	2	2,200				1,200	2	2,400				1,200	2	2,400	Assumed use - 25% Population - 5 times/week
Art Workroom w/ Storage & kiln	1,280	1	1,280				300	1	300				150	2	300	
Band - 50 - 100 seats	1,936	1	1,936				1,500	1	1,500				1,500	1	1,500	Assumed use - 25% Population - 5 times/week
Chorus - 50 - 100 seats		0	-				1,500	1	1,500				1,500	1	1,500	
Ensemble	300	1	300				200	1	200				200	1	200	
Music Practice	90	4	360				75	3	225				75	3	225	
Music Storage	294	1	294				300	1	300				500	1	500	
									-							
VOCATIONS & TECHNOLOGY			**7,316**			**0**			**6,600**			**0**			**6,400**	
Tech Clrm. - (Computer Labs-drafting etc)	600	2	1,200				1,200	2	2,400				1,200	2	2,400	Assumed use - 50% Population - 5 times/week
Tech Clrm. - (Computer Labs-drafting etc)	1,100	1	1,100						-							
Tech Clrm. - (Computer Labs-drafting etc)	936	1	936						-							
Tech Shop - (E.G. Consumer, Wood)Child Dev.	1,160	1	1,160				1,200	1	1,200							
Tech Shop - (E.G. Consumer, Wood)Fashion La	1,160	1	1,160				1,200	1	1,200							
Tech Shop - (E.G. Consumer, Wood)Culinary	1,160	1	1,160				1,200	1	1,200				2,000	2	4,000	Assumed use - 50% Population - 5 times/week
School Store	600	1	600				600	1	600							

Stoneham High School	Existing Conditions			PROPOSED									MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
				Existing to Remain/Renovated			New			Total						
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
HEALTH & PHYSICAL EDUCATION			**34,448**			**0**			**23,900**			**0**			**20,232**	
Gymnasium	16,000	1	16,000				16,000	1	16,000				12,000	1	12,000	
PE Alternatives- Weight Room	2,200	1	2,200				2,200	1	2,200				3,000	1	3,000	
Gym Storeroom	924	1	924				300	1	300				300	1	300	
Locker Rooms - Boys / Girls w/ Toilets	6,000	1	6,000				4,500	1	4,500				4,032	1	4,032	5.6 sf/student total
Phys. Ed. Storage	864	1	864				500	1	500				500	1	500	
Athletic Director's Office	1,000	1	1,000				150	1	150				150	1	150	
Health Instructor's Office w/ Shower & Toilet	250	2	500				250	1	250				250	1	250	
Team Rooms	1,790	2	3,580													
Team Rooms	1,140	2	2,280													
Health Classroom	1,100	1	1,100													
MEDIA CENTER			**5,900**			**0**			**5,040**			**0**			**4,400**	
Media Center / Reading Room	3,440	1	3,440				3,440	1	3,440				4,400	1	4,400	
Computer Lab	800	2	1,600				800	2	1,600							
Storage	860	1	860													
AUDITORIUM / DRAMA			**11,634**			**0**			**11,900**			**0**			**7,630**	
Auditorium	8,820	1	8,820				8,800	1	8,800				4,800	1	4,800	2/3 Enrollment @ 10 SF/Seat - 750 seats MAX
Stage	1,914	1	1,914				1,900	1	1,900				1,600	1	1,600	
Auditorium Storage	600	1	600				600	1	600				430	1	430	
Make-up / Dressing Rooms	200	1	200				200	2	400				300	2	600	
Controls / Lighting / Projection	100	1	100				200	1	200				200	1	200	
									-							
DINING & FOOD SERVICE			**9,050**			**0**			**8,930**			**0**			**6,980**	
Cafeteria / Student Lounge / Break-out	5,500	1	5,500				5,500	1	5,500				3,600	1	3,600	3 seatings - 15SF per seat
Chair / Table Storage	260	1	260				330	1	330				330	1	330	
Scramble Serving Area	200	1	200				600	1	600				600	1	600	
Kitchen	2,030	1	2,030				2,000	1	2,000				2,020	1	2,020	1600 SF for first 300 + 1 SF/student Add'l
Staff Lunch Room	1,060	1	1,060				500	1	500				430	1	430	20 SF/Occupant
MEDICAL			**960**			**0**			**710**			**0**			**710**	
Medical Suite Toilet	80	2	160				60	1	60				60	1	60	
Nurses' Office / Waiting Room	400	1	400				250	1	250				250	1	250	
Interview Room			-				100	1	100				100	1	100	
Examination Room / Resting	400	1	400				300	1	300				100	3	300	

Stoneham High School	Existing Conditions			PROPOSED: Existing to Remain/Renovated			PROPOSED: New			PROPOSED: Total			MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines)			
ROOM TYPE	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	ROOM NFA[1]	# OF RMS	area totals	Comments
ADMINISTRATION & GUIDANCE			**4,027**			**0**			**3,670**			**0**			**3,685**	
General Office / Waiting Room / Toilet	884	1	884				300	1	300				360	1	360	
Teachers' Mail and Time Room	200	1	200				100	1	100				100	1	100	
Duplicating Room	132	1	132				200	1	200				200	1	200	
Records Room	192	1	192				200	1	200				200	1	200	
Principal's Office w/ Conference Area	215	1	215				375	1	375				375	1	375	
Principal's Secretary / Waiting			-				125	1	125				125	1	125	
Assistant Principal's Office - AP1	156	1	156				150	1	150				150	1	150	
Assistant Principal's Office - AP2	156	1	156				150	1	150				150	0	-	
Supervisory / Spare Office	160	1	160				120	1	120				120	1	120	
Conference Room	132	1	132				450	1	450				450	1	450	
Guidance Office	96	5	480				150	4	600				150	4	600	
Guidance Waiting Room	880	1	880				100	1	100				100	1	100	
Guidance Storeroom	80	2	160				100	1	100				100	1	100	
Career Center			-				300	1	300				330	1	330	
Records Room	80	1	80				100	1	100				115	1	115	
Teachers' Work Room	200	1	200				300	1	300				360	1	360	
CUSTODIAL & MAINTENANCE			**2,212**			**0**			**2,100**			**0**			**2,165**	
Custodian's Office	120	1	120				2,100	1	2,100				150	1	150	
Custodian's Workshop			-										250	1	250	
Custodian's Storage			-										375	1	375	
Recycling Room / Trash			-										400	1	400	
Receiving and General Supply	612	1	612										330	1	330	
Storeroom	480	1	480										460	1	460	
Network / Telecom Room	1,000	1	1,000										200	1	200	
OTHER			**2,200**			**0**			**12,400**			**0**			**0**	
District Offices-Superintendent/PPS	2,200	1	2,200				2,200	1	2,200							
Pre School Classrooms							1,200	7	8,400							
Pre School OT/PT							400	1	400							
Pre School Director Office							350	1	350							
Pre School Speech							350	2	700							
Pre School Coference Room			-				350	1	350							
Total Building Net Floor Area (NFA)			**122,083**			**0**			**126,245**			**0**			**102,357**	
Proposed Student Capacity / Enrollment															**720**	212
Total Building Gross Floor Area (GFA)[2]			211,000						189,368						**152,640**	
Grossing factor (GFA/NFA)			**1.73**						1.5			**#DIV/0!**			**1.49**	

[1] **Individual Room Net Floor Area (NFA)** Includes the net square footage measured from the inside face of the perimeter walls and includes all specific spaces assigned to a particular program area including such spaces as non-communal toilets and storage rooms.

[2] **Total Building Gross Floor Area (GFA)** Includes the entire building gross square footage measured from the outside face of exterior walls

02.5 Estimates

Feasibility Estimate

Stoneham High School
Design Options

Stoneham, MA

PM&C LLC
20 Downer Ave, Suite 1C
Hingham, MA 02043
(T) 781-740-8007
(F) 781-740-1012

Prepared for:

HMFH Architects, Inc.

November 30, 2017

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

MAIN CONSTRUCTION COST SUMMARY

	Construction Start		Gross Floor Area	$/sf	Estimated Construction Cost
RENOVATION HIGH SCHOOL ONLY - Option 1					
	Sep-18				
RENOVATIONS TO EXISTING SCHOOL			211,000	$209.57	$44,218,715
REMOVE HAZARDOUS MATERIALS (not including foundation damproofing) [1]					$2,395,000
DEMOLISH EXISTING SCHOOL - PARTIAL (phased)			5,575	$15.00	$83,625
PHASING COSTS					$6,050,000
GAME FIELDS - OPTION 1 [2]					$1,498,600
BASEBALL FIELD [2]					$1,751,680
PRACTICE FIELD - CONCEPT 1 (synthetic turf with irrigation) [2]					$420,000
SITEWORK					$3,426,615
SUB-TOTAL			211,000	$283.62	$59,844,235
ESCALATION TO MID-POINT - (assumed 3% PA)	9%				$5,385,981
DESIGN AND PRICING CONTINGENCY	15%				$9,784,532
SUB-TOTAL			211,000	$355.52	$75,014,748
GENERAL CONDITIONS		48	MTHS	$160,000	$7,680,000
GENERAL REQUIREMENTS	5.00%				$3,750,737
BONDS	1.15%				$862,670
INSURANCE	1.40%				$1,050,206
PERMIT					Waived
CM FEE	2.5%				$1,875,369
CM/GMP CONTINGENCY	3%				$2,250,442
TOTAL OF ALL CONSTRUCTION			211,000	$438.31	**$92,484,172**

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

	Construction Start		Gross Floor Area	$/sf	Estimated Construction Cost
OPTION 2 RENOVATION + ADDITION					
	Sep-18				
RENOVATIONS TO EXISTING SCHOOL			38,714	$211.30	$8,180,242
ADDITIONS			149,079	$283.55	$42,271,079
DEMOLISH EXISTING SCHOOL - PARTIAL (phased)			172,286	$8.00	$1,378,288
REMOVE HAZARDOUS MATERIALS (including foundation damproofing) [1]					$3,240,000
PHASING COSTS					$550,000
GAME FIELDS - OPTION 1 [2]					$1,498,600
BASEBALL FIELD [2]					$1,751,680
PRACTICE FIELD - CONCEPT 1 (synthetic turf with irrigation) [2]					$420,000
SITEWORK					$5,214,136
SUB-TOTAL			187,793	$343.48	$64,504,025
ESCALATION TO MID-POINT - (assumed 3% PA)	8%				$5,160,322
DESIGN AND PRICING CONTINGENCY	10%				$6,966,435
SUB-TOTAL			187,793	$408.06	$76,630,782
GENERAL CONDITIONS		40	MTHS	$160,000	$6,400,000
GENERAL REQUIREMENTS	3.00%				$2,298,923
BONDS	1.15%				$881,254
INSURANCE	1.40%				$1,072,831
PERMIT					Waived
CM FEE	2.5%				$1,915,770
CM/GMP CONTINGENCY	3%				$2,298,923
TOTAL OF ALL CONSTRUCTION			187,793	$487.23	**$91,498,483**

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

	Construction Start		Gross Floor Area	$/sf	Estimated Construction Cost
NEW HIGH SCHOOL ONLY OPTION 3	Sep-18				
NEW SCHOOL			187,793	$274.45	$51,540,533
DEMOLISH EXISTING SCHOOL			211,000	$6.00	$1,266,000
REMOVE HAZARDOUS MATERIALS (including foundation damproofing) [1]					$3,240,000
PHASING COSTS					NR
GAME FIELDS - OPTION 1 [2]					$1,498,600
BASEBALL FIELD [2]					$1,751,680
PRACTICE FIELD - CONCEPT 1 (synthetic turf with irrigation) [2]					$420,000
SITEWORK					$5,214,136
SUB-TOTAL			187,793	$345.76	$64,930,949
ESCALATION TO MID-POINT - (assumed 3% PA)	7%				$4,545,166
DESIGN AND PRICING CONTINGENCY	10%				$6,947,612
SUB-TOTAL			187,793	$406.96	$76,423,727
GENERAL CONDITIONS		33	MTHS	$160,000	$5,280,000
GENERAL REQUIREMENTS	3.00%				$2,292,712
BONDS	1.15%				$878,873
INSURANCE	1.40%				$1,069,932
PERMIT					Waived
CM FEE	2.5%				$1,910,593
CM/GMP CONTINGENCY	3%				$2,292,712
TOTAL OF ALL CONSTRUCTION			187,793	$480.04	**$90,148,549**

PM&C

Stoneham High School
Design Options 30-Nov-17
Stoneham, MA

Feasibility Estimate

ALTERNATES (Includes all Markups):

1. Sports Stadium and Concession Buildings	ADD	**$7,887,875**

[1] Pricing from UEC report dated June 1st 2017 (testing, inspection and monitoring fees excluded)

[2] Pricing from Warner Larsen Study Dated Dec 23rd, 2014 (escalated to 2017 at 4% per year)

This Feasibility cost estimate was produced from drawings, narratives and other documentation prepared by HMFH Architects Inc. and their design team received October 25, 2017. Design and engineering changes occurring subsequent to the issue of these documents have not been incorporated in this estimate.

This estimate includes all direct construction costs, construction manager's overhead, fee and design contingency. Cost escalation assumes start dates indicated.

Bidding conditions are expected to be public bidding under Chapter 149a of the Massachusetts General Laws to pre-qualified construction managers, and pre-qualified sub-contractors, open specifications for materials and manufactures.

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.

ITEMS NOT CONSIDERED IN THIS ESTIMATE

Items not included in this estimate are:

- Land acquisition, feasibility, and financing costs
- All professional fees and insurance
- Site or existing conditions surveys investigations costs, including to determine subsoil conditions
- All Furnishings, Fixtures and Equipment
- Items identified in the design as Not In Contract (NIC)
- Items identified in the design as by others
- Owner supplied and/or installed items as indicated in the estimate
- Utility company back charges, including work required off-site
- Work to City streets and sidewalks, (except as noted in this estimate)
- Construction contingency (GMP Contingency is included)
- Contaminated soils removal

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 211,000

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
HIGH SCHOOL ONLY RENOVATION - OPTION 1						
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$77,500			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$400,600	**$478,100**	$2.27	1.1%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$475,255			
	B1020	Roof Construction	$770,530	**$1,245,785**	$5.90	2.8%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$1,536,452			
	B2020	Windows/Curtainwall	$1,402,260			
	B2030	Exterior Doors	$197,748	**$3,136,460**	$14.86	7.1%
B30	**ROOFING**					
	B3010	Roof Coverings	$2,862,508			
	B3020	Roof Openings	$49,000	**$2,911,508**	$13.80	6.6%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$962,670			
	C1020	Interior Doors	$496,800			
	C1030	Specialties/Millwork	$1,532,400	**$2,991,870**	$14.18	6.8%
C20	**STAIRCASES**					
	C2010	Stair Construction	$156,000			
	C2020	Stair Finishes	$36,000	**$192,000**	$0.91	0.4%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$860,500			
	C3020	Floor Finishes	$2,154,945			
	C3030	Ceiling Finishes	$1,274,887	**$4,290,332**	$20.33	9.7%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$480,000	**$480,000**	$2.27	1.1%
D20	**PLUMBING**					
	D20	Plumbing	$2,832,600	**$2,832,600**	$13.42	6.4%
D30	**HVAC**					
	D30	HVAC	$11,605,000	**$11,605,000**	$55.00	26.2%
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$949,500	**$949,500**	$4.50	2.1%
D50	**ELECTRICAL**					
	D5010	Electrical Systems	$8,103,650	**$8,103,650**	$38.41	18.3%
E10	**EQUIPMENT**					
	E10	Equipment	$1,299,000	**$1,299,000**	$6.16	2.9%

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 211,000

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM	*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
HIGH SCHOOL ONLY RENOVATION - OPTION 1					
E20	**FURNISHINGS**				
E2010	Fixed Furnishings	$2,497,490			
E2020	Movable Furnishings	NIC	**$2,497,490**	$11.84	5.6%
F10	**SPECIAL CONSTRUCTION**				
F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**SELECTIVE BUILDING DEMOLITION**				
F2010	Building Elements Demolition	$1,205,420			
F2020	Hazardous Components Abatement	$0	**$1,205,420**	$5.71	2.7%
TOTAL DIRECT COST (Trade Costs)			***$44,218,715***	*$209.57*	*100.0%*

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 211,000

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL ONLY RENOVATION - OPTION 1						
	GROSS FLOOR AREA CALCULATION						
	Basement				27,843		
	First Floor				130,114		
	Second Floor				53,043		
	TOTAL GROSS FLOOR AREA (GFA)				**211,000**	***sf***	
	A10 FOUNDATIONS						
	A1010 STANDARD FOUNDATIONS						
	Repair cracks and resurface exposed concrete foundations	**1**	ls	25,000	25,000		
	Repair at site retaining wall	**1**	ls	20,000	20,000		
	Allowance for spalled concrete	**500**	sf	65.00	32,500		
	SUBTOTAL					77,500	
	A1020 SPECIAL FOUNDATIONS						
	No work in this section						
	SUBTOTAL						
	A1030 LOWEST FLOOR CONSTRUCTION						
	Cutting and patching for MEP	**1**	ls	25,000.00	25,000		
	New slab at bathroms and kitchen	**7,030**	sf	20.00	140,600		
	Replace loading dock	**1**	ls	30,000.00	30,000		
	Upgrade auditorium slopes for ADA compliance	**7,500**	sf	20.00	150,000		
	Equipment pads	**1**	ls	15,000.00	15,000		
	New elevator pit	**1**	ls	40,000.00	40,000		
	SUBTOTAL					400,600	
	TOTAL - FOUNDATIONS						**$478,100**
	B10 SUPERSTRUCTURE						
	B1010 FLOOR CONSTRUCTION						
	Openings in structure for MEP systems	**211,000**	gsf	0.50	105,500		
	Structural modifications to facilitate science classroom relocations	**1**	ls	100,000.00	100,000		
	Infill existing stair openings	**1,760**	sf	40.00	70,400		
	New stage floor structure	**2,553**	sf	35.00	89,355		
	New code compliant ramp	**2**	loc	30,000.00	60,000		
	Fire stopping floors	**1**	ls	50,000.00	50,000		
	SUBTOTAL					475,255	
	B1020 ROOF CONSTRUCTION						
	Roof Structure - Steel:						
	New reinforcing to low roofs for snow loading; 1 bay only against building	**11,653**	sf	10.00	116,530		
	New structural steel at new stage and fly loft	**37.5**	tns	6,000.00	225,000		
	New deck at rebuilt stage and fly loft	**2,600**	sf	15.00	39,000		
	Allowance to reinforce roof diaphrams	**68,000**	sf	5.00	340,000		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate **GFA** 211,000

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL ONLY RENOVATION - OPTION 1						
26	Support framing for new MEP systems	1	ls	50,000.00	50,000		
27	SUBTOTAL					770,530	
28	***TOTAL - SUPERSTRUCTURE***						**$1,245,785**
29	***B20 EXTERIOR CLOSURE***						
30	**B2010 EXTERIOR WALLS**	*39,579*	*sf*				
31	Repair and repoint exterior walls; assume 5%	1,979	sf	35.00	69,265		
31	Clean all exterior walls; includes staging	39,579	sf	8.00	316,632		
32	Repairs to existing chimney including new liner	1	ls	35,000.00	35,000		
32	Insulate exterior walls to meet code; blow in insulation	39,579	sf	5.00	197,895		
33	Repair spalling to concrete walls	1	ls	50,000.00	50,000		
33	Remove/patch walls for new windows	540	sf	25.00	13,500		
34	New lintel for windows	90	lf	250.00	22,500		
34	New masonry stage/fly loft walls	5,000	sf	65.00	325,000		
35	Clean existing lintels	922	lf	30.00	27,660		
35	Re-caulk existing CJ	300	lf	15.00	4,500		
36	Anchor the top of perimeter masonry partitions to the underside of the floor or structure above	949	loc	500.00	474,500		
36	SUBTOTAL					1,536,452	
37	**B2020 WINDOWS/CURTAINWALL**						
38	Replace existing windows/curtainwall etc.	11,070	sf	110.00	1,217,700		
38	New windows	540	sf	100.00	54,000		
39	Replace translucent panels	1,632	sf	80.00	130,560		
39	SUBTOTAL					1,402,260	
40	**B2030 EXTERIOR DOORS**						
41	Replace exterior glazed door, double	15	pr	8,500.00	127,500		
41	Replace exterior glazed door, single	2	ea	4,000.00	8,000		
42	Replace exterior single door	10	ea	2,100.00	21,000		
42	Replace garage doors	4	ea	8,800.00	35,200		
43	Backer rod & double sealant	504	lf	9.00	4,536		
43	Wood blocking at openings	504	lf	3.00	1,512		
44	SUBTOTAL					197,748	
45	***TOTAL - EXTERIOR CLOSURE***						**$3,136,460**
46	***B30 ROOFING***						
47	**B3010 ROOF COVERINGS**						
48	Replace existing roofing systems at auditorium/gymnasium/cafeteria	68,419	sf	22.00	1,505,218		
48	Replace remaining roofing	61,695	sf	22.00	1,357,290		
49	SUBTOTAL					2,862,508	
50	**B3020 ROOF OPENINGS**						
50	New stage smoke hatches	3	ea	8,000.00	24,000		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate **GFA** 211,000

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL ONLY RENOVATION - OPTION 1						
51	Replace roof ladders/hatches etc.	1	ls	25,000.00	25,000		
51	SUBTOTAL					49,000	
52	***TOTAL - ROOFING***						**$2,911,508**
53							
54	***C10 INTERIOR CONSTRUCTION***						
55	**C1010 PARTITIONS**						
55	Anchor the top of all masonry partitions to the underside of the floor or structure above	1,970	loc	350.00	689,500		
56	Fire rated partition @ stairs	5,445	sf	26.00	141,570		
56	Replace auditorium operable wall	68	lf	1,200.00	81,600		
57	Repair/Fill cracks in CMU walls	1	ls	50,000.00	50,000		
57	SUBTOTAL					962,670	
58	**C1020 INTERIOR DOORS**						
59	Adjust openings to meet code requirements	100	ea	3,500.00	350,000		
59	Remove and replace doors	92	ea	500.00	46,000		
60	New hardware to doors	192	ea	450.00	86,400		
60	New fire rated doors at stairs	4	pr	3,600.00	14,400		
61	SUBTOTAL					496,800	
62	**C1030 SPECIALTIES / MILLWORK**						
62	Toilet Partitions and accessories	211,000	gsf	0.80	168,800		
63	New stage proscenium	1	ls	100,000	100,000		
63	New markerboards/tackboards	211,000	gsf	1.00	211,000		
64	Upgrade athletic locker rooms specifically reconfigure showers to provide accessible shower stalls	2	ea	30,000.00	60,000		
64	Lockers, full height	710	ea	350.00	248,500		
65	New catwalk	1	ls	90,000.00	90,000		
65							
66	*055000 MISCELLANEOUS METALS*						
66	Miscellaneous metals throughout building	211,000	sf	1.00	211,000		
67							
67	*061000 ROUGH CARPENTRY*						
68	Rough blocking	211,000	sf	0.50	105,500		
68							
69	*070001 WATERPROOFING, DAMPPROOFING AND CAULKING*						
69	Miscellaneous sealants throughout building	211,000	sf	1.25	263,750		
70							
70							
71	*101400 SIGNAGE*						
71	Code compliant signage	211,000	sf	0.35	73,850		
72	SUBTOTAL					1,532,400	
72							
73	***TOTAL - INTERIOR CONSTRUCTION***						**$2,991,870**
73							
74							
74	***C20 STAIRCASES***						
75							

PM&C

Stoneham High School 30-Nov-17
Design Options
Stoneham, MA

Feasibility Estimate **GFA** 211,000

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL ONLY RENOVATION - OPTION 1						
	C2010 STAIR CONSTRUCTION						
	Upgrade existing stairs for code	2	flt	8,000.00	16,000		
	New stairs	4	flt	35,000.00	140,000		
	SUBTOTAL					156,000	
	C2020 STAIR FINISHES						
	New stair finishes; rubber treads/risers/landing and painting	6	flt	6,000.00	36,000		
	SUBTOTAL					36,000	
	TOTAL - STAIRCASES						**$192,000**
	C30 INTERIOR FINISHES						
	C3010 WALL FINISHES						
	Painting	211,000	gsf	3.00	633,000		
	Replace wood paneling at auditorium	1	ls	150,000.00	150,000		
	Replace acoustic panels at gym	1	ls	60,000.00	60,000		
	Repoint areas of exposed brick that have been damaged - Allowance	500	sf	35.00	17,500		
	SUBTOTAL					860,500	
	C3020 FLOOR FINISHES						
	New linoleum flooring throughout including floor prep	159,098	sf	8.00	1,272,784		
	New shock-absorbing wood gym floor	16,300	sf	20.00	326,000		
	Bathroom renovations	5,000	sf	90.00	450,000		
	New flooring at the stage	2,553	sf	22.00	56,166		
	New carpet	1,111	sy	45.00	49,995		
	SUBTOTAL					2,154,945	
	C3030 CEILING FINISHES						
	Replace ceiling at auditorium, provide new clouds	1	ls	200,000	200,000		
	Replace existing ACT	159,098	sf	6.50	1,034,137		
	Paint gym exposed ceiling	16,300	sf	2.50	40,750		
	SUBTOTAL					1,274,887	
	TOTAL - INTERIOR FINISHES						**$4,290,332**
	D10 CONVEYING SYSTEMS						
	Remove existing elevator	1	ls	40,000.00	40,000		
	Remove existing elevator and install new elevator	3	stp	135,000.00	405,000		
	New lift	1	stp	35,000.00	35,000		
	SUBTOTAL					480,000	
	TOTAL - CONVEYING SYSTEMS						**$480,000**
	D20 PLUMBING						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate **GFA** 211,000

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL ONLY RENOVATION - OPTION 1						
101	**D20 PLUMBING, GENERALLY**						
101	Equipment						
102	Gas fired domestic HW heater; 400,000 BTUH	2	ea	28,000.00	56,000		
102	HW storage tank	2	ea	5,000.00	10,000		
103	Plumbing equipment	211,000	sf	2.00	422,000		
103	Plumbing Fixtures & Specialties						
104	Miscellaneous plumbing fixtures	211,000	sf	1.00	211,000		
104	Domestic Water Type L Copper Pipe						
105	Domestic water pipe with fittings & hangers	211,000	sf	2.50	527,500		
105	Domestic water pipe insulation	211,000	sf	1.50	316,500		
106	Sanitary Waste And Vent Pipe w/ Hangers						
106	Sanitary waste pipe with fittings & hangers	211,000	sf	2.35	495,850		
107	Kitchen waste pipe with fittings & hangers	211,000	sf	0.30	63,300		
107	Acid Waste And Vent Pipe w/ Hangers						
108	Acid waste & vent pipe with fittings & hangers	211,000	sf	0.75	158,250		
108	Storm Drainage, Hubless Cast Iron Pipe						
109	Storm water pipe with fittings & hangers	211,000	sf	1.25	263,750		
109	Pipe insulation on horizontal runs	211,000	sf	0.20	42,200		
110	Gas And Fuel Distribution Pipe						
110	Gas pipe with fittings & hangers	211,000	sf	0.75	158,250		
111	Miscellaneous						
111	Coordination & BIM	1	ls	50,000.00	50,000		
112	Coring, sleeves & firestopping	1	ls	7,000.00	7,000		
112	Commissioning support	1	ls	20,000.00	20,000		
113	Testing and sterilization	1	ls	6,000.00	6,000		
113	Fees & permits	1	ls	25,000.00	25,000		
114	SUBTOTAL					2,832,600	
114							
115	***TOTAL - PLUMBING***						**$2,832,600**
115							
116							
116	***D30 HVAC***						
117							
117	**D30 HVAC, GENERALLY**						
118	HVAC Equipment						
118	Gas fired HW boiler	3	ea	30,000.00	ETR		
119	New HVAC system; full AC; chilled beam; 4-pipe system	211,000	gsf	55.00	11,605,000		
119	SUBTOTAL					11,605,000	
120							
120	***TOTAL - HVAC***						**$11,605,000**
121							
121							
122	***D40 FIRE PROTECTION***						
122							
123	**D40 FIRE PROTECTION, GENERALLY**						
123	New sprinkler system	211,000	gsf	4.50	949,500		
124	SUBTOTAL					949,500	
124							
125	***TOTAL - FIRE PROTECTION***						**$949,500**
125							

PM&C

Stoneham High School 30-Nov-17
Design Options
Stoneham, MA

Feasibility Estimate **GFA** 211,000

		DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
		HIGH SCHOOL ONLY RENOVATION - OPTION 1						
		D50 ELECTRICAL						
	D5010	**SERVICE & DISTRIBUTION**						
		Gear & Distribution						
		2000 amp switchgear				ETR		
		Normal power distribution switchgear & feeders	**211,000**	sf	4.00	844,000		
		Emergency power						
		Emergency power distribution switchgear & feeders; 275 kW diesel generator	**211,000**	sf	4.00	844,000		
		UPS system						
		30kVA UPS system and switchgear	**1**	ea	30,000.00	30,000		
		Equipment Wiring						
		Equipment wiring	**211,000**	sf	2.25	474,750		
		SUBTOTAL					2,192,750	
	D5020	**LIGHTING & POWER**						
		Lighting & Branch Power				-		
		Lighting fixtures (LED as BOD) with installation labor	**211,000**	sf	5.00	1,055,000		
		Lighting control system						
		Lighting controls including interface with DDC	**211,000**	sf	1.75	369,250		
		Branch devices						
		Branch devices	**211,000**	sf	0.50	105,500		
		Lighting and branch circuitry						
		Lighting & branch circuitry	**211,000**	sf	5.50	1,160,500		
260000		SUBTOTAL					2,690,250	
	D5030	**COMMUNICATION & SECURITY SYSTEMS**						
		Fire Alarm						
		Fire alarm system	**211,000**	sf	2.50	527,500		
		Bi-Directional System						
		BDA system	**211,000**	sf	0.50	105,500		
		Security System						
		Security System	**211,000**	sf	2.50	527,500		
		Telephone/Data/CATV						
		Network switches, PBX, IP, VP, CCTV (By owner)				By Owner		
		Telecommunications rough in	**211,000**	sf	1.50	316,500		
		Telecommunications devices and cabling	**211,000**	sf	2.00	422,000		
		Public Address/Clock System						
		PA/Master Clock system	**211,000**	sf	1.25	263,750		
		Audio Visual (rough-in and power only)						
		AV equipment				By Owner		
		Rough-In conduit and backboxes only	**211,000**	sf	0.50	105,500		
		Auditorium						
		Rigging system equipment & installation				See equipment		
		Power to rigging equipment	**1**	ls	12,000.00	12,000		
		Stage dimming system with performance fixture package, allow	**1**	ls	275,000.00	275,000		
		Installation, rough-in & 120V power to dimming equipment	**1**	ls	70,000.00	70,000		
		Performance audio visual equipment, installation & LV cabling, allow	**1**	ls	150,000.00	150,000		
		Performance audio visual rough-in and power	**1**	ls	60,000.00	60,000		
		Gymnasium						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate **GFA** 211,000

		DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
		HIGH SCHOOL ONLY RENOVATION - OPTION 1						
151		Sound system	1	ls	15,000.00	15,000		
151		Scoreboard/ shot clocks with feed and connection	1	ea	15,000.00	15,000		
152		Misc. gym equipment feed and connections	1	ls	15,000.00	15,000		
152		SUBTOTAL					2,880,250	
153								
153	**D5040**	**OTHER ELECTRICAL SYSTEMS**						
154		Miscellaneous						
154		Demolition & make safe	1	ls	30,000.00	30,000		
155		Temp power and lights	211,000	sf	0.45	94,950		
155		Seismic restraints	1	ls	15,000.00	15,000		
156		Lightning Protection System, UL Master label	211,000	sf	0.45	94,950		
156		Fees & Permits	211,000	sf	0.50	105,500		
157		SUBTOTAL					340,400	
157								
158		***TOTAL - ELECTRICAL***						**$8,103,650**
158								
159								
159	***E10***	***EQUIPMENT***						
160								
160	**E10**	**EQUIPMENT, GENERALLY**						
161		Gym wall pads	1	ls	20,000.00	20,000		
161		Basketball backstops; swing up; electric operated	12	loc	10,000.00	120,000		
162		Gymnasium dividing net; electrically operated	3	ea	30,000.00	90,000		
162		Volleyball net and standards	1	ls	5,000.00	5,000		
163		Telescoping bleachers	900	seats	120.00	108,000		
163		Theatrical Equipment Stage curtains, rigging and controls	1	ls	350,000.00	350,000		
164		Theatrical AV allowance	1	ls	200,000.00	200,000		
164		Kitchen equipment	2,030	sf	200.00	406,000		
165		SUBTOTAL					1,299,000	
165								
166		***TOTAL - EQUIPMENT***						**$1,299,000**
166								
167								
167	***E20***	***FURNISHINGS***						
168								
168	**E2010**	**FIXED FURNISHINGS**						
169		Window shades	11,070	sf	7.00	77,490		
169		Entrance mats	1	ls	20,000.00	20,000		
170		Replace auditorium seats	1,100	seat	350.00	385,000		
170								
171	*123553*	*CASEWORK*						
171		Sinks, counters and casework in classrooms	51	ea	25,000.00	1,275,000		
172		New casework in science rooms inclusive of eyewash and emergency shower stations and four fume hoods	10	ea	60,000.00	600,000		
172		Sinks, counters and casework in computer rooms	4	ea	25,000.00	100,000		
173		Sinks, counters and casework in art	1	ea	40,000.00	40,000		

PM&C

Stoneham High School 30-Nov-17
Design Options
Stoneham, MA

Feasibility Estimate **GFA** 211,000

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL ONLY RENOVATION - OPTION 1						
	SUBTOTAL					2,497,490	
E2020	**MOVABLE FURNISHINGS**						
	All movable furnishings to be provided and installed by owner						
	SUBTOTAL					NIC	
	TOTAL - FURNISHINGS						**$2,497,490**
F10	***SPECIAL CONSTRUCTION***						
F10	**SPECIAL CONSTRUCTION**						
	SUBTOTAL					-	
	TOTAL - SPECIAL CONSTRUCTION						
F20	***SELECTIVE BUILDING DEMOLITION***						
F2010	**BUILDING ELEMENTS DEMOLITION**						
	Remove exterior glazing	**11,070**	sf	6.00	66,420		
	Remove roofing	**68,419**	sf	2.00	In HazMat		
	Demolish existing stage	**2,600**	sf	15.00	39,000		
	Shoring	**1**	ls	25,000.00	25,000		
	Remove existing stairs	**4**	flts	5,000.00	20,000		
	Interior demolition	**211,000**	gsf	4.00	844,000		
	Temporary enclosures/protection	**211,000**	sf	1.00	211,000		
	SUBTOTAL					1,205,420	
F2020	**HAZARDOUS COMPONENTS ABATEMENT**						
	See summary						
	SUBTOTAL						
	TOTAL - SELECTIVE BUILDING DEMOLITION						**$1,205,420**

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1 RENOVATION - PHASING COSTS							
	Foundations for stick built lobbies/connector	**5,000**	sf	8.00	40,000		
	SOG at temporary work	**5,000**	sf	10.00	50,000		
	Stick built lobbies/connector	**5,000**	sf	140.00	700,000		
	Temporary classrooms; including bathrooms	**28**	rooms	180,000.00	5,040,000		
	Temporary utilities to the modular construction	**1**	ls	50,000.00	50,000		
	Temporary main entrance	**1**	ls	100,000.00	100,000		
	Rebuild parking area after removal of PH1 temporary classrooms	**14,000**	sf	5.00	70,000		
	TOTAL - PHASING COSTS						**6,050,000**

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	SITEWORK RENOVATE HIGH SCHOOL - OPTION 1						
	G SITEWORK						
G10	**SITE PREPARATION & DEMOLITION**						
	Site construction fence/barricades	**3,400**	lf	12.00	40,800		
	Site construction fence gates	**1**	ea	10,000.00	10,000		
	Stabilized construction entrance	**1**	ls	15,000.00	15,000		
	Miscellaneous demolition	**1**	ls	150,000.00	150,000		
	Site Earthwork						
	Strip Topsoil and remove; 6" thick	**3,148**	cy	12.00	37,776		
	Fine grading	**200,000**	sf	0.20	40,000		
	Silt fence/erosion control, wash bays, stock piles	**3,400**	lf	12.00	40,800		
	Silt fence maintenance and monitoring	**1**	ls	40,000.00	40,000		
	Hazardous Waste Remediation						
	Remove existing underground fuel storage tanks	**1**	ls		NR		
	Dispose/treat contaminated soils	**1**	ls		NR		
	SUBTOTAL					374,376	
G20	**SITE IMPROVEMENTS**						
	Asphalt Paving; parking lot and roadway; mill and pave only	*163,157*	sf				
	gravel base; 12" thick	**6,043**	cy	35.00	ETR		
	asphalt; mill and pave	**18,129**	sy	16.00	290,064		
	VGC	**7,231**	lf	34.00	ETR		
	Single solid lines, 4" thick	**1**	ls	10,000.00	10,000		
	Crosswalk Hatching	**4**	loc	900.00	3,600		
	Other road markings	**1**	ls	7,500.00	7,500		
	HC curb cuts	**8**	loc	350.00	2,800		
	Signage	**1**	ls	20,000.00	20,000		
	Pedestrian Paving						
	Concrete paving						
	gravel base; 8" thick	**372**	cy	35.00	13,020		
	4" concrete paving	**15,000**	sf	7.00	105,000		
	Site Improvements						
	Flag pole 50' high	**1**	ea	6,500.00	6,500		
	Concrete retaining walls				Assumed not required		
	Repair to stairs	**1**	ls	50,000.00	50,000		
	Pre-K playground and equipment	**1**	ls	150,000.00	150,000		
	Other site improvements; walls, fences etc.	**1**	ls	200,000.00	200,000		
	SUBTOTAL					858,484	
	Landscaping						
	Topsoil - Import new topsoil; minimum 6"	**3,148**	cy	42.00	132,216		
	Lawn - loam & seed	**170,000**	sf	0.25	42,500		
	Allowance for courtyard upgrades	**2**	loc	75,000.00	150,000		
	Planting allowance	**1**	ls	150,000.00	150,000		
	SUBTOTAL					474,716	
G30	**CIVIL MECHANICAL UTILITIES**						
	Utilities - Enabling						
	Allowance for temporary utilities etc.	**1**	ls	50,000.00	50,000		
	Water supply; Pricing includes E&B and bedding						
	New DI piping; 8"	**557**	lf	100.00	ETR		
	New DI piping; 8" Fire	**557**	lf	100.00	55,700		
	Connect to existing	**1**	loc	5,000.00	5,000		
	FD connection	**1**	ea	2,000.00	2,000		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	SITEWORK RENOVATE HIGH SCHOOL - OPTION 1						
	Gate valves	8	ea	750.00	6,000		
	Fire hydrant	3	ea	5,000.00	15,000		
	Sanitary; Pricing includes E&B and bedding						
	Manholes	2	ea	4,000.00	8,000		
	Grease trap	1	ea	15,000.00	15,000		
	8" PVC	200	lf	60.00	12,000		
	Connect to existing drain	1	ea	3,000.00	3,000		
	Storm water; Pricing includes E&B and bedding						
	Allowance for new drainage systems; piping only	163,157	sf	2.00	326,314		
	Infiltration systems; cultec chambers	137,500	cf	7.00	962,500		
	Catch basins	12	ea	3,800.00	45,600		
	Manholes	10	ea	4,500.00	45,000		
	WQ structures	3	ea	16,000.00	48,000		
	Area drains	4	ea	1,500.00	6,000		
	Gas service						
	E&B trench for new gas pipe - install by plumbing	557	lf	25.00	13,925		
	SUBTOTAL					1,619,039	
G40	**ELECTRICAL UTILITIES**						
	Power						
	Utility co. backcharges, allow	1	ls	30,000.00	Utility co.		
	Connections at existing manhole				Utility co.		
	Manhole	1	ls	8,500.00	ETR		
	Connections in manhole	1	ls	3,500.00	ETR		
	Primary ductbank 2-5" ductbank, empty, allow	557	lf	120.00	ETR		
	Transformer by utility company				By Utility Co.		
	Transformer pad	1	ea	2,500.00	ETR		
	Secondary service	60	lf	1,100.00	ETR		
	Communications						
	Connection at riser pole, allow	1	ea	1,500.00	ETR		
	Telecom ductbank 4-4", allow	557	lf	152.00	ETR		
	Site Lighting						
	Site Parking lighting (allow)	1	ls	100,000.00	100,000		
	SUBTOTAL					100,000	
	TOTAL - SITE DEVELOPMENT						***$3,426,615***

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 38,714

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
HIGH SCHOOL RENOVATION - OPTION 2						
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$42,500			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$61,000	**$103,500**	$2.67	1.3%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$24,357			
	B1020	Roof Construction	$100,000	**$124,357**	$3.21	1.5%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$487,588			
	B2020	Windows/Curtainwall	$687,710			
	B2030	Exterior Doors	$44,416	**$1,219,714**	$31.51	14.9%
B30	**ROOFING**					
	B3010	Roof Coverings	$382,074			
	B3020	Roof Openings	$5,000	**$387,074**	$10.00	4.7%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$151,850			
	C1020	Interior Doors	$113,600			
	C1030	Specialties/Millwork	$249,699	**$515,149**	$13.31	6.3%
C20	**STAIRCASES**					
	C2010	Stair Construction	$8,000			
	C2020	Stair Finishes	$6,000	**$14,000**	$0.36	0.2%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$193,642			
	C3020	Floor Finishes	$534,924			
	C3030	Ceiling Finishes	$170,282	**$898,848**	$23.22	11.0%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$40,000	**$40,000**	$1.03	0.5%
D20	**PLUMBING**					
	D20	Plumbing	$541,996	**$541,996**	$14.00	6.6%
D30	**HVAC**					
	D30	HVAC	$1,742,130	**$1,742,130**	$45.00	21.3%
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$174,213	**$174,213**	$4.50	2.1%
D50	**ELECTRICAL**					
	D5010	Electrical Systems	$1,470,798	**$1,470,798**	$37.99	18.0%
E10	**EQUIPMENT**					
	E10	Equipment	$343,000	**$343,000**	$8.86	4.2%

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 38,714

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM	*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
HIGH SCHOOL RENOVATION - OPTION 2					
E20	**FURNISHINGS**				
E2010	Fixed Furnishings	$281,635			
E2020	Movable Furnishings	NIC	**$281,635**	$7.27	3.4%
F10	**SPECIAL CONSTRUCTION**				
F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**SELECTIVE BUILDING DEMOLITION**				
F2010	Building Elements Demolition	$323,828			
F2020	Hazardous Components Abatement	$0	**$323,828**	$8.36	4.0%
TOTAL DIRECT COST (Trade Costs)			***$8,180,242***	*$211.30*	*100.0%*

PM&C

Stoneham High School 30-Nov-17
Design Options
Stoneham, MA

Feasibility Estimate **GFA** 38,714

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL RENOVATION - OPTION 2						
	GROSS FLOOR AREA CALCULATION						
	Basement				21,347		
	First Floor				17,367		
	TOTAL GROSS FLOOR AREA (GFA)				**38,714**	***sf***	
	A10 FOUNDATIONS						
A1010	**STANDARD FOUNDATIONS**						
	Repair cracks and resurface exposed concrete foundations	**1**	ls	10,000	10,000		
	Allowance for spalled concrete	**500**	sf	65.00	32,500		
	SUBTOTAL					42,500	
A1020	**SPECIAL FOUNDATIONS**						
	No work in this section						
	SUBTOTAL						
A1030	**LOWEST FLOOR CONSTRUCTION**						
	Cutting and patching for MEP	**1**	ls	10,000.00	10,000		
	New slab at bathroms and kitchen	**550**	sf	20.00	11,000		
	Replace loading dock	**1**	ls	30,000.00	30,000		
	Equipment pads	**1**	ls	10,000.00	10,000		
	SUBTOTAL					61,000	
	TOTAL - FOUNDATIONS						**$103,500**
	B10 SUPERSTRUCTURE						
B1010	**FLOOR CONSTRUCTION**						
	Openings in structure for MEP systems	**38,714**	gsf	0.50	19,357		
	Fire stopping floors	**1**	ls	5,000.00	5,000		
	SUBTOTAL					24,357	
B1020	**ROOF CONSTRUCTION**						
	Roof Structure - Steel:						
	Allowance to reinforce roof diaphrams	**17,000**	sf	5.00	85,000		
	Support framing for new MEP systems	**1**	ls	15,000.00	15,000		
	SUBTOTAL					100,000	
	TOTAL - SUPERSTRUCTURE						**$124,357**
	B20 EXTERIOR CLOSURE						
B2010	**EXTERIOR WALLS**	*7,701*	*sf*				
	Repair and repoint exterior walls; assume 5%	**385**	sf	35.00	13,475		
	Clean all exterior walls; includes staging	**7,701**	sf	8.00	61,608		
	Repairs to existing chimney including new liner	**1**	ls	35,000.00	35,000		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate **GFA** 38,714

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL RENOVATION - OPTION 2						
52	Insulate exterior walls to meet code; blow in insulation	7,701	sf	5.00	38,505		
53	Repair spalling to concrete walls	1	ls	25,000.00	25,000		
54	New masonry at exterior wall once demoltion of existing occurs	2,940	sf	65.00	191,100		
55	Clean existing lintels	280	lf	30.00	8,400		
56	Anchor the top of perimeter masonry partitions to the underside of the floor or structure above	229	loc	500.00	114,500		
57	SUBTOTAL					487,588	
58							
59	**B2020 WINDOWS/CURTAINWALL**						
60	Replace existing windows/curtainwall etc.	3,805	sf	110.00	418,550		
61	New windows at exterior wall after demolition	1,260	sf	110.00	138,600		
62	Replace translucent panels	1,632	sf	80.00	130,560		
63	SUBTOTAL					687,710	
64							
65	**B2030 EXTERIOR DOORS**						
66	Replace exterior single door	4	ea	2,100.00	8,400		
67	Replace garage doors	4	ea	8,800.00	35,200		
68	Backer rod & double sealant	68	lf	9.00	612		
69	Wood blocking at openings	68	lf	3.00	204		
70	SUBTOTAL					44,416	
71							
72	***TOTAL - EXTERIOR CLOSURE***						**$1,219,714**
73							
74							
75	***B30 ROOFING***						
76							
77	**B3010 ROOF COVERINGS**						
78	Replace existing roofing systems	17,367	sf	22.00	382,074		
79	SUBTOTAL					382,074	
80							
81	**B3020 ROOF OPENINGS**						
82	Replace roof ladders/hatches etc.	1	ls	5,000.00	5,000		
83	SUBTOTAL					5,000	
84							
85	***TOTAL - ROOFING***						**$387,074**
86							
87							
88	***C10 INTERIOR CONSTRUCTION***						
89							
90	**C1010 PARTITIONS**						
91	Anchor the top of all masonry partitions to the underside of the floor or structure above	391	loc	350.00	136,850		
92	Repair/Fill cracks in CMU walls	1	ls	15,000.00	15,000		
93	SUBTOTAL					151,850	
94							
95	**C1020 INTERIOR DOORS**						
96	Adjust openings to meet code requirements	19	ea	3,500.00	66,500		
97	Remove and replace doors	19	ea	500.00	9,500		
98	New dioors, frames and hardware	7	ea	1,900.00	13,300		
99	New hardware to doors	38	ea	450.00	17,100		
100	New fire rated doors at stairs	2	pr	3,600.00	7,200		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate **GFA** 38,714

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL RENOVATION - OPTION 2						
	SUBTOTAL					113,600	
C1030	**SPECIALTIES / MILLWORK**						
	Toilet Partitions and accessories	**38,714**	gsf	0.80	30,971		
	New markerboards/tackboards	**38,714**	gsf	1.00	38,714		
	Upgrade athletic locker rooms specifically reconfigure showers to provide accessible shower stalls	**2**	ea	30,000.00	60,000		
055000	*MISCELLANEOUS METALS*						
	Miscellaneous metals throughout building	**38,714**	sf	1.00	38,714		
061000	*ROUGH CARPENTRY*						
	Rough blocking	**38,714**	sf	0.50	19,357		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Miscellaneous sealants throughout building	**38,714**	sf	1.25	48,393		
101400	*SIGNAGE*						
	Code compliant signage	**38,714**	sf	0.35	13,550		
	SUBTOTAL					249,699	
	TOTAL - INTERIOR CONSTRUCTION						**$515,149**
C20	***STAIRCASES***						
C2010	**STAIR CONSTRUCTION**						
	Upgrade existing stairs for code	**1**	flt	8,000.00	8,000		
	SUBTOTAL					8,000	
C2020	**STAIR FINISHES**						
	New stair finishes; rubber treads/risers/landing and painting	**1**	flt	6,000.00	6,000		
	SUBTOTAL					6,000	
	TOTAL - STAIRCASES						**$14,000**
C30	***INTERIOR FINISHES***						
C3010	**WALL FINISHES**						
	Painting	**38,714**	gsf	3.00	116,142		
	Replace acoustic panels at gym	**1**	ls	60,000.00	60,000		
	Repoint areas of exposed brick that have been damaged - Allowance	**500**	sf	35.00	17,500		
	SUBTOTAL					193,642	
C3020	**FLOOR FINISHES**						
	New linoleum flooring throughout including floor prep	**19,928**	sf	8.00	159,424		
	New shock-absorbing wood gym floor	**16,300**	sf	20.00	326,000		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate **GFA** 38,714

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL RENOVATION - OPTION 2						
	Bathroom renovations	550	sf	90.00	49,500		
	SUBTOTAL					534,924	
C3030	**CEILING FINISHES**						
	Replace existing ACT	19,928	sf	6.50	129,532		
	Paint gym exposed ceiling	16,300	sf	2.50	40,750		
	SUBTOTAL					170,282	
	TOTAL - INTERIOR FINISHES						**$898,848**
D10	***CONVEYING SYSTEMS***						
	Remove existing elevator	1	ls	40,000.00	40,000		
	SUBTOTAL					40,000	
	TOTAL - CONVEYING SYSTEMS						**$40,000**
D20	***PLUMBING***						
D20	**PLUMBING, GENERALLY**						
	Plumbing allowance	38,714	gsf	14.00	541,996		
	SUBTOTAL					541,996	
	TOTAL - PLUMBING						**$541,996**
D30	***HVAC***						
D30	**HVAC, GENERALLY**						
	HVAC Equipment						
	Gas fired HW boiler	3	ea	30,000.00	ETR		
	New HVAC system; full AC	38,714	gsf	45.00	1,742,130		
	SUBTOTAL					1,742,130	
	TOTAL - HVAC						**$1,742,130**
D40	***FIRE PROTECTION***						
D40	**FIRE PROTECTION, GENERALLY**						
	New sprinkler system	38,714	gsf	4.50	174,213		
	SUBTOTAL					174,213	
	TOTAL - FIRE PROTECTION						**$174,213**
D50	***ELECTRICAL***						
D5010	**SERVICE & DISTRIBUTION**						
	Gear & Distribution						
	2000 amp switchgear				ETR		
	Normal power distribution switchgear & feeders	38,714	sf	4.00	154,856		
	Emergency power						

PM&C

Stoneham High School 30-Nov-17
Design Options
Stoneham, MA

Feasibility Estimate **GFA** 38,714

		DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
		HIGH SCHOOL RENOVATION - OPTION 2						
205		Emergency power distribution switchgear & feeders; 275 kW diesel generator	**38,714**	sf	4.00	154,856		
206		UPS system						
207		30kVA UPS system and switchgear	**1**	ea	30,000.00	30,000		
208		Equipment Wiring						
209		Equipment wiring	**38,714**	sf	2.25	87,107		
210		SUBTOTAL					426,819	
211								
212	**D5020**	**LIGHTING & POWER**						
213		Lighting & Branch Power				-		
214		Lighting fixtures (LED as BOD) with installation labor	**38,714**	sf	5.00	193,570		
215		Lighting control system						
216		Lighting controls including interface with DDC	**38,714**	sf	1.75	67,750		
217		Branch devices						
218		Branch devices	**38,714**	sf	0.50	19,357		
219		Lighting and branch circuitry						
220		Lighting & branch circuitry	**38,714**	sf	5.50	212,927		
221	260000	SUBTOTAL					493,604	
222								
223	**D5030**	**COMMUNICATION & SECURITY SYSTEMS**						
224		Fire Alarm						
225		Fire alarm system	**38,714**	sf	2.50	96,785		
226		Bi-Directional System						
227		BDA system	**38,714**	sf	0.50	19,357		
228		Security System						
229		Security System	**38,714**	sf	2.50	96,785		
230		Telephone/Data/CATV						
231		Network switches, PBX, IP, VP, CCTV (By owner)				By Owner		
232		Telecommunications rough in	**38,714**	sf	1.50	58,071		
233		Telecommunications devices and cabling	**38,714**	sf	2.00	77,428		
234		Public Address/Clock System						
235		PA/Master Clock system	**38,714**	sf	1.25	48,393		
236		Audio Visual (rough-in and power only)						
237		AV equipment				By Owner		
238		Rough-In conduit and backboxes only	**38,714**	sf	0.50	19,357		
239		Gymnasium						
240		Sound system	**1**	ls	15,000.00	15,000		
241		Scoreboard/ shot clocks with feed and connection	**1**	ea	15,000.00	15,000		
242		Misc. gym equipment feed and connections	**1**	ls	15,000.00	15,000		
243		SUBTOTAL					461,176	
244								
245	**D5040**	**OTHER ELECTRICAL SYSTEMS**						
246		Miscellaneous						
247		Demolition & make safe	**1**	ls	30,000.00	30,000		
248		Temp power and lights	**38,714**	sf	0.45	17,421		
249		Seismic restraints	**1**	ls	5,000.00	5,000		
250		Lightning Protection System, UL Master label	**38,714**	sf	0.45	17,421		
251		Fees & Permits	**38,714**	sf	0.50	19,357		
252		SUBTOTAL					89,199	
253								
254		***TOTAL - ELECTRICAL***						**$1,470,798**

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate **GFA** 38,714

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL RENOVATION - OPTION 2						
	E10 EQUIPMENT						
E10	**EQUIPMENT, GENERALLY**						
	Gym wall pads	**1**	ls	20,000.00	20,000		
	Basketball backstops; swing up; electric operated	**12**	loc	10,000.00	120,000		
	Gymnasium dividing net; electrically operated	**3**	ea	30,000.00	90,000		
	Volleyball net and standards	**1**	ls	5,000.00	5,000		
	Telescoping bleachers	**900**	seats	120.00	108,000		
	SUBTOTAL					343,000	
	TOTAL - EQUIPMENT						**$343,000**
	E20 FURNISHINGS						
E2010	**FIXED FURNISHINGS**						
	Window shades	**3,805**	sf	7.00	26,635		
	Entrance mats	**1**	ls	5,000.00	5,000		
123553	*CASEWORK*						
	Sinks, counters and casework in classrooms	**10**	ea	25,000.00	250,000		
	SUBTOTAL					281,635	
E2020	**MOVABLE FURNISHINGS**						
	All movable furnishings to be provided and installed by owner						
	SUBTOTAL					NIC	
	TOTAL - FURNISHINGS						**$281,635**
	F10 SPECIAL CONSTRUCTION						
F10	**SPECIAL CONSTRUCTION**						
	SUBTOTAL					-	
	TOTAL - SPECIAL CONSTRUCTION						
	F20 SELECTIVE BUILDING DEMOLITION						
F2010	**BUILDING ELEMENTS DEMOLITION**						
	Remove exterior glazing	**3,805**	sf	6.00	22,830		
	Remove roofing	**17,367**	sf	2.00	In HazMat		
	Interior demolition	**38,714**	gsf	4.00	154,856		
	Temporary exterior	**750**	sf	40.00	30,000		
	Temporary enclosures/protection	**38,714**	sf	3.00	116,142		
	SUBTOTAL					323,828	
F2020	**HAZARDOUS COMPONENTS ABATEMENT**						
	See summary						

PM&C

Stoneham High School 30-Nov-17

Design Options

Stoneham, MA

Feasibility Estimate **GFA** 38,714

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	HIGH SCHOOL RENOVATION - OPTION 2						
307	SUBTOTAL						
308							
308	***TOTAL - SELECTIVE BUILDING DEMOLITION***						**$323,828**
309							

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 149,079

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 2 NEW ADDITION						
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$1,291,931			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$1,009,391	**$2,301,322**	$15.44	5.4%
A20	**BASEMENT CONSTRUCTION**					
	A2010	Basement Excavation	$423,302			
	A2020	Basement Walls	$649,916	**$1,073,218**	$7.20	2.5%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$2,379,194			
	B1020	Roof Construction	$3,031,464	**$5,410,658**	$36.29	12.8%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$2,118,166			
	B2020	Windows	$1,416,101			
	B2030	Exterior Doors	$89,960	**$3,624,227**	$24.31	8.6%
B30	**ROOFING**					
	B3010	Roof Coverings	$1,975,138			
	B3020	Roof Openings	$32,500	**$2,007,638**	$13.47	4.7%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$3,279,738			
	C1020	Interior Doors	$745,395			
	C1030	Specialties/Millwork	$1,255,372	**$5,280,505**	$35.42	12.5%
C20	**STAIRCASES**					
	C2010	Stair Construction	$158,000			
	C2020	Stair Finishes	$25,149	**$183,149**	$1.23	0.4%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$1,490,790			
	C3020	Floor Finishes	$1,639,869			
	C3030	Ceiling Finishes	$1,192,632	**$4,323,291**	$29.00	10.2%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$120,000	**$120,000**	$0.80	0.3%
D20	**PLUMBING**					
	D20	Plumbing	$2,087,106	**$2,087,106**	$14.00	4.9%
D30	**HVAC**					
	D30	HVAC	$6,708,555	**$6,708,555**	$45.00	15.9%

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 149,079

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 2 NEW ADDITION						
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$670,856	**$670,856**	$4.50	1.6%
D50	**ELECTRICAL**					
	D5010	Complete System	$6,001,211	**$6,001,211**	$40.26	14.2%
E10	**EQUIPMENT**					
	E10	Equipment	$1,341,000	**$1,341,000**	$9.00	3.2%
E20	**FURNISHINGS**					
	E2010	Fixed Furnishings	$1,138,343			
	E2020	Movable Furnishings	NIC	**$1,138,343**	$7.64	2.7%
F10	**SPECIAL CONSTRUCTION**					
	F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**HAZMAT REMOVALS**					
	F2010	Building Elements Demolition	$0			
	F2020	Hazardous Components Abatement	$0	**$0**	$0.00	0.0%
TOTAL DIRECT COST (Trade Costs)				***$42,271,079***	*$283.55*	*100.0%*

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	GROSS FLOOR AREA CALCULATION						
	Basement			19,545			
	First Floor			89,779			
	Third floor			39,755			
	TOTAL GROSS FLOOR AREA (GFA)				**149,079**	***sf***	
A10	***FOUNDATIONS***						
A1010	**STANDARD FOUNDATIONS**						
	Continuous Footings at interior; 2'-6" wide x 12" deep						
	Formwork	**2,528**	sf	12.00	30,336		
	Re-bar	**12,640**	lbs.	1.32	16,685		
	Concrete material; 3,000 psi	**129**	cy	132.00	17,028		
	Placing concrete	**129**	cy	90.00	11,610		
	Foundation wall; 14" thick x 36" high						
	Formwork	**7,584**	sf	17.00	128,928		
	Re-bar	**15,168**	lbs.	1.32	20,022		
	Concrete material; 3,000 psi	**181**	cy	132.00	23,892		
	Placing concrete	**181**	cy	90.00	16,290		
	Grade beams at interior; 2'-6" wide x 2'-6" deep						
	Formwork	**5,385**	sf	12.00	64,620		
	Re-bar	**48,465**	lbs.	1.32	63,974		
	Concrete material; 3,000 psi	**274**	cy	132.00	36,168		
	Placing concrete	**274**	cy	90.00	24,660		
	Spread Footings at interior; 10'-0" x 10'-0" x 2'-4" deep						
	Formwork	**4,008**	sf	16.00	64,128		
	Re-bar	**40,850**	lbs.	1.32	53,922		
	Concrete material; 3,000 psi	**408**	cy	132.00	53,856		
	Placing concrete	**408**	cy	90.00	36,720		
	Set anchor bolts grout plates	**172**	ea	165.00	28,380		
	Spread Footings at perimeter; 7'-0" x 7'-0" x 1'-10" deep						
	Formwork	**3,945**	sf	16.00	63,120		
	Re-bar	**26,950**	lbs.	1.32	35,574		
	Concrete material; 3,000 psi	**281**	cy	132.00	37,092		
	Placing concrete	**281**	cy	90.00	25,290		
	Set anchor bolts grout plates	**308**	ea	165.00	50,820		
	Piers/Pilasters; 22" x 22"						
	Formwork 18" x 18"	**1,848**	sf	18.00	33,264		
	Re-bar	**12,320**	lbs	1.32	16,262		
	Concrete material; 3,000 psi	**50**	cy	132.00	6,600		
	Placing concrete	**50**	cy	150.00	7,500		
	Allowance for foundation against existing building	**136**	lf	200.00	27,200		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Dampproofing foundation wall and footing	**3,792**	sf	3.00	NIC		
072100	*THERMAL INSULATION*						
	Insulation	**3,792**	sf	3.00	11,376		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
312000	*EARTHWORK*						
	Continuous footings						
	Excavation	**936**	cy	25.00	23,400		
	Remove off site	**936**	cy	20.00	18,720		
	Backfill with imported material	**626**	cy	38.00	23,788		
	Spread footings						
	Excavation	**2,302**	cy	25.00	57,550		
	Remove off site	**2,302**	cy	20.00	46,040		
	Backfill with imported material	**1,613**	cy	38.00	61,294		
	Grade Beams						
	Excavation	**798**	cy	25.00	19,950		
	Remove off site	**798**	cy	20.00	15,960		
	Backfill with imported material	**524**	cy	38.00	19,912		
	SUBTOTAL					1,291,931	
A1020	**SPECIAL FOUNDATIONS**						
	No work assumed						
	SUBTOTAL						
A1030	**LOWEST FLOOR CONSTRUCTION**						
	New Slab on grade, 5" thick						
	Gravel fill, 12"	**3,325**	cy	36.00	119,700		
	Rigid insulation	**89,779**	sf	2.25	202,003		
	Vapor barrier	**89,779**	sf	0.75	67,334		
	Compact existing sub-grade	**89,779**	sf	0.50	44,890		
	Mesh reinforcing 15% lap	**103,246**	sf	0.80	82,597		
	Concrete - 5" thick; 4,000 psi	**1,466**	cy	125.00	183,250		
	Placing concrete	**1,466**	cy	45.00	65,970		
	Finishing and curing concrete	**89,779**	sf	1.50	134,669		
	Control joints - saw cut	**89,779**	sf	0.10	8,978		
	Miscellaneous						
	Premium for sloped floor at auditorium	**1**	ls	50,000.00	50,000		
	New Elevator pit	**1**	ea	35,000.00	35,000		
	Equipment pads	**1**	ls	15,000.00	15,000		
	SUBTOTAL					1,009,391	
	TOTAL - FOUNDATIONS						**$2,301,322**
A20	***BASEMENT CONSTRUCTION***						
A2010	**BASEMENT EXCAVATION**						
	Excavation	**5,067**	cy	14.00	70,938		
	Remove off site	**5,067**	cy	20.00	101,340		
	Allowance for rock excavation; 50%	**2,534**	cy	70.00	177,380		
	Backfill with imported material	**1,938**	cy	38.00	73,644		
	SUBTOTAL					423,302	
A2020	**BASEMENT WALLS**						
	Continuous Footings; 2'-6" wide x 12" deep						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	Formwork	1,068	sf	12.00	12,816		
	Re-bar	8,010	lbs.	1.32	10,573		
	Concrete material; 3,000 psi	54	cy	132.00	7,128		
	Placing concrete	54	cy	90.00	4,860		
	Basement wall; 16" thick						
	Formwork	14,952	sf	16.00	239,232		
	Re-bar	89,712	lbs.	1.32	118,420		
	Concrete material; 3,000 psi	405	cy	132.00	53,460		
	Placing concrete	405	cy	90.00	36,450		
	Piers/Pilasters; 22" x 22"						
	Formwork 18" x 18"	1,890	sf	18.00	34,020		
	Re-bar	4,116	lbs	1.32	5,433		
	Concrete material; 3,000 psi	14	cy	132.00	1,848		
	Placing concrete	14	cy	150.00	2,100		
	Allowance for foundation against existing building	90	lf	200.00	18,000		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Waterproofing foundation wall and footing	7,476	sf	7.00	52,332		
072100	*THERMAL INSULATION*						
	Insulation	7,476	sf	3.00	22,428		
312000	*EARTHWORK*						
	Continuous footings						
	Excavation	396	cy	25.00	9,900		
	Remove off site	396	cy	20.00	7,920		
	Backfill with imported material	342	cy	38.00	12,996		
	SUBTOTAL					649,916	
	TOTAL - BASEMENT CONSTRUCTION						**$1,073,218**
B10	***SUPERSTRUCTURE***						
		14.50	lbs/sf		-		
B1010	**FLOOR CONSTRUCTION**	1,081	tns		-		
	Floor Structure - Steel:						
	Steel beams and columns to new addition; 14.5#/SF	430	tns	3,500.00	1,505,000		
	Premium for HSS	108	tns	300.00	32,400		
	Shear studs	11,860	ea	2.50	29,650		
	Floor Structure						
	2" 18 Ga. Metal galvanized floor Deck	59,300	sf	3.75	222,375		
	WWF reinforcement	68,195	sf	0.80	54,556		
	Concrete Fill to metal deck; 6" Normal Weight	1,384	cy	135.00	186,840		
	Place and finish concrete	59,300	sf	2.00	118,600		
	Rebar to decks	17,790	lbs	1.20	21,348		
	Misc. angles	59,300	sf	0.50	Incl		
	Miscellaneous						
	Fire proofing to columns and beams	59,300	sf	2.25	133,425		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	Intumescent paint	1	ls	50,000.00	50,000		
	Fire stopping floors	1	ls	25,000.00	25,000		
	SUBTOTAL					2,379,194	
B1020	**ROOF CONSTRUCTION**						
	Roof Structure - Steel:						
	Steel beams and columns to new addition; 14.5#/SF	651	tns	3,500.00	2,278,500		
	Premium for HSS	163	tns	300.00	48,900		
	Exposed steel	1	ls	50,000.00	50,000		
	Roof Structure						
	Acoustic deck allowance	5,000	sf	7.00	35,000		
	3" 20 Ga. galvanized Metal Roof Deck	84,779	sf	3.50	296,727		
	Miscellaneous						
	Concrete under RTU's	8,500	sf	8.00	68,000		
	Fire proofing to columns, beams and deck	84,779	sf	3.00	254,337		
	SUBTOTAL					3,031,464	
	TOTAL - SUPERSTRUCTURE						**$5,410,658**
B20	***EXTERIOR CLOSURE***						
B2010	**EXTERIOR WALLS**						
	Exterior Wall Area - Solid Assume 70%	*26,948*	sf				
042000	*MASONRY*						
	Brick veneer, 3 color; 85% of solid area	22,906	sf	40.00	916,240		
	Staging to exterior wall	26,948	sf	4.00	107,792		
055000	*MISC. METALS*						
	Stainless steel sign at main entrance	1	ls	10,000.00	10,000		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Air barrier	26,948	sf	6.50	175,162		
	Air barrier/flashing at windows	6,794	lf	6.25	42,463		
	Miscellaneous sealants to closure	26,948	sf	1.00	26,948		
072100	*THERMAL INSULATION*						
	Insulation	26,948	sf	3.00	80,844		
076400	*CLADDING*						
	Metal panel; 15% of solid area	4,042	sf	75.00	303,150		
	Roof equipment screen	1	ls	50,000.00	50,000		
092900	*GYPSUM BOARD ASSEMBLIES*						
	6" metal stud backup	26,948	sf	9.00	242,532		
	Gypsum Sheathing	26,948	sf	2.75	74,107		
	Drywall lining to interior face of stud backup	26,948	sf	3.30	88,928		
	SUBTOTAL					2,118,166	

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
B2020	**WINDOWS**						
	Exterior Wall Area - Glazed Assume 30%	*11,549*	sf				
061000	*ROUGH CARPENTRY*						
	Wood blocking at openings	**6,794**	lf	8.00	54,352		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Backer rod & double sealant	**6,794**	lf	8.50	57,749		
080001	*METAL WINDOWS*						
	Windows, double glazed; 50% of glazed area	**5,775**	sf	90.00	519,750		
	Curtainwall, double glazed; 50% of glazed area	**5,775**	sf	120.00	693,000		
	Sunshades; horizontal	**1**	ls	75,000.00	75,000		
089000	*LOUVERS*						
	Louvers	**250**	sf	65.00	16,250		
	SUBTOTAL					1,416,101	
B2030	**EXTERIOR DOORS**						
	Glazed entrance doors including frame and hardware; double door	**10**	pr	8,000.00	80,000		
	HM doors, frames and hardware- Double	**4**	pr	2,000.00	8,000		
	Backer rod & double sealant	**280**	lf	4.00	1,120		
	Wood blocking at openings	**280**	lf	3.00	840		
	SUBTOTAL					89,960	
	TOTAL - EXTERIOR CLOSURE						**$3,624,227**
B30	***ROOFING***						
B3010	**ROOF COVERINGS**						
	New roofing complete	**89,779**	sf	22.00	1,975,138		
	SUBTOTAL					1,975,138	
B3020	**ROOF OPENINGS**						
	Skylights, allow	**1**	ls	30,000.00	30,000		
	Roof hatch	**1**	loc	2,500.00	2,500		
	SUBTOTAL					32,500	
	TOTAL - ROOFING						**$2,007,638**
C10	***INTERIOR CONSTRUCTION***						
C1010	**PARTITIONS**						
	Miscellaneous partitions/glazed partitions/borrowed lights/blocking etc.	**149,079**	gsf	22.00	3,279,738		
	SUBTOTAL					3,279,738	
C1020	**INTERIOR DOORS**						
	Interior doors, frames and hardware	**149,079**	gsf	5.00	745,395		
	SUBTOTAL					745,395	
C1030	**SPECIALTIES / MILLWORK**						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	Toilet Partitions and accessories	149,079	gsf	0.80	119,263		
	Backer panels in electrical closets	1	ls	1,000.00	1,000		
	Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms	149,079	sf	1.00	149,079		
	Room Signs	149,079	gsf	0.40	59,632		
	Fire extinguisher cabinets	50	ea	350.00	17,500		
	Lockers, full height	710	ea	350.00	248,500		
	New catwalk	1	ls	90,000.00	90,000		
	Janitors Work Shop Accessories	1	ls	1,500.00	1,500		
	Janitors Closet Accessories	3	rms	300.00	900		
	Media						
	Reception desks	2	loc	25,000	50,000		
	Railings to open to below areas	151	lf	300	45,300		
	Library shelving at perimeters 7' Tall				F,F & E		
	Library shelving at perimeters 3' Tall				F,F & E		
	Stage proscenium	1	ls	100,000	100,000		
	Display cases	149,079	gsf	0.25	37,270		
	Miscellaneous metals throughout building	149,079	sf	1.00	149,079		
	Miscellaneous sealants throughout building	149,079	sf	1.25	186,349		
	SUBTOTAL					1,255,372	
	TOTAL - INTERIOR CONSTRUCTION						**$5,280,505**
C20	***STAIRCASES***						
C2010	**STAIR CONSTRUCTION**						
	Metal pan stair; egress stair	2	flt	25,000.00	50,000		
	Main staircase	2	flt	50,000.00	100,000		
	Concrete fill to stairs	4	flt	2,000.00	8,000		
	SUBTOTAL					158,000	
C2020	**STAIR FINISHES**						
	High performance coating to stairs including all railings etc.	4	flt	3,000.00	12,000		
	Rubber tile at stairs - landings	400	sf	10.00	4,000		
	Rubber tile at stairs - treads & risers	480	lft	19.06	9,149		
	SUBTOTAL					25,149	
	TOTAL - STAIRCASES						**$183,149**
C30	***INTERIOR FINISHES***						
C3010	**WALL FINISHES**						
	Wall finishes	149,079	sf	10.00	1,490,790		
	SUBTOTAL					1,490,790	
C3020	**FLOOR FINISHES**						
	Floor finishes	149,079	sf	11.00	1,639,869		
	SUBTOTAL					1,639,869	
C3030	**CEILING FINISHES**						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	Ceiling finishes	**149,079**	sf	8.00	1,192,632		
	SUBTOTAL					1,192,632	
	TOTAL - INTERIOR FINISHES						**$4,323,291**
D10	***CONVEYING SYSTEMS***						
D1010	**ELEVATOR**						
	New elevator; 3 stop; oversize; 5,000 lbs	**1**	ea	120,000.00	120,000		
	SUBTOTAL					120,000	
	TOTAL - CONVEYING SYSTEMS						**$120,000**
D20	***PLUMBING***						
D20	**PLUMBING, GENERALLY**						
	Plumbing; complete system	**149,079**	sf	14.00	2,087,106		
	SUBTOTAL					2,087,106	
	TOTAL - PLUMBING						**$2,087,106**
D30	***HVAC***						
D30	**HVAC, GENERALLY**						
	New HVAC system; full AC	**149,079**	gsf	45.00	6,708,555		
	SUBTOTAL					6,708,555	
	TOTAL - HVAC						**$6,708,555**
D40	***FIRE PROTECTION***						
D40	**FIRE PROTECTION, GENERALLY**						
	Fire protection system	**149,079**	gsf	4.50	670,856		
	SUBTOTAL					670,856	
	TOTAL - FIRE PROTECTION						**$670,856**
D50	***ELECTRICAL***						
D5010	**SERVICE & DISTRIBUTION**						
	Gear & Distribution						
	Normal power distribution switchgear & feeders based on 3000A 480/277V	**149,079**	sf	5.00	745,395		
	Emergency power						
	Emergency power distribution switchgear & feeders; 275 kW diesel generator	**149,079**	sf	4.00	596,316		
	UPS system						
	30kVA UPS system and switchgear	**1**	ea	30,000.00	30,000		
	Equipment Wiring						
	Equipment wiring	**149,079**	sf	2.25	335,428		
	SUBTOTAL					1,707,139	
D5020	**LIGHTING & POWER**						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	Lighting & Branch Power				-		
	Lighting fixtures (LED as BOD) with installation labor	**149,079**	sf	5.00	745,395		
	Lighting control system						
	Lighting controls including interface with DDC	**149,079**	sf	1.75	260,888		
	Branch devices						
	Branch devices	**149,079**	sf	0.50	74,540		
	Lighting and branch circuitry						
	Lighting & branch circuitry	**149,079**	sf	5.50	819,935		
	SUBTOTAL					1,900,758	
D5030	**COMMUNICATION & SECURITY SYSTEMS**						
	Fire Alarm						
	Fire alarm system	**149,079**	sf	2.50	372,698		
	Bi-Directional System						
	BDA system	**149,079**	sf	0.50	74,540		
	Security System						
	Security System	**149,079**	sf	2.50	372,698		
	Telephone/Data/CATV						
	Network switches, PBX, IP, VP, CCTV (By owner)				By Owner		
	Telecommunications rough in	**149,079**	sf	1.50	223,619		
	Telecommunications devices and cabling	**149,079**	sf	2.00	298,158		
	Public Address/Clock System						
	PA/Master Clock system	**149,079**	sf	1.25	186,349		
	Audio Visual (rough-in and power only)						
	AV equipment				By Owner		
	Rough-In conduit and backboxes only	**149,079**	sf	0.50	74,540		
	Auditorium						
	Rigging system equipment & installation				See equipment		
	Power to rigging equipment	**1**	ls	12,000.00	12,000		
	Stage dimming system with performance fixture package, allow	**1**	ls	275,000.00	275,000		
	Installation, rough-in & 120V power to dimming equipment	**1**	ls	70,000.00	70,000		
	Performance audio visual equipment, installation & LV cabling, allow	**1**	ls	150,000.00	150,000		
	Performance audio visual rough-in and power	**1**	ls	60,000.00	60,000		
	Gymnasium						
	Sound system	**1**	ls	15,000.00	In Renovation		
	Scoreboard/ shot clocks with feed and connection	**2**	ea	15,000.00	In Renovation		
	Misc. gym equipment feed and connections	**1**	ls	25,000.00	In Renovation		
	SUBTOTAL					2,169,602	
D5040	**OTHER ELECTRICAL SYSTEMS**						
	Miscellaneous						
	Temp power and lights	**149,079**	sf	0.45	67,086		
	Seismic restraints	**1**	ls	15,000.00	15,000		
	Lightning Protection System, UL Master label	**149,079**	sf	0.45	67,086		
	Fees & Permits	**149,079**	sf	0.50	74,540		
	SUBTOTAL					223,712	
	TOTAL - ELECTRICAL						**$6,001,211**

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	E10 EQUIPMENT						
E10	**EQUIPMENT, GENERALLY**						
	Theatrical Equipment Stage curtains, rigging and controls	**1**	ls	350,000.00	350,000		
	Theatrical AV allowance	**1**	ls	200,000.00	200,000		
	Kitchen equipment	**2,030**	sf	200.00	406,000		
	Auditorium seats	**1,100**	seat	350.00	385,000		
	SUBTOTAL					1,341,000	
	TOTAL - EQUIPMENT						**$1,341,000**
	E20 FURNISHINGS						
E2010	**FIXED FURNISHINGS**						
	Entry mats & frames - recessed with carpet/rubber strips	**500**	sf	55.00	27,500		
	Window blinds	**11,549**	sf	7.00	80,843		
123553	*CASEWORK*						
	Sinks, counters and casework in classrooms	**26**	ea	25,000.00	650,000		
	New casework in science rooms inclusive of eyewash and emergency shower stations and four fume hoods	**4**	ea	60,000.00	240,000		
	Sinks, counters and casework in computer rooms	**4**	ea	25,000.00	100,000		
	Sinks, counters and casework in art	**1**	ea	40,000.00	40,000		
	SUBTOTAL					1,138,343	
E2020	**MOVABLE FURNISHINGS**						
	All movable furnishings to be provided and installed by owner						
	SUBTOTAL					NIC	
	TOTAL - FURNISHINGS						**$1,138,343**
	F10 SPECIAL CONSTRUCTION						
F10	**SPECIAL CONSTRUCTION**						
	No items in this section						
	SUBTOTAL						
	TOTAL - SPECIAL CONSTRUCTION						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 149,079

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
F20	***SELECTIVE BUILDING DEMOLITION***						
F2010	**BUILDING ELEMENTS DEMOLITION**						
	No items in this section						
	SUBTOTAL						
F2020	**HAZARDOUS COMPONENTS ABATEMENT**						
	See main summary for HazMat allowance				See Summary		
	SUBTOTAL						
	TOTAL - SELECTIVE BUILDING DEMOLITION						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 RENOVATION - PHASING COSTS							
	Backfeed existing electrical room with new switchgear	1	ls	250,000.00	250,000		
	Maintain existing FA systems during construction	1	ls	100,000.00	100,000		
	Three existing through-wall boiler air intake vents must be relocated prior to construction of building addition. Three 12-inch air intakes to be relocated through west wall of existing building	1	ls	20,000.00	20,000		
	The existing 6-inch domestic water service and 4-inch compound meter will be relocated to existing shop areas to facilitate installation of addition building foundations	1	ls	30,000.00	30,000		
	Temporary main entrance	1	ls	100,000.00	100,000		
	Relocate pick-up and drop-off loop	1	ls	50,000.00	50,000		
	TOTAL - PHASING COSTS						**550,000**

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITEWORK OPTION 2							
	G SITEWORK						
G10	**SITE PREPARATION & DEMOLITION**						
	Site construction fence/barricades	**3,657**	lf	12.00	43,884		
	Site construction fence gates	**1**	ea	10,000.00	10,000		
	Stabilized construction entrance	**1**	ls	15,000.00	15,000		
	Pavement/curbing removal, crush and re-use for sub-base	**163,157**	sf	1.00	163,157		
	Walkways	**1**	ls	20,000.00	20,000		
	Miscellaneous demolition	**1**	ls	100,000.00	100,000		
	Site Earthwork						
	Strip Topsoil and remove; 6" thick	**3,148**	cy	12.00	37,776		
	Fine grading	**200,000**	sf	0.20	40,000		
	Cut and Fill; assumed AV 1ft; balanced site	**7,407**	cy	8.00	59,256		
	Silt fence/erosion control, wash bays, stock piles	**3,657**	lf	12.00	43,884		
	Silt fence maintenance and monitoring	**1**	ls	40,000.00	40,000		
	Hazardous Waste Remediation						
	Remove existing underground fuel storage tanks				NR		
	Dispose/treat contaminated soils				NR		
	SUBTOTAL					572,957	
G20	**SITE IMPROVEMENTS**						
	Asphalt Paving; parking lot and roadway	*158,850*					
	gravel base; 12" thick	**5,883**	cy	35.00	205,905		
	asphalt; 4" thick	**17,650**	sy	25.00	441,250		
	VGC	**6,191**	lf	34.00	210,494		
	Single solid lines, 4" thick	**1**	ls	10,000.00	10,000		
	Crosswalk Hatching	**4**	loc	900.00	3,600		
	Other road markings	**1**	ls	7,500.00	7,500		
	HC curb cuts	**8**	loc	350.00	2,800		
	Signage	**1**	ls	20,000.00	20,000		
	Pedestrian Paving						
	Concrete paving						
	gravel base; 8" thick	**372**	cy	35.00	13,020		
	4" concrete paving	**15,000**	sf	7.00	105,000		
	Site Improvements						
	Flag pole 50' high	**1**	ea	6,500.00	6,500		
	Concrete retaining walls; AV 9ft high	**910**	lf	790.00	718,900		
	Pre-K playground and equipment	**1**	ls	150,000.00	150,000		
	Other site improvements; walls, fences etc.	**1**	ls	200,000.00	200,000		
	Outdoor dining	**1**	ls	50,000.00	50,000		
	Soccer fields						
	Crushed stone - 12" thick	**2,593**	cy	32.00	82,976		
	Sports seeding	**70,000**	sf	0.50	35,000		
	Soccer goals (movable) - Allowance	**2**	loc	10,000.00	20,000		
	20' sports netting	**1**	ls	50,000.00	50,000		
	SUBTOTAL					2,332,945	
	Landscaping						
	Topsoil - Import new topsoil; minimum 6"	**3,148**	cy	42.00	132,216		
	Lawn - loam & seed	**170,000**	sf	0.25	42,500		
	Planting allowance	**1**	ls	150,000.00	150,000		
	SUBTOTAL					324,716	
G30	**CIVIL MECHANICAL UTILITIES**						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITEWORK OPTION 2							
	Water supply; Pricing includes E&B and bedding						
	New DI piping; 8"	450	lf	100.00	45,000		
	New DI piping; 8" Fire	450	lf	100.00	45,000		
	Connect to existing	1	loc	5,000.00	5,000		
	FD connection	1	ea	2,000.00	2,000		
	Gate valves	8	ea	750.00	6,000		
	Fire hydrant	3	ea	5,000.00	15,000		
	Sanitary; Pricing includes E&B and bedding						
	Manholes	4	ea	4,000.00	16,000		
	Grease trap	1	ea	15,000.00	15,000		
	8" PVC	300	lf	60.00	18,000		
	Connect to existing drain	1	ea	3,000.00	3,000		
	Storm water; Pricing includes E&B and bedding						
	Allowance for new drainage systems; piping only	158,850	sf	2.00	317,700		
	Infiltration systems; cultec chambers	137,500	cf	7.00	962,500		
	Catch basins	12	ea	3,800.00	45,600		
	Manholes	10	ea	4,500.00	45,000		
	WQ structures	3	ea	16,000.00	48,000		
	Area drains	4	ea	1,500.00	6,000		
	Gas service						
	E&B trench for new gas pipe - install by plumbing	450	lf	25.00	11,250		
	SUBTOTAL					1,606,050	
G40	**ELECTRICAL UTILITIES**						
	Power						
	Utility co. backcharges, allow	1	ls	30,000.00	Utility co.		
	Connections at existing manhole				Utility co.		
	Manhole	1	ls	8,500.00	8,500		
	Connections in manhole	1	ls	3,500.00	3,500		
	Primary ductbank 2-5" ductbank, empty, allow	450	lf	120.00	54,000		
	Transformer by utility company				By Utility Co.		
	Transformer pad	1	ea	2,500.00	2,500		
	Secondary service	60	lf	1,100.00	66,000		
	Communications						
	Connection at riser pole, allow	1	ea	1,500.00	1,500		
	Telecom ductbank 4-4", allow	450	lf	152.00	68,400		
	Site Lighting						
	Site Parking lighting (allow)	1	ls	100,000.00	100,000		
	SUBTOTAL					304,400	
	TOTAL - SITE DEVELOPMENT						***$5,141,068***

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 3 NEW BUILDING						
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$1,402,459			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$949,168	**$2,351,627**	$12.52	4.6%
A20	**BASEMENT CONSTRUCTION**					
	A2010	Basement Excavation	$0			
	A2020	Basement Walls	$0	**$0**	$0.00	0.0%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$4,207,770			
	B1020	Roof Construction	$2,919,495	**$7,127,265**	$37.95	13.8%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$3,471,755			
	B2020	Windows	$2,287,177			
	B2030	Exterior Doors	$89,960	**$5,848,892**	$31.15	11.3%
B30	**ROOFING**					
	B3010	Roof Coverings	$1,844,260			
	B3020	Roof Openings	$32,500	**$1,876,760**	$9.99	3.6%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$4,131,446			
	C1020	Interior Doors	$938,965			
	C1030	Specialties/Millwork	$1,441,876	**$6,512,287**	$34.68	12.6%
C20	**STAIRCASES**					
	C2010	Stair Construction	$293,000			
	C2020	Stair Finishes	$56,585	**$349,585**	$1.86	0.7%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$1,877,930			
	C3020	Floor Finishes	$2,391,723			
	C3030	Ceiling Finishes	$1,502,344	**$5,771,997**	$30.74	11.2%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$120,000	**$120,000**	$0.64	0.2%
D20	**PLUMBING**					
	D20	Plumbing	$2,629,102	**$2,629,102**	$14.00	5.1%
D30	**HVAC**					
	D30	HVAC	$7,511,720	**$7,511,720**	$40.00	14.6%

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 3 NEW BUILDING						
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$845,069	**$845,069**	$4.50	1.6%
D50	**ELECTRICAL**					
	D5010	Complete System	$7,470,721	**$7,470,721**	$39.78	14.5%
E10	**EQUIPMENT**					
	E10	Equipment	$1,684,000	**$1,684,000**	$8.97	3.3%
E20	**FURNISHINGS**					
	E2010	Fixed Furnishings	$1,441,508			
	E2020	Movable Furnishings	NIC	**$1,441,508**	$7.68	2.8%
F10	**SPECIAL CONSTRUCTION**					
	F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**HAZMAT REMOVALS**					
	F2010	Building Elements Demolition	$0			
	F2020	Hazardous Components Abatement	$0	**$0**	$0.00	0.0%
TOTAL DIRECT COST (Trade Costs)				***$51,540,533***	*$274.45*	*100.0%*

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 NEW BUILDING							
	GROSS FLOOR AREA CALCULATION						
	First Floor			83,830			
	Second Floor			60,270			
	Third floor			43,693			
	TOTAL GROSS FLOOR AREA (GFA)				**187,793**	***sf***	
A10	***FOUNDATIONS***						
A1010	**STANDARD FOUNDATIONS**						
	Continuous Footings at interior; 2'-6" wide x 12" deep						
	Formwork	**2,380**	sf	12.00	28,560		
	Re-bar	**11,900**	lbs.	1.32	15,708		
	Concrete material; 3,000 psi	**121**	cy	132.00	15,972		
	Placing concrete	**121**	cy	90.00	10,890		
	Foundation wall; 14" thick x 36" high						
	Formwork	**7,140**	sf	17.00	121,380		
	Re-bar	**14,280**	lbs.	1.32	18,850		
	Concrete material; 3,000 psi	**170**	cy	132.00	22,440		
	Placing concrete	**170**	cy	90.00	15,300		
	Grade beams at interior; 2'-6" wide x 2'-6" deep						
	Formwork	**5,030**	sf	12.00	60,360		
	Re-bar	**45,270**	lbs.	1.32	59,756		
	Concrete material; 3,000 psi	**256**	cy	132.00	33,792		
	Placing concrete	**256**	cy	90.00	23,040		
	Spread Footings at interior; 10'-0" x 10'-0" x 2'-4" deep						
	Formwork	**6,524**	sf	16.00	104,384		
	Re-bar	**66,500**	lbs.	1.32	87,780		
	Concrete material; 3,000 psi	**664**	cy	132.00	87,648		
	Placing concrete	**664**	cy	90.00	59,760		
	Set anchor bolts grout plates	**280**	ea	165.00	46,200		
	Spread Footings at perimeter; 7'-0" x 7'-0" x 1'-10" deep						
	Formwork	**2,101**	sf	16.00	33,616		
	Re-bar	**14,350**	lbs.	1.32	18,942		
	Concrete material; 3,000 psi	**150**	cy	132.00	19,800		
	Placing concrete	**150**	cy	90.00	13,500		
	Set anchor bolts grout plates	**164**	ea	165.00	27,060		
	Piers/Pilasters; 22" x 22"						
	Formwork 18" x 18"	**984**	sf	18.00	17,712		
	Re-bar	**6,560**	lbs	1.32	8,659		
	Concrete material; 3,000 psi	**27**	cy	132.00	3,564		
	Placing concrete	**27**	cy	150.00	4,050		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Dampproofing foundation wall and footing	**3,570**	sf	3.00	NIC		
072100	*THERMAL INSULATION*						
	Insulation	**3,570**	sf	3.00	10,710		
312000	*EARTHWORK*						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 NEW BUILDING							
	Continuous footings						
	Excavation	**881**	cy	25.00	22,025		
	Remove off site	**881**	cy	20.00	17,620		
	Backfill with imported material	**590**	cy	38.00	22,420		
	Spread footings						
	Excavation	**2,482**	cy	25.00	62,050		
	Remove off site	**2,482**	cy	20.00	49,640		
	Backfill with imported material	**1,668**	cy	38.00	63,384		
	Grade Beams						
	Excavation	**745**	cy	25.00	18,625		
	Remove off site	**745**	cy	20.00	14,900		
	Backfill with imported material	**489**	cy	38.00	18,582		
	Allowance for rock excavation; 50%	**2,054**	cy	70.00	143,780		
	SUBTOTAL					1,402,459	
A1020	**SPECIAL FOUNDATIONS**						
	No work assumed						
	SUBTOTAL						
A1030	**LOWEST FLOOR CONSTRUCTION**						
	New Slab on grade, 5" thick						
	Gravel fill, 12"	**3,105**	cy	36.00	111,780		
	Rigid insulation	**83,830**	sf	2.25	188,618		
	Vapor barrier	**83,830**	sf	0.75	62,873		
	Compact existing sub-grade	**83,830**	sf	0.50	41,915		
	Mesh reinforcing 15% lap	**96,405**	sf	0.80	77,124		
	Concrete - 5" thick; 4,000 psi	**1,369**	cy	125.00	171,125		
	Placing concrete	**1,369**	cy	45.00	61,605		
	Finishing and curing concrete	**83,830**	sf	1.50	125,745		
	Control joints - saw cut	**83,830**	sf	0.10	8,383		
	Miscellaneous						
	Premium for sloped floor at auditorium	**1**	ls	50,000.00	50,000		
	New Elevator pit	**1**	ea	35,000.00	35,000		
	Equipment pads	**1**	ls	15,000.00	15,000		
	SUBTOTAL					949,168	
	TOTAL - FOUNDATIONS						**$2,351,627**
A20	***BASEMENT CONSTRUCTION***						
A2010	**BASEMENT EXCAVATION**						
	SUBTOTAL					-	
A2020	**BASEMENT WALLS**						
	SUBTOTAL					-	
	TOTAL - BASEMENT CONSTRUCTION						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 NEW BUILDING							
B10	***SUPERSTRUCTURE***						
		15.01	lbs/sf		-		
B1010	**FLOOR CONSTRUCTION**	1,409	tns		-		
	Floor Structure - Steel:						
	Steel beams and columns to new addition; 15#/SF	**780**	tns	3,500.00	2,730,000		
	Premium for HSS	**195**	tns	300.00	58,500		
	Shear studs	**20,793**	ea	2.50	51,983		
	Floor Structure						
	2" 18 Ga. Metal galvanized floor Deck	**103,963**	sf	3.75	389,861		
	WWF reinforcement	**119,557**	sf	0.80	95,646		
	Concrete Fill to metal deck; 6" Normal Weight	**2,426**	cy	135.00	327,510		
	Place and finish concrete	**103,963**	sf	2.00	207,926		
	Rebar to decks	**31,189**	lbs	1.20	37,427		
	Misc. angles	**103,963**	sf	0.50	Incl		
	Miscellaneous						
	Fire proofing to columns and beams	**103,963**	sf	2.25	233,917		
	Intumescent paint	**1**	ls	50,000.00	50,000		
	Fire stopping floors	**1**	ls	25,000.00	25,000		
	SUBTOTAL					4,207,770	
B1020	**ROOF CONSTRUCTION**						
	Roof Structure - Steel:						
	Steel beams and columns to new addition; 15#/SF	**629**	tns	3,500.00	2,201,500		
	Premium for HSS	**157**	tns	300.00	47,100		
	Exposed steel	**1**	ls	50,000.00	50,000		
	Roof Structure						
	Acoustic deck allowance	**16,000**	sf	7.00	112,000		
	3" 20 Ga. galvanized Metal Roof Deck	**67,830**	sf	3.50	237,405		
	Miscellaneous						
	Concrete under RTU's	**8,500**	sf	8.00	68,000		
	Fire proofing to columns, beams and deck	**67,830**	sf	3.00	203,490		
	SUBTOTAL					2,919,495	
	TOTAL - SUPERSTRUCTURE						**$7,127,265**
B20	***EXTERIOR CLOSURE***						
B2010	**EXTERIOR WALLS**						
	Exterior Wall Area - Solid Assume 70%	*44,670*	sf				
042000	*MASONRY*						
	Brick veneer, 3 color; 85% of solid area	**37,970**	sf	40.00	1,518,800		
	Staging to exterior wall	**44,670**	sf	4.00	178,680		
055000	*MISC. METALS*						
	Stainless steel sign at main entrance	**1**	ls	10,000.00	10,000		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 NEW BUILDING							
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Air barrier	**44,670**	sf	6.50	290,355		
	Air barrier/flashing at windows	**11,261**	lf	6.25	70,381		
	Miscellaneous sealants to closure	**44,670**	sf	1.00	44,670		
072100	*THERMAL INSULATION*						
	Insulation	**44,670**	sf	3.00	134,010		
076400	*CLADDING*						
	Metal panel; 15% of solid area	**6,701**	sf	75.00	502,575		
	Roof equipment screen	**1**	ls	50,000.00	50,000		
092900	*GYPSUM BOARD ASSEMBLIES*						
	6" metal stud backup	**44,670**	sf	9.00	402,030		
	Gypsum Sheathing	**44,670**	sf	2.75	122,843		
	Drywall lining to interior face of stud backup	**44,670**	sf	3.30	147,411		
	SUBTOTAL					3,471,755	
B2020	**WINDOWS**						
	Exterior Wall Area - Glazed Assume 30%	*19,144*	sf				
061000	*ROUGH CARPENTRY*						
	Wood blocking at openings	**11,261**	lf	8.00	90,088		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Backer rod & double sealant	**11,261**	lf	8.50	95,719		
080001	*METAL WINDOWS*						
	Windows, double glazed; 50% of glazed area	**9,572**	sf	90.00	861,480		
	Curtainwall, double glazed; 50% of glazed area	**9,572**	sf	120.00	1,148,640		
	Sunshades; horizontal	**1**	ls	75,000.00	75,000		
089000	*LOUVERS*						
	Louvers	**250**	sf	65.00	16,250		
	SUBTOTAL					2,287,177	
B2030	**EXTERIOR DOORS**						
	Glazed entrance doors including frame and hardware; double door	**10**	pr	8,000.00	80,000		
	HM doors, frames and hardware- Double	**4**	pr	2,000.00	8,000		
	Backer rod & double sealant	**280**	lf	4.00	1,120		
	Wood blocking at openings	**280**	lf	3.00	840		
	SUBTOTAL					89,960	
	TOTAL - EXTERIOR CLOSURE						**$5,848,892**
B30	***ROOFING***						
B3010	**ROOF COVERINGS**						
	New roofing complete	**83,830**	sf	22.00	1,844,260		
	SUBTOTAL					1,844,260	

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 NEW BUILDING							
B3020	**ROOF OPENINGS**						
	Skylights, allow	1	ls	30,000.00	30,000		
	Roof hatch	1	loc	2,500.00	2,500		
	SUBTOTAL					32,500	
	TOTAL - ROOFING						**$1,876,760**
C10	***INTERIOR CONSTRUCTION***						
C1010	**PARTITIONS**						
	Miscellaneous partitions/glazed partitions/borrowed lights/blocking etc.	187,793	gsf	22.00	4,131,446		
	SUBTOTAL					4,131,446	
C1020	**INTERIOR DOORS**						
	Interior doors, frames and hardware	187,793	gsf	5.00	938,965		
	SUBTOTAL					938,965	
C1030	**SPECIALTIES / MILLWORK**						
	Toilet Partitions and accessories	187,793	gsf	0.80	150,234		
	Backer panels in electrical closets	1	ls	1,000.00	1,000		
	Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms	187,793	sf	1.00	187,793		
	Room Signs	187,793	gsf	0.40	75,117		
	Fire extinguisher cabinets	63	ea	350.00	22,050		
	Lockers, full height	710	ea	350.00	248,500		
	New catwalk	1	ls	90,000.00	90,000		
	Janitors Work Shop Accessories	1	ls	1,500.00	1,500		
	Janitors Closet Accessories	3	rms	300.00	900		
	Media						
	Reception desks	2	loc	25,000	50,000		
	Railings to open to below areas	151	lf	300	45,300		
	Library shelving at perimeters 7' Tall				F,F & E		
	Library shelving at perimeters 3' Tall				F,F & E		
	Stage proscenium	1	ls	100,000	100,000		
	Display cases	187,793	gsf	0.25	46,948		
	Miscellaneous metals throughout building	187,793	sf	1.00	187,793		
	Miscellaneous sealants throughout building	187,793	sf	1.25	234,741		
	SUBTOTAL					1,441,876	
	TOTAL - INTERIOR CONSTRUCTION						**$6,512,287**
C20	***STAIRCASES***						
C2010	**STAIR CONSTRUCTION**						
	Metal pan stair; egress stair	7	flt	25,000.00	175,000		
	Main staircase	2	flt	50,000.00	100,000		
	Concrete fill to stairs	9	flt	2,000.00	18,000		
	SUBTOTAL					293,000	

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 NEW BUILDING							
C2020	**STAIR FINISHES**						
	High performance coating to stairs including all railings etc.	**9**	flt	3,000.00	27,000		
	Rubber tile at stairs - landings	**900**	sf	10.00	9,000		
	Rubber tile at stairs - treads & risers	**1,080**	lft	19.06	20,585		
	SUBTOTAL					56,585	
	TOTAL - STAIRCASES						**$349,585**
C30	***INTERIOR FINISHES***						
C3010	**WALL FINISHES**						
	Wall finishes	**187,793**	sf	10.00	1,877,930		
	SUBTOTAL					1,877,930	
C3020	**FLOOR FINISHES**						
	New shock-absorbing wood gym floor	**16,300**	sf	20.00	326,000		
	Floor finishes	**187,793**	sf	11.00	2,065,723		
	SUBTOTAL					2,391,723	
C3030	**CEILING FINISHES**						
	Ceiling finishes	**187,793**	sf	8.00	1,502,344		
	SUBTOTAL					1,502,344	
	TOTAL - INTERIOR FINISHES						**$5,771,997**
D10	***CONVEYING SYSTEMS***						
D1010	**ELEVATOR**						
	New elevator; 3 stop; oversize; 5,000 lbs	**1**	ea	120,000.00	120,000		
	SUBTOTAL					120,000	
	TOTAL - CONVEYING SYSTEMS						**$120,000**
D20	***PLUMBING***						
D20	**PLUMBING, GENERALLY**						
	Plumbing; complete system	**187,793**	sf	14.00	2,629,102		
	SUBTOTAL					2,629,102	
	TOTAL - PLUMBING						**$2,629,102**
D30	***HVAC***						
D30	**HVAC, GENERALLY**						
	New HVAC system; displacement ventilation system	**187,793**	gsf	40.00	7,511,720		
	SUBTOTAL					7,511,720	
	TOTAL - HVAC						**$7,511,720**
D40	***FIRE PROTECTION***						
D40	**FIRE PROTECTION, GENERALLY**						
	Fire protection system	**187,793**	gsf	4.50	845,069		
	SUBTOTAL					845,069	

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 NEW BUILDING							
	TOTAL - FIRE PROTECTION						**$845,069**
	D50 ELECTRICAL						
D5010	**SERVICE & DISTRIBUTION**						
	Gear & Distribution						
	Normal power distribution switchgear & feeders based on 3000A 480/277V	**187,793**	sf	5.00	938,965		
	Emergency power						
	Emergency power distribution switchgear & feeders; 275 kW diesel generator	**187,793**	sf	4.00	751,172		
	UPS system						
	30kVA UPS system and switchgear	**1**	ea	30,000.00	30,000		
	Equipment Wiring						
	Equipment wiring	**187,793**	sf	2.25	422,534		
	SUBTOTAL					2,142,671	
D5020	**LIGHTING & POWER**						
	Lighting & Branch Power				-		
	Lighting fixtures (LED as BOD) with installation labor	**187,793**	sf	5.00	938,965		
	Lighting control system						
	Lighting controls including interface with DDC	**187,793**	sf	1.75	328,638		
	Branch devices						
	Branch devices	**187,793**	sf	0.50	93,897		
	Lighting and branch circuitry						
	Lighting & branch circuitry	**187,793**	sf	5.50	1,032,862		
	SUBTOTAL					2,394,362	
D5030	**COMMUNICATION & SECURITY SYSTEMS**						
	Fire Alarm						
	Fire alarm system	**187,793**	sf	2.50	469,483		
	Bi-Directional System						
	BDA system	**187,793**	sf	0.50	93,897		
	Security System						
	Security System	**187,793**	sf	2.50	469,483		
	Telephone/Data/CATV						
	Network switches, PBX, IP, VP, CCTV (By owner)				By Owner		
	Telecommunications rough in	**187,793**	sf	1.50	281,690		
	Telecommunications devices and cabling	**187,793**	sf	2.00	375,586		
	Public Address/Clock System						
	PA/Master Clock system	**187,793**	sf	1.25	234,741		
	Audio Visual (rough-in and power only)						
	AV equipment				By Owner		
	Rough-In conduit and backboxes only	**187,793**	sf	0.50	93,897		
	Auditorium						
	Rigging system equipment & installation				See equipment		
	Power to rigging equipment	**1**	ls	12,000.00	12,000		
	Stage dimming system with performance fixture package, allow	**1**	ls	275,000.00	275,000		
	Installation, rough-in & 120V power to dimming equipment	**1**	ls	70,000.00	70,000		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

GFA 187,793

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 NEW BUILDING							
	Performance audio visual equipment, installation & LV cabling, allow	1	ls	150,000.00	150,000		
	Performance audio visual rough-in and power	1	ls	60,000.00	60,000		
	Gymnasium						
	Sound system	1	ls	15,000.00	15,000		
	Scoreboard/ shot clocks with feed and connection	2	ea	15,000.00	30,000		
	Misc. gym equipment feed and connections	1	ls	25,000.00	25,000		
	SUBTOTAL					2,655,777	
D5040	**OTHER ELECTRICAL SYSTEMS**						
	Miscellaneous						
	Temp power and lights	187,793	sf	0.45	84,507		
	Seismic restraints	1	ls	15,000.00	15,000		
	Lightning Protection System, UL Master label	187,793	sf	0.45	84,507		
	Fees & Permits	187,793	sf	0.50	93,897		
	SUBTOTAL					277,911	
	TOTAL - ELECTRICAL						**$7,470,721**
E10	***EQUIPMENT***						
E10	**EQUIPMENT, GENERALLY**						
	Gym wall pads	1	ls	20,000.00	20,000		
	Basketball backstops; swing up; electric operated	12	loc	10,000.00	120,000		
	Gymnasium dividing net; electrically operated	3	ea	30,000.00	90,000		
	Volleyball net and standards	1	ls	5,000.00	5,000		
	Telescoping bleachers	900	seats	120.00	108,000		
	Theatrical Equipment Stage curtains, rigging and controls	1	ls	350,000.00	350,000		
	Theatrical AV allowance	1	ls	200,000.00	200,000		
	Kitchen equipment	2,030	sf	200.00	406,000		
	Auditorium seats	1,100	seat	350.00	385,000		
	SUBTOTAL					1,684,000	
	TOTAL - EQUIPMENT						**$1,684,000**
E20	***FURNISHINGS***						
E2010	**FIXED FURNISHINGS**						
	Entry mats & frames - recessed with carpet/rubber strips	500	sf	55.00	27,500		
	Window blinds	19,144	sf	7.00	134,008		
123553	*CASEWORK*						
	Sinks, counters and casework in classrooms	36	ea	25,000.00	900,000		
	New casework in science rooms inclusive of eyewash and emergency shower stations and four fume hoods	4	ea	60,000.00	240,000		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate GFA 187,793

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	OPTION 3 NEW BUILDING						
	Sinks, counters and casework in computer rooms	4	ea	25,000.00	100,000		
	Sinks, counters and casework in art	1	ea	40,000.00	40,000		
	SUBTOTAL					1,441,508	
E2020	**MOVABLE FURNISHINGS**						
	All movable furnishings to be provided and installed by owner						
	SUBTOTAL					NIC	
	TOTAL - FURNISHINGS						**$1,441,508**
F10	***SPECIAL CONSTRUCTION***						
F10	**SPECIAL CONSTRUCTION**						
	No items in this section						
	SUBTOTAL						
	TOTAL - SPECIAL CONSTRUCTION						
F20	***SELECTIVE BUILDING DEMOLITION***						
F2010	**BUILDING ELEMENTS DEMOLITION**						
	No items in this section						
	SUBTOTAL						
F2020	**HAZARDOUS COMPONENTS ABATEMENT**						
	See main summary for HazMat allowance				See Summary		
	SUBTOTAL						
	TOTAL - SELECTIVE BUILDING DEMOLITION						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITEWORK OPTION 3							
	G SITEWORK						
G10	**SITE PREPARATION & DEMOLITION**						
	Site construction fence/barricades	**3,657**	lf	12.00	43,884		
	Site construction fence gates	**1**	ea	10,000.00	10,000		
	Stabilized construction entrance	**1**	ls	15,000.00	15,000		
	Pavement/curbing removal, crush and re-use for sub-base	**163,157**	sf	1.00	163,157		
	Walkways	**1**	ls	20,000.00	20,000		
	Miscellaneous demolition	**1**	ls	100,000.00	100,000		
	Site Earthwork						
	Strip Topsoil and remove; 6" thick	**3,148**	cy	12.00	37,776		
	Fine grading	**200,000**	sf	0.20	40,000		
	Cut and Fill; assumed AV 1ft; balanced site	**7,407**	cy	8.00	59,256		
	Silt fence/erosion control, wash bays, stock piles	**3,657**	lf	12.00	43,884		
	Silt fence maintenance and monitoring	**1**	ls	40,000.00	40,000		
	Hazardous Waste Remediation						
	Remove existing underground fuel storage tanks				NR		
	Dispose/treat contaminated soils				NR		
	SUBTOTAL					572,957	
G20	**SITE IMPROVEMENTS**						
	Asphalt Paving; parking lot and roadway	*167,443*					
	gravel base; 12" thick	**6,202**	cy	35.00	217,070		
	asphalt; 4" thick	**18,605**	sy	25.00	465,125		
	VGC	**6,804**	lf	34.00	231,336		
	Single solid lines, 4" thick	**1**	ls	10,000.00	10,000		
	Crosswalk Hatching	**4**	loc	900.00	3,600		
	Other road markings	**1**	ls	7,500.00	7,500		
	HC curb cuts	**8**	loc	350.00	2,800		
	Signage	**1**	ls	20,000.00	20,000		
	Pedestrian Paving						
	Concrete paving						
	gravel base; 8" thick	**372**	cy	35.00	13,020		
	4" concrete paving	**15,000**	sf	7.00	105,000		
	Site Improvements						
	Flag pole 50' high	**1**	ea	6,500.00	6,500		
	Concrete retaining walls; AV 9ft high	**910**	lf	790.00	718,900		
	Pre-K playground and equipment	**1**	ls	150,000.00	150,000		
	Other site improvements; walls, fences etc.	**1**	ls	200,000.00	200,000		
	Outdoor dining	**1**	ls	50,000.00	50,000		
	Soccer fields						
	Crushed stone - 12" thick	**2,593**	cy	32.00	82,976		
	Sports seeding	**70,000**	sf	0.50	35,000		
	Soccer goals (movable) - Allowance	**2**	loc	10,000.00	20,000		
	20' sports netting	**1**	ls	50,000.00	50,000		
	SUBTOTAL					2,388,827	
	Landscaping						
	Topsoil - Import new topsoil; minimum 6"	**3,148**	cy	42.00	132,216		
	Lawn - loam & seed	**170,000**	sf	0.25	42,500		
	Planting allowance	**1**	ls	150,000.00	150,000		
	SUBTOTAL					324,716	
G30	**CIVIL MECHANICAL UTILITIES**						

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITEWORK OPTION 3							
	Water supply; Pricing includes E&B and bedding						
	New DI piping; 8"	450	lf	100.00	45,000		
	New DI piping; 8" Fire	450	lf	100.00	45,000		
	Connect to existing	1	loc	5,000.00	5,000		
	FD connection	1	ea	2,000.00	2,000		
	Gate valves	8	ea	750.00	6,000		
	Fire hydrant	3	ea	5,000.00	15,000		
	Sanitary; Pricing includes E&B and bedding						
	Manholes	4	ea	4,000.00	16,000		
	Grease trap	1	ea	15,000.00	15,000		
	8" PVC	300	lf	60.00	18,000		
	Connect to existing drain	1	ea	3,000.00	3,000		
	Storm water; Pricing includes E&B and bedding						
	Allowance for new drainage systems; piping only	167,443	sf	2.00	334,886		
	Infliltration systems; cultec chambers	137,500	cf	7.00	962,500		
	Catch basins	12	ea	3,800.00	45,600		
	Manholes	10	ea	4,500.00	45,000		
	WQ structures	3	ea	16,000.00	48,000		
	Area drains	4	ea	1,500.00	6,000		
	Gas service						
	E&B trench for new gas pipe - install by plumbing	450	lf	25.00	11,250		
	SUBTOTAL					1,623,236	
G40	**ELECTRICAL UTILITIES**						
	Power						
	Utility co. backcharges, allow	1	ls	30,000.00	Utility co.		
	Connections at existing manhole				Utility co.		
	Manhole	1	ls	8,500.00	8,500		
	Connections in manhole	1	ls	3,500.00	3,500		
	Primary ductbank 2-5" ductbank, empty, allow	450	lf	120.00	54,000		
	Transformer by utility company				By Utility Co.		
	Transformer pad	1	ea	2,500.00	2,500		
	Secondary service	60	lf	1,100.00	66,000		
	Communications						
	Connection at riser pole, allow	1	ea	1,500.00	1,500		
	Telecom ductbank 4-4", allow	450	lf	152.00	68,400		
	Site Lighting						
	Site Parking lighting (allow)	1	ls	100,000.00	100,000		
	SUBTOTAL					304,400	
	TOTAL - SITE DEVELOPMENT						***$5,214,136***

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SPORTS STADIUM ALTERNATE							
G	***SITEWORK***						
G20	**SITE IMPROVEMENTS**						
	Stairs						
	Concrete to stair treads at press box	**196**	lfr	140.00	27,440		
	Cheek walls	**45**	lf	450.00	20,250		
	Concrete curb at sports field D area	**205**	lf	22.00	4,510		
	Synthetic turf anchor curb integral with trench drain	**1,310**	lf	80.00	104,800		
	ATHLETIC FIELD						
	Resilient surface at track	**75,525**	sf	8.00	604,200		
	Gravel base - assumed 12" thick	**3,334**	cy	40.00	133,360		
	Geotextile drainage fabric over subgrade	**90,015**	sf	1.00	90,015		
	Compacted dense grade with stone dust leveling course, 10"	**2,767**	cy	32.00	88,544		
	Geotextile reinforced impermeable liner 20 mill	**90,015**	sf	1.00	90,015		
	Synthetic turf field - Hybrid infill synthetic field with premolded resilient drainage pad	**90,015**	sf	12.00	1,080,180		
	Football goals	**4**	ea	3,500.00	14,000		
	Scoreboard, allowance provided	**1**	ea	60,000.00	60,000		
	Line markings - allowance	**2**	ls	2,000.00	4,000		
	Soccer goals (movable)	**2**	loc	10,000.00	20,000		
	Field Hockey Nets	**2**	sets	3,000.00	6,000		
	Lacrosse goals	**2**	sets	4,000.00	8,000		
	1250 seat bleacher	**1**	loc	437,500.00	437,500		
	Rip-Rap under bleachers	**1**	ls	25,000.00	25,000		
	Field logo's	**1**	loc	6,000.00	6,000		
	Discus pad & enclosure	**1**	ea	15,000.00	15,000		
	Shot put pad & enclosure	**1**	ea	15,000.00	15,000		
	Long jump/triple jump	**2**	ea	10,000.00	20,000		
	Pole vault and accessories	**1**	ea	10,000.00	10,000		
	High jump pads	**1**	ea	6,000.00	6,000		
	Javelin with track surfacing runway	**1**	ea	10,000.00	10,000		
	Hurdles and starting blocks	**1**	ls	8,000.00	8,000		
	Track crossing pad	**1**	ls	10,000.00	10,000		
	Trash/recycling receptacles	**12**	ea	800.00	9,600		
	Team benches- 7'-5" long	**12**	ea	1,500.00	18,000		
	Portable ball control netting, 120' long	**4**	ea	2,500.00	10,000		
	Pit covers	**2**	ea	3,500.00	7,000		
	Concessions building			under separate tab			
	Team rooms			under separate tab			
	Press box			under separate tab			
	athletic track & field drainage						
	Subsurface infiltration basin - drainage fabric and 2" double washed stone	**778**	cy	50.00	38,900		
	Trench drain integral catch basin	**10**	ea	4,500.00	45,000		
	12" HDPE high flow	**270**	lf	80.00	21,600		
	Concrete encased 12" perforated smooth wall corrugated subdrain, 6/L7.3	**760**	lf	130.00	98,800		
	6" HDPE high flow	**270**	lf	40.00	10,800		

PM&C

Stoneham High School
Design Options
Stoneham, MA

30-Nov-17

Feasibility Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SPORTS STADIUM ALTERNATE							
G40	**ELECTRICAL UTILITIES**						
	Sports Field Lighting and Sound System						
	Football/Soccer field lighting, bases and circuitry	1	ls	250,000.00	250,000		
	Track Field lighting, bases and circuitry	1	ls	150,000.00	150,000		
	Remote lighting control system	1	ls	50,000.00	50,000		
	Stadium sound system (AV)	1	ls	60,000.00	60,000		
	TOTAL - STADIUM						***3,687,514***

PM&C

$127,475,590

Stoneham High School
Design Options
Stoneham, MA
Feasibility Estimate

30-Nov-17

GFA 5,232

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITE BUILDINGS - SPORTS STADIUM ALTERNATE							
	GROSS FLOOR AREA CALCULATION						
	Team Rooms			3,022			
	Concessions			1,710			
	Press Box			500			
	TOTAL GROSS FLOOR AREA (GFA)				**5,232**	***sf***	
A10	***FOUNDATIONS***						
A1010	**STANDARD FOUNDATIONS**						
	Continuous Footings at interior; 2'-2" wide x 12" deep						
	Formwork	**1,078**	sf	14.00	15,092		
	Re-bar	**5,390**	lbs.	1.32	7,115		
	Concrete material; 3,000 psi	**48**	cy	132.00	6,336		
	Placing concrete	**48**	cy	55.00	2,640		
	Foundation wall; 8" thick						
	Formwork	**4,312**	sf	16.00	68,992		
	Re-bar	**5,390**	lbs.	1.32	7,115		
	Concrete material; 3,000 psi	**59**	cy	132.00	7,788		
	Placing concrete	**59**	cy	55.00	3,245		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Dampproofing foundation wall and footing	**2,156**	sf	3.00	NIC		
072100	*THERMAL INSULATION*						
	Insulation	**2,156**	sf	3.00	6,468		
312000	*EARTHWORK*						
	Continuous footings						
	Excavation	**616**	cy	25.00	15,400		
	Remove off site	**616**	cy	20.00	12,320		
	Backfill with imported material	**509**	cy	38.00	19,342		
	SUBTOTAL					171,853	
A1020	**SPECIAL FOUNDATIONS**						
	Geo-piers	**5,232**	sf	10.50	54,936		
	SUBTOTAL					54,936	
A1030	**LOWEST FLOOR CONSTRUCTION**						
	New Slab on grade, 6" thick						
	Gravel fill, 6"	**97**	cy	38.00	3,686		
	Rigid insulation	**5,232**	sf	2.25	11,772		
	Vapor barrier	**5,232**	sf	0.75	3,924		
	Compact existing sub-grade	**5,232**	sf	0.50	2,616		
	Rebar; #4 e.w.	**8,038**	lbs	1.32	10,610		
	Concrete - 6" thick; 4,000 psi	**102**	cy	125.00	12,750		
	Placing concrete	**102**	cy	45.00	4,590		
	Finishing and curing concrete	**5,232**	sf	1.50	7,848		
	Control joints - saw cut	**5,232**	sf	0.10	523		
	SUBTOTAL					58,319	
	TOTAL - FOUNDATIONS						**$285,108**

PM&C $127,475,590

Stoneham High School
Design Options
Stoneham, MA
Feasibility Estimate

30-Nov-17

GFA 5,232

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITE BUILDINGS - SPORTS STADIUM ALTERNATE							
	A20 BASEMENT CONSTRUCTION						
A2010	**BASEMENT EXCAVATION**						
	No Work in this section						
	SUBTOTAL					-	
A2020	**BASEMENT WALLS**						
	No Work in this section						
	SUBTOTAL					-	
	TOTAL - BASEMENT CONSTRUCTION						
	B10 SUPERSTRUCTURE						
B1010	**FLOOR CONSTRUCTION**						
	No Work in this section						
	SUBTOTAL					-	
B1020	**ROOF CONSTRUCTION**						
	Wood framed construction	**5,232**	sf	18.00	94,176		
	SUBTOTAL					94,176	
	TOTAL - SUPERSTRUCTURE						**$94,176**
	B20 EXTERIOR CLOSURE						
B2010	**EXTERIOR WALLS**						
	Exterior Wall Area; Solid	*6,897*	sf				
042000	*MASONRY*						
	CMU backup, 8"	**6,897**	sf	26.00	179,322		
055000	*MISC. METALS*						
	Miscellaneous metals to exterior masonry; lintels, angles etc.	**6,897**	sf	1.50	10,346		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Air barrier	**6,897**	sf	6.50	44,831		
	Air barrier/flashing at windows	**75**	lf	6.25	469		
	Miscellaneous sealants to closure	**6,897**	sf	1.00	6,897		
072100	*THERMAL INSULATION*						
	3" Mineral wool insulation	**6,897**	sf	2.50	17,243		
	Insulation at windows openings	**75**	lf	8.00	600		
076400	*CLADDING*						
	Phenolic panel cladding	**6,897**	sf	70.00	482,790		
	SUBTOTAL					742,498	
B2020	**WINDOWS**						
	Exterior Wall Area; Glazed	*112*	sf				

PM&C

$127,475,590

Stoneham High School
Design Options
Stoneham, MA
Feasibility Estimate

30-Nov-17

GFA 5,232

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITE BUILDINGS - SPORTS STADIUM ALTERNATE							
061000	*ROUGH CARPENTRY*						
	Wood blocking at openings	**75**	lf	14.00	1,050		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Backer rod & double sealant	**75**	lf	9.00	675		
080001	*METAL WINDOWS + CURTAINWALL*						
	Aluminum windows, double glazed	**112**	sf	90.00	10,080		
	SUBTOTAL					11,805	
B2030	**EXTERIOR DOORS**						
061000	*ROUGH CARPENTRY*						
	Wood blocking at openings	**176**	lf	11.00	1,936		
079200	*JOINT SEALANTS*						
	Backer rod & double sealant	**176**	lf	9.00	1,584		
081110	*HOLLOW METAL*						
	Door, frame and hardware						
	Single	**8**	ea	1,800.00	14,400		
	Double	**2**	pr	3,600.00	7,200		
083513	*OVERHEAD DOORS*						
	Overhead door	**160**	sf	65.00	10,400		
090007	*PAINTING*						
	Finish doors and frames	**12**	ea	200.00	2,400		
	SUBTOTAL					37,920	
	TOTAL - EXTERIOR CLOSURE						**$792,223**
B30	***ROOFING***						
B3010	**ROOF COVERINGS**						
061000	*ROUGH CARPENTRY*						
	Wood blocking at roof edge	**539**	lf	20.00	10,780		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	AVB at roof perimeter	**539**	lf	8.00	4,312		
070002	*ROOFING AND FLASHING*						
	PVC roofing	**5,232**	sf	10.00	52,320		
	Cover board	**5,232**	sf	2.00	10,464		
	Insulation; including tapered at select areas	**5,232**	sf	5.00	26,160		
	Substrate board	**5,232**	sf	2.00	10,464		
	Reinforced vapor barrier	**5,232**	sf	1.00	5,232		
	Miscellaneous Roofing						
	Roof edge	**539**	lf	30.00	16,170		
	SUBTOTAL					135,902	
B3020	**ROOF OPENINGS**						

PM&C $127,475,590

Stoneham High School 30-Nov-17
Design Options
Stoneham, MA
Feasibility Estimate GFA 5,232

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITE BUILDINGS - SPORTS STADIUM ALTERNATE							
165 *086300*	*ROOF SKYLIGHTS*						
166	4'x4' Unit skylight	**16**	ea	1,500.00	24,000		
167	SUBTOTAL					24,000	
168							
169	***TOTAL - ROOFING***						**$159,902**
170							
171							
172 ***C10***	***INTERIOR CONSTRUCTION***						
173							
174							
175 **C1010**	**PARTITIONS**						
176							
177 *042000*	*MASONRY*						
178	6" CMU	**2,158**	sf	22.00	47,476		
179	8" CMU	**3,016**	sf	24.00	72,384		
180	SUBTOTAL					119,860	
181							
182 **C1020**	**INTERIOR DOORS**						
183							
184 *061000*	*ROUGH CARPENTRY*						
185	Wood blocking at openings	**140**	lf	4.00	560		
186							
187 *070001*	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
188	Backer rod & double sealant	**140**	lf	2.50	350		
189							
190 *081110*	*HOLLOW METAL DOOR FRAMES*						
191	Door, frame and hardware						
192	Single	**7**	ea	1,800.00	12,600		
193							
194 *090007*	*PAINTING*						
195	Finish doors and frames	**7**	ea	200.00	1,400		
196	SUBTOTAL					14,910	
197							
198 **C1030**	**SPECIALTIES / MILLWORK**						
199							
200 *102110*	*TOILET COMPARTMENTS*						
201	ADA	**4**	ea	1,800.00	7,200		
202	Standard	**16**	ea	1,600.00	25,600		
203	Urinal screen	**2**	ea	650.00	1,300		
204							
205 *102800*	*TOILET ACCESSORIES*						
206	Gang bathroom	**4**	rms	2,350.00	9,400		
207	Electric hand dryers at gang bathrooms	**8**	ea	800.00	6,400		
208	Sanitary napkin vendors	**2**	ea	650.00	1,300		
209	Fire extinguisher cabinets	**2**	ea	350.00	700		
210	SUBTOTAL					51,900	
211							
212	***TOTAL - INTERIOR CONSTRUCTION***						**$186,670**
213							
214							
215 ***C20***	***STAIRCASES***						
216							
217 **C2010**	**STAIR CONSTRUCTION**						
218	No work in this section						
219	SUBTOTAL					-	
220							
221 **C2020**	**STAIR FINISHES**						

PM&C

$127,475,590

Stoneham High School
Design Options
Stoneham, MA
Feasibility Estimate

30-Nov-17

GFA 5,232

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	SITE BUILDINGS - SPORTS STADIUM ALTERNATE						
222	No work in this section				-		
223	SUBTOTAL					-	
224							
225	***TOTAL - STAIRCASES***						
226							
227							
228	***C30 INTERIOR FINISHES***						
229							
230							
231	**C3010 WALL FINISHES**						
232							
233	*090007 PAINTING*						
234	Paint to CMU	**15,087**	sf	1.25	18,859		
235	SUBTOTAL					18,859	
236							
237	**C3020 FLOOR FINISHES**						
238							
239	*033000 CONCRETE*						
240	Sealed concrete	**5,232**	sf	2.50	13,080		
241	SUBTOTAL					13,080	
242							
243	**C3030 CEILING FINISHES**						
244							
245	*090003 ACOUSTICAL TILE*						
246	ACT, 2x2	**4,567**	sf	5.00	22,835		
247							
248	*090007 PAINTING*						
249	Paint to exposed ceilings	**665**	sf	2.50	1,663		
250	SUBTOTAL					24,498	
251							
252	***TOTAL - INTERIOR FINISHES***						**$56,437**
253							
254							
255	***D10 CONVEYING SYSTEMS***						
256							
257	**D1010 ELEVATOR**						
258	LULA	**1**	ls	90,000.00	90,000		
259	SUBTOTAL					90,000	
260							
261	***TOTAL - CONVEYING SYSTEMS***						**$90,000**
262							
263							
264	***D20 PLUMBING***						
265							
266	**D20 PLUMBING, GENERALLY**						
267	Equipment						
268	Electric water heater (Concession Bldg)	**4**	ea	1,000.00	4,000		
269	Electric water heater (Team Rooms)	**3**	ea	1,000.00	3,000		
270	Plumbing equipment	**5,232**	sf	1.75	9,156		
271	Plumbing Fixtures & Specialties						
272	Water closet (Concession stand & team room)	**20**	ea	1,100.00	22,000		
273	Urinal (Concession stand & team room)	**3**	ea	1,000.00	3,000		
274	Lavatory (Concession stand & team room)	**12**	ea	950.00	11,400		
275	Domestic Water Type L Copper Pipe						
276	Domestic water pipe with fittings & hangers	**5,232**	sf	2.50	13,080		
277	Domestic water pipe insulation	**5,232**	sf	1.50	7,848		
278	Sanitary Waste And Vent Pipe w/ Hangers						
279	Sanitary waste pipe with fittings & hangers	**5,232**	sf	2.35	12,295		

PM&C $127,475,590

Stoneham High School 30-Nov-17
Design Options
Stoneham, MA
Feasibility Estimate GFA 5,232

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	SITE BUILDINGS - SPORTS STADIUM ALTERNATE						
	Kitchen waste pipe with fittings & hangers	5,232	sf	0.30	1,570		
	Storm Drainage, Hubless Cast Iron Pipe						
	Storm water pipe with fittings & hangers	5,232	sf	1.25	6,540		
	Pipe insulation on horizontal runs	5,232	sf	0.20	1,046		
	Miscellaneous						
	Coordination & BIM	1	ls	2,000.00	2,000		
	Coring, sleeves & fire stopping	1	ls	1,000.00	1,000		
	Commissioning support	1	ls	1,500.00	1,500		
	Testing and sterilization	1	ls	1,000.00	1,000		
	Fees & permits	1	ls	1,000.00	1,000		
	SUBTOTAL					101,435	
	TOTAL - PLUMBING						**$101,435**
D30	***HVAC***						
D30	**HVAC, GENERALLY**						
	HVAC Equipment						
	HVAC equipment	5,232	sf	1.50	7,848		
	Air distribution						
	Air distribution equipment	5,232	sf	2.00	10,464		
	Exhaust fans	2	ea	2,500.00	5,000		
	Sheet metal & Accessories						
	Sheet metal & accessories	5,232	sf	4.00	20,928		
	Automatic Temperature Controls						
	Local control	5,232	sf	5.00	26,160		
	Balancing						
	System testing & balancing	5,232	sf	0.25	1,308		
	SUBTOTAL					71,708	
	TOTAL - HVAC						**$71,708**
D40	***FIRE PROTECTION***						
D40	**FIRE PROTECTION, GENERALLY**						
	No work in this section						
	SUBTOTAL					-	
	TOTAL - FIRE PROTECTION						
D50	***ELECTRICAL***						
	Press Box/Concession Stand/Team rooms						
	Electrical work						
	400A panelboard	1	ea	10,000.00	10,000		
	100A panelboard	2	ea	1,850.00	3,700		
	30KVA transformer	1	ea	4,525.00	4,525		
	Manhole	1	ls	8,500.00	8,500		
	400A feed and 4" spare conduit	450	lf	145.00	65,250		
	Lighting control panel	1	ls	3,500.00	3,500		
	Timeclock and photocell	1	ls	750.00	750		
	Grounding	1	ls	1,000.00	1,000		

PM&C

$127,475,590

Stoneham High School
Design Options
Stoneham, MA
Feasibility Estimate

30-Nov-17

GFA 5,232

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	SITE BUILDINGS - SPORTS STADIUM ALTERNATE						
	2 1/2" PVC conduits (Empty, Data)	1,350	lf	12.00	16,200		
	Press Box/Concession Stand/Team rooms Electrical work		sf	10.00			
	SUBTOTAL					113,425	
	TOTAL - ELECTRICAL						**$113,425**
E10	***EQUIPMENT***						
E10	**EQUIPMENT, GENERALLY**						
116600	*EQUIPMENT*						
	Chain-link fence including 2# double doors/gates	650	lf	30.00	19,500		
	Concessions equipment				assume FF+E		
	SUBTOTAL					19,500	
	TOTAL - EQUIPMENT						**$19,500**
E20	***FURNISHINGS***						
E2010	**FIXED FURNISHINGS**						
	Window treatments; manual & electrically operated including blackout shades in Auditorium	84	sf	8.00	672		
	Casework						
	Counters in Press box	33	lf	120.00	3,960		
	Allowance for counter in Concessions	30	lf	400.00	12,000		
	SUBTOTAL					16,632	
E2020	**MOVABLE FURNISHINGS**						
	All movable furnishings to be provided and installed by owner						
	SUBTOTAL					NIC	
	TOTAL - FURNISHINGS						**$16,632**
F10	***SPECIAL CONSTRUCTION***						
F10	**SPECIAL CONSTRUCTION**						
	No work in this section						
	SUBTOTAL						
	TOTAL - SPECIAL CONSTRUCTION						
F20	***SELECTIVE BUILDING DEMOLITION***						
F2010	**BUILDING ELEMENTS DEMOLITION**						
	See main summary for demolition of existing buildings						
	SUBTOTAL						
F2020	**HAZARDOUS COMPONENTS ABATEMENT**						
	See main summary for HazMat allowance				See Summary		
	SUBTOTAL						
	TOTAL - SELECTIVE BUILDING DEMOLITION						
	SUBTOTAL ATHLETIC BUILDINGS						**$ 1,987,216**
							$380

02.6 Building Options

Option Analysis

GOALS/ PRIORITIES (1 Preferred)	OPTION 1 - RENOVATION	OPTION 2 - RENOVATION OF GYM WITH LARGE ADDITION	OPTION 3 - NEW HIGH SCHOOL
Shortest Construction Schedule	3	2	1
Modular Classrooms Required	3	1	1
Phased Construction	3	2	1
Impacts Educational Delivery During Construction	3	2	1
Programs Not Available During Construction	3	1	1
Separates Community Space and Educational Space for Afterhours Use	3	1	1
Provides Sufficient Security Measures	1	1	1
Optimizes Cohesive Educational Teams	2	1	1
Promotes Teacher Collaboration	1	1	1
Maintains Larger Gymnasium/ Auditorium	1	1	1
Provides Maker Space/ Fabrication Lab for Students and Community	1	1	1
Provides MSBA Prescribed Minimum SF for Educational Space	3	1	1
Includes District Offices	3	1	1
Includes Pre-K Program	1	1	1
Energy Efficient/ Green Design Features	1	1	1
Has Capacity for Future Expansion	3	1	1
Maximizes Green Spaces/ Adds Playfields	3	2	1
Provides Outdoor Classroom and Dining Space	1	1	1
TOTALS	**39**	**22**	**18**

The committee has many goals for the project. They are separated in the following categories:

1.Educational

2.Construction

3.Cost

The chart on the following page lists the various criteria and rates them in a system where 1 is preferred.

Options in which modular classrooms are required or phased construction in an occupied building are not preferred because of the impacts on educational delivery. Options where certain programs or spaces like the Gymnasium are not available during construction are also not preferred but maintaining the larger Gymnasium/Auditorium is very important.

The ideal option would separate community space and educational space for afterhours use and provide sufficient security measures. Educationally the goals are to optimize cohesive educational teams, promote teacher collaboration, provide Maker Spaces and Fabrication Labs for students and community, and provide a home for the Pre-School at the high school. Ideally, the new or renovated building should include space for the District Offices and have space for future expansion.

The final design should be energy efficient and include as many green design features as possible. It should maximize green spaces and if possible add playfields, outdoor classrooms, and outdoor dining space.

The cost of any option will need to be compared with all of the goals and help to determine the direction for the District.

03. Conclusion

After review of the options and the goals of the project, the Stoneham Building Committee has concluded that either the renovation with addition or the all new option best meet the needs of the community.

The educational goals to optimize cohesive educational teams, promote teacher collaboration, provide Maker Spaces and Fabrication Labs for students and community, and provide a home for the Pre-School at the high school can be met in all options.

The all renovation option which requires multi-year phased construction in an occupied building is not preferred because of the impacts on educational delivery. This option also requires modular classrooms to be purchased to temporarily house the students during the renovation of the classroom wings of the building. The cost for purchasing these modular would come at the expense of long-term educational benefit to the students and learning. Spaces such as the Gymnasium and Auditorium would not be easily accessible during construction while the students are housed in modular classrooms. These spaces may also be completely offline for periods of time while they are renovated. Renovation would mean that these spaces must remain where they are currently located within the building and would not allow them to be separated from educational space for after hour use by the community. In addition, the District Offices would need to be relocated in one of the other schools or town hall due to lack of available square footage in the existing building.

The renovation with addition or all new options would separate community space and educational space for afterhours use and provide sufficient security measures. Both options include space for the District Offices and have space for future expansion. The design of either of these options would be more energy efficient than a renovation option due to higher floor to floor heights for inclusion of ductwork and better HVAC systems. Both options maximize outdoor green spaces and add playfields, outdoor classrooms, and outdoor dining space. Both options are slightly less expensive than the all renovation option with more dollars going directly to new educational space and less to phasing and temporary facilities. For all the above listed reasons, the District is leaning towards options 2 and 3-renovation with addition or an all new high school.

Future steps include updating the SOI for submission to the MSBA in April. Beginning to plan for a future MSBA project including organizing population data, preparing a budget for the first phase of the project through Schematic Design, and organizing an official Building Committee.

Preliminary Design Study by HMFH

VOLUME 2

HMFH

Stoneham High School

Preliminary Design Study

VOLUME 2

MARCH 12, 2018

HMFH ARCHITECTS

130 Bishop Allen Drive Cambridge, MA 02139 617 492 2200 hmfh.com

HM
FH

Ask.
Design.
Learn.

Contents

Volume 1 of 2

01. Introduction

02. Planning Process

- 02.1 Existing Conditions
- 02.2 Facility Assessment
- 02.3 Educational Program
- 02.4 Building Options
  - 1. Renovation
  - 2. Renovation with Addition
  - 3. New Build
- 02.5 Estimates
- 02.6 Option Analysis

03. Conclusion

Volume 2 of 2

04. Appendices

- Appendix A - Hazardous Material Report
- Appendix B - Warner Larson Field Turf Investigations
- Appendix C - Teacher Interviews
- Appendix D - School Committee Meeting Minutes
- Appendix E - Mechanical Electrical Plumbing and Fire Protection Option Narratives
- Appendix F - Structurtal Option Narratives

04. Appendices

Appendix A: Hazardous Material Report

REPORT
FOR LIMITED
HAZARDOUS MATERIALS IDENTIFICATION
STUDY
AT THE
HIGH SCHOOL
STONEHAM, MASSACHUSETTS

PROJECT NO: 217 214.00

Survey Date:
May 31, 2017

CONDUCTED BY:

UNIVERSAL ENVIRONMENTAL CONSULTANTS
12 Brewster Road
Framingham, MA 01702

UEC universal environmental consultants

June 1, 2017

Ms. Tina Stanislaski
HMFH Architects
130 Bishop Allen Drive
Cambridge, MA 02139

Reference: Report for Hazardous Materials Identification Study
High School, Stoneham, MA

Dear Ms. Stanislaski:

Thank you for the opportunity for Universal Environmental Consultants (UEC) to provide professional services.

Enclosed please find the report for the hazardous materials identification study at the High School, Stoneham, MA.

Please do not hesitate to call should you have any questions.

Very truly yours,

Universal Environmental Consultants

Ammar M. Dieb
President

UEC:\217 214.00\Report.DOC

Enclosure

1.0 INTRODUCTION:

Universal Environmental Consultants (UEC) has been providing comprehensive asbestos services since 2001 and has completed projects throughout New England. We have completed projects for a variety of clients including commercial, industrial, municipal, and public and private schools. We maintain appropriate asbestos licenses and staff with a minimum of twenty five years of experience.

UEC was requested by HMFH Architects to conduct a determination review for the following at the High School, Stoneham, Massachusetts:

- Asbestos Containing Materials (ACM) determination inspection;
- Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures inspection;
- PCB's in Caulking inspection;
- Lead Based Paint (LBP) inspection;
- Other hazardous materials inspection.

The scope of work included the review of the AHERA Management Plan and exterior inspection of the building for ACM. No sampling was performed. A comprehensive survey per the Environmental Protection Agency (EPA) NESHAP regulation would be required prior to any renovation or demolition activities.

2.0 FINDINGS:

Asbestos Containing Materials (ACM):
Observations and Conclusions:
The condition of ACM is very important. ACM in good condition does not present a health issue unless it is disturbed. Therefore, it is not necessary to remediate ACM in good condition unless it will be disturbed through renovation, demolition or other activity.

Refer to the AHERA Management Plan for condition of ACM.

1. Soft ceiling plaster was previously found to contain asbestos.
2. Linoleum floor covering was previously found to contain asbestos.
3. 2' x 4' Ceiling tiles were assumed to contain asbestos.
4. Cement boards were previously found to contain asbestos.
5. Various types of flooring materials were previously found to contain asbestos.
6. Thermal insulation was previously found to contain asbestos.
7. Hard joint insulation was previously found to contain asbestos.
8. Fire doors insulation was previously found to contain asbestos.
9. Textured wall coating was previously found to contain asbestos.
10. Textured ceiling plaster was previously found to contain asbestos.
11. Ceramic wall tile was assumed to contain asbestos.
12. Baseboard and glue was previously found to contain asbestos.
13. Fire curtain was assumed to contain asbestos.
14. Sink damproofing was assumed to contain asbestos.
15. Paper under hardwood floor was assumed to contain asbestos.
16. Interior window glazing caulking was assumed to contain asbestos.
17. Glazing caulking for window in wood door was assumed to contain asbestos.
18. Transite panel around exterior soffits was assumed to contain asbestos.
19. Exterior vertical caulking in brick was assumed to contain asbestos.
20. Exterior window framing caulking was found to contain asbestos.
21. Exterior unit vent grille caulking was found to contain asbestos.
22. Interior glazing caulking for exterior window was found to contain asbestos.
23. Exterior window glazing caulking was found to contain asbestos.
24. Glue holding old blackboard was assumed to contain asbestos.

25. Roofing material was assumed to contain asbestos. Roofing material does not have to be removed by a licensed asbestos contractor. However, the Demolition/Roofing Contractor must comply with OSHA regulation during demolition and with state regulations for proper disposal. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval
26. Exterior damproofing on exterior and foundation walls was assumed to contain asbestos. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval.
27. Underground sewer pipes were assumed to contain asbestos.
28. Thru-wall flashing was assumed to contain asbestos. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval.

Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures:
Observations and Conclusions
Ballasts in light fixtures were assumed to contain PCB's. Tubes in light fixtures, thermostats, signs and switches were assumed to contain mercury. It would be very costly to test those equipments and dismantling would be required to access. Therefore, the above mentioned equipments should be disposed in an EPA approved landfill as part of the demolition project.

PCB's in Caulking Material:
Observations and Conclusions
Building caulking was assumed to contain PCB's. PCB's are manmade chemicals that were widely produced and distributed across the country from the 1950s to 1977 until the production of PCB's was banned by the US Environmental Protection Agency (EPA) law which became effective in 1978. PCB's are a class of chemicals made up of more than 200 different compounds. PCB's are non-flammable, stable, and good insulators so they were widely used in a variety of products including: electrical transformers and capacitors, cable and wire coverings, sealants and caulking, and household products such as television sets and fluorescent light fixtures. Because of their chemical properties, PCB's are not very soluble in water and they do not break down easily in the environment. PCB's also do not readily evaporate into air but tend to remain as solids or thick liquids. Even though PCB's have not been produced or used in the country for more than 30 years, they are still present in the environment in the air, soil, and water and in our food. EPA requires that all construction waste including caulking be disposed as PCB's if PCB's level exceed 50 mg/kg (ppm). An abatement plan might also be required.

Lead Based Paint (LBP):
Observations and Conclusions
LBP was assumed to exist on various painted surfaces. A school is not considered a regulated facility. All LBP activities performed, including waste disposal, should be in accordance with applicable Federal, State, or local laws, ordinances, codes or regulations governing evaluation and hazard reduction. In the event of discrepancies, the most protective requirements prevail. These requirements can be found in OSHA 29 CFR 1926-Construction Industry Standards, 29 CFR 1926.62-Construction Industry Lead Standards, 29 CFR 1910.1200-Hazards Communication, 40 CFR 261-EPA Regulations.

According to OSHA, any amount of LBP triggers compliance.

3.0 COST ESTIMATES:

The cost includes removal and disposal of all accessible ACM, other hazardous material and an allowance for removal of inaccessible or hidden ACM that may be found during renovation or demolition project

Location	Material	Approximate Quantity	Cost Estimate ($)
Throughout	Various Types of Flooring and Mastic	180,000 SF	720,000.00
	Interior Windows	Unknown	50,000.00
	Interior Doors with Windows	Unknown	30,000.00

Location	Material	Approximate Quantity	Cost Estimate ($)
	Blackboards/Tackboards	Unknown	60,000.00
	Miscellaneous Hazardous Materials	Unknown	125,000.00
	Hidden ACM	Unknown	75,000.00
	Light Fixtures	Unknown	100,000.00
Stage	Fire Curtain	1 Total	7,500.00
Boiler Room	Thermal Insulation	2,000 SF	100,000.00
Various Locations	Old Ceiling Tiles	200 SF	2,000.00
	Sinks	Unknown	2,500.00
	Wood Fire Doors	Unknown	5,000.00
	Ceramic Tiles	Unknown	15,000.00
	Wall and Ceiling Plaster	5,000 SF	60,000.00
	Hard Joint Insulation	Unknown	25,000.00
Exterior	Roofing Materials	200,000 SF	600,000.00
	Windows	600 Total	120,000.00
	Doors	50 Total	10,000.00
	Unit Vent Grilles	80 Total	8,000.00
	Transite Panels	2,000 SF	10,000.00
	Vertical Caulking	2,000 LF	15,000.00
	Transite Sewer Pipes	Unknown[1]	75,000.00
	Damproofing/Flashing on Walls	6,500 Tons[1]	845,000.00
PCB's Remediation[2]			180,000.00
Estimated costs for PCB's Testing and Abatement Plans Services[2]			50,000.00
Estimated costs for NESHAP Inspection and Testing Services			25,000.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			285,000.00
		TOTAL:	**$ 3,600,000.00**

[1]: Part of total demolition.
[2]: Should results exceed EPA limit.

4.0 LIMITATIONS AND CONDITIONS:

This report has been completed based on visual and physical observations made and information available at the time of the site visits, as well as an interview with the Owner's representatives. This report is intended to be used as a summary of available information on existing conditions with conclusions based on a reasonable and knowledgeable review of evidence found in accordance with normally accepted industry standards, state and federal protocols, and within the scope and budget established by the client. Any additional data obtained by further review must be reviewed by UEC and the conclusions presented herein may be modified accordingly.

This report and attachments, prepared for the exclusive use of Owner for use in an environmental evaluation of the subject site, are an integral part of the inspections and opinions should not be formulated without reading the report in its entirety. No part of this report may be altered, used, copied or relied upon without prior written permission from UEC, except that this report may be conveyed in its entirety to parties associated with Owner for this subject study.

Appendix B: Warner Larson Field Turf Investigations

WARNER LARSON
LANDSCAPE ARCHITECTS

December 23, 2014

Dr. Les Olson, Superintendent
Stoneham Public Schools
149 Franklin Street
Stoneham, MA 02180

Re: Stoneham High School - Synthetic Turf Study

Dear Dr. Olson:

Enclosed is the completed feasibility study evaluation to convert existing athletic fields at the Stoneham High School property from natural grass to synthetic turf. As requested, this study includes the game field inside the track, the baseball field north of the track and the two soccer fields north of the baseball field. This study is based on visual observations, record drawings provided to us, Geographic Information System (GIS) maps obtained online and a limited subsurface exploration.

Briggs Engineering & Testing performed the subsurface investigations based on the initial scope authorization limited to the game field and two soccer fields. Their report, included as Appendix A, identifies the depth to refusal recorded at test pits and borings, the observed physical characteristics of soils encountered and sieve analysis of particle size gradation from composite samples obtained from the soil borings.

Nitsch Engineering, Inc. reviewed the existing conditions in person with us as well as the record drawings, GIS maps and soils information from Briggs and prepared a Civil Narrative, included as Appendix B. Their narrative describes different strategies for approaching the drainage design and summarizes the applicable permitting requirements.

Existing Conditions

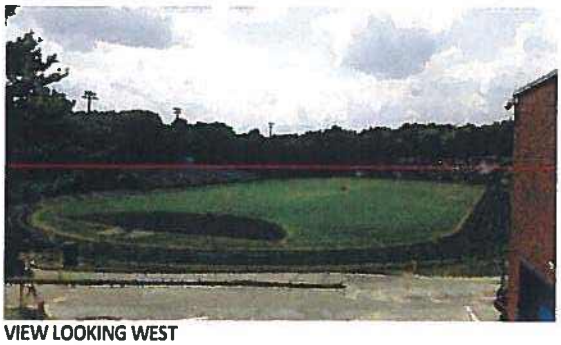
The fields included in this study are located along the western side of the high school site. The land rises 35 to 40 feet in elevation west of the fields where it is wooded, providing good protection from low sun angles. A ledge face is exposed apparently from the excavation for the original equal quadrant 6-lane running track construction which has an East-West orientation. The track was recently resurfaced and is excluded from this study along with associated facilities surrounding it. Bleachers with a press box are located along the south side of the track facing north, and 6 wooden poles support the sports lighting. The long and triple jumps are located in the west "D" zone inside the track and the high jump is located inside the east end. Pole vault is located as an extension of the track chute. Discus, shot put and javelin are thrown at the practice field east of the school.

The baseball field is oriented in a southeasterly direction from home plate to second base, but protected from low sun angles with the infield located up against the wooded rise in the land mentioned previously. The two soccer fields are oriented north-south located end to end.

The Briggs report identified stable subgrade but shallow refusals at the game field and along the west side of the two soccer fields. Briggs recommends additional test pits be performed to determine the nature of the refusals. Given the evidence of ledge removal from prior construction, it seems likely the refusals are either from unexcavated rock or rock used in the fills required for the original field construction.

Unsuitable materials were encountered in deeper fills along the east side of the soccer fields, eliminating the two soccer fields from consideration in this study. After completion of the subsurface exploration, we were asked to estimate the value of converting the baseball field to synthetic turf, which is included later in this report.

AERIAL VIEW LOOKING WEST



VIEW LOOKING WEST

VIEW LOOKING EAST

TRACK PERIMETER CONDITIONS

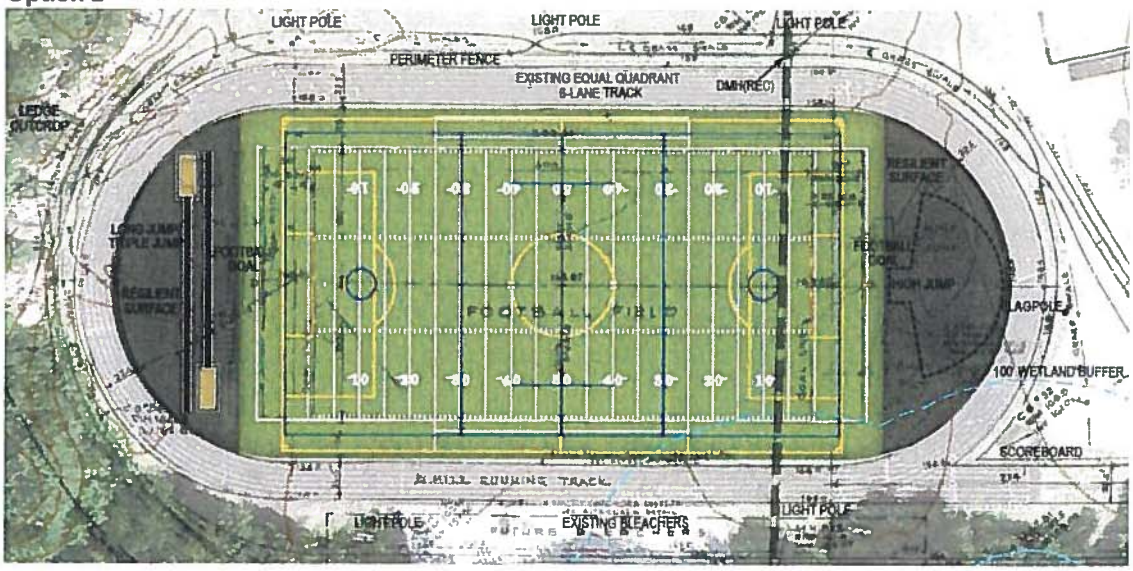
TRACK PERIMETER CONDITIONS

BASEBALL VIEW LOOKING NORTH

Game Field

The existing equal quadrant track provides a 205' wide grass area allowing for the minimum high school soccer field width of 195' and extends throughout the "D" zones. The two options have the same 205' x 380' synthetic turf area, but Option 1 includes pavement with resilient track surfacing in the "D" zones whereas Option 2 leaves the "D" zones natural grass, which reduces the impervious area and quantity of stormwater storage required. The budget estimates for this field includes the following:

Option 1



- Construction access bridge to protect track
- Removal & disposal of topsoil under proposed turf area and "D" zones
- Excavation and installation of drainage system connecting to 48" pipe outside track
    - Includes trenching and patching track surface
- Paving and resilient surfacing at "D" zones
- Reconstruct jumps within "D" zones
- Trench drain between track and "D" zone
- Cast in place concrete edge around turf perimeter
- Base stone layer under the turf
- Drainage and shock pad (recommended) $135,000 value
- Multi-sport turf synthetic turf with rubber and sand infill
- Permanent field markings for football and soccer (no logo)
- New permanent football goal posts
- Survey, design, engineering and permitting fee
- 10% contingency

Option 1 Estimated Budget: $1,280,000

Option 2

Eliminates the following items in Option 1

- Removal and disposal of topsoil at "D" zones
- Paving and resilient surfacing at "D" zones
- Reconstruct jumps
- Trench drain between track and "D" zone
- Drainage system and stormwater storage from "D" zones

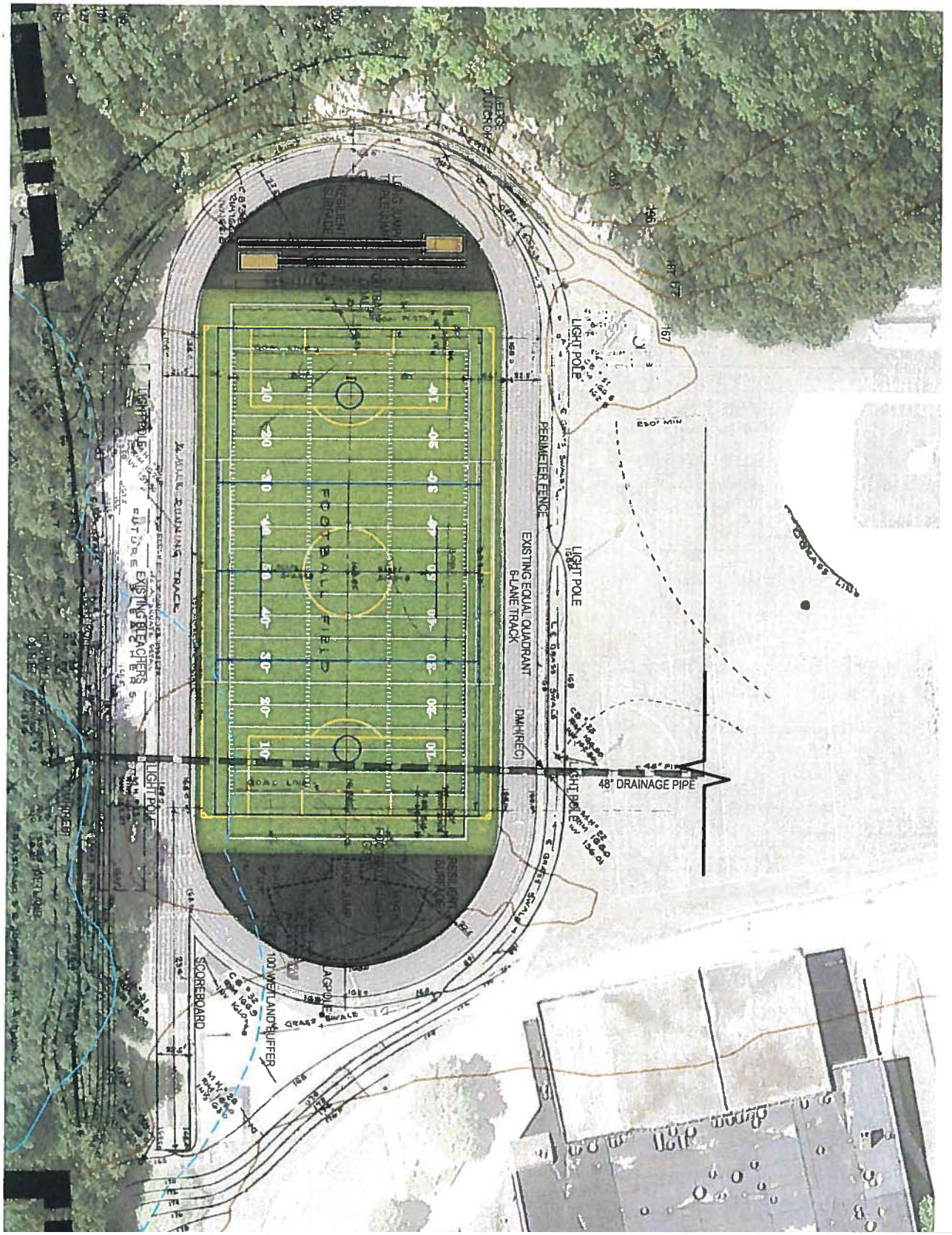
Option 2 Estimated Budget: $995,000

Baseball Field

Replacing the natural grass with synthetic turf at the baseball field which measures approximately 360' x 330' from the dugouts is 118,800 square feet would require:

- Topsoil removal (assume 15" depth)
- Excavation and installation of drainage system
- Cast in place concrete edger around turf perimeter
- Base stone layer under turf
- Drainage and shock pad (recommended) $196,000 value
- Multi-sport turf synthetic turf infield and outfield with rubber and sand infill
- Clay pitcher's mound, synthetic turf at home plate and bases
- Survey, design and engineering fee
- 10% contingency

Baseball Field Estimated Budget: $1,564,500



STONEHAM HIGH SCHOOL
SYNTHETIC TURF FIELD
OPTION 1

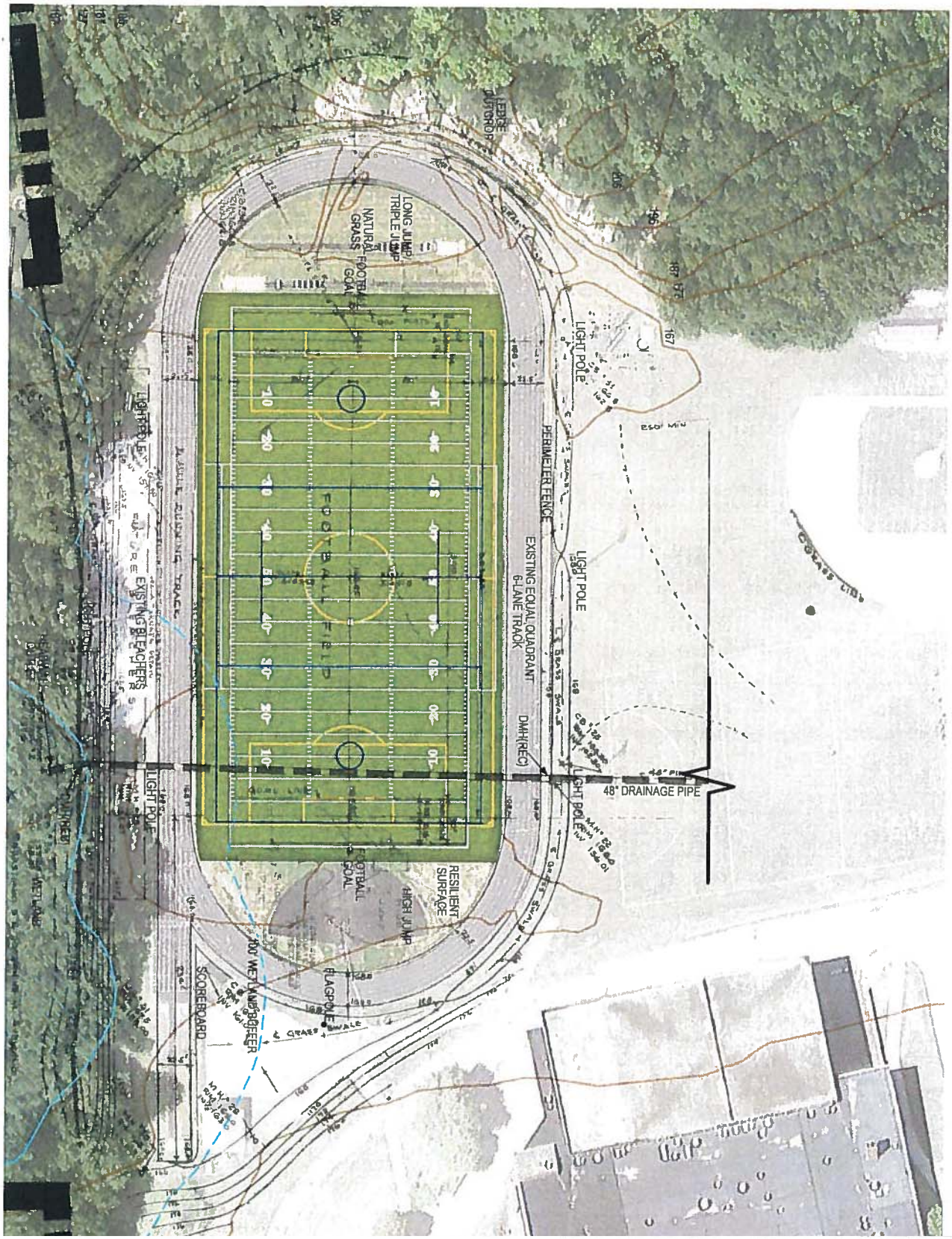
December 23rd, 2014

WARNER LARSON
LANDSCAPE ARCHITECTS

SCALE: 1" = 60'-0"

60 30 0 60 120

source: property line, wetland boundaries and topographical information from MassGIS



STONEHAM HIGH SCHOOL
SYNTHETIC TURF FIELD
OPTION 1

December 23rd, 2014

WARNER LARSON
LANDSCAPE ARCHITECTS

SCALE: 1" = 60'-0"

60 30 0 60 120

source: property line, wetland boundaries and topographical information from MassGIS

APPENDIX A

Briggs Engineering & Testing
A Division of PK Associates, Inc.

Warner Larson Landcape Architects
c/o Mr. David Warner
130 West Broadway
Boston, MA 02127

September 17, 2014
Briggs Project No. 27856

RE: Proposed Field Turf Investigations and Analyses
High School, 149 Franklin Street, Stoneham, MA

In accordance with your authorization, Briggs Engineering & Testing, *A Division of PK Associates* (Briggs) has completed our sampling and analyses of subsurface conditions at the above referenced fields at Stoneham High School.

1.0 Project Scope

The following services were performed by Briggs in accordance with the terms of the proposal for this project.

a. Excavated and sampled surface soils at five locations along the west side of the two northerly soccer fields and three locations along the north side of the football field at the site. These fields are located to the west of the high school main buildings.
b. Monitored advancement of four test borings along the east side of the soccer fields and three along the south side of the football field.
c. Submitted samples of gravelly silty sand fill soils for sieve analyses.
d. Reviewed laboratory reports and prepared this summary report regarding sampling and testing procedures and results and provided soil classifications and exploration logs.

2.0 Site Location and Description

Stoneham High School is located in the east-central part of Stoneham. Franklin Street lies about 1000 feet north of the fields. Buckman Pond is located about 1000 feet southwest of the playing fields. Route 28 (Main Street) is located about 0.8 mile west of the site. The existing soccer fields are located about 1000 feet northwest of the existing high school buildings. The existing football field is located about 500 feet southwest of the high school buildings. These fields are located about 10 feet lower elevation than the high school ground floor grade. Refer to Figure 1 for existing site layout and adjacent streets.

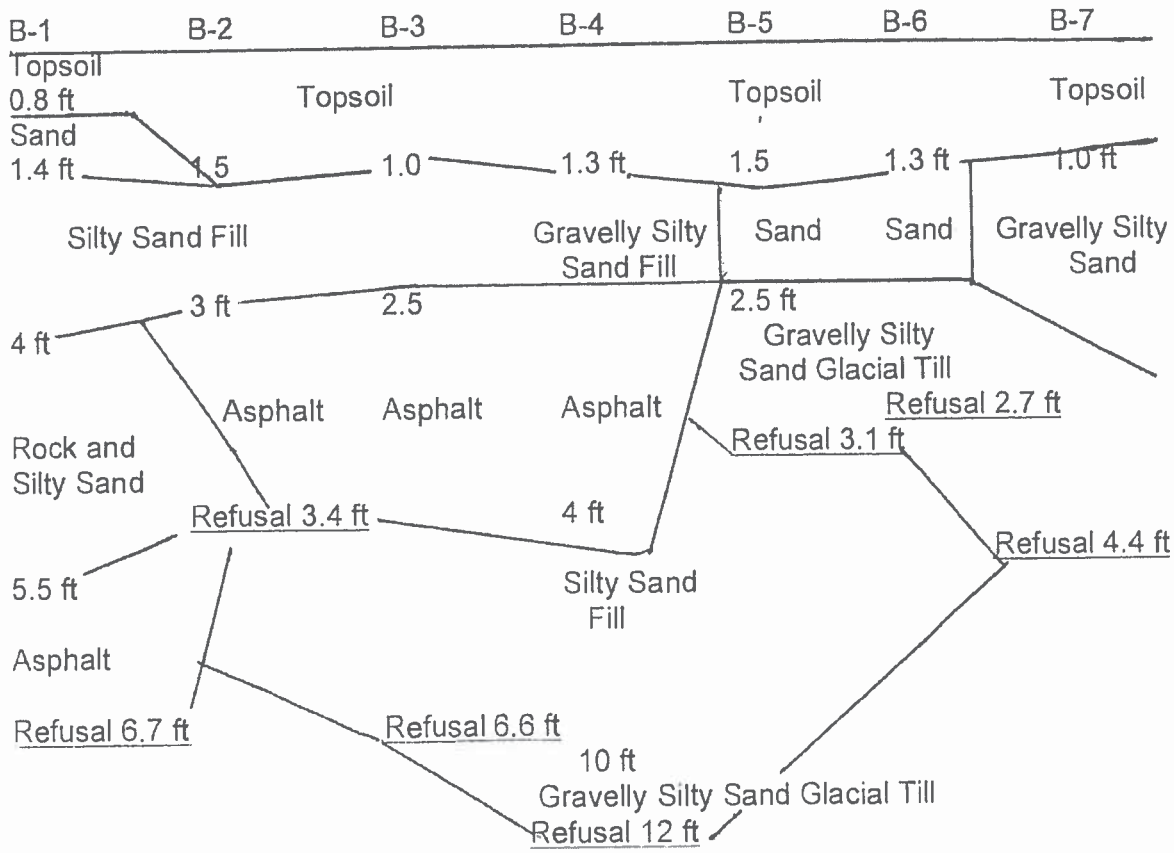
2.0 Subsurface Explorations

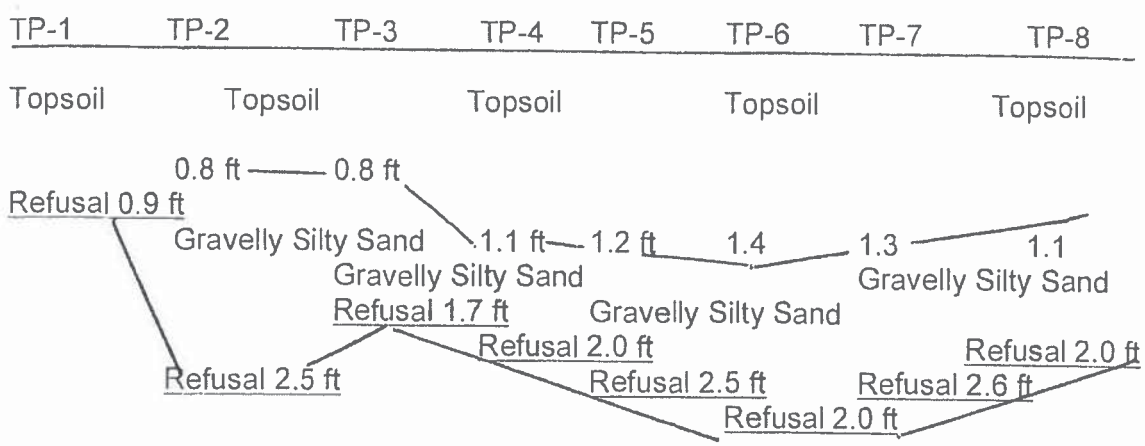
The subsurface conditions at the Site were explored under the supervision of the undersigned Briggs' Geotechnical Engineer. The explorations consisted of advancing seven (7) test borings and eight (8) test pits within the existing soccer fields (2) and football field. Refer to Figure 1 for exploration locations.

The borings were advanced on September 3, 2014 by Able - EarthTech of Burrillville, RI. The borings were drilled by a portable tripod drill rig mounted with continuous split spoon sampling to refusal. Borings were accomplished via ASTM D1586, "Penetration Test and Split Barrel Sampling of Soils". Standard Penetration Tests (SPT) were as noted on the attached test boring logs.

Soil samples were field classified by David Geisser, Geotechnical Engineer using the Bermister Soil Classification System. Soil descriptions by Briggs are presented in the attached test boring logs.

The test pits were hand excavated by Briggs on August 27, September 3 and 7, 2014. Each pit was excavated by post hole digger to refusal on rock. A ½ inch diameter piece of steel rebar was driven at the refusal depth in an attempt to probe around the rock or break through the rock. Soil conditions are as tabulated below:





3.0 Lab Tests

Briggs tested two composited soil samples of similar soils recovered from the test borings. These samples were tested for gradation distribution via ASTM C136 and C117.

Sample S3 from boring B-7 was mixed with sample S-2 from boring B-6. These are gravelly silty sands. The lab report indicates the soil has 43% gravel (material larger than #4 sieve), 14% fines (material passing #200 sieve) and 43% sand (remainder of soil).

Sample S1A from boring B-3 was mixed with sample S-2 from boring B-4. This sample is gravelly silty sands with 24% gravel, 14% fines and 52% sand.

4.0 Conclusions and Recommendations

Soils beneath the proposed sports field reconstructions consist of topsoil over sandy fill in places or gravelly silty sands. Buried asphalt exists under the two northerly soccer fields. Shallow refusals were encountered at 0.9 to 3 feet depth in all test pits. These pits were hand excavated and did not use the 140-pound sample driver used for the test borings. The borings revealed shallow refusals at 2.7 to 3.4 feet in B-2, B-5 and B-6. Test pits should be accomplished to determine if refusals are due to shallow bedrock or large rocks. Shallow refusals could require relocation of under-field drainage pipes or other penetrations such as goal posts.

The surface topsoil and any underlying organic soils or organic materials such as roots should be removed from below proposed synthetic turf areas as typical.

No loose soils were encountered below the surface topsoil within the limits of explorations. Since loose or soft zones might exist between exploration locations, Briggs recommends that all proposed synthetic turf areas be proof rolled using a vibratory roller weighing at least 7 tons making at least 10 passes over each field area. Proof rolling should be witnessed by a Geotechnical Engineer. Soft or weak zones

should be explored by test pitting. Recommendations for removing or improving these areas would be made on a case-by-case basis.

5.0 Limitations and Exclusions

All the professional opinions presented in this report are based solely on the scope of work conducted and sources referred to in our report. The data presented by Briggs in this report were collected and analyzed using generally accepted industry methods and practices at the time the report was generated. This report represents the conditions, locations, and materials that were observed at the time the field-work was conducted. No inferences regarding other conditions, locations, or materials, at a later or earlier time may be made based on the contents of the report. No other warranty, express or implied is made.

This report was prepared for the sole use of our client. The use of this report by anyone other than our client or Briggs is strictly prohibited without the express prior written consent of Briggs. Portions of the report may not be used independently of the entire report.

The above recommendations and conclusions are based on our evaluation of the obtained data presented in the text. We would welcome the opportunity to monitor the pertinent phases of proposed repairs or construction; thus, if differences are found between the field conditions described herein and those encountered during construction, we can modify our recommendations in a timely and professional manner.

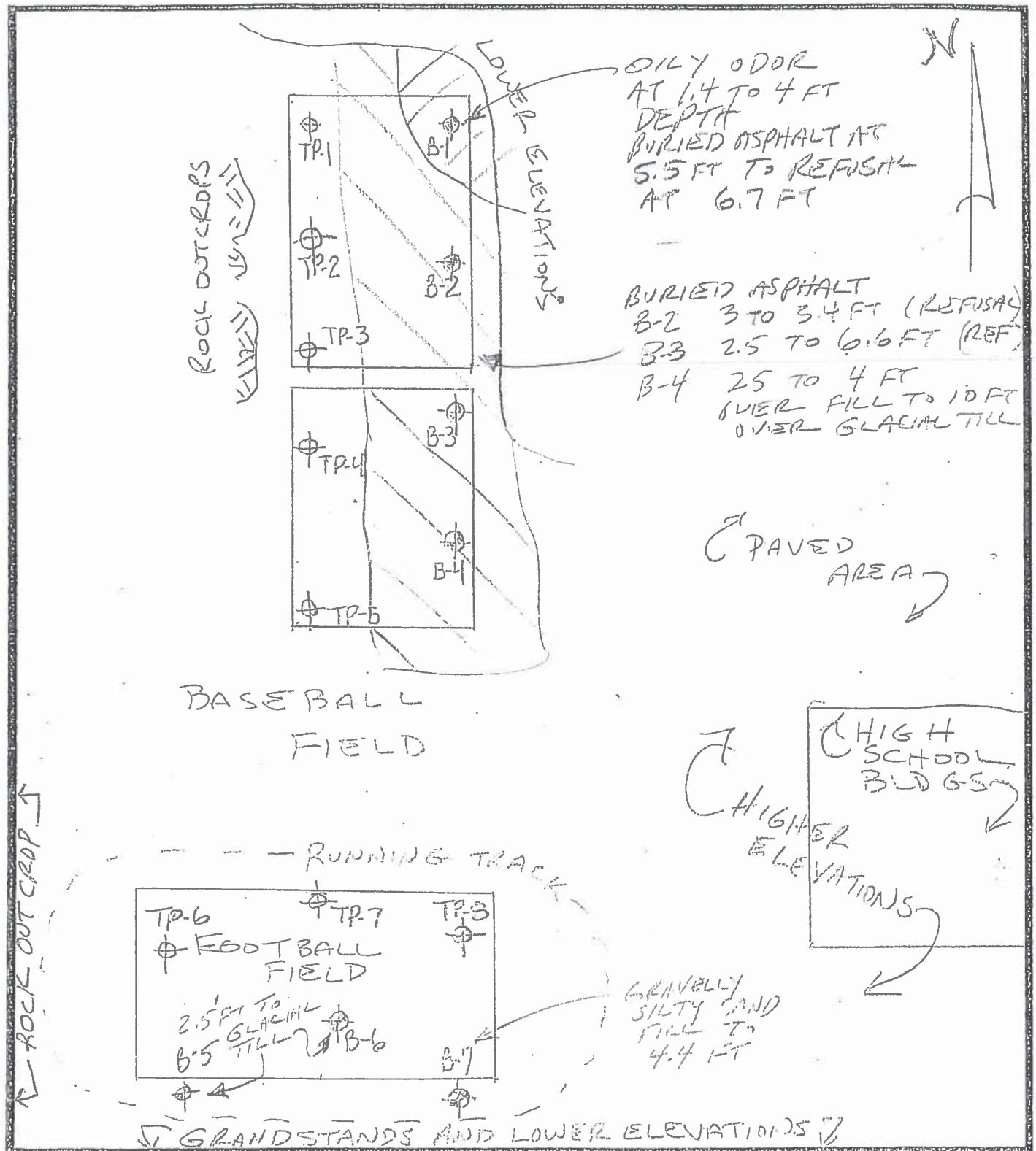
Thank you for engaging our services to undertake this project. If you have any questions, please do not hesitate to contact us at your convenience.

Very truly yours,
Briggs Engineering & Testing

David W. Geisser
Project Engineer

DWG:dg
Enclosures:

Figure 1 - Location Plan
Test Boring Logs
Laboratory Reports



Briggs Engineering & Testing
A Division of PK Associates, Inc.

B-3 NUMBER & APPROX LOCATION OF TEST BORING.

TP-1 NUMBER & APPROX. LOCATION OF HAND DUG TEST PIT.

LOCATION PLAN
STONEHAM H.S. FIELDS
149 FRANKLIN ST - STONEHAM, MA

Scale: N.T.S.	Drawn: DWG	FIG. 1
9-3-14	Check: DWG	

PERRY DRILL.SERVICE
Geotechnical Services
HARRISVILLE, RI.

BORING / WELL LOG

CLIENT: BRIGGS ENGINEERING & TESTING
ROCKLAND, MA
PROJECT: STONEHAM HIGH SCHOOL
STONEHAM, MA.

DRILLER	S. PERRY	BORING			CASING	SAMPLER	CORE BARREL
INSPECTOR	D. GEISSER	NO.	B-1				
LINE & STA	OFFSET	SHEET	1	TYPE	HSA	SS	
SUR.ELEV.		OF	1	SIZE ID	3.25	1.375	
START	SEPTEMBER 3,2014			HAMMER WT.		140 LB.	
FINISH	SEPTEMBER 3,2014		14709	HAMM. FALL		30 IN.	

DEPTH	COL. A	NO.	DEPTH RANGE FEET	REC / PEN	BLOWS/6" ON SAMPLER	TYPE	MOISTURE DENSITY OR CONSIST	STRATA CHANGE FEET	SOIL IDENTIFICATION IS FIELD CLASSIFICATION ONLY FOR EXACT GRADATION LABORATORY TESTING IS REQUIRED
									GRASS AND TOPSOIL, F / C SAND,TRACE GRAVEL,LITTLE SILT,
		1	0' – 2.0'	16"/24"	5-11-15-17	SS	DRY	0.8'	TRACE ORGANIC,BLACK
							M. DENSE	1.4'	SAND, F / C, TRACE SILT,BROWN
		2	2.0' – 4.0'	10"/24"	30-25-30-80	SS	DRY		SILTY SAND FILL, F / C, SOME GRAVEL,SOME CLAYEY SILT,
5							V. DENSE	4.0'	TRACE (-) BRICK,COAL,GRAY
		3	4.0' – 6.0'	10"/24"	60-45-42-95	SS	DRY	5.5'	ROCK,SHATTERED,LITTLE SILTY SAND,GRAY TO BLACK
							V. DENSE		ASPHALT AND ROCK,MOSTLY ASPHALT,LITTLE GRAVEL
		4	6.0' – 6.7'	8"/9"	109 – 100 / 3	SS	DRY	6.7'	
							V. DENSE		
10									REFUSAL AT 6.7 FEET
		1	0' – 2.0'	16"/24"	5-11-17-29	SS	DRY		MOVED 3 FEET SOUTH
							M. DENSE		PROBED P – 1
		2	2.0' – 4.0'	14"/24"	15-14-70-20	SS	DRY		
15							V. DENSE		
		3	4.0' – 6.0'	11"/24"	35-25-25-38	SS	DRY		
							V. DENSE		
		4	6.0' – 6.3'	3"/3"	150 / 3	SS	DRY	6.3'	
							V. DENSE		
20									REFUSAL AT 6.3 FEET
25									
30									
35									

SAMPLE IDENTIFICATION
S - SPLIT SPOON
T - THIN WALL TUBE
U - UNDISTURBED PISTON
O - OPEN END ROD
W - WASH SAMPLE
A - AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density	Cohesive Consistency
0-4 Very Loose	0-2 Very Soft
5-9 Loose	3-4 Soft
10-29 Med. Dense	5-8 Med. Stiff
30 - 49 Dense	9-15 Stiff
50+ Very Dense	16-30 Very Stiff
	31+ Hard

COLUMN A
PROPORTIONS USED
trace 0-10%
little 10-20%
some 20-35%
and 35-50%

GROUNDWATER OBSERVATIONS
AT NONE 4 HRS
AT HRS
NOTE: Levels may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken.

S. PERRY DRILL.SERVICE
Geotechnical Services
HARRISVILLE, RI.

BORING / WELL LOG

CLIENT: BRIGGS ENGINEERING & TESTING, ROCKLAND, MA
PROJECT: STONEHAM HIGH SCHOOL, STONEHAM, MA.

DRILLER	S. PERRY	BORING NO.	B-2		CASING	SAMPLER	CORE BARREL
INSPECTOR	D. GEISSER	SHEET	1	TYPE	HSA	SS	
LINE & STA	OFFSET	OF	1	SIZE ID	3.25	1.375	
SUR.ELEV.				HAMMER WT.		140 LB.	
START	SEPTEMBER 3,2014			HAMM. FALL		30 IN.	
FINISH	SEPTEMBER 3,2014		14709				

DEPTH	COL. A	NO.	DEPTH RANGE FEET	REC / PEN	BLOWS/6" ON SAMPLER	TYPE	MOISTURE DENSITY OR CONSIST	STRATA CHANGE FEET	SOIL IDENTIFICATION IS FIELD CLASSIFICATION ONLY FOR EXACT GRADATION LABORATORY TESTING IS REQUIRED
		1	0' – 2.0'	16"/24"	5-9-9-13	SS	DRY	1.5'	GRASS AND TOPSOIL, F / M, TRACE GRAVEL,SOME SILT, TRACE ORGANIC,BLACK
							M. DENSE		SILTY SAND FILL, F / C, TRACE GRAVEL,LITTLE TO SOME SILT
		2	2.0' – 3.4'	9"/16"	18-27-150-/-4	SS	DRY	3.0'	AND CLAYEY SILT,TRACE BRICK AND ORGANICS
5							V. DENSE	3.4'	ASPHALT FILL
									REFUSAL AT 3.4 FEET
10		1	0' – 2.0'	16"/24"	7-8-9-13	SS	DRY		MOVED 4 FEET NORTH
							M. DENSE		PROBED P – 2
		2	2.0' – 3.0'	12"/24"	18-160	SS	DRY	3.0'	
							V. DENSE		REFUSAL P - 2 AT 3.0 FEET
15									
20									
25									
30									
35									

SAMPLE IDENTIFICATION
S - SPLIT SPOON
T - THIN WALL TUBE
U - UNDISTURBED PISTON
O - OPEN END ROD
W - WASH SAMPLE
A - AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density	Cohesive Consistency
0-4 Very Loose	0-2 Very Soft
5-9 Loose	3-4 Soft
10-29 Med. Dense	5-8 Med. Stiff
30 - 49 Dense	9-15 Stiff
50+ Very Dense	16-30 Very Stiff
	31+ Hard

COLUMN A
PROPORTIONS USED
trace 0-10%
little 10-20%
some 20-35%
and 35-50%

GROUNDWATER OBSERVATIONS
AT NONE 0.3 HRS
AT HRS
NOTE: Levels may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken.

PERRY DRILL.SERVICE
Geotechnical Services
HARRISVILLE, RI.

BORING / WELL LOG

CLIENT: BRIGGS ENGINEERING & TESTING, ROCKLAND, MA
PROJECT: STONEHAM HIGH SCHOOL, STONEHAM, MA.

DRILLER	S. PERRY	BORING NO.	B-3		CASING	SAMPLER	CORE BARREL
INSPECTOR	D. GEISSER	SHEET	1	TYPE	HSA	SS	
LINE & STA	OFFSET	OF	1	SIZE ID	3.25	1.375	
SUR.ELEV.				HAMMER WT.		140 LB.	
START	SEPTEMBER 3,2014			HAMM. FALL		30 IN.	
FINISH	SEPTEMBER 3,2014		14709				

DEPTH	COL. A	NO.	DEPTH RANGE FEET	REC / PEN	BLOWS/6" ON SAMPLER	TYPE	MOISTURE DENSITY OR CONSIST	STRATA CHANGE FEET	SOIL IDENTIFICATION IS FIELD CLASSIFICATION ONLY FOR EXACT GRADATION LABORATORY TESTING IS REQUIRED
									GRASS AND TOPSOIL, F / M, TRACE GRAVEL,SOME SILT,
		1	0' – 2.0'	16"/24"	4-5-15-18	SS	DRY	1.0'	TRACE ORGANIC,BLACK
							M. DENSE		SILTY SAND FILL,SIMILAR TO ABOVE,DARK BROWN
		2	2.0' – 4.0'	16"/24"	17-24-50-40	SS	DRY	2.5'	ASPHALT FILL,TRACE BRICK AND GRAVEL
5							V. DENSE		
		3	4.0' – 6.0'	16"/24"	24-40-70-19	SS	DRY		SIMILAR TO ABOVE
							V. DENSE		
		4	6.0' – 6.6'	4"/6"	18-50 / 1	SS	DRY	6.6'	SIMILAR TO ABOVE
							V. DENSE		
10									REFUSAL AT 6.6 FEET
15									
20									
25									
30									
35									

SAMPLE IDENTIFICATION
S - SPLIT SPOON
T - THIN WALL TUBE
U - UNDISTURBED PISTON
O - OPEN END ROD
W - WASH SAMPLE
A - AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density	Cohesive Consistency
0-4 Very Loose	0-2 Very Soft
5-9 Loose	3-4 Soft
10-29 Med. Dense	5-8 Med. Stiff
30 - 49 Dense	9-15 Stiff
50+ Very Dense	16-30 Very Stiff
	31+ Hard

COLUMN A
PROPORTIONS USED
trace 0-10%
little 10-20%
some 20-35%
and 35-50%

GROUNDWATER OBSERVATIONS
AT NONE HRS
AT HRS
NOTE: Levels may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken.

S.PERRY DRILL.SERVICE
Geotechnical Services
HARRISVILLE, RI.

BORING / WELL LOG

CLIENT: BRIGGS ENGINEERING & TESTING, ROCKLAND, MA
PROJECT: STONEHAM HIGH SCHOOL, STONEHAM, MA.

DRILLER	S. PERRY	BORING			CASING	SAMPLER	CORE BARREL
INSPECTOR	D. GEISSER	NO.	B-4				
LINE & STA	OFFSET	SHEET	1	TYPE	HSA	SS	
SUR.ELEV.		OF	1	SIZE ID	3.25	1.375	
START	SEPTEMBER 3,2014			HAMMER WT.		140 LB.	
FINISH	SEPTEMBER 3,2014		14709	HAMM. FALL		30 IN.	

DEPTH	COL. A	NO.	DEPTH RANGE FEET	REC / PEN	BLOWS/6" ON SAMPLER	TYPE	MOISTURE DENSITY OR CONSIST	STRATA CHANGE FEET	SOIL IDENTIFICATION IS FIELD CLASSIFICATION ONLY FOR EXACT GRADATION LABORATORY TESTING IS REQUIRED
		1	0' – 2.0'	16"/24"	5-12-20-88	SS	DRY	1.2'	GRASS AND TOPSOIL,SAND,TRACE GRAVEL,SILT, ORGANIC,BLACK
							M. DENSE		GRAVELLY SILTY SAND FILL, F / C, LITTLE GRAVEL,LITTLE SILT,
		2	2.0' – 4.0'	14"/24"	45-35-33-65	SS	DRY	2.5'	TRACE ORGANIC,DARK BROWN / BLACK
5							V. DENSE		ASPHALT FILL,TRACE BRICK,SOME SILTY SAND,DARK BROWN
		3	4.0' – 5.8'	10"/24"	42-35-	SS	DRY	4.0'	
					100-100 / 3		V. DENSE		SILTY SAND FILL,TRACE GRAVEL,SOME CLAYEY SILT,BRICK,
		4	6.0' – 8.0'	12"/24"	120-31-31-17	SS	DRY		ORGANIC,GRAY BROWN
							V. DENSE		
10		5	8.0' – 10.0'	10"/24"	18-7-12-12	SS	DRY	10.0'	SIMILAR TO ABOVE,LITTLE GRAVEL
							M. DENSE		POSSIBLE VIRGIN SILTY SAND,LITTLE GRAVEL,SOME SILT,
		6	10.0' – 12.0'	10"/24"	12-30-39-160	SS	DRY	12.0'	OLIVE GRAY
							V. DENSE		
									REFUSAL AT 12.0 FEET
15									
20									
25									
30									
35									

SAMPLE IDENTIFICATION
S - SPLIT SPOON
T - THIN WALL TUBE
U - UNDISTURBED PISTON
C - OPEN END ROD
W - WASH SAMPLE
A - AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density	Cohesive Consistency
0-4 Very Loose	0-2 Very Soft
5-9 Loose	3-4 Soft
10-29 Med. Dense	5-8 Med. Stiff
30 - 49 Dense	9-15 Stiff
50+ Very Dense	16-30 Very Stiff
	31+ Hard

COLUMN A
PROPORTIONS USED
trace 0-10%
little 10-20%
some 20-35%
and 35-50%

GROUNDWATER OBSERVATIONS
AT NONE 4 HRS
AT HRS
NOTE: Levels may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken.

S.PERRY DRILL.SERVICE
Geotechnical Services
HARRISVILLE, RI.

BORING / WELL LOG

CLIENT: BRIGGS ENGINEERING & TESTING, ROCKLAND, MA
PROJECT: STONEHAM HIGH SCHOOL, STONEHAM, MA.

DRILLER	S. PERRY	BORING NO.	B-5		CASING	SAMPLER	CORE BARREL
INSPECTOR	D. GEISSER	SHEET	1	TYPE	HSA	SS	
LINE & STA	OFFSET	OF	1	SIZE ID	3.25	1.375	
SUR.ELEV.				HAMMER WT.		140 LB.	
START	SEPTEMBER 3,2014			HAMM. FALL		30 IN.	
FINISH	SEPTEMBER 3,2014		14709				

DEPTH	COL. A	NO.	DEPTH RANGE FEET	REC / PEN	BLOWS/6" ON SAMPLER	TYPE	MOISTURE DENSITY OR CONSIST	STRATA CHANGE FEET	SOIL IDENTIFICATION IS FIELD CLASSIFICATION ONLY FOR EXACT GRADATION LABORATORY TESTING IS REQUIRED
									GRASS AND TOPSOIL, F / M SAND,TRACE GRAVEL,
		1	0' – 2.0'	18"/24"	3-3-3-9	SS	DRY	1.5'	LITTLE TO SOME SILT,DARK BROWN
							LOOSE	2.5'	SAND, F / C, TRACE GRAVEL,TRACE SAND,BROWN
		2	2.0' – 3.1'	4"/13"	30-102-75 / 1	SS	DRY		GRAVELLY SILTY SAND,APPARENTLY GLACIAL TILL,
5							V. DENSE	3.1'	SOME SILT,OLIVE GRAY
									REFUSAL AT 3.1 FEET
10									
15									
20									
25									
30									
35									

SAMPLE IDENTIFICATION
S - SPLIT SPOON
T - THIN WALL TUBE
U - UNDISTURBED PISTON
O - OPEN END ROD
W - WASH SAMPLE
A - AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density	Cohesive Consistency
0-4 Very Loose	0-2 Very Soft
5-9 Loose	3-4 Soft
10-29 Med. Dense	5-8 Med. Stiff
30 - 49 Dense	9-15 Stiff
50+ Very Dense	16-30 Very Stiff
	31+ Hard

COLUMN A
PROPORTIONS USED
trace 0-10%
little 10-20%
some 20-35%
and 35-50%

GROUNDWATER OBSERVATIONS
AT NONE HRS
AT HRS
NOTE: Levels may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken.

S.PERRY DRILL.SERVICE
Geotechnical Services
HARRISVILLE, RI.

BORING / WELL LOG

CLIENT: BRIGGS ENGINEERING & TESTING, ROCKLAND, MA
PROJECT: STONEHAM HIGH SCHOOL, STONEHAM, MA.

DRILLER	S. PERRY	BORING NO.	B-6		CASING	SAMPLER	CORE BARREL
INSPECTOR	D. GEISSER	SHEET	1	TYPE	HSA	SS	
LINE & STA	OFFSET	OF	1	SIZE ID	3.25	1.375	
SUR.ELEV.				HAMMER WT.		140 LB.	
START	SEPTEMBER 3,2014			HAMM. FALL		30 IN.	
FINISH	SEPTEMBER 3,2014		14709				

DEPTH	COL. A	NO.	DEPTH RANGE FEET	REC / PEN	BLOWS/6" ON SAMPLER	TYPE	MOISTURE DENSITY OR CONSIST	STRATA CHANGE FEET	SOIL IDENTIFICATION IS FIELD CLASSIFICATION ONLY FOR EXACT GRADATION LABORATORY TESTING IS REQUIRED
									GRASS AND TOPSOIL, F / M SAND,TRACE GRAVEL,
		1	0' – 2.0'	14"/24"	3-5-4-6	SS	DRY	1.3'	LITTLE TO SOME SILT,DARK BROWN
							LOOSE	2.5'	SAND, F / C, TRACE GRAVEL,TRACE SAND,BROWN
		2	2.0' – 2.7'	4"/7"	18-160-/-1	SS	DRY		GRAVELLY SILTY SAND,APPARENTLY GLACIAL TILL,
5							V. DENSE	2.7'	SOME SILT,OLIVE GRAY
									REFUSAL AT 2.7 FEET
10									
15									
20									
25									
30									
35									

SAMPLE IDENTIFICATION
S - SPLIT SPOON
T - THIN WALL TUBE
U - UNDISTURBED PISTON
O - OPEN END ROD
W - WASH SAMPLE
A - AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density	Cohesive Consistency
0-4 Very Loose	0-2 Very Soft
5-9 Loose	3-4 Soft
10-29 Med. Dense	5-8 Med. Stiff
30 - 49 Dense	9-15 Stiff
50+ Very Dense	16-30 Very Stiff
	31+ Hard

COLUMN A
PROPORTIONS USED
trace 0-10%
little 10-20%
some 20-35%
and 35-50%

GROUNDWATER OBSERVATIONS
AT NONE HRS
AT HRS
NOTE: Levels may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken.

PERRY DRILL.SERVICE
Geotechnical Services
HARRISVILLE, RI.

BORING / WELL LOG

CLIENT: BRIGGS ENGINEERING & TESTING
ROCKLAND, MA
PROJECT: STONEHAM HIGH SCHOOL
STONEHAM, MA.

DRILLER	S. PERRY	BORING NO.	B-7		CASING	SAMPLER	CORE BARREL
INSPECTOR	D. GEISSER	SHEET	1	TYPE	HSA	SS	
LINE & STA	OFFSET	OF	1	SIZE ID	3.25	1.375	
SUR.ELEV.				HAMMER WT.		140 LB.	
START	SEPTEMBER 3,2014			HAMM. FALL		30 IN.	
FINISH	SEPTEMBER 3,2014		14709				

DEPTH	COL. A	NO.	DEPTH RANGE FEET	REC / PEN	BLOWS/6" ON SAMPLER	TYPE	MOISTURE DENSITY OR CONSIST	STRATA CHANGE FEET	SOIL IDENTIFICATION IS FIELD CLASSIFICATION ONLY FOR EXACT GRADATION LABORATORY TESTING IS REQUIRED
									GRASS AND TOPSOIL, F / M SAND,LITTLE SILT,TRACE ORGANIC, BLACK
		1	0' – 1.5'	16"/24"	03/07/60	SS	DRY	1.0'	
							LOOSE	1.0'	GRAVELLY SAND, F / C, SOME GRAVEL,LITTLE SILT,BROWN
5									REFUSAL AT 1.5 FEET
									MOVED 8 FEET NORTH TO B-7 A
		1	0' – 2.0'	16"/24"	7-5-8-35	SS	DRY	1.0'	TOPSOIL, SAME AS ABOVE
10							M. DENSE		
		2	2.0' – 2.4'	2"/4"	160 / 4	SS	DRY	2.4'	GRAVELLY SAND, SAME AS ABOVE
							V. DENSE		
									REFUSAL AT 2.4 FEET
15									MOVED 5 FEET EAST TO B-7 B
		1	0' – 2.0'	16"/24"	3-3-6-28	SS	DRY	1.0'	TOPSOIL
							M. DENSE		
		2	2.0' – 4.0'	12"/24"	35-54-8-8	SS	WET		GRAVELLY SAND, WET AT 2.5 FT.
20							V. DENSE		
		3	4.0' – 4.4'	0"/4"	110 / 4	SS	WET	4.4'	PUSHED ROCK, NO SAMPLE RECOVERED
							V. DENSE		
									REFUSAL AT 4.4 FEET
25									
30									
35									

SAMPLE IDENTIFICATION
S - SPLIT SPOON
T - THIN WALL TUBE
U - UNDISTURBED PISTON
O - OPEN END ROD
W - WASH SAMPLE
A - AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density	Cohesive Consistency
0-4 Very Loose	0-2 Very Soft
5-9 Loose	3-4 Soft
10-29 Med. Dense	5-8 Med. Stiff
30 - 49 Dense	9-15 Stiff
50+ Very Dense	16-30 Very Stiff
	31+ Hard

COLUMN A
PROPORTIONS USED
trace 0-10%
little 10-20%
some 20-35%
and 35-50%

GROUNDWATER OBSERVATIONS
AT NONE 0.2 HRS
AT HRS
NOTE: Levels may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken.

Briggs Engineering & Testing
A Division of PK Associates, Inc.

Warner Larson Landscape Architects
130 West Broadway
Boston, MA 02127
Attn: David Warner

Report Date: 9/16/14

Project: **Stoneham H.S.**
Briggs #:

Tested: 9/15/14
Received: 9/4/14

1. Sample No.	Description	Source of Material
M-24781	Boring Sample Composite	B3 S1A + B4S2

2. Sieve Analysis {ASTM C 136, and ASTM C 117}

Sieve Size		Results	Specifications
Standard	Alternate	{% Passing by Wt.}	
100 mm	4"	100	
90 mm	3-1/2"	100	
75 mm	3"	100	
63 mm	2-1/2"	100	
50 mm	2"	100	
37.5 mm	1-1/2"	100	
25 mm	1"	100	
19 mm	3/4"	100	
12.5 mm	1/2"	93	
9.5 mm	3/8"	87	
4.75 mm	#4	76	
2.00 mm	#10	64	
0.850 mm	#20	52	
0.425 mm	#40	40	
0.180 mm	#80	25	
0.150 mm	#100	22	
0.075 mm	#200	13.9	

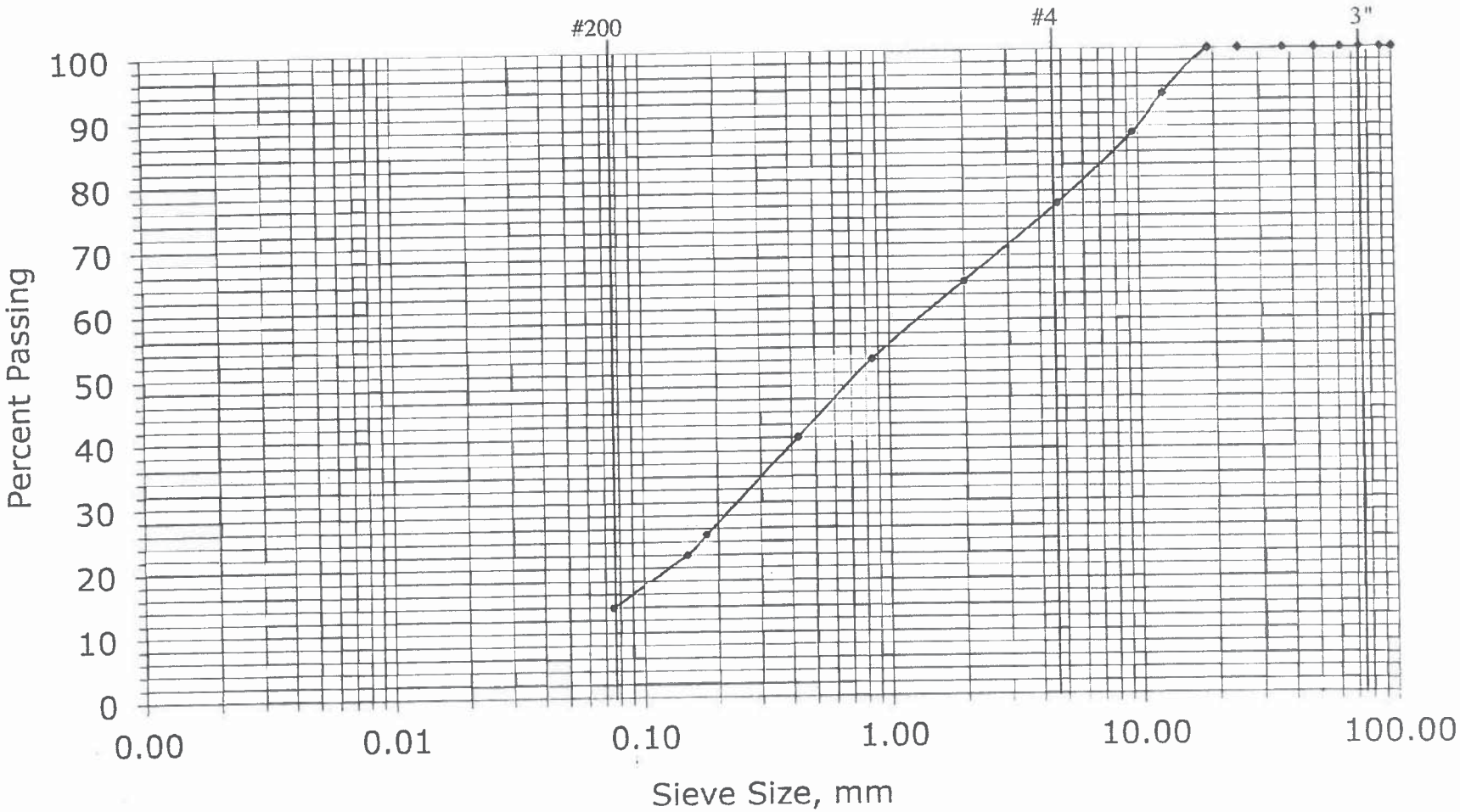
BRIGGS ENGINEERING & TESTING
A Division of PK Associates, Inc.

Sean Skorohod
Director of Testing Services
Construction Technology Division

Briggs Engineering & Testing
A Division of PK Associates, Inc.

Project:	Stoneham H.S.
Date Tested:	9/15/14
Lab Ref. No.:	M-24781

Sieve Analysis



Briggs Engineering & Testing
A Division of PK Associates, Inc.

Warner Larson Landscape Architects
130 West Broadway
Boston, MA 02127
Attn: David Warner

Report Date: 9/16/14

Project: **Stoneham H.S.**
Briggs #:

Tested: 9/15/14
Received: 9/4/14

1. Sample No.	Description	Source of Material
M-24782	Boring Sample Composite	B7 BS3 + B6-S2

2. Sieve Analysis {ASTM C 136, and ASTM C 117}

Sieve Size		Results	Specifications
Standard	Alternate	{% Passing by Wt.}	
100 mm	4"	100	
90 mm	3-1/2"	100	
75 mm	3"	100	
63 mm	2-1/2"	100	
50 mm	2"	100	
37.5 mm	1-1/2"	100	
25 mm	1"	100	
19 mm	3/4"	89	
12.5 mm	1/2"	75	
9.5 mm	3/8"	69	
4.75 mm	#4	57	
2.00 mm	#10	46	
0.850 mm	#20	37	
0.425 mm	#40	31	
0.180 mm	#80	23	
0.150 mm	#100	21	
0.075 mm	#200	14.3	

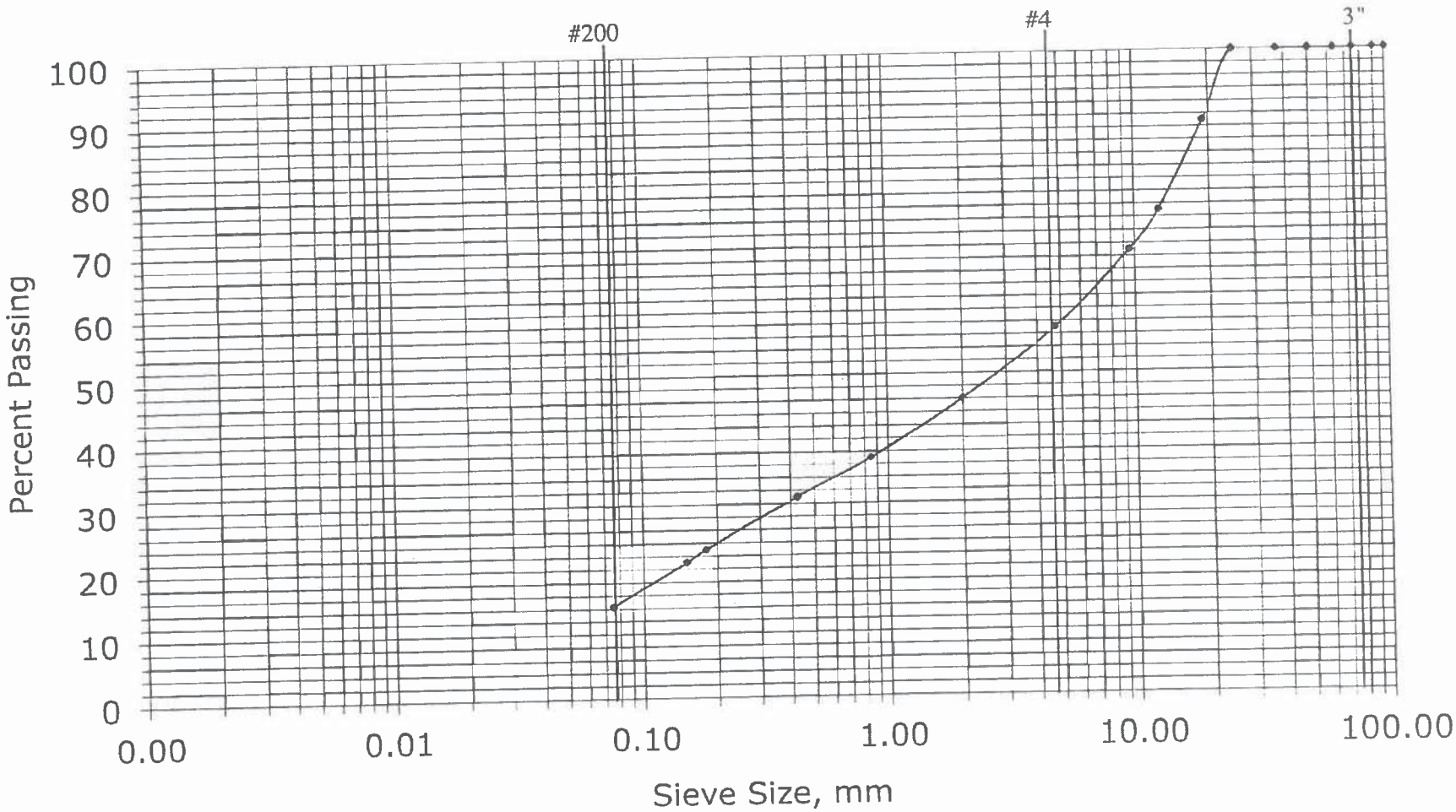
BRIGGS ENGINEERING & TESTING
A Division of PK Associates, Inc.

Sean Skorohod
Director of Testing Services
Construction Technology Division

Briggs Engineering & Testing
A Division of PK Associates, Inc.

Project:	Stoneham H.S.
Date Tested:	9/15/14
Lab Ref. No.:	M-24782

Sieve Analysis



Nitsch Engineering

www.nitscheng.com
186 Lincoln Street, Suite 200
Boston, MA 02111-2403
T: 617-338-0063
F: 617-338-6472

APPENDIX B

Stoneham High School, Artificial Fields Study

Stoneham, Massachusetts

Nitsch Project #10441

Civil Narrative

November 7, 2014

Site Drainage:

By taking a natural turf field and replacing it with an artificial turf field including an underdrain system the runoff potential from the project site will be increased due to the change from existing conditions. This means that it will likely be necessary to provide some detention/retention capacity as part of this project to help control the increased rate of runoff from the football field and track area. Based on the geotechnical report there appears to be a shallow rock/ledge layer underlying the field. The soils above the ledge appear to be sand and sandy silt which allow a moderate amount of infiltration to occur under existing conditions. The proposed artificial field cross section will have a much higher rate of infiltration and because an underdrain would be installed as part of the new field runoff would be conveyed from the field to the wetland resource area at a higher rate than under existing conditions.

If the underdrains are installed to sit directly on top of the subgrade layer (ledge) a potential option for detention/retention would be to include two collector pipes (likely 12" perforated CPP) to be located under the north and south sidelines of the new field. These collector pipes would take flow from the proposed underdrains and convey the flow to the existing 48" drain pipe that runs north south under the east side of the football field. The collector pipes would be embedded in a layer of filter fabric and crushed stone and would be laid with minimal slope or flat. Each collector pipe would be connected to a manhole structure prior to it connecting to the existing 48" drain line. The manholes will be designed such that they will act as a control structure and help mitigate peak flows from the field by holding back runoff within the collector pipes during small storm events and letting it out at a rate equal to existing conditions. A bypass would be incorporated into the manholes to allow for runoff from larger rain events to flow freely from the collector pipe and minimize the backup in the system. **(Approximate Cost – $25-$35k)**

Another potential strategy could be to place the underdrains 4-inches above the ledge layer (slightly higher than the bottom of the artificial turf section). This would allow some detention/retention to be accomplished under the field itself for smaller storm events. The storage volume provided in that 4-inch layer may be large enough to negate the need for the larger diameter collector drains to be used as detention/retention mitigation as described above. However, a full set of calculations would need to be completed to determine if this strategy would be feasible. **(Approximate Cost $5-$10k)**

There are currently two options being discussed for the football field D Zones. Option 1 proposes to pave the "D Zones" at each end of the field with asphalt. By paving the D Zones additional impervious area will be added to the project site which will increase the runoff from the site and would add to the size of the required detention/retention facilities discussed above. Additionally, the paved "D Zones" would

require the installation of a number drain inlets (catch basins or trench drains) to help collect and convey the runoff from the D Zones. **(Approximate Cost – $15-$20k)**

Option 2 proposes to leave the D Zones unaltered. The D Zones are currently natural turf with small paved areas used in the field events at Track and Field meets held at the school. Because there would be no increase in impervious surface in the D Zones there would be no need to provide additional storage within the proposed detention/retention system. The runoff from these paved areas would be allowed to flow onto the natural turf surrounding them as they do under existing conditions with no additional drainage collection structures required. **(No additional cost)**

Permitting

Wetlands:
According to Mass GIS information there is an existing wetland resource area located south of the project site. The limits of the wetland resource area and the associated 100' buffer zone are shown on the graphics for each option. This project would fall under the jurisdiction of the Wetland Protection Act because portions of the work associated with the field renovation will fall within the 100' buffer zone. Therefore an application will need to be filed with the Stoneham Conservation Commission for this work. Because the area within the jurisdiction of the Conservation Commission is small and the majority of the project will take place outside of the 100' buffer zone we would recommend that a Request for Determination of Applicability (RDA) be filed with the Conservation Commission to determine if the project would have enough of an impact to warrant the filing of a Notice of Intent (NOI).

Environmental Protection Agency (NPDES program)
Construction activities that disturb more than one acre are regulated under the United States Environmental Protection Agency (EPA) National Pollution Discharge Elimination System (NPDES) Program. In Massachusetts, the USEPA issues NPDES permits to operators and owners of regulated construction sites. Regulated projects are required to develop and implement stormwater pollution plans (SWPPP) in order to obtain permit coverage. Because this project will disturb more than one acre of land it would fall under the NPDES program and will require a SWPPP.

WARNER LARSON
LANDSCAPE ARCHITECTS

Stoneham High School
Practice Field Improvements

Feasibility Study
September 1, 2011

This feasibility study considers a range of improvements to the existing practice field on the east side of the high school campus, currently used for football practice in the fall and track throwing events in the spring. The unirrigated field is narrow (approximately 140 feet at the narrowest point) and has an uneven surface sloping from south to north over most of its length.

The southern two-thirds of the field has reasonably good topsoil about 6-inches in depth (see attached analysis), while the northern third of this area has little to no topsoil and soil containing considerable rocks. A steep slope drops off quickly to the east where the property line is within close proximity to the base of the fill slope. The school's primary parking area along the west side of the field is lower than the field with an increasing slope between field and parking from south to north. Wood poles laid flat along the edge of parking provide a partial vehicular barrier.

VIEW LOOKING SOUTH

VIEW LOOKING NORTH

EMBANKMENT ALONG PARKING

ROUGH AREA AT SOUTH END

NORTH END OF FIELD

DISCUS CAGE

Two concepts have been developed to demonstrate minimum to maximum improvements and associated planning budgets. Concept 1 improves the field within the existing field area, and Concept 2 expands the field to full size football dimensions. The options for an irrigation system and for a synthetic turf practice area apply to both concepts.

Concept 1

Concept 1 provides the maximum practice field area (with overrun space) within the spatial and grading constraints of the existing field area. This requires importing topsoil to be spread over existing grade for the northern 2/3rds of the field area. The southern 1/3 of the field area requires regrading and importing topsoil for a full depth root zone. The grading design requires a small amount of excess cut that could be spread between the field and tennis courts. Additional site improvements are one football goal post, new discus/shot put cage and concrete pad, vehicular barrier, accessible walkway and 6' high chain link fence.

Total Approximate Cost: **$100,000 to $115,000.**

Concept 2

Concept 2 expands the field area into the parking lot in order to provide a full size (160' x 360') football practice field with over run space and a preferred grading design. The design requires that existing topsoil be stripped, stockpiled, screened and amended as necessary. A significant amount of fill will need to be imported to achieve the proposed grades. The design adds 16 parking spaces adjacent to the high school, but results in a net loss of 23 spaces. The addition of parking spaces along the building will require a new walkway and ramp system to provide an accessible pedestrian route. Additional site improvements are a football goal post, new discus/shot put cage and concrete pad, vehicular barrier, accessible walkway and 6' high chain link fence.

Total Approximate Cost: **$140,000-$155,000.**

Option 1- Synthetic Turf Practice Area

The Synthetic Turf Practice Area requires additional earthwork and grading, as well as the turf field material, gravel base, underdrain system and concrete curb edger.

Total Approximate Cost: **$190,000-205,000**

Option 2- Irrigation System

Option 2 requires a water connection, back flow preventer, irrigation system piping, and automated control system.

Total Approximate Cost: **$45,000-55,000**

SOIL ANALYSIS REPORT FOR ESTABLISHED TURF 07/07/11

SOIL AND PLANT TISSUE TESTING LAB
WEST EXPERIMENT STATION
UNIVERSITY OF MASSACHUSETTS
AMHERST, MA 01003

LAB NUMBER: S110705-127
BAG NUMBER: 102018

SOIL WEIGHT: 4.56 g/5cc
CROP: OTHER

WARNER LARSON, INC- B RILEY
130 W. BROADWAY
BOSTON, MA 02127

COMMENTS: BRILEY@WARNERLARSON.COM

SAMPLE ID: STONEHAM HS PRACTICE FIELD

LIMESTONE AND FERTILIZER RECOMMENDATIONS FOR ESTABLISHED TURFGRASS

Total lime required is 122 lb of calcitic limestone per 1000 sq ft.
Apply 50 lb/1000 sq ft in early spring and mid-autumn.
Do NOT surface apply more than 50 lbs/1000 sq ft at one time.
Retest the soil next year.

Recommendation: 2 lb/1000 sq ft P2O5, and 4 lb/1000 sq ft K2O.

To provide the above recommendation you may follow the directions below, or you may devise your own fertilizer program using the recommended amounts of phosphorus (P2O5) and potassium (K2O) along with one pound of Nitrogen per 1000 sq feet. It may necessary to raise nutrient levels over several applications.

Apply a 20-3-12 fertilizer @ 5 lbs/1000 sq ft in late April, late June, and very late August.
If more convenient you may substitute the late April recommendation with the same application made 1 to 2 weeks after your last fall mowing.
Follow these recommendations for two years. Retest the following year.
In addition apply superphosphosphate (0-20-0) @ 5 lbs/1000 sq ft in very late August of the first year.

Consult the interpretation sheet enclosed or obtain one of the Turf Guides referenced on the backside of the interpretation sheet.

MICRONUTRIENT		PPM	SOIL RANGE	MICRONUTRIENT		PPM	SOIL RANGE
Boron	(B)	0.2	0.1-2.0	Copper	(Cu)	0.0	0.3-8.0
Manganese	(Mn)	7.1	3 - 20	Iron	(Fe)	34.7	1.0- 40
Zinc	(Zn)	1.2	0.1- 70	Sulfur	(S)	20.9	1.0- 40

SOIL pH 5.5 NITROGEN: NO3-N = 5 ppm
BUFFER pH 6.0 ORGANIC MATTER: 9.8 % (Desirable range 4-10%)

NUTRIENT LEVELS:		PPM	Low Medium High Very High
Phosphorus	(P)	3	XXXXX
Potassium	(K)	39	XXXXXXXXX
Calcium	(Ca)	686	XXXXXXXXXXXXXXXXXXXXX
Magnesium	(Mg)	63	XXXXXXXXXXXXXXX

CATION EXCH CAP
16.7 Meq/100g

PERCENT BASE SATURATION
K= 0.7 Mg= 3.4 Ca=22.6

MICRONUTRIENT LEVELS
ALL NORMAL

EXTRACTABLE ALUMINUM: 240 ppm (Soil range: 10-250 ppm)

The lead level in this soil is low.

VISIT www.umass.edu/soiltest FOR FURTHER INFORMATION ON SOIL TESTING AT UMASS.

SOIL ANALYSIS REPORT FOR RESEARCH 07/07/11

SOIL AND PLANT TISSUE TESTING LAB
WEST EXPERIMENT STATION
UNIVERSITY OF MASSACHUSETTS
AMHERST, MA 01003

LAB NUMBER: S110705-127
BAG NUMBER: 102018

SOIL WEIGHT: 4.56 g/5cc

WARNER LARSON, INC- B RILEY
130 W. BROADWAY
BOSTON, MA 02127

COMMENTS: BRILEY@WARNERLARSON.COM

ANALYSIS REPORT

SAMPLE ID: STONEHAM HS PRACTICE FIELD
SOIL TYPE:

SOIL PH 5.5
BUFFER PH 6.0

ALUMINUM (AL): 240 PPM (Soil Range: 10-300)
ORGANIC MATTER: 9.8 %. Desirable range 4-8%.

NUTRIENT LEVELS:	PPM	LOW	MEDIUM	HIGH	VERY HIGH
PHOSPHORUS (P)	3	XXXXX			
POTASSIUM (K)	39	XXXXXXXXX			
CALCIUM (CA)	686	XXXXXXXXXXXXXXXXXXXXX			
MAGNESIUM (MG)	63	XXXXXXXXXXXXXXX			
NITRATE (NO3-N)	5	XXX			

CATION EXCH CAP
16.7 MEQ/100G

PERCENT BASE SATURATION
K= 0.7 MG= 3.4 CA=22.6

MICRONUTRIENT		PPM	SOIL RANGE	MICRONUTRIENT		PPM	SOIL RANGE
Boron	(B)	0.2	0.1-2.0	Copper	(Cu)	0.0	0.3-8.0
Manganese	(Mn)	7.1	3 - 20	Iron	(Fe)	34.7	1.0- 40
Zinc	(Zn)	1.2	0.1- 70	Sulfur	(S)	20.9	1.0- 40

EXTRACTED LEAD (PB) 3 PPM.
EXTRACTED CADMIUM (CD) 0.1 PPM.
EXTRACTED NICKEL (NI) 0.1 PPM.

ESTIMATED TOTAL LEAD IS 62 PPM.

EXTRACTED CHROMIUM (CR) 0.1 PPM.

COMMENTS

COMPUTER PROGRAM & RECOMMENDATIONS BY DEPT OF PLANT & SOIL SCI UMASS-AMHERST.

SOIL ANALYSIS REPORT FOR NEW LAWN 07/07/11

SOIL AND PLANT TISSUE TESTING LAB
WEST EXPERIMENT STATION
UNIVERSITY OF MASSACHUSETTS
AMHERST, MA 01003

LAB NUMBER: S110705-127
BAG NUMBER: 102018

SOIL WEIGHT: 4.56 g/5cc
CROP: OTHER

WARNER LARSON, INC- B RILEY
130 W. BROADWAY
BOSTON, MA 02127

COMMENTS: BRILEY@WARNERLARSON.COM

SAMPLE ID: STONEHAM HS PRACTICE FIELD

LIMESTONE AND FERTILIZER RECOMMENDATIONS FOR NEW LAWN CONSTRUCTION

Total lime required is 264 lb of limestone/1000 sq ft. Incorporate thoroughly 100 lbs/1000 sq ft lime into the top 6 inches of soil. Mix an additional 100 lbs/1000 sq ft into the top 3 to 4 inches of soil along with recommended fertilizers. Retest soil early next fall.

Fertilizer (per 1000 sq ft): 1-2 lbs N, 4 lbs P2O5, and 4 lbs K2O.

Many fertilizer sources and rates may combine to provide acceptable turfgrass establishment either from seed or sod. One or two options based on this soil test follow:

Incorporate EITHER a 5-10-10 fertilizer at 40 lbs/1000 sq ft, OR a 15-25-10 starter lawn fertilizer at 15 lbs/1000 sq ft plus 0-0-60 (muriate of potash) fertilizer at 4 lbs/1000 sq ft into the top 3 to 4 inches of soil. Retest one year after turf establishment.

PLEASE read the enclosed fact sheets for more specific information on fertilization and liming procedures.

MICRONUTRIENT		PPM	SOIL RANGE	MICRONUTRIENT		PPM	SOIL RANGE
Boron	(B)	0.2	0.1-2.0	Copper	(Cu)	0.0	0.3-8.0
Manganese	(Mn)	7.1	3 - 20	Iron	(Fe)	34.7	1.0- 40
Zinc	(Zn)	1.2	0.1- 70	Sulfur	(S)	20.9	1.0- 40

SOIL pH 5.5 NITROGEN: NO3-N = 5 ppm
BUFFER pH 6.0 ORGANIC MATTER: 9.8 % (Desirable range 4-10%)

NUTRIENT LEVELS:		PPM	Low Medium High Very High
Phosphorus	(P)	3	XXXXX
Potassium	(K)	39	XXXXXXXXX
Calcium	(Ca)	686	XXXXXXXXXXXXXXXXXXXXX
Magnesium	(Mg)	63	XXXXXXXXXXXXXXX

CATION EXCH CAP 16.7 Meq/100g

PERCENT BASE SATURATION K= 0.7 Mg= 3.4 Ca=22.6

MICRONUTRIENT LEVELS ALL NORMAL

EXTRACTABLE ALUMINUM: 240 ppm (Soil range: 10-250 ppm)

The lead level in this soil is low.

VISIT www.umass.edu/soiltest FOR FURTHER INFORMATION ON SOIL TESTING AT UMASS.

UNIVERSITY OF MASSACHUSETTS

UMass Extension

Agriculture & Landscape Program
Soil and Plant Nutrient Testing Lab
West Experiment Station
University of Massachusetts
Amherst, MA 01003
413.545.2311
413.545.1931
HTTP://www.umass.edu/plsoils/soiltest

07/07/11

TEXTURAL ANALYSIS RESULTS

Customer Name: Warner Larson, Inc- Brandon Riley
130 W. Broadway
Boston, MA 02127

Sample ID: S110705-127

Customer Designation: Stoneham H.S. Practice Field

USDA SIZE FRACTIONS

Main Fractions	Size (mm)	Percent
Sand	0.05-2.0	61.1
Silt	0.002-0.05	32.2
Clay	< 0.002	6.7
Total	< 2.0	100.0

Sand Fractions	Size (mm)	Percent
Very Coarse	1.0-2.0	7.0
Coarse	0.5-1.0	9.5
Medium	0.25-0.5	12.7
Fine	0.10-0.25	17.3
Very Fine	0.05-0.10	14.5
		61.1

Silt Fractions	Size (mm)	Percent
Coarse	0.02-0.05	18.7
Medium	0.005-0.02	11.1
Fine	0.002-0.005	2.4
		32.2

PERCENT OF WHOLE SAMPLE PASSING

Size (mm)	Sieve #	%
2.00	#10	90.3
1.00	#18	84.0
0.50	#35	75.4
0.25	#60	63.9
0.10	#140	48.3
0.05	#270	35.1
0.02	20 um	18.3
0.005	5 um	8.3
0.002	2 um	6.1

USDA Textural Class = fine sandy loam

Gravel Content = 9.7%

COMMENTS:

UMASS EXTENSION

Soil and Plant Tissue
Testing Laboratory

Turfgrass Lime and Fertilizer Recommendations

Periodic soil testing is an important part of any successful turfgrass management program. Since soil type, grass species, and desired turf quality level vary among turf areas: lime and fertilizer recommendations must be generalized to some extent. One must remember that a soil test is not an exact recipe for success. It should be incorporated into a coordinated effort to provide the cultural conditions required for healthy turfgrass. These include: (1) watering properly (amounts and timing); (2) insuring good drainage; (3) choosing seed carefully prior to establishment; (4) providing adequate light and air circulation; (5) using proper mowing techniques; (6) dethatching when necessary; and (7) preventing soil compaction. By liming and fertilizing properly and attending to the cultural requirements listed above one minimizes the chances for disease and weed problems and maximizes the likelihood of having healthy and attractive turfgrass.

Soil pH & Lime Recommendation- A soil pH 4.0 is extremely acidic, while one of pH 8.5 is very alkaline. Though turfgrasses are adaptable to a wide soil pH range, they generally grow best at levels between 6 and 7. Ryegrasses and bluegrasses prefer a soil pH near 7. Bentgrasses and fescues perform best at pH levels near 6. Since the climate and rock-types of New England tend to produce acid soils, limestone is commonly recommended to raise soil pH.

It is unnecessary to lime soils in turfgrass unless the soil pH is less than 6.4. Liming soils to pH levels above 7.5 can result in micronutrient deficiencies (particularly if certain woody ornamentals are part of the landscape). Lime according to your recommendation. Since dolomitic (high magnesium) lime is so commonly available in our area, many soil tests show high magnesium levels. In these instances, a calcitic (calcium-rich) lime is often recommended. This can be difficult to find at lawn supply dealers. In this case, simply use the best available product. Although lime can be applied at any time of year, early spring is best for turfgrass. Late fall applications have been associated with the development of snow mold. Ground limestone and pelletized lime are the two most common liming agents used on lawns. Ground lime is usually cheaper, but the dust it produces can be a nuisance. Pelletized lime is more expensive (although prices have dropped), but "cleaner" to work with. The choice of which to use is a personal one. Claims of superiority of one over the other are exaggerated.

Buffer pH, Cation Exchange Capacity, & percent Base Saturation- Buffer pH is a measure of the soil's reserve acidity. A value higher than 6.8 indicates that very little or no acidity must be neutralized through liming. Values decreasing from 6.8 indicate increasing amounts of reserve acidity. An acid soil with a significant amount of organic matter and/or clay will have a lower buffer pH (thus higher lime requirement) than a sandy acid soil (with the same soil pH) with little organic matter. This is because lime must neutralize acidity residing on the surfaces of the humus (organic matter) and clay, before one realizes a rise in soil pH to the desired level.

The surfaces of soil particles are often electrically charged. The results in a soil's capacity to attract oppositely charged substances in the soil water surrounding them. Most often the soil is negatively charged and attracts positively charged ions (cations) to its surfaces. Calcium, magnesium, and potassium are examples of plant nutrients held in this way. These basic (not acidic) cations are available to plants. Acidic cations (e.g. aluminum and hydrogen) can also be absorbed on the surfaces of soil particles. The sum of these is referred to as the soil's Cation Exchange Capacity (**CEC**). A CEC of 10 to 15 is typical and usually adequate. It indicates that the soil has either a sufficient amount of humus (organic matter) or reactive mineral material (clay and fine silt). Values below 6 may indicate that the soil will have trouble supporting good turf growth unless special management techniques are employed. The proportion of basic cations held by the soil is referred to as a **Percent Base Saturation.** A good balance is recommended. For example, a soil with base saturations of calcium 70%, magnesium 12%, and potassium 4% is considered well balanced. There are no strict limits, but a properly limed and fertilized soil will approach these values.

Organic Matter- The percentage of organic matter is determined only if requested. Organic matter in soils can improve nutrient and moisture retention, drainage, and aeration. It can also help prevent compaction. What level is appropriate will depend on the other characteristics of your soil and the turf management scheme employed. Values between 7% and 10% are generally acceptable. Building organic matter to an acceptable level is best accomplished prior to establishment.

Nutrient Levels

Nitrogen (N) - Nitrogen, as nitrate (NO_3-N) is routinely measured as part of the soil test. This value, however, is not used to make nitrogen recommendations, but to detect extreme soil conditions. Nitrogen is a very dynamic and easily transformed element in soil. The turf's actual need for nitrogen additions may bear little relation to soil test levels. The best way to determine N need is to observe the color, density, and vigor of the turfgrass. If it is green enough for your tastes, is fairly dense, and is growing rapidly enough to require mowing once or twice a week in the spring and early fall, nitrogen is probably not currently needed. However, turf requires a regular supply of N to maintain quality. We recommend that a total of 3 lbs/1000 square feet be supplied each growing season, split over 3 or 4 applications.

Phosphorus (P) - Phosphorus appears on fertilizer bags as P_20_5 (phosphorus pentoxide). Your recommendation is also expresses in this way. P fertility is most important during grass establishment, when good root development is vital. Since P does not move readily through the soil, it is important to incorporate sufficient P into the top six inches of soil prior to seeding new turf or laying sod. Fertilization of established turf will not increase quality as noticeably as will N, but moderate P soil levels should be maintained.

Potassium (K) - Potassium appears on fertilizer bags as K_20 (potassium oxide). Your recommendation is also expressed in this way. Turf deficient in K is unable to utilize nitrogen and water efficiently, and is more susceptible to disease, heat, cold and drought stress. When possible, choose fertilizers containing potassium as the sulfate over those containing potassium chloride (muriate of potash). Potassium sulfate is less apt to "burn" turf if over applied.

Calcium (Ca) and Magnesium (Mg) - Properly limed soils have sufficient Ca and Mg.

Aluminum (Al) - Aluminum is toxic to some plants under acid soil conditions. It should not be a problem for turfgrass if the soil has been properly limed.

Organic Lawn Care- Interest has grown in organic methods of lawn care. The recommendations provided with your soil test (N, P_205_5, and K_20) still apply. Organic amendments are generally lower in nutrient content, so target soil test levels may take longer to attain. We, however, encourage efforts in this area. More information on this topic is available in **Turf IPM Facts** (see below)

Micronutrient and heavy metal levels are not reported on your soil test report unless they are out of the normal range. If soil lead is elevated refer to the separate fact sheet enclosed with these results.

For detailed information on Turfgrass Management we suggest you visit the UM Extension Bookstore website at www.umassextensionbookstore.com or call (413) 545-5537. The publications **Turf IPM Facts** and **Professional Turfgrass Management Guide** are excellent resources on lawn care.

Soil and Plant Tissue Testing Laboratory
West Experiment Station
University of Massachusetts
Amherst, MA 01003-8010

413-545-2311
413-545-1931 fax
http://www.umass.edu/plsoils/soiltest

TOPSOIL

A common misconception when buying topsoil is that the soil we receive should be a dark, fertile and friable loam capable of serving all of our landscaping needs. There are, however, no legal marketing standards for topsoil. To further complicate matters, the terms topsoil and loam are often used interchangeably when, in fact, they refer to different soil characteristics.

DEFINITIONS

Soil is the foundation of our landscape. It is comprised of sand, silt and clay, mixed with varying amounts of organic matter, water, and air. It is a complex and dynamic medium, able to serve many functions. For the horticulturist it is a plant growth medium; for the engineer a construction material and load bearing medium; to the geologist just a stage in the recycling of rock materials. Soil often becomes the scapegoat for a multitude of lawn and garden difficulties. Though poor soil can often contribute to a problem, one must also consider other cultural and environmental factors.

Topsoil, as the name infers, is the uppermost layer of soil. The surface soil is usually darker in color than the subsoil below it because of the accumulation of organic matter. Virgin topsoil in Massachusetts generally ranges from 0 to 5 inches in thickness. A more functional definition of topsoil is the depth of soil that one normally mixes during tillage, in most cases 6 to 8 inches.

Loam, on the other hand, is a textural classification. **Texture** refers to the relative amounts of sand, silt and clay in a soil. A loam is technically a soil with between 7% and 27% clay, 28% and 50% silt, and less than 52% sand. One may modify the term, loam, to sandy loam, sandy clay loam, clay loam, silty clay loam or silt loam as the proportions of these individual soil fractions change.

Considerable variability exists among topsoils throughout the state. Eastern Massachusetts soils generally contain slightly more sand than those in central and western Massachusetts. Naturally wet soils often maintain higher organic matter levels than well-drained soils. Soils often mistaken for clays actually contain considerable amounts of silt and sand. Characteristics of these soils may resemble those popularly associated with clays. These include blue-gray color, extreme hardness, cracking, slow drainage and difficulty in cultivation. Since most purchased topsoil is local in origin, its texture may be similar to that which one presently has on site; but its quality as topsoil may be very different.

WHAT TO LOOK FOR

Before one buys any topsoil it is a good idea to visually inspect the stockpiled soil. It should be free of trash and other debris. One may wish to assess the soil's texture. Whereas the nutrient levels of a soil are easily improved with lime and fertilizer, its texture is more difficult to change.

To estimate the texture of a soil, moisten a small handful. Rub it gently between one's thumb and forefinger. Use the following criteria to judge the soil's textural class (USDA, 1975).

Loamy sand: harsh, gritty feel; very slight tendency of the moist soil to stick together when pressed.

Sandy loam: gritty; may be pressed into a soft mass, if moist.
Fine sandy loam: mellow and only moderately gritty feel; may be pressed into a firm mass, if moist.
Loam: mellow, moderately smooth feel; moist soil may be rolled into firm rods; not perceptibly sticky.
Silt loam: smooth and "floury" feel; moist soil only slightly sticky; readily rolled into firm, slender rods.
Clay loam: very smooth, "slippery" feel; definitely sticky when moist; easily molded into any shape.

When buying topsoil, a common notion is "the darker, the better". While an increase in darkness is often associated with an increase in organic matter, very dark and grayish soil may have been dredged from swampy areas. These soils are usually very acidic and poorly structured. Avoid them.

AMENDMENTS

It is usually unrealistic to believe that purchased topsoil will require no amendments. Lime and fertilizer are frequently necessary. The addition of organic matter can greatly improve the soil's physical condition. Aside from increasing the soil's nutrient and water holding capacity, organic matter can improve drainage and promote soil aggregation. The result is often a desirable granular, manageable structure. Two or three inches of organic matter, tilled to a depth of 6 to 8 inches, is a typical recommendation for a topsoil low in organic matter. Sources of organic matter include screened compost, peat moss, manure, leaf mold, rotted sawdust, and cover crops. The characteristics of each of these must be considered before use. Although it is tempting to add sand to a "heavy" soil (one that is very cohesive), adding organic matter will ultimately produce the best results.

Topsoil is generally sold by the cubic yard. Prices vary depending on location; but range from $10 to $20 per cubic yard "picked up" and from $15 to $25 per cubic yard "delivered". The minimum commonly delivered is from 3 to 6 yards. Most soils are screened through a 3/4-inch mesh. Unscreened soil is less expensive than screened, but the few dollars saved is rarely worth the time and effort spent removing coarse fragments after delivery. Estimate the amount needed by figuring 12 cubic yards will cover about 1000 square feet to the depth of 4 inches. Rural companies may mix compost or manure with the topsoil. "Manufactured" topsoil is a more recent market development. It is commonly a coarse-grained (sandy) mineral base mixed with some composted organic material. This serves a dual function of providing a potentially useful horticultural product and disposing of bulky organic wastes. Not all are worthy of our consideration as topsoil.

Few companies selling topsoil have it tested before it is sold. One may want to have a soil test performed to determine its lime and fertilizer requirements. If one plans to grow vegetables in the purchased soil it may be wise to check the levels of heavy metals such as lead. Due to the high cost, testing for contaminants such as gasoline, oil or pesticides is less common.

Further inquiries may be directed to:

Soil and Plant Tissue Testing Laboratory
West Experiment Station
University of Massachusetts
Amherst, MA 01003

Phone: (413) 545-2311
Fax: (413) 545-1931
Web: http://www.umass.edu/plsoils/soiltest
Revised: 04/2001

Issued by UMass Extension, Robert Helgesen, Dean, in furtherance of the Acts of May 8 and June 30, 1914; USDA and Massachusetts Counties cooperating.
UMass Extension offers equal opportunity in programs and employment.

Appendix C: Teacher Interviews

MINUTES

date:	11.29.2017
meeting date:	6.22.17
re:	Teacher and Staff Meetings
attendees:	Tina Stanislaski, Julia Nugent, Rick Newell GGD, David Pieria GGD
item:	Donna Cargill, Principal

1. SPED program is expanding very quickly. Six years ago, they changed the SPED policy and have been trying to keep as many students with needs in the district and they would like to keep doing this but they are running out of space. Every year space needs increase and varied types of spaces are required to meet the specific needs of this population. Because the school is slightly over sized they have been able to creatively meet the needs each year but they are running out of space. Physical conditions in the building also make keeping this population in district difficult. Many of the learning spaces are over heated when the temperature is warm outside and the mechanical systems cannot keep up with ventilation needs. Many staff complain of sickness because the air is not circulating properly. There is currently no space for OT/PT and Guidance is struggling to find meeting and testing space every day. Many other programs struggle with the sprawling building layout such as the Art Department whose kiln is across the school from their spaces. Spaces that were originally designed as shops on the lowest level are not utilized because of their remote location and related security issues. Students and staff do not feel safe in that location because it is so remote and there are no cameras in the school. Currently those spaces are only used for storage and athletic team rooms.

2. The site is large and has many playing fields that are in good condition. The fields are used constantly by the school and the community. Much of the land where the current baseball fields are located was donated by Weis Farm, a local business. This area floods. There is ledge under the soccer fields to the east of the school and a lot of blasting had to be done to build the existing school.

3. Because the elementary school in town is smaller, it shares some space such as the cafeteria for events in the existing high school. It also shares the fields for events such as Field Day.

4. The high school hosts many camps that run through the summer but does not currently have a high school summer school program. Other neighboring communities have summer school programs.

5. Along with Athletics, Fine and Performing arts are very important to the town. The Gym and Auditorium are large but the outdated systems do not serve them well. There is not adequate air in either of the spaces.

6. They have been expanding the technology education every year. They have added AP Computer Programming, Biotechnology, and Engineering into the program this year. They would like to add more of these STEM/STEAM programs but do not have the physical space or utilities within the spaces required to do so.

7. The building is a big security risk. There are many sprawling corridors and multiple doors that do not lock properly so someone could easily enter the building undetected. Because there are no interior security cameras, once a person is inside, they could move through the school easily. Areas of special concern are the remote wings such as the science wing and basement shops. The school also has connecting doors between all the classrooms which do not lock so once an intruder gets into one classroom they can move through all of them.

8. The school is moving towards a one to one device program and has SMART boards in most classrooms. The district would like to move to newer technology.

9. The library is a well-used space especially before and after school and during lunch. The students use the library for research and for help with technology. They would like to see a “genius bar” type of set up in that space.

10. Students participate in National History Day. This is a Social Studies program which requires research and development of a topic which is then presented. Most of this work is done in the library. A large space for presentation and display of projects is difficult to secure. Some years the students use the cafeteria and or the library but because it is a multiple day event, it is very disruptive to whichever space it takes over. The students also participate in a yearly district wide Art Show which has similar disruptive issues.

11. The current furniture is original to the school and is very difficult to move. Because the furniture is not flexible, students and teachers seldom reconfigure the classroom environment even though they would like to and it would facilitate what and how they are teaching.

12. Acoustics in the classrooms are terrible. There is no acoustic separation between spaces. During testing, they cannot use classrooms to either side of the space where the testing is happening so others are not disrupted. The lack of acoustical separation is especially problematic for students with learning disabilities and special needs. Stoneham also has an unusually high number of deaf students which are adversely effected by the lack of acoustic separation.

Facilities Staff-Rob Furtado, Rick Newell GGD

1. Building has no insulation and single-pane windows so it is difficult to heat and cool. Boilers were replaced in 2016 but controls and hot water heater were not updated. Controls are still done through pneumatic time clocks. When the pumps were replaced it saved electricity but gas consumption did not decrease.

2.Once the building heats up, it can maintain its heat well.

3. Hot water pipes in exterior walls burst easily due to no insulation

4. Hot water heater is original to the building and so is the 2,000-gallon storage tank. Students do not shower so there is not that much demand for hot water.

5. There are many roof leaks. The previous Facilities Director used black plastic garbage bags above the dropped ceilings to capture all the water. There are many damaged ceiling tiles and possible mold.

6. Main water meter does not work and the gate valve needs to be replaced.

7. So many valves have broken over time that for a period of years there was hot water feeding the all of the plumbing fixtures in toilet rooms including the water closets.

8. There are five interior rooms on the second floor adjacent to the gymnasium that are feed from rooftop units for cooling. These rooftops are not functioning.

9. The school is not HCP accessible and there are many special needs students. They have retrofitted the school this year to accommodate a special needs student arriving this fall. These are minor updates but would like to renovate all the school so those students are not mandated to stay in one area with teachers traveling to them. An accessibility study was done by recently which showed that the costs to update the entire school was beyond the district's financial means.

10. There is an emergency generator that is original to the school. It does not serve the elevator or boiler, it only serves egress lighting. The generator does still come on when there is a power loss but it is difficult to shut down once this happens.

Science- Sharon Chapman

1. The students take 4 years of Science as follows:

- Earth-9th
- Biology-10th
- Chemistry-11th
- Physics or elective science- 12th

2. Every science teacher teaches at least one elective course. Currently they have Oceanography, Meteorology, and Engineering. They would like to expand these offerings but do not have the space.

3. Current courses also struggle with the space. Physics has non-movable lab tables which eat up all of the floor area in the classrooms so they cannot perform experiments that they would like to. Engineering is also taught in the Physics Lab and has a similar issue with lack of floor space and flexible furniture. Oceanography is taught in the Biology Lab and has similar issues with layout interfering with teaching.

4. Science classrooms are currently located in different areas of the building. Science teachers would prefer to be together to share materials and collaborate more.

5. Science teachers would also like to be closer to the Mathematics Department. Currently there is some cross curricular teaching happening between these two departments but there could be more if they were closer and shared common project areas. This year they are beginning a course that will combine Chemistry and upper level math.

6. The teachers do not feel space in the isolated wings of the school. This is especially true after school because things are so spread out.

7. AP environmental science teaches classes outside and would love an actual outdoor classroom.

8. The MS has a robust STEM program which falls apart at the HS due to space constraints and available space to do projects.

9. Science department worries that more and more students will leave because the program is not as robust as it could be and the facilities are really holding them back.

10. There is no proper storage room for chemicals. Should have properly ventilated room and storage cabinets in prep rooms.

11. There is an acid neutralization tank but it backs up often.

12. The gas works in most labs but there are often leaks.

13. One of the classrooms has animals in it and is not tied to the generator.

14. The plumbing in the Earth Science Labs does not work well and floods the classrooms below.

15. GIS is taught in the Earth Science Lab but should be taught in a computer lab.

Math-Karen Hammond

1. Typical class size is 20-25 although some classes are as much as 38 students.

2. Teachers want rooms with:

- Windows that function
- SMART boards and document cameras
- Projectors on multiple walls
- White boards on every surface
- Storage
- Flexible furniture that reconfigures easily

3. Classroom should serve the hearing impaired

4. If classrooms are to be shared, there should be common planning rooms with workstation that serve as home bases for the teachers.

5. Currently there are 12 AP offerings

6. A new facility might give them the ability to offer more AP's that require specialty spaces

7. Thematic grouping of classes like STEM wing could be a good arrangement because disciplines like to be together for collaboration and sharing of materials.

8. The current building lacks staff bathrooms, copy rooms and temperature regulation

Social Studies-Paula Sampson

1. The classrooms need more flexible space and flexible furniture

2. Classrooms are too small and lack storage

3. Project space would be used by the World History Day projects for creating, display and presentation

4. Social Studies uses the library often for research so they should be close to each other.

5. The current library is used by 80-100 students at a time

6. Small group rooms for individual or team use should be located in the library for study groups and in between classrooms for pull out, meeting space and small group instruction.

7. Department offices should be in the classroom wings with teachers

8. Display for student work is lacking

9. Interdisciplinary work is difficult because there is no space for two classes of students to meet or to work on projects long term

10. Social Studies would collaborate with literature, English, and science

11. SPED needs are creating an overpopulation issue.

SPED

1. HS SPED director's office and conference room is remote from the main SPED offices. Having a dedicated conference room is good but finds it difficult to collaborate with the district SPED folks.

2. This office requires a large conference room that can accommodate up to 16 people. Space should have a phone for conference calls and technology.

3. Shared spaces beyond the classroom are important.

4. Six years ago, the district made a push to keep students in district and this has created a need for many different types of spaces in the schools. There is currently no acoustic separation between classrooms and this is very problematic for the special needs population. Many students need smaller learning environment and private work areas. Temperatures in the current classrooms are too high for the special needs population. Currently they have the following spaces:

- 2 life skills rooms
- 2 EDBD classrooms
- Autism classroom
- Resource classrooms
- Transition classroom
- Office spaces for students
- OT/PT
- Sensory room
- Speech/language
- Reading Specialist
- ELL
- Suite of offices:

i. Substance abuse counselor

ii. School psychologist

iii. De-escalation rooms

5. They need:

a. Closed lockable storage

b. Accessible technology

6. The district has many students that are deaf and hearing impaired. HMFH to review ASHA guidelines which is more stringent than other code regulations. Currently a few classrooms have additional sound treatment so teachers have to move to the students that have hearing impairments that use those spaces. The students with hearing impairments cannot use most of the spaces in the building.

7. SPED would like to have an 18-22-year-old program with an outside entrance and that is located in a separate area of the building

from the main high school classrooms. This zone should feel like the students are moving up into a different type of school between high school and college.

8. Currently the Student Services for the district have 5 offices total and a dedicated conference room for IEP meetings, mediation, and data team meetings. This office also needs file storage both short and long-term storage. Long term storage could be high density file system. This suite is adjacent to the main administrative offices.

Athletics/ David Pignone

1. Athletics is an important part of Stoneham.

2. Currently they have a large multi-station Gymnasium which the District uses for PE classes and all sports events. The only issue with the space is when the set-up for Gymnastics, the floor conflicts with the main basketball court. Ventilation is not in working condition and the space gets very warm. There is also an issue with birds getting into the space and dying once in they are trapped inside.

3. The first floor locker rooms are oversized and have amenities like multiple showers and changing stalls that do not get used. This are would be better served as team rooms.

4. The current training rooms is in one of the former shops in the basement.

5. Athletic teams use the locker rooms in the basement. This area is remote and difficult to supervise.

6. Outdoor storage is handled by containers at the fields.

7. The weight room does not have any cardio equipment so it is underutilized.

8. A multi-purpose space could be used by wrestling, cheerleading and could be shared with Adaptive PE.

9. There are 3 PE teachers who have offices and locker rooms adjacent to the Gymnasium.

10. Currently there are two coaches' offices in the basement level locker rooms. This is adequate space for the coaches to share.

Appendix D: School Committee Meeting Minutes

MINUTES

date:	11.29.2017
meeting date:	8 24 2017
re:	School Committee meeting
attendees:	Stoneham School Committee-Shelly A. MacNeill, Marie T. Christie,
	Shawn M. McCarthy, Rachel Meredith-Warren,
	David C. Maurer, Chairman,
	Superintendent John Macero, Tina Stanislaski

HMFH met with the Stoneham School Committee members to go over things that are important to the town and the school and [possibilities for a new or renovated high school facility. Conversation was as follows:

Currently the high school loses 200 students a year to other schools in the area. These schools include:

• Austin Prep- 60 students

• Essex Aggie Tech

• Minuteman Tech

• Bishop Fenwick-9 students

There could be as many as 900 students in the high school once it is renovated and these students come back. The Superintendent is going to research how many students came back to the MS once a new facility opened.

Typical grades run about 170 students but this year the 8th grade has 202. This could be a typical uptick due to the new facility.

Rachel- 1.) Energy Efficiency and lowest possible operating cost, 2.) conserve open space and involve recreation and planning department in design process, 3.) use wetlands for outdoor classroom and educational purposes.

Marie-1.) would like to see a full renovation of the spaces that are larger than what MSBA will allow in a new project such as the Gymnasium, Auditorium, Cafeteria and Library, 2.) would like to have a facility that could host MIAA sporting events, 3.) would like to have an indoor track and a swimming pool because there are no facilities like that in the area and it would be of great benefit to the students and the community.

HMFH will provide a cost for a new indoor track and pool facility as part of the feasibility study.

David- 1.) STEM education should be a focus in the new building, 2.) there should be a large maker space/ fabrication lab/ prototyping lab that is available to the community for use after hours. 2.) MIT could be a partner in developing the program for this space- Beaver works is a program that does this type of educational PD with teachers. There could be other business partners in the community that would also be interested in helping with this STEM lab program. 3.) The building should be a community resource and could be a hub for Adult Education

John- 1.) Pre-school should be moved to the high school to help alleviate crowding at the elementary school level and reduce the waiting list for current pre-school programs, 2.) A Daycare program for staff should be investigated for a new or renovated facility.

Superintendent to provide number of students to be accommodated in the pre-school and the daycare.

Appendix E: Mechanical, Electrical, Plumbing, and Fire Protection Option

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 in accordance with LEED for schools. The project shall conform to LEED Silver rating.

1. CODES

All work installed under Section 230000 shall comply with the State of Massachusetts Building Code and all College, local, county, and federal codes, laws, standards, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

The work of Section 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:

Massachusetts Code values are listed herein based on Middlesex County values as determined from ASHRAE local weather data.

Outside: Winter 7°F, Summer 88°F DB 72°F WB

Inside: 70° +/- 2 deg F. for heating 75°F +/- 2 deg F (50% RH +/- 5%RH) for cooling. Unoccupied temperature setback will be provided.

Generally outside air shall be provided at the rate of in accordance with ASHRAE standard 62.1-2010 and IMC 2012 mechanical code, as a minimum.

4. SYSTEM DESCRIPTION

A. Demolition:

All of the existing building HVAC systems shall be demolished and removed in its entirety with the exception of the newly installed boilers. This includes hot water piping, unit ventilators, air handling units, exhaust fans, terminal heating equipment, associated ductwork and associated pneumatic controls.

B. Phasing:

The mechanical subcontractor shall construct the subject project in phases as directed by the Architect to suit the project progress schedule, as well as the completion date of the project.

For additional information related to phasing, review the General Conditions and Supplementary Conditions and the Architectural drawings.

C. Central Heating Plant:

Heating for the building will be through the existing heating plant.

The heating system will supply heating hot water to all heating apparatus located throughout the building through a two-pipe fiberglass insulated schedule 40 black steel and copper piping system. New hot water piping shall be installed to serve new HVAC systems. The heating plant shall supply a maximum hot water temperature of 160 deg F on a design heating day and the hot water supply water temperature will be adjusted downward based on an outside temperature reset schedule to improve the overall operating efficiency of the heating system. Primary and standby end suction base mounted pumps will be provided with variable frequency drives for variable volume flow through the water distribution system for improved energy efficiency. Pumps shall have lead/lad/alternating control capability. The hot water systems will consist of a 35% propylene glycol solution. Glycol make-up feed unit systems shall be provided.

D. Central Cooling Plant:

A new chilled water cooling plant will be located within the mechanical room (located where the 2 abandoned boilers are presently located). The chilled water plant shall consist of two (2) 200-ton high efficiency modular chillers, with estimated 400-ton total capacity that will be connected to a remote 400-ton cooling tower. It is proposed that the chiller will be of the high-efficiency design with TurboCor compressors and will distribute between 45°F and 55°F chilled water to the air handling units and 50 deg. F to 60 deg. F chilled water to terminal cooling induction units located throughout both buildings. The chilled water distribution piping will be of the fiberglass insulated schedule 40 steel type and copper type piping. Chilled water distribution to the air handling units will be completely separate from the hot water distribution piping system. Primary loop base mounted chilled water pumps with an estimated capacity of 960 GPM, arranged in a primary-standby fashion, each with a variable frequency drive (which will control down to maintain a minimum flow to the chiller) will be provided for overall water system distribution. The primary loop pump shall distribute chilled water to and from the chiller and air handling unit cooling coils. There will also be a set of secondary compensated chilled water temperature loop pumps, equipped with VFD drives, which will distribute CHW with a higher temperature to the terminal cooling induction units. Pumps shall have lead/lad/alternating control capability. The chilled water systems will consist of a 35% propylene glycol solution. Glycol make-up feed unit systems shall be provided.

Primary and standby vertical split case base mounted condenser pumps with a capacity of 1200 GPM each with variable frequency drives will be provided to distribute condenser water from the chiller to the remote cooling tower. Pumps shall have lead/lad/alternating control capability.

E. Classroom Heating, Ventilation, and Air Conditioning:

It is proposed that a ducted horizontal ceiling mounted 4 pipe heating ventilation and cooling active chilled beam induction unit system with perimeter fintube radiation heating shall be provided to serve the Classroom areas.

Multiple 100% outside air handling unit with supply and return fans with VFDs, exhaust air energy recovery wheel and reheat energy recovery wheel, hot water heating and reheat coils with modulating capacity control, chilled water cooling coils with modulating capacity control, and MERV 13 filtration will be provided to serve the induction system. Supply air will be provided to the space through new galvanized steel supply duct distribution system and shall be connected to ceiling mounted induction units 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 a galvanized sheet metal return air ductwork distribution system. A wall mounted thermostat shall be provided for each space and shall control flow to the fin tube for space temperature control.

Each classroom 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 the Classroom areas indicated above:

Three 100% outside air handling units with an approximate capacity of 5,000 CFM each (30 Tons Cooling, 300 MBH Heating) to be located on the roof.

Two 100% outside air handling units with an approximate capacity of 2500 CFM each (15-tons cooling, 150 MBH Heating) to be located on the roof.

Classroom Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

F. Science Classroom:

Each Science Classroom will be provided with a fume hood exhaust fan with an approximate capacity of 1,200 CFM at 2 HP for dedicated chemical exhaust.

Classroom Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

G. Computer Rooms:

Computer rooms which require additional cooling loads or year-round cooling above that of which the proposed induction unit systems can achieve shall be provided with high efficiency Ductless Cooling split unit systems. It is estimated that approximately two (2) 3-ton units with associated outdoor air-cooled condensers. Ventilation will be provided through the associated classroom air handling unit.

Computer Rooms Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

H. Gymnasium:

The gymnasium will be provided with two rooftop units of the 100% outside air design. Each unit will be approximately 6,000 CFM and will include supply and return fans with VFDs, energy recovery wheels, 300 MBH hot water heating coils with modulating control valves, 30 tons of chilled water cooling capacity with two position control valves, and MERV 13 filtration. Supply air will be provided to the space through new galvanized steel supply duct distribution system located high within the space and exposed with duct mounted diffusers. Return air will be drawn back to the units by low wall mounted return air registers located within the space and will be routed back to the unit by a galvanized sheet metal return air ductwork distribution system.

Supplemental hot water fin tube radiation heating will be provided along exterior walls. CO2 demand ventilation will be utilized to reduce outside air based on population.

As levels of carbon dioxide drop generally relating to a reduction in population the outside air damper will modulate to reduce outside air flow and allow recirculation while always maintaining a maximum of 800 ppm, CO_2 level within the space.

I. Locker Rooms:

The Locker Rooms and adjacent offices will be served by (1) rooftop unit of the 100% outside air design. The unit will be approximately 3,000 CFM and will include a supply and exhaust fan with VFDs, energy recovery wheel, 200 MBH hot water heating coil with modulating control valve, 15 tons of chilled water cooling capacity with two position control valve, and MERV 13 filtration. Supply air ventilation will be provided to each space through new galvanized supply duct which will travel throughout each locker room area to a series of ceiling mounted supply registers. New exhaust air ductwork and air ceiling mounted registers shall be installed and shall travel from the locker rooms to the new rooftop unit.

J. Administration and Guidance Areas (First Floor):

Spatial heating, ventilation, and air-conditioning for the Administration, and Guidance areas will be served by ducted horizontal ceiling mounted 4-pipe heating, ventilation, and cooling active chilled beam induction units. Ventilation air to these areas will be provided by a new 100% outside air rooftop air handling unit with an approximate capacity of 6,500 CFM, supply and return fan with VFDs, energy recovery wheels, 250 gas-fired heating sections with modulating gas valve, 20-ton capacity DX cooling, hot gas reheat system, and MERV 13 filtration.

Administration Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

K. Cafeteria:

The cafeteria will be provided with one (1) new rooftop air handling unit of the 100% outside air design. The unit will be approximately 10,000 CFM and will include supply and return fans with VFDs, energy recovery wheels, 500 MBH gas-fired heating sections with modulating gas valve, 50-ton DX cooling system, and MERV 13 filtration. Supply air will be provided to the space through new galvanized steel supply duct distribution system located high within the space and exposed with duct mounted diffusers. Return air will be drawn back to the units by low wall mounted return air registers located within the space and will be routed back to the rooftop unit by a galvanized sheet metal return air ductwork distribution system. Supplemental hot water fin tube radiation heating will be provided along exterior walls. CO2 demand ventilation will be utilized to reduce outside air based on population. As levels of carbon dioxide drop generally relating to a reduction in population the outside air damper will modulate to reduce outside air flow and allow recirculation while always maintaining a maximum of 800 ppm CO_2 levels.

Cafeteria Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

L. Auditorium (Full Air Conditioning):

The auditorium will be provided with heating, ventilation and air conditioning by one rooftop unit of the 100% outside air design. The unit will be approximately 9,000 CFM for auditorium and will include a supply and exhaust fan with VFD's, gas fired furnace heating section with modulating control, MERV 13 filtration, DX direct expansion cooling and dehumidification with hot gas reheat control, exhaust air fan, and demand ventilation controls.

Supply air will be provided to the space through galvanized steel metal ductwork with ceiling type diffusers. Return air will be drawn back to the unit through a galvanized sheet metal ductwork terminating with ceiling mounted return air. In addition, carbon dioxide (CO2) controls will be installed which will monitor the overall level of carbon dioxide at a threshold level of 800 ppm. As levels drop generally relating to a reduction in population the air handling unit outside air damper will modulate to reduce air flow and ventilation while always maintaining a maximum of 800 ppm.

Auditorium Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

M. IT Data Rooms:

IT Data Rooms shall be air conditioned by dedicated variable refrigerant flow Ductless Cooling unit systems.

N. Lobby, Corridor, and Entry Way Heating:

Lobby, corridor and entry ways shall be heated by a combination of new hot water convectors, cabinet unit heaters and fin tube radiation heating equipment.

O. Testing, Adjusting, Balancing and Commissioning

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

P. Automatic Temperature Controls – Building Energy Management System

A new DDC (direct digital control) automatic temperature control (ATC) and energy management system (EMS) shall be installed to control all new HVAC systems and equipment.

Flow and BTU meters will be installed on the domestic, heating, and cold systems to determine energy consumption and water usage. Electrical meters will be placed on the main service to determine and quantify usage. Lighting controls will be interfaced with EMS system to provide a central location where all building components can be viewed, adjusted, modified, and controlled.

ELECTRICAL SYSTEMS NARRATIVE REPORT

RENOVATION OPTION

The following is the Electrical Systems 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.

1. CODES

   A. All work installed under Section 260000 shall comply with the Massachusetts State Building Code and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   A. The work of Section 260000 is as described in this Narrative. 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 networked controls. The control of the relays will be by automatic means, such as an occupancy sensor in each classroom. The system will have a BACnet gateway and will be interfaced with the DDC control system for schedule functions. The controllability shall be in conformance with associated LEED credit in indoor environmental quality.

   B. Automatic control of receptacles based on occupancy will be provided for at least 50% of the receptacles. Installed in private offices, open offices, and computer classrooms. Controlled receptacles will be marked per NEC 406.3 (E).

   C. Exterior lighting will be controlled by photocell “ON” and “scheduled” for “OFF” operation. The parking area lighting will be controlled by “zones” with dimmable capability.

   D. Emergency and Exit lighting will be run through life safety panels to be “ON “during normal power conditions, as well as, power outage conditions. The emergency lighting system will have time control so that lights are “ON” only when building is occupied.

4. DESCRIPTION OF THE SYSTEMS

   A. Utilities:

      1. The new building will be supplied with utility power from the utility company Eversource. The new service will be fed via underground primary duct bank to a pad mounted utility company owned liquid filled transformer. The metering will be done at the transformer. The new service will be installed prior to the existing being taken off line. The existing service will be back-fed from the new until no longer needed.

2. The temporary modular classrooms will be supplied by a separate service from the utility company Eversource. The temporary service will be fed via underground primary ductbank to a pad-mounted utility company owned liquid filled transformer. Metering will be done at the transformer. The temporary service will be removed in Phase 2.

3. The service electrical transformer will be furnished, installed, owned and maintained by Eversource, and it will be located adjacent to the building. The transformer will be of the pad- mounted type with a primary voltage of 13.8 kV and a secondary voltage of 480Y/277 volts. The transformer will be sized by the utility company based on the load data provided by the design team.

4. Concrete pad and grounding grid for the pad-mounted transformer is provided by the Contractor per the Eversource standards.

5. Concrete encased duct bank of the two 5" PVC conduits will be provided by the Electrical Contractor for the primary feeder installation from a utility pole riser to the pad-mounted transformer. Pre-cast concrete manholes 12' x 9' will be provided by the Contractor to facilitate the primary cables field installation.

6. Utility company will provide a primary feeder cable from the utility manhole to the pad-mounted transformer via the new manhole and terminate the feeder cable on the both ends.

7. Transformer secondary feeder of the copper conductors will be installed underground in the duct bank of eight (8) 4" PVC conduits from the pad-mounted transformer to the main electrical switchboard located in the Main Electrical Room. The secondary feeder and terminations at the switchboard side will be provide by the Electrical Contractor, and terminated at the transformer side by Eversource. The new service will be metered at the transformer secondary voltage.

8. The Eversource metering CTs will be installed in a CT section of the switch board, the meter will be located at the direction of the utility company.

9. Telephone, Cable TV, and City Fiber will be fed underground into the buildings Main Distribution Frame/Head end room.

B. Electrical Distribution System:

1. Service ratings for the Main Building are designed for a connected load of 10 watts/s.f. The service capacity will be sized for 3,000 amperes at 277/480 volt, 3∅, 4 wire with 100% rated main breaker. The main buss will be sized at 4,000 amperes and will have an available space provision at the end of the gear to accommodate a future grid connected photovoltaic array. The switchboard will be furnished with a service entrance transient voltage surge protection device (SPD) rated 240 kA and digital metering unit to monitor voltage, current, power factor, demand kW and with a data communication port for interface with BMS. Main switchboard's short circuit rating shall be coordinated with Eversource, but it is estimated to be 65 KAIC.

2. Service ratings for the Temporary Modular Building is based on electric heat which yields a 1600 Ampere 120/208V, 3 Phase, 4 Wire service.

3. The building connected electrical load estimate is based on the preliminary building systems design:

Load Type	KVA
Site lighting	10 KVA
HVAC Loads (including chiller and pumps, RTUs, MAUs, exhaust fans, etc.)	600 KVA
Boilers and Pumps	35 KVA
Interior Lighting Load	240 KVA
Classrooms, Labs, Office Power	780 KVA
Kitchen (full-service)	75 KVA
Miscellaneous Power	50 KVA
Elevator	90 KVA
Auditorium Lighting	150 KVA
Total Connected Load	**2,030 KVA**

4. Electrical power distribution equipment will be installed in the Main Electrical Room and in the electrical closets. There is one Main Electric Room that also contains a 2 hour rated Emergency Electric Room for life safety electrical switchgear. Sub-panels with shunt trip main breakers will be provided within maker space and labs which require emergency off operation.

5. A typical Electric Room will serve interior lighting, HVAC equipment, and receptacle loads in the academic core areas. Each closet will house a 250 Amp 120/208 volt power panel (double tub) via a 75KVA dry-type transformer, a 100 Amp 277/480 panel for lighting, and a 150Amp 120/208 volt mechanical panel via a 45KVA transformer.

6. The panels in the Gym electrical closet will serve local HVAC equipment, lighting, receptacles and Gym equipment. The closet will house a 225 Amp 277/480 volt power distribution panel to feed a lighting 100 Amp, 277/480 volt 3 phase panel and a dry-type 75 kVA transformer with a double-tub 250 Amp,120/208 volt 3 phase receptacle panel. Provide 20 amp, 120 volt circuits for the basketball backboards, shot clocks, scoreboards, divider curtains and 20Amp, 208 volt, 3 phase circuit and disconnect for a mat lifter. Provide control stations and wiring for the all Gym equipment.

7. The panels in the Administration area electrical closet will serve local HVAC equipment, lighting, receptacles and equipment serving this area and also the Band room and Art classrooms. The closet will house a 250 Amp 277/480 volt power distribution panel to feed a lighting 100 Amp, 277/480 volt 3 phase panel and a dry-type 75 kVA transformer with a double-tub 250 Amp,120/208 volt 3 phase receptacle panel.

8. Auditorium lighting electrical closet will house a dedicated transformer 225 kVA and 800 Amp 120/208 volt, 3 phase panel for the Auditorium lighting dimming system.

9. A dry-type 112.5 kVA transformer and 400 Amp,120/208 volt, 3 phase panels will be provided for the Cafeteria and Kitchen loads. The kitchen refrigeration equipment will be power fed from the standby power panel.

10. Roof-mounted HVAC equipment will be power fed from the 400 Amp 480 volt 3 phase power panels located in the nearest fourth or fifth floor electrical closets.

11. HVAC equipment serving data communication rooms, a boiler plant equipment including boilers and pumps, a sewage pump station, and an elevator will be supported by the standby generator power panels.

C. Interior Lighting System:

1. The intent of the lighting design is to provide a visual environment for the students and faculty that is supportive of the educational activities within the building. The lighting system will be designed in compliance with the applicable Energy Code and be eligible for the Utility company rebate program.

2. Interior lighting illumination levels will meet the IES recommended values for applicable activity type, be in compliance with the IECC 2012 energy allowances and LEED for Schools control requirements.

PROPOSED ILLUMINATION LEVELS

Location	Average Illumination Levels
Classrooms	30-35 FC
Science Labs	40 FC
Offices, Conference Rooms, Library	30-35 FC
Kitchen	40-50 FC
Gymnasium	50 FC
Cafeteria	30-35 FC
Corridors	20-25 FC
Utility and Storage Rooms	20-25 FC

3. Classroom lighting fixtures will consist of pendant mounted indirect luminaries with LED lamps and electronic dimmable drivers. The fixtures will be pre-wired for continuous dimming control where natural daylight is available and also for multi-level switching. Two daylight dimming zones will be provided in each classroom.

4. Office lighting fixtures will consist of pendant mounted indirect LED luminaries and electronic drivers for dual-level switching. Offices on the perimeter with windows will have daylight dimming controls similar to classrooms.

In general, lighting power density will be 30-40% less than ASHRAE 90.1-2010. The power density reduction relates to associated LEED credit in energy and atmosphere.

5. Lighting levels will be approximately 30 foot candles in classrooms and offices. The daylight dimming foot-candle level will be in compliance with associated LEED credit in indoor environment quality.

6. Gymnasium lighting will be comprised of direct fixtures with LED lamps and electronic drivers. The fixtures will be provided with clear lens and protective wire guards. The light level will be designed for approximately 50 foot candles. Multi-level switching will be provided.

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

7. Corridor lighting will be comprised of recessed acrylic fixtures with LED lamps and electronic drivers. The Corridor light level will be designed for approximately 20 foot candles. Corridor lighting will be on time clock control and only “ON” during occupied hours. The Corridor lighting will be dual-level controlled by schedule.

8. Cafeteria lighting will be a combination of pendant direct/indirect fixtures and linear recessed fixtures with LED lamps and electronic drivers. The light levels will be designed for approximately 30 foot candles. Daylighting controls will be provided on perimeter light fixtures with 15 feet of glazing

9. Stage and Auditorium theatrical lights with connector strips and a dimming system will be provided for performances. House lighting in Auditorium will be dimmable LED and controlled by theatrical dimming system.

10. Kitchen and Servery lighting will consist of recessed 2’x4’ acrylic lensed gasketed troffers with aluminum frame doors with LED lamps and electronic drivers. Light levels will be approximately 50 foot candles.

11. Media Center lighting will be a combination of pendant direct/indirect fixtures and linear recessed fixtures with LED lamps and electronic drivers. The light levels will be designed for approximately 30 foot candles. Daylighting controls will be provided on perimeter light fixtures with 15 feet of glazing

12. Each area will be locally switched and designed for multi-level controls. Each Classroom, Office space, and Toilet room will have occupancy sensors to turn lights off when unoccupied. Occupancy sensors will be set to vacancy mode where required by Energy Code.

13. The maker spaces will have industrial grade strips with LED lamps and protective wireguards. Light levels will be approximately 50 foot-candles.

14. Daylight dimming sensors will be installed in each room where natural light is available for continuous dimming of light fixtures. The control system will be in accordance with associated LEED credit in indoor environmental quality.

15. The entire school will be controlled with an automatic lighting control system for programming of interior and exterior lights “on and off”. Lighting control system will be interfaced with DDC system, and will be demand response capable in accordance with associated LEED credit in Energy and atmosphere.

D. Emergency Lighting System:

1. An exterior 275 kW diesel emergency generator with sound attenuated enclosure and base tank with alarms will be provided. An integral 100 kW resistive load bank will be provided for generator testing under load. 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 power system has been sized to support emergency (life safety), and optional standby building loads.

   a. Emergency (life safety) power loads as required by the Code:
      - Emergency exit and egress lighting (interior and building exterior at the exits)
      - Fire alarm system

   b. Standby power loads:
      - Heating system boilers with associated pumps and controls
      - Telephone/ data closets and associated A/C equipment
      - Communication systems (telephone and public address systems)
      - Building DDC system control panels
      - Kitchen refrigeration equipment
      - Lighting and power in the nurse/medical area
      - Security system equipment
      - Sewage pump station
      - Elevator

E. Site Lighting System:

1. Fixtures for area lighting will be pole mounted cut-off ‘LED’ luminaries in the parking area and roadways. Pole heights will be 20 feet. The exterior lighting will be connected to the automatic lighting control system for photocell “ON” and timed “OFF” operation. The site lighting fixtures will be dark sky compliant. The illumination level will be 0.5fc for parking areas in accordance with Illuminating Engineering Society. Lighting will be designed in accordance with associated LEED credit in sustainable sites.

2. Building perimeter fixtures will be ‘LED’ wall mounted cut-off over exterior doors for Exit discharge.

F. 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.

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 25-40 foot intervals.

4. Exterior weatherproof receptacles with lockable enclosures will be installed at exterior doors.

5. A system of computer grade panelboards with double neutrals and surge protective devices will be provided for receptacle circuits.

G. Fire Alarm System:

1. A fire alarm and detection system will be provided with 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.

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.

5. Manual pull stations will be provided at Exit discharge doors and at each egress stairwell not located at grade level.

6. The system will be remotely connected to automatically report alarms to fire department via an approved method by the fire department.

7. The generator status panel will be located at the Fire Command Center.

H. Uninterruptible Power Supply (UPS):

1. One (1) 30 kVA, 3 phase centralized UPS system will be provided with eight minutes of battery back-up. One (1) will be located in the MDF Room and one (1) will be located in a remote IDF Room.

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 and communication systems during a prolonged power outage.

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

I. Lightning Protection System:

1. A system of lightning protection devices will be provided.

2. The lightning protection equipment will include air terminals, roof and down conductors, conduits, fasteners, connectors, ground rods, etc.

3. The facility will be issued a UL Mater Label Certificate.

J. Renewable Energy System Provisions:

1. The base project will include:

- Electrical provisions will be made for a roof mounted renewable energy system consisting of photovoltaic panels covering 80% of the roof area. The system will be grid connected photovoltaic PV system intended to reduce the facilities demand for power.

K. Two-Way Communications System:

A Two-Way Communications System will be provided at the elevator lobbies that do not have grade access. Area of rescue assistance call boxes will be provided at Elevator Lobbies with no grade access. The call boxes connect to a main panel located adjacent to the Fire Alarm annunciator panel.

L. Distribution Antennae System (DAS):

1. A public safety radio distributed antenna system (DAS) which consists of bi-directional amplifiers (BDA), donor antennas, coverage antennas, coax cable, coax connectors, splitters, combiners and couplers. These devices will be used as part of a system for in-building public safety 2-way radio system communication.

5. CCTV

A. 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).

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

C. 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.

6. INTRUSION SYSTEM

A. 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.

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

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

7. CARD ACCESS

A. 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.

B. 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.

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

8. TESTING REQUIREMENTS

A. 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.
- Uninterruptible Power System, UPS.
- Lightning protection system.

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

9. OPERATION MANUALS AND MAINTENANCE MANUALS

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

10. 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.

11. COMMISSIONING

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

HVAC SYSTEMS NARRATIVE REPORT

RENOVATION OPTION

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 in accordance with LEED for schools. The project shall conform to LEED Silver rating.

1. CODES

All work installed under Section 230000 shall comply with the State of Massachusetts Building Code and all College, local, county, and federal codes, laws, standards, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

The work of Section 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:

Massachusetts Code values are listed herein based on Middlesex County values as determined from ASHRAE local weather data.

Outside: Winter 7°F, Summer 88°F DB 72°F WB

Inside: 70° +/- 2 deg F. for heating 75°F +/- 2 deg F (50% RH +/- 5%RH) for cooling. Unoccupied temperature setback will be provided.

Generally outside air shall be provided at the rate of in accordance with ASHRAE standard 62.1-2010 and IMC 2012 mechanical code, as a minimum.

4. SYSTEM DESCRIPTION

A. Demolition:

All of the existing building HVAC systems shall be demolished and removed in its entirety with the exception of the newly installed boilers. This includes hot water piping, unit ventilators, air handling units, exhaust fans, terminal heating equipment, associated ductwork and associated pneumatic controls.

B. Phasing:

The mechanical subcontractor shall construct the subject project in phases as directed by the Architect to suit the project progress schedule, as well as the completion date of the project.

For additional information related to phasing, review the General Conditions and Supplementary Conditions and the Architectural drawings.

C. Central Heating Plant:

Heating for the building will be through the existing heating plant.

The heating system will supply heating hot water to all heating apparatus located throughout the building through a two-pipe fiberglass insulated schedule 40 black steel and copper piping system. New hot water piping shall be installed to serve new HVAC systems. The heating plant shall supply a maximum hot water temperature of 160 deg F on a design heating day and the hot water supply water temperature will be adjusted downward based on an outside temperature reset schedule to improve the overall operating efficiency of the heating system. Primary and standby end suction base mounted pumps will be provided with variable frequency drives for variable volume flow through the water distribution system for improved energy efficiency. Pumps shall have lead/lad/alternating control capability. The hot water systems will consist of a 35% propylene glycol solution. Glycol make-up feed unit systems shall be provided.

D. Central Cooling Plant:

A new chilled water cooling plant will be located within the mechanical room (located where the 2 abandoned boilers are presently located). The chilled water plant shall consist of two (2) 200-ton high efficiency modular chillers, with estimated 400-ton total capacity that will be connected to a remote 400-ton cooling tower. It is proposed that the chiller will be of the high-efficiency design with TurboCor compressors and will distribute between 45°F and 55°F chilled water to the air handling units and 50 deg. F to 60 deg. F chilled water to terminal cooling induction units located throughout both buildings. The chilled water distribution piping will be of the fiberglass insulated schedule 40 steel type and copper type piping. Chilled water distribution to the air handling units will be completely separate from the hot water distribution piping system. Primary loop base mounted chilled water pumps with an estimated capacity of 960 GPM, arranged in a primary-standby fashion, each with a variable frequency drive (which will control down to maintain a minimum flow to the chiller) will be provided for overall water system distribution. The primary loop pump shall distribute chilled water to and from the chiller and air handling unit cooling coils. There will also be a set of secondary compensated chilled water temperature loop pumps, equipped with VFD drives, which will distribute CHW with a higher temperature to the terminal cooling induction units. Pumps shall have lead/lad/alternating control capability. The chilled water systems will consist of a 35% propylene glycol solution. Glycol make-up feed unit systems shall be provided.

Primary and standby vertical split case base mounted condenser pumps with a capacity of 1200 GPM each with variable frequency drives will be provided to distribute condenser water from the chiller to the remote cooling tower. Pumps shall have lead/lad/alternating control capability.

E. Classroom Heating, Ventilation, and Air Conditioning (Full Air Conditioning):

It is proposed that a ducted horizontal ceiling mounted 4 pipe heating ventilation and cooling active chilled beam induction unit system with perimeter radiation heating panels shall be provided to serve the Classroom areas.

Multiple 100% outside air handling unit with supply and return fans with VFDs, exhaust air energy recovery wheel and reheat energy recovery wheel, hot water heating and reheat coils with modulating capacity control, chilled water cooling coils with modulating capacity control, and MERV 13 filtration will be provided to serve the induction system. Supply air will be provided to the space through new galvanized steel supply duct distribution system and shall be connected to ceiling mounted induction units 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 a galvanized sheet metal return air ductwork distribution system. A wall mounted thermostat shall be provided for each space and shall control flow to the fin tube for space temperature control.

Each classroom 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 the Classroom areas indicated above:

Three (3) 100% outside air handling units with an approximate capacity of 5,000 CFM each (30 Tons Cooling, 300 MBH Heating) to be located on the roof.

Two (2) 100% outside air handling units with an approximate capacity of 2,500 CFM each (15-tons cooling, 150 MBH Heating) to be located on the roof.

Classroom Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

F. Science Classroom:

Each Science Classroom will be provided with a fume hood exhaust fan with an approximate capacity of 1,200 CFM at 2 HP for dedicated chemical exhaust.

Classroom Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

G. Computer Rooms:

Computer rooms which require additional cooling loads or year-round cooling above that of which the proposed induction unit systems can achieve shall be provided with high efficiency Ductless Cooling split unit systems. It is estimated that approximately two (2) 3-ton units with associated outdoor air-cooled condensers. Ventilation will be provided through the associated classroom air handling unit.

Computer Rooms Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

H. Gymnasium (Full Air Conditioning):

The gymnasium will be provided with two rooftop units of the 100% outside air design. Each unit will be approximately 8,000 CFM and will include supply and return fans with VFDs, energy recovery wheels, 500 MBH gas-fired heating coils with modulating gas valves, 40 tons of chilled water cooling capacity with modulating control valves, and MERV 13 filtration. Supply air will be provided to the space through new galvanized steel supply duct distribution system located high within the space and exposed with duct mounted diffusers. Return air will be drawn back to the units by low wall mounted return air registers located within the space and will be routed back to the unit by a galvanized sheet metal return air ductwork distribution system.

Supplemental hot water fin tube radiation heating will be provided along exterior walls. CO2 demand ventilation will be utilized to reduce outside air based on population.

As levels of carbon dioxide drop generally relating to a reduction in population the outside air damper will modulate to reduce outside air flow and allow recirculation while always maintaining a maximum of 800 ppm, CO_2 level within the space.

I. Locker Rooms (Dehumidification):

The Locker Rooms and adjacent offices will be served by (1) rooftop unit of the 100% outside air design. The unit will be approximately 4,500 CFM and will include a supply and exhaust fan with VFDs, energy recovery wheel, 250 MBH heating coil with modulating control valve, 15 tons of chilled water cooling capacity with two position control valve, and MERV 13 filtration. Supply air ventilation will be provided to each space through new galvanized supply duct which will travel throughout each locker room area to a series of ceiling mounted supply registers. New exhaust air ductwork and air ceiling mounted registers shall be installed and shall travel from the locker rooms to the new rooftop unit.

J. Administration and Guidance Areas (Full Air Conditioning):

Spatial heating, ventilation, and air-conditioning for the Administration, and Guidance areas will be served by ducted horizontal ceiling mounted 4-pipe heating, ventilation, and cooling active chilled beam induction units. Ventilation air to these areas will be provided by a new 100% outside air rooftop air handling unit with an approximate capacity of 2,500 CFM, supply and return fan with VFDs, energy recovery wheels, 150 MBH gas-fired heating sections with modulating gas valve, 12-ton capacity chilled water cooling, hot gas reheat system, and MERV 13 filtration.

Administration Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

K. Music Rooms (Full Air Conditioning):

Spatial heating, ventilation, and air-conditioning for the Music Center areas will be served by ducted horizontal ceiling mounted 4-pipe heating, ventilation, and cooling active chilled beam induction units. Ventilation air to these areas will be provided by a new 100% outside air rooftop air handling unit with an approximate capacity of 1,500 CFM, supply and return fan with VFDs, energy recovery wheels, 100 MBH gas-fired heating sections with modulating gas valve, 8-ton capacity chilled water cooling, hot gas reheat system, and MERV 13 filtration.

Music Center Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

L. Cafeteria (Full Air Conditioning):

The cafeteria will be provided with one (1) new rooftop air handling unit of the 100% outside air design. The unit will be approximately 10,000 CFM and will include supply and return fans with VFDs, energy recovery wheels, 500 MBH gas-fired heating section with modulating gas valve, 50-ton chilled water cooling system, and MERV 13 filtration. Supply air will be provided to the space through new galvanized steel supply duct distribution system located high within the space and exposed with duct mounted diffusers. Return air will be drawn back to the units by low wall mounted return air registers located within the space and will be routed back to the rooftop unit by a galvanized sheet metal return air ductwork distribution system. Supplemental hot water fin tube radiation heating will be provided along exterior walls. CO2 demand ventilation will be utilized to reduce outside air based on population. As levels of carbon dioxide drop generally relating to a reduction in population the outside air damper will modulate to reduce outside air flow and allow recirculation while always maintaining a maximum of 800 ppm CO_2 levels.

Cafeteria Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

M. Kitchen:

The kitchen areas shall be provided with a new kitchen exhaust air fan and make-up air rooftop unit (MAU-1). Make-up air shall be provided by a 5,000 CFM roof mounted heating and ventilation air handling unit with modulating 200 MBH gas fired heating. The exhaust fan will be sized at 5,500 CFM.

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.

The kitchen area will be heated by a 4,000 CFM roof mounted heating and ventilation air handling unit (HV-1) with modulating 200 MBH gas fired heating.

N. Auditorium (Full Air Conditioning):

The auditorium will be provided with heating, ventilation and air conditioning by one rooftop unit of the 100% outside air design. The unit will be approximately 10,000 CFM for auditorium and will include a supply and exhaust fan with VFD's, gas fired furnace heating section with modulating control, MERV 13 filtration, cooling and dehumidification, exhaust air fan, and demand ventilation controls.

Supply air will be provided to the space through galvanized steel metal ductwork with ceiling type diffusers. Return air will be drawn back to the unit through a galvanized sheet metal ductwork terminating with ceiling mounted return air. In addition, carbon dioxide (CO2) controls will be installed which will monitor the overall level of carbon dioxide at a threshold level of 800 ppm. As levels drop generally relating to a reduction in population the air handling unit outside air damper will modulate to reduce air flow and ventilation while always maintaining a maximum of 800 ppm.

Auditorium Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

O. IT Data Rooms:

IT Data Rooms shall be air conditioned by dedicated variable refrigerant flow Ductless Cooling unit systems.

P. Lobby, Corridor, and Entry Way Heating:

Lobby, corridor and entry ways shall be heated by a combination of new hot water convectors, cabinet unit heaters and fin tube radiation heating equipment.

Q. Testing, Adjusting, Balancing and Commissioning

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

R. Automatic Temperature Controls – Building Energy Management System

A new DDC (direct digital control) automatic temperature control (ATC) and energy management system (EMS) shall be installed to control all new HVAC systems and equipment.

Flow and BTU meters will be installed on the domestic, heating, and cold systems to determine energy consumption and water usage. Electrical meters will be placed on the main service to determine and quantify usage. Lighting controls will be interfaced with EMS system to provide a central location where all building components can be viewed, adjusted, modified, and controlled.

TECHNOLOGY SYSTEMS NARRATIVE REPORT

RENOVATION OPTION

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

1. CODES

   A. All work installed under Section 270000 shall comply with the Massachusetts Building Code 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 6 UTP Plenum rated cabling for both data and telephone systems for gigabit connectivity. The telephone infrastructure will accommodate PBX, or VOIP based voice systems.

   B. Each classroom will have 2 data outlets for student computers. Two data, one voice with video and audio connections to a wall mounted projector will be provided at teacher's station with interconnectivity to a interactive whiteboard. A wall phone outlet with 2 way ceiling speaker will be provided for communications with administration. Wireless access points will be provided in all classrooms and other spaces and consist of (2) CAT6A.cables and multimode fiber.

   C. A central paging system will be provided and integrated with the telephone system.

   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 10 Gbps Ethernet.

   F. Two-way communication call boxes will be provided adjacent to each elevator that is above or below grade level. The base station will be located at a control point on the first floor.

4. TESTING REQUIREMENTS

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

- Telephone and data cabling
- Fiber optic backbone cabling
- 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.

8. PHASING

A. New MDF will be constructed in Phase 1. All existing IDF's that are required to remain active will be back-fed from the new MDF via temporary fiber optic backbone. Temporary backbone to be removed in final phase.

B. New and existing paging systems will require interference during Phase 1 so that all occupied areas are covered by either new or existing paging system. Existing paging system to be removed in final phase.

FIRE PROTECTION SYSTEMS NARRATIVE REPORT

RENOVATION OPTION

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. The existing building is currently not protected with an automatic sprinkler system. In accordance with Massachusetts General Law, an existing school building of greater than 7,500 s.f. that undergoes major renovations must be protected with an automatic sprinkler system.

4. DESCRIPTION

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

   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. A total of ten (10) wet type sprinkler zones will be provided.

   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 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.

   F. Fire department valves and cabinets will be provided on each side of the Stage in the Building.

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 hydrant flow test must be performed to confirm the Municipal water supply capacity.

6. 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.

7. 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.

8. 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.

9. 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

PLUMBING SYSTEMS NARRATIVE REPORT

RENOVATION OPTION

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 for Schools*** 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. New Soil, Waste, and Vent piping system is provided to connect to all fixtures and equipment. The new soil, waste and vent piping will connect to the existing building systems.

   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. New roof drains will be provided throughout. All new storm drainage piping will be connected to existing building system.

   D. New 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 new 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.

   F. In existing building to remain, existing drainage piping may be reused if adequately sized for intended use. Integrity of existing piping will be confirmed via video inspection.

E. A new 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.

F. In existing building to remain, existing drainage piping may be reused if adequately sized for intended use. Integrity of existing piping will be confirmed via video inspection.

5. WATER SYSTEM

A. The existing 6-inch domestic water service from the municipal water system will remain.

B. New cold and hot water distribution piping will be provided.

C. Non-freeze wall hydrants with integral back flow preventers are provided along the exterior of the building.

D. New domestic hot water heating will be provided with a combination of two gas fired, high efficiency, condensing water heaters (400,000 BTUH input each), with separate storage tank (500 gallon). System is to be equipped with thermostatically controlled mixing devices to control water temperature to the fixtures.

E. A pump will re-circulate hot water from the piping system. Water temperature will be 120 deg. to serve general use fixtures. A 140 deg. F hot water will be supplied to the kitchen dishwasher.

F. 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.

G. A new dedicated non-potable cold and hot water system will be provided to Science Classrooms. Water system will be protected with a reduced pressure backflow preventer. A dedicated tank type water heater will be provided to deliver hot water to all Science Classroom sinks.

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

6. GAS SYSTEM

A. Existing gas service will remain. New gas piping will be provided in the building and will serve the boilers, domestic water heaters, kitchen cooking equipment, roof top equipment and generator.

B. Gas piping will be Schedule 40 black steel pipe with threaded gas pattern malleable fittings for 2 in. and under and butt welded fittings for 2-1/2 in. and larger.

7. FIXTURES ***LEED for Schools Credit WEp1***

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. Each Art Classroom sink shall include a plaster trap.

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 or equal.

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

8. 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.

9. 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.

10. INSULATION

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

11. 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.

12. 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.

13. WATER HEATER

A. Gas fired, high efficiency, two condensing water heaters (400,000 BTUH input each), with separate storage tank (500 gallon).

HVAC SYSTEMS NARRATIVE REPORT

ADD/RENO OPTION

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 in accordance with LEED for schools. The project shall conform to LEED Silver rating.

1. CODES

All work installed under Section 230000 shall comply with the State of Massachusetts Building Code and all College, local, county, and federal codes, laws, standards, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

The work of Section 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:

Massachusetts Code values are listed herein based on Middlesex County values as determined from ASHRAE local weather data.

Outside: Winter 7°F, Summer 88°F DB 72°F WB

Inside: 70° +/- 2 deg F. for heating 75°F +/- 2 deg F (50% RH +/- 5%RH) for cooling. Unoccupied temperature setback will be provided.

Generally outside air shall be provided at the rate of in accordance with ASHRAE standard 62.1-2010 and IMC 2012 mechanical code, as a minimum.

4. SYSTEM DESCRIPTION

A. Demolition:

All of the existing building HVAC systems shall be demolished and removed in its entirety with the exception of the newly installed boilers. This includes hot water piping, unit ventilators, air handling units, exhaust fans, terminal heating equipment, associated ductwork and associated pneumatic controls.

B. Phasing:

The mechanical subcontractor shall construct the subject project in phases as directed by the Architect to suit the project progress schedule, as well as the completion date of the project.

For additional information related to phasing, review the General Conditions and Supplementary Conditions and the Architectural drawings.

C. Central Heating Plant:

Heating for the building will be through the existing heating plant.

The heating system will supply heating hot water to all heating apparatus located throughout the building through a two-pipe fiberglass insulated schedule 40 black steel and copper piping system. New hot water piping shall be installed to serve new HVAC systems. The heating plant shall supply a maximum hot water temperature of 160 deg F on a design heating day and the hot water supply water temperature will be adjusted downward based on an outside temperature reset schedule to improve the overall operating efficiency of the heating system. Primary and standby end suction base mounted pumps will be provided with variable frequency drives for variable volume flow through the water distribution system for improved energy efficiency. Pumps shall have lead/lad/alternating control capability. The hot water systems will consist of a 35% propylene glycol solution. Glycol make-up feed unit systems shall be provided.

D. Classroom Heating, Ventilation, and Air Conditioning (Dehumidification):

Rooftop air handling units with supply and exhaust fans with VFDs, energy recovery wheels, gas fired heating section with modulating capacity control, DX cooling system with modulating hot gas reheat coils and MERV 13 filtration will be provided to serve a new dehumidification displacement ventilation system. Supply air will be provided to the space through a galvanized steel supply duct distribution system 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 rooftop unit by a galvanized sheetmetal return air ductwork distribution system. Supplemental hot water ceiling mounted radiant heating panels will be provided along exterior walls.

Each classroom shall be provided with a variable volume (VAV) terminal box with combination temperature, humidity, and CO2 sensor controls and shall be interlocked with occupancy sensors that will reduce outside air as allowed maintaining a maximum of 800 PPM while providing sufficient ventilation to the diffusers to meet the required heating or cooling load of the classroom. As VAV boxes modulate, the supply and return air fans associated Variable Frequency Drives (VFD) of the air handling units will adjust the fan speed based on system static pressure, reducing the energy consumed by the fans.

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

Classrooms 1 RTU: 100% outside air rooftop air handling unit with a capacity of 12,000 CFM (50 tons cooling, 450 MBH heating), serving the north classrooms of the classroom wing

Classrooms 2 RTU: 100% outside air rooftop air handling unit with a capacity of 13,500 CFM (47 tons cooling, 320 MBH heating), serving the west and interior classrooms of the classroom wing

Music: 100% outside air rooftop air handling unit with a capacity of 5,000 CFM (25 tons cooling, 300 MBH heating), serving the south classrooms of the classroom wing.

Pre-K: 100% outside air rooftop air handling unit with a capacity of 5,500 CFM (25 tons cooling, 300 MBH heating), serving the OT/PT and Music classrooms.

Displacement Ventilation:

The displacement ventilation system for the classroom wings are intended to provide a maximum cooling temperature during peak cooling periods of approximately 78°F to 80°F, however, the ventilation air provided will be extremely dry which will be the result of utilizing refrigeration equipment and hot gas reheat to reduce vapor pressure to an extremely low condition of approximately 50 grains of moisture per pound of air and reheating the air to a supply temperature of approximately 68°F which will be distributed to each space. The extremely dry condition of the supply air provides the perception of a condition that is cooler than is actually occurring due to the evaporation of moisture to the adjacent air from the occupants of the space.

Considering maximum cooling requirements occur primarily during the months of July and August when the majority of the academic areas are not in use, it would suggest maintaining slightly higher temperatures may not present a discomfort, however, will relate to a substantial operating cost savings and a reduced installation cost.

An additional major benefit of utilizing dry air within the building will be the overall reduction of vapor pressure typically present in outside ventilation air during summer months. This reduction in vapor pressure will dramatically reduce the amount of moisture entering the building and the potential of condensation resulting in moisture, and a direct relationship with the formation of mold.

Classrooms Requiring Supplemental Air Conditioning:

Tech lab classrooms, the TV Studio, and TV Studio Control Room located in Areas B & D of the first floor require supplemental air conditioning; therefore, they will be provided with supplemental cooling equipment, including (5) five 2-ton high efficiency refrigerant AC split ductless cooling units. One 2-ton unit will be located in each of these rooms and each will be connected to an independent roof mounted condenser with interconnecting refrigerant piping and condensate drain piping.

E. Science Classroom:

Each Science Classroom will be provided with a fume hood exhaust fan with an approximate capacity of 1,200 CFM at 2 HP for dedicated chemical exhaust.

Classroom Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

F. Computer Rooms:

Computer rooms which require additional cooling loads or year-round cooling above that of which the proposed induction unit systems can achieve shall be provided with high efficiency Ductless Cooling split unit systems. It is estimated that approximately two (2) 3-ton units with associated outdoor air-cooled condensers. Ventilation will be provided through the associated classroom air handling unit.

Computer Rooms Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

G. Gymnasium:

The gymnasium will be provided with two rooftop units of the 100% outside air design. Each unit will be approximately 8,000 CFM and will include supply and return fans with VFDs, energy recovery wheels, 500 MBH gas-fired heating coils with modulating gas valves, 40 tons of DX cooling capacity with modulating control valves, and MERV 13 filtration. Supply air will be provided to the space through new galvanized steel supply duct distribution system located high within the space and exposed with duct mounted diffusers. Return air will be drawn back to the units by low wall mounted return air registers located within the space and will be routed back to the unit by a galvanized sheet metal return air ductwork distribution system.

Supplemental hot water fin tube radiation heating will be provided along exterior walls. CO2 demand ventilation will be utilized to reduce outside air based on population.

As levels of carbon dioxide drop generally relating to a reduction in population the outside air damper will modulate to reduce outside air flow and allow recirculation while always maintaining a maximum of 800 ppm, CO_2 level within the space.

H. Locker Rooms (Dehumidification):

The Locker Rooms and adjacent offices will be served by (1) rooftop unit of the 100% outside air design. The unit will be approximately 4,500 CFM and will include a supply and exhaust fan with VFDs, energy recovery wheel, 250 MBH heating coil with modulating control valve, 15 tons of DX cooling capacity with modulating valve, and MERV 13 filtration. Supply air ventilation will be provided to each space through new galvanized supply duct which will travel throughout each locker room area to a series of ceiling mounted supply registers. New exhaust air ductwork and air ceiling mounted registers shall be installed and shall travel from the locker rooms to the new rooftop unit.

I. Administration Areas (Full Air Conditioning):

The Administration and Nurse areas will be provided with a roof mounted recirculation style air handling unit capable of 100% outside air economizer mode. The unit will be approximately 2,500 CFM and will include supply and exhaust fans with VFDs, 150 MBH gas fired heating section with modulating capacity control, MERV 13 filtration, 12 ton capacity DX cooling section with hot gas reheat, and energy recovery wheel to serve a new full air conditioning displacement ventilation system. Supply air will be provided to the space through a galvanized steel supply duct distribution system connected to wall mounted displacement ventilation diffusers located within each space. Each space shall be provided with a variable volume (VAV) terminal box with combination temperature, humidity, and CO2 sensor controls. The controls will reduce outside air as allowed to maintain a maximum of 800 PPM while providing sufficient ventilation to meet the required heating or cooling load of each space. As the VAV boxes modulate, the supply and return air fans associated Variable Frequency Drives (VFD) on the rooftop unit will adjust the fan speed based on system static pressure, reducing the energy consumed by the fans. Return air will be drawn back to the unit by ceiling return air registers located within each space

and will be routed back to the rooftop unit by a galvanized sheetmetal return air ductwork distribution system. Supplemental hot water ceiling mounted radiant heating panels will be provided along exterior walls.

J. District Offices (Full Air Conditioning):

The District Offices will be provided with a roof mounted recirculation style air handling unit capable of 100% outside air economizer mode. The unit will be approximately 2,500 CFM and will include supply and exhaust fans with VFDs, 150 MBH gas fired heating section with modulating capacity control, MERV 13 filtration, 12 ton capacity DX cooling section with hot gas reheat, and energy recovery wheel to serve a new full air conditioning displacement ventilation system. Supply air will be provided to the space through a galvanized steel supply duct distribution system connected to wall mounted displacement ventilation diffusers located within each space. Each space shall be provided with a variable volume (VAV) terminal box with combination temperature, humidity, and CO2 sensor controls. The controls will reduce outside air as allowed to maintain a maximum of 800 PPM while providing sufficient ventilation to meet the required heating or cooling load of each space. As the VAV boxes modulate, the supply and return air fans associated Variable Frequency Drives (VFD) on the rooftop unit will adjust the fan speed based on system static pressure, reducing the energy consumed by the fans. Return air will be drawn back to the unit by ceiling return air registers located within each space and will be routed back to the rooftop unit by a galvanized sheetmetal return air ductwork distribution system. Supplemental hot water ceiling mounted radiant heating panels will be provided along exterior walls.

K. Cafeteria (Dehumidification):

The Cafeteria will be provided with dehumidification displacement ventilation by rooftop air handling units of the recirculation design capable of 100% outside air economizer mode with supply and return fans with VFDs, energy recovery wheels, demand ventilation, gas fired heating sections with modulating capacity control, DX cooling systems with hot gas reheat, and MERV 13 filtration. Supply air will be provided to each space through a galvanized steel supply duct distribution system and shall be connected to wall mounted displacement ventilation diffusers located within each space. Return air will be drawn back to each unit by ceiling return air registers located within each space and will be routed back to the rooftop unit by galvanized sheetmetal return air ductwork distribution systems. In addition, carbon dioxide controls will be installed which will monitor the overall level of carbon dioxide at a threshold level of 800 ppm. As levels drop generally relating to a reduction in population the air handling unit outside air damper will modulate to reduce air flow and ventilation while always maintaining a maximum of 800 ppm. Supplemental hot water fin tube radiation heating will be provided along exterior walls.

It is estimated that the following rooftop air handling equipment will be required to serve the Cafeteria:

Cafeteria: Recirculation rooftop air handling unit with a capacity of 5,000 CFM (20 tons cooling, 240 MBH heating), serving the Cafeteria/Servery.

L. Kitchen:

The kitchen areas shall be provided with a new kitchen exhaust air fan and make-up air rooftop unit (MAU-1). Make-up air shall be provided by a 5,000 CFM roof mounted heating and ventilation air handling unit with modulating 200 MBH gas fired heating. The exhaust fan will be sized at 5,500 CFM.

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.

The kitchen area will be heated by a 4,000 CFM roof mounted heating and ventilation air handling unit (HV-1) with modulating 200 MBH gas fired heating.

M. Auditorium (Full Air Conditioning):

The auditorium will be provided with heating, ventilation and air conditioning by one rooftop unit of the 100% outside air design. The unit will be approximately 10,000 CFM for auditorium and will include a supply and exhaust fan with VFD's, gas fired furnace heating section with modulating control, MERV 13 filtration, DX direct expansion cooling and dehumidification with hot gas reheat control, exhaust air fan, and demand ventilation controls.

Supply air will be provided to the space through galvanized steel metal ductwork with ceiling type diffusers. Return air will be drawn back to the unit through a galvanized sheet metal ductwork terminating with ceiling mounted return air. In addition, carbon dioxide (CO2) controls will be installed which will monitor the overall level of carbon dioxide at a threshold level of 800 ppm. As levels drop generally relating to a reduction in population the air handling unit outside air damper will modulate to reduce air flow and ventilation while always maintaining a maximum of 800 ppm.

Auditorium Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

N. IT Data Rooms:

IT Data Rooms shall be air conditioned by dedicated variable refrigerant flow Ductless Cooling unit systems.

O. Lobby, Corridor, and Entry Way Heating:

Lobby, corridor and entry ways shall be heated by a combination of new hot water convectors, cabinet unit heaters and fin tube radiation heating equipment.

P. Testing, Adjusting, Balancing and Commissioning

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

Q. Automatic Temperature Controls – Building Energy Management System

A new DDC (direct digital control) automatic temperature control (ATC) and energy management system (EMS) shall be installed to control all new HVAC systems and equipment.

Flow and BTU meters will be installed on the domestic, heating, and cold systems to determine energy consumption and water usage. Electrical meters will be placed on the main service to determine and quantify usage. Lighting controls will be interfaced with EMS system to provide a central location where all building components can be viewed, adjusted, modified, and controlled.

2. The service electrical transformer will be furnished, installed, owned and maintained by Eversource, and it will be located adjacent to the building. The transformer will be of the pad- mounted type with a primary voltage of 13.8 kV and a secondary voltage of 480Y/277 volts. The transformer will be sized by the utility company based on the load data provided by the design team.

3. Concrete pad and grounding grid for the pad-mounted transformer is provided by the Contractor per the Eversource standards.

4. Concrete encased duct bank of the two 5" PVC conduits will be provided by the Electrical Contractor for the primary feeder installation from a utility pole riser to the pad-mounted transformer. Pre-cast concrete manholes 12' x 9' will be provided by the Contractor to facilitate the primary cables field installation.

5. Utility company will provide a primary feeder cable from the utility manhole to the pad-mounted transformer via the new manhole and terminate the feeder cable on the both ends.

6. Transformer secondary feeder of the copper conductors will be installed underground in the duct bank of eight (8) 4" PVC conduits from the pad-mounted transformer to the main electrical switchboard located in the Main Electrical Room. The secondary feeder and terminations at the switchboard side will be provide by the Electrical Contractor, and terminated at the transformer side by Eversource. The new service will be metered at the transformer secondary voltage.

7. The Eversource metering CTs will be installed in a CT section of the switch board, the meter will be located at the direction of the utility company.

8. Telephone, Cable TV, and City Fiber will be fed underground into the buildings Main Distribution Frame/Head end room.

B. Electrical Distribution System:

1. Service ratings for the Main Building are designed for a connected load of 10 watts/s.f. The service capacity will be sized for 3,000 amperes at 277/480 volt, 3∅, 4 wire with 100% rated main breaker. The main buss will be sized at 4,000 amperes and will have an available space provision at the end of the gear to accommodate a future grid connected photovoltaic array. The switchboard will be furnished with a service entrance transient voltage surge protection device (SPD) rated 240 kA and digital metering unit to monitor voltage, current, power factor, demand kW and with a data communication port for interface with BMS. Main switchboard's short circuit rating shall be coordinated with Eversource, but it is estimated to be 65 KAIC.

2. The building connected electrical load estimate is based on the preliminary building systems design:

Load Type	KVA
Site lighting	10 KVA
HVAC Loads (including chiller and pumps, RTUs, MAUs, exhaust fans, etc.)	600 KVA

Load Type	KVA
Boilers and Pumps	35 KVA
Interior Lighting Load	240 KVA
Classrooms, Labs, Office Power	780 KVA
Kitchen (full-service)	75 KVA
Miscellaneous Power	50 KVA
Elevator	90 KVA
Auditorium Lighting	150 KVA
Total Connected Load	**2,030 KVA**

3. Electrical power distribution equipment will be installed in the Main Electrical Room and in the electrical closets. There is one Main Electric Room that also contains a 2 hour rated Emergency Electric Room for life safety electrical switchgear. Sub-panels with shunt trip main breakers will be provided within maker space and labs which require emergency off operation.

4. A typical Electric Room will serve interior lighting, HVAC equipment, and receptacle loads in the academic core areas. Each closet will house a 250 Amp 120/208 volt power panel (double tub) via a 75KVA dry-type transformer, a 100 Amp 277/480 panel for lighting, and a 150Amp 120/208 volt mechanical panel via a 45KVA transformer.

5. The panels in the Gym electrical closet will serve local HVAC equipment, lighting, receptacles and Gym equipment. The closet will house a 225 Amp 277/480 volt power distribution panel to feed a lighting 100 Amp, 277/480 volt 3 phase panel and a dry-type 75 kVA transformer with a double-tub 250 Amp,120/208 volt 3 phase receptacle panel. Provide 20 amp, 120 volt circuits for the basketball backboards, shot clocks, scoreboards, divider curtains and 20Amp, 208 volt, 3 phase circuit and disconnect for a mat lifter. Provide control stations and wiring for the all Gym equipment.

6. The panels in the Administration area electrical closet will serve local HVAC equipment, lighting, receptacles and equipment serving this area and also the Band room and Art classrooms. The closet will house a 250 Amp 277/480 volt power distribution panel to feed a lighting 100 Amp, 277/480 volt 3 phase panel and a dry-type 75 kVA transformer with a double-tub 250 Amp,120/208 volt 3 phase receptacle panel.

7. Auditorium lighting electrical closet will house a dedicated transformer 225 kVA and 800 Amp 120/208 volt, 3 phase panel for the Auditorium lighting dimming system.

8. A dry-type 112.5 kVA transformer and 400 Amp,120/208 volt, 3 phase panels will be provided for the Cafeteria and Kitchen loads. The kitchen refrigeration equipment will be power fed from the standby power panel.

9. Roof-mounted HVAC equipment will be power fed from the 400 Amp 480 volt 3 phase power panels located in the nearest fourth or fifth floor electrical closets.

10. HVAC equipment serving data communication rooms, a boiler plant equipment including boilers and pumps, a sewage pump station, and an elevator will be supported by the standby generator power panels.

C. Interior Lighting System:

1. The intent of the lighting design is to provide a visual environment for the students and faculty that is supportive of the educational activities within the building. The lighting system will be designed in compliance with the applicable Energy Code and be eligible for the Utility company rebate program.

2. Interior lighting illumination levels will meet the IES recommended values for applicable activity type, be in compliance with the IECC 2012 energy allowances and LEED for Schools control requirements.

PROPOSED ILLUMINATION LEVELS

Location	Average Illumination Levels
Classrooms	30-35 FC
Science Labs	40 FC
Offices, Conference Rooms, Library	30-35 FC
Kitchen	40-50 FC
Gymnasium	50 FC
Cafeteria	30-35 FC
Corridors	20-25 FC
Utility and Storage Rooms	20-25 FC

3. Classroom lighting fixtures will consist of pendant mounted indirect luminaries with LED lamps and electronic dimmable drivers. The fixtures will be pre-wired for continuous dimming control where natural daylight is available and also for multi-level switching. Two daylight dimming zones will be provided in each classroom.

4. Office lighting fixtures will consist of pendant mounted indirect LED luminaries and electronic drivers for dual-level switching. Offices on the perimeter with windows will have daylight dimming controls similar to classrooms.

   In general, lighting power density will be 30-40% less than ASHRAE 90.1-2010. The power density reduction relates to associated LEED credit in energy and atmosphere.

5. Lighting levels will be approximately 30 foot candles in classrooms and offices. The daylight dimming foot-candle level will be in compliance with associated LEED credit in indoor environment quality.

6. Gymnasium lighting will be comprised of direct fixtures with LED lamps and electronic drivers. The fixtures will be provided with clear lens and protective wire guards. The light level will be designed for approximately 50 foot candles. Multi-level switching will be provided.

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

7. Corridor lighting will be comprised of recessed acrylic fixtures with LED lamps and electronic drivers. The Corridor light level will be designed for approximately 20 foot candles. Corridor lighting will be on time clock control and only “ON” during occupied hours. The Corridor lighting will be dual-level controlled by schedule.

8. Cafeteria lighting will be a combination of pendant direct/indirect fixtures and linear recessed fixtures with LED lamps and electronic drivers. The light levels will be designed for approximately 30 foot candles. Daylighting controls will be provided on perimeter light fixtures with 15 feet of glazing

9. Stage and Auditorium theatrical lights with connector strips and a dimming system will be provided for performances. House lighting in Auditorium will be dimmable LED and controlled by theatrical dimming system.

10. Kitchen and Servery lighting will consist of recessed 2’x4’ acrylic lensed gasketed troffers with aluminum frame doors with LED lamps and electronic drivers. Light levels will be approximately 50 foot candles.

11. Media Center lighting will be a combination of pendant direct/indirect fixtures and linear recessed fixtures with LED lamps and electronic drivers. The light levels will be designed for approximately 30 foot candles. Daylighting controls will be provided on perimeter light fixtures with 15 feet of glazing

12. Each area will be locally switched and designed for multi-level controls. Each Classroom, Office space, and Toilet room will have occupancy sensors to turn lights off when unoccupied. Occupancy sensors will be set to vacancy mode where required by Energy Code.

13. The maker spaces will have industrial grade strips with LED lamps and protective wireguards. Light levels will be approximately 50 foot-candles.

14. Daylight dimming sensors will be installed in each room where natural light is available for continuous dimming of light fixtures. The control system will be in accordance with associated LEED credit in indoor environmental quality.

15. The entire school will be controlled with an automatic lighting control system for programming of interior and exterior lights “on and off”. Lighting control system will be interfaced with DDC system, and will be demand response capable in accordance with associated LEED credit in Energy and atmosphere.

D. Emergency Lighting System:

1. An exterior 275 kW diesel emergency generator with sound attenuated enclosure and base tank with alarms will be provided. An integral 100 kW resistive load bank will be provided for generator testing under load. 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 power system has been sized to support emergency (life safety), and optional standby building loads.

   a. Emergency (life safety) power loads as required by the Code:
      - Emergency exit and egress lighting (interior and building exterior at the exits)
      - Fire alarm system

   b. Standby power loads:
      - Heating system boilers with associated pumps and controls
      - Telephone/ data closets and associated A/C equipment
      - Communication systems (telephone and public address systems)
      - Building DDC system control panels
      - Kitchen refrigeration equipment
      - Lighting and power in the nurse/medical area
      - Security system equipment
      - Sewage pump station
      - Elevator

E. Site Lighting System:

1. Fixtures for area lighting will be pole mounted cut-off 'LED' luminaries in the parking area and roadways. Pole heights will be 20 feet. The exterior lighting will be connected to the automatic lighting control system for photocell "ON" and timed "OFF" operation. The site lighting fixtures will be dark sky compliant. The illumination level will be 0.5fc for parking areas in accordance with Illuminating Engineering Society. Lighting will be designed in accordance with associated LEED credit in sustainable sites.

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

F. 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.

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 25-40 foot intervals.

4. Exterior weatherproof receptacles with lockable enclosures will be installed at exterior doors.

5. A system of computer grade panelboards with double neutrals and surge protective devices will be provided for receptacle circuits.

G. Fire Alarm System:

1. A fire alarm and detection system will be provided with 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.

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.

5. Manual pull stations will be provided at Exit discharge doors and at each egress stairwell not located at grade level.

6. The system will be remotely connected to automatically report alarms to fire department via an approved method by the fire department.

7. The generator status panel will be located at the Fire Command Center.

H. Uninterruptible Power Supply (UPS):

1. One (1) 30 kVA, 3 phase centralized UPS system will be provided with eight minutes of battery back-up. One (1) will be located in the MDF Room and one (1) will be located in a remote IDF Room.

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 and communication systems during a prolonged power outage.

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

I. Lightning Protection System:

1. A system of lightning protection devices will be provided.

2. The lightning protection equipment will include air terminals, roof and down conductors, conduits, fasteners, connectors, ground rods, etc.

3. The facility will be issued a UL Mater Label Certificate.

J. Renewable Energy System Provisions:

1. The base project will include:

- Electrical provisions will be made for a roof mounted renewable energy system consisting of photovoltaic panels covering 80% of the roof area. The system will be grid connected photovoltaic PV system intended to reduce the facilities demand for power.

K. Two-Way Communications System:

A Two-Way Communications System will be provided at the elevator lobbies that do not have grade access. Area of rescue assistance call boxes will be provided at Elevator Lobbies with no grade access. The call boxes connect to a main panel located adjacent to the Fire Alarm annunciator panel.

L. Distribution Antennae System (DAS):

1. A public safety radio distributed antenna system (DAS) which consists of bi-directional amplifiers (BDA), donor antennas, coverage antennas, coax cable, coax connectors, splitters, combiners and couplers. These devices will be used as part of a system for in-building public safety 2-way radio system communication.

5. CCTV

A. 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).

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

C. 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.

6. INTRUSION SYSTEM

A. 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.

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

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

7. CARD ACCESS

A. 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.

B. 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.

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

8. TESTING REQUIREMENTS

A. 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.
- Uninterruptible Power System, UPS.
- Lightning protection system.

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

9. OPERATION MANUALS AND MAINTENANCE MANUALS

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

10. 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.

11. COMMISSIONING

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

12. PHASING

A. The work will be conducted in phases to provide the least possible interference to the activities of the School.

1. The new Main Electric Room/Head End Room and building utilities will be constructed in Phase 1. Existing services will be back-fed from the new until no longer needed.

2. Both fire alarm systems during Phase 1 will be operational and interfaced so that either system initiates a general alarm and notifies the fire department until the final phase.

TECHNOLOGY SYSTEMS NARRATIVE REPORT

ADD/RENO OPTION

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

1. CODES

   A. All work installed under Section 270000 shall comply with the Massachusetts Building Code 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 6 UTP Plenum rated cabling for both data and telephone systems for gigabit connectivity. The telephone infrastructure will accommodate PBX, or VOIP based voice systems.

   B. Each classroom will have 2 data outlets for student computers. Two data, one voice with video and audio connections to a wall mounted projector will be provided at teacher's station with interconnectivity to a interactive whiteboard. A wall phone outlet with 2 way ceiling speaker will be provided for communications with administration. Wireless access points will be provided in all classrooms and other spaces and consist of (2) CAT6A.cables and multimode fiber.

   C. A central paging system will be provided and integrated with the telephone system.

   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 10 Gbps Ethernet.

   F. Two-way communication call boxes will be provided adjacent to each elevator that is above or below grade level. The base station will be located at a control point on the first floor.

4. TESTING REQUIREMENTS

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

- Telephone and data cabling
- Fiber optic backbone cabling
- 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.

8. PHASING

A. New MDF will be constructed in Phase 1. All existing IDF's that are required to remain active will be back-fed from the new MDF via temporary fiber optic backbone. Temporary backbone to be removed in final phase.

B. New and existing paging systems will require interference during Phase 1 so that all occupied areas are covered by either new or existing paging system. Existing paging system to be removed in final phase.

FIRE PROTECTION SYSTEMS NARRATIVE REPORT

ADD/RENO OPTION

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. The existing building is currently not protected with an automatic sprinkler system. In accordance with Massachusetts General Law, an existing school building of greater than 7,500 s.f. that undergoes major renovations and additions must be protected with an automatic sprinkler system.

4. DESCRIPTION

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

   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. A total of nine (9) wet type sprinkler zones will be provided.

   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 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.

   F. Fire department valves and cabinets will be provided on each side of the Stage in the Building.

   G. The temporary modular classrooms will be fully sprinklered in accordance with NFPA 13. Each group of modular buildings will have its own dedicated 6-inch fire service.

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 hydrant flow test must be performed to confirm the Municipal water supply capacity.

6. 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.

7. 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.

8. 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.

9. 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

PLUMBING SYSTEMS NARRATIVE REPORT

ADD/RENO OPTION

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 for Schools*** 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. In existing building, new soil, waste and vent piping will connect to the existing building systems.

   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. In existing building, existing storm drain piping will remain if adequately sized to meet current codes.

   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.

F. In existing building to remain, existing drainage piping may be reused if adequately sized for intended use. Integrity of existing piping will be confirmed via video inspection.

5. WATER SYSTEM

A. New 6-inch domestic water service from the municipal water system will be provided. A meter and backflow preventer will be provided. The water service and meter will be located in the building addition.

B. Cold water distribution main is provided. All piping within the existing building to remain will be replaced with new.

C. Non-freeze wall hydrants with integral back flow preventers are provided along the exterior of the building.

D. Domestic hot water heating will be provided with a combination of two gas fired, high efficiency, condensing water heaters (400,000 BTUH input each), with separate storage tank (500 gallon). System is to be equipped with thermostatically controlled mixing devices to control water temperature to the fixtures.

E. A pump will re-circulate hot water from the piping system. Water temperature will be 120 deg. to serve general use fixtures. A 140 deg. F hot water will be supplied to the kitchen dishwasher.

F. 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.

G. A dedicated non-potable cold and hot water system will be provided to Science Classrooms. Water system will be protected with a reduced pressure backflow preventer. A dedicated tank type water heater will be provided to deliver hot water to all Science Classroom sinks.

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

6. GAS SYSTEM

A. Natural gas service will be provided for the building and will serve the boilers, domestic water heaters, kitchen cooking equipment, roof top equipment and generator.

B. Gas piping will be Schedule 40 black steel pipe with threaded gas pattern malleable fittings for 2 in. and under and butt welded fittings for 2-1/2 in. and larger.

7. FIXTURES ***LEED for Schools Credit WEp1***

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. Each Art Classroom sink shall include a plaster trap.

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 or equal.

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

8. 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.

9. 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.

10. INSULATION

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

11. 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.

12. 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.

13. WATER HEATER

A. Gas fired, high efficiency, two condensing water heaters (400,000 BTUH input each), with separate storage tank (500 gallon).

HVAC SYSTEMS NARRATIVE REPORT

NEW CONSTRUCTION OPTION

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 in accordance with LEED for schools. The project shall conform to LEED Silver rating.

1. CODES

   All work installed under Section 230000 shall comply with the State of Massachusetts Building Code and all College, local, county, and federal codes, laws, standards, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   The work of Section 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:

   Massachusetts Code values are listed herein based on Middlesex County values as determined from ASHRAE local weather data.

   Outside: Winter 7°F, Summer 88°F DB 72°F WB

   Inside: 70° +/- 2 deg F. for heating 75°F +/- 2 deg F (50% RH +/- 5%RH) for cooling. Unoccupied temperature setback will be provided.

   Generally outside air shall be provided at the rate of in accordance with ASHRAE standard 62.1-2010 and IMC 2012 mechanical code, as a minimum.

4. SYSTEM DESCRIPTION

   A. General:

      1. Phasing: HVAC Systems shall be installed in accordance with the Architect's phasing plan and specifications.

      2. HVAC Contractor shall provide temporary heating work, filter changes, and maintenance of installed HVAC systems during construction in accordance with the Project General Condition Temporary Facilities specifications.

B. Central Heating Plant:

Heating for the entire building will be through the use of a high efficiency gas-fired condensing boiler plant.

The boiler plant shall be provided with (3) 2,500 MBH output boilers and (2) end suction base mounted pumps with a capacity of 750 gpm each to be located in the mechanical room. In addition to new boilers and pumps, new hot water accessories including air separators and expansion tanks shall be provided.

The 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 piping system. The boiler plants shall supply a maximum hot water temperature of 160 deg F on a design heating day and the hot water supply water temperature will be adjusted downward based on an outside temperature reset schedule to improve the overall operating efficiency of the power plants. Primary and standby end suction base mounted pumps will be provided with variable frequency drives for variable volume flow through the water distribution system for improved energy efficiency.

Combustion air for each boiler will be directly ducted to each boiler through a galvanized ductwork distribution system. Venting from each boiler shall be through separate double wall aluminized stainless steel (AL29-4C) vent system and shall discharge approximately 12 feet above the roof level. Final venting height will be depending on the location of building intake air locations and adjacent roofs.

C. Classroom Heating and Ventilation (Pre-K):

Rooftop air handling units with supply and exhaust fans with VFDs, energy recovery wheels, gas fired heating section with modulating capacity control, DX cooling system with modulating hot gas reheat coils and MERV 13 filtration will be provided to serve a new dehumidification displacement ventilation system. Supply air will be provided to the space through a galvanized steel supply duct distribution system 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 rooftop unit by a galvanized sheetmetal return air ductwork distribution system. Supplemental hot water ceiling mounted radiant heating panels will be provided along exterior walls.

Each classroom shall be provided with a variable volume (VAV) terminal box with combination temperature, humidity, and CO2 sensor controls and shall be interlocked with occupancy sensors that will reduce outside air as allowed maintaining a maximum of 800 PPM while providing sufficient ventilation to the diffusers to meet the required heating or cooling load of the classroom. As VAV boxes modulate, the supply and return air fans associated Variable Frequency Drives (VFD) of the air handling units will adjust the fan speed based on system static pressure, reducing the energy consumed by the fans.

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

Classrooms 1 RTU: 100% outside air rooftop air handling unit with a capacity of 12,000 CFM (50 tons cooling, 450 MBH heating), serving the north classrooms of the classroom wing

Classrooms 2 RTU: 100% outside air rooftop air handling unit with a capacity of 13,500 CFM (47 tons cooling, 320 MBH heating), serving the west and interior classrooms of the classroom wing

Music: 100% outside air rooftop air handling unit with a capacity of 5,000 CFM (25 tons cooling, 300 MBH heating), serving the south classrooms of the classroom wing.

Pre-K: 100% outside air rooftop air handling unit with a capacity of 5,500 CFM (25 tons cooling, 300 MBH heating), serving the OT/PT and Music classrooms.

Displacement Ventilation:

The displacement ventilation system for the classroom wings are intended to provide a maximum cooling temperature during peak cooling periods of approximately 78°F to 80°F, however, the ventilation air provided will be extremely dry which will be the result of utilizing refrigeration equipment and hot gas reheat to reduce vapor pressure to an extremely low condition of approximately 50 grains of moisture per pound of air and reheating the air to a supply temperature of approximately 68°F which will be distributed to each space. The extremely dry condition of the supply air provides the perception of a condition that is cooler than is actually occurring due to the evaporation of moisture to the adjacent air from the occupants of the space.

Considering maximum cooling requirements occur primarily during the months of July and August when the majority of the academic areas are not in use, it would suggest maintaining slightly higher temperatures may not present a discomfort, however, will relate to a substantial operating cost savings and a reduced installation cost.

An additional major benefit of utilizing dry air within the building will be the overall reduction of vapor pressure typically present in outside ventilation air during summer months. This reduction in vapor pressure will dramatically reduce the amount of moisture entering the building and the potential of condensation resulting in moisture, and a direct relationship with the formation of mold.

Classrooms Requiring Supplemental Air Conditioning:

Tech lab classrooms, the TV Studio, and TV Studio Control Room located in Areas B & D of the first floor require supplemental air conditioning; therefore, they will be provided with supplemental cooling equipment, including (5) five 2-ton high efficiency refrigerant AC split ductless cooling units. One 2-ton unit will be located in each of these rooms and each will be connected to an independent roof mounted condenser with interconnecting refrigerant piping and condensate drain piping.

D. Science Classroom:

Each Science Classroom will be provided with a fume hood exhaust fan with an approximate capacity of 1,200 CFM at 2 HP for dedicated chemical exhaust.

Classroom Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

E. Computer Rooms:

Computer rooms which require additional cooling loads or year-round cooling above that of which the proposed induction unit systems can achieve shall be provided with high efficiency Ductless Cooling split unit systems. It is estimated that approximately two (2) 3-ton units with associated outdoor air-cooled condensers. Ventilation will be provided through the associated classroom air handling unit.

Computer Rooms Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

F. Gymnasium:

The gymnasium will be provided with two rooftop units of the 100% outside air design. Each unit will be approximately 8,000 CFM and will include supply and return fans with VFDs, energy recovery wheels, 500 MBH gas-fired heating coils with modulating gas valves, 40 tons of DX cooling capacity with modulating control valves, and MERV 13 filtration. Supply air will be provided to the space through new galvanized steel supply duct distribution system located high within the space and exposed with duct mounted diffusers. Return air will be drawn back to the units by low wall mounted return air registers located within the space and will be routed back to the unit by a galvanized sheet metal return air ductwork distribution system.

Supplemental hot water fin tube radiation heating will be provided along exterior walls. CO2 demand ventilation will be utilized to reduce outside air based on population.

As levels of carbon dioxide drop generally relating to a reduction in population the outside air damper will modulate to reduce outside air flow and allow recirculation while always maintaining a maximum of 800 ppm, CO_2 level within the space.

G. Locker Rooms (Dehumidification):

The Locker Rooms and adjacent offices will be served by (1) rooftop unit of the 100% outside air design. The unit will be approximately 4,500 CFM and will include a supply and exhaust fan with VFDs, energy recovery wheel, 250 MBH heating coil with modulating control valve, 15 tons of DX cooling capacity with modulating control valve, and MERV 13 filtration. Supply air ventilation will be provided to each space through new galvanized supply duct which will travel throughout each locker room area to a series of ceiling mounted supply registers. New exhaust air ductwork and air ceiling mounted registers shall be installed and shall travel from the locker rooms to the new rooftop unit.

H. Administration Areas (Full Air Conditioning):

The Administration and Nurse areas will be provided with a roof mounted recirculation style air handling unit capable of 100% outside air economizer mode. The unit will be approximately 2,500 CFM and will include supply and exhaust fans with VFDs, 150 MBH gas fired heating section with modulating capacity control, MERV 13 filtration, 12 ton capacity DX cooling section with hot gas reheat, and energy recovery wheel to serve a new full air conditioning displacement ventilation system. Supply air will be provided to the space through a galvanized steel supply duct distribution system connected to wall mounted displacement ventilation diffusers located within each space. Each space shall be provided with a variable volume (VAV) terminal box with combination temperature, humidity, and CO2 sensor controls. The controls will reduce outside air as allowed to maintain a maximum of 800 PPM while providing sufficient ventilation to meet the required heating or cooling load of each space. As the VAV boxes modulate, the supply and return air fans associated Variable Frequency Drives (VFD) on the rooftop unit will adjust the fan speed based on system static pressure, reducing the energy consumed by the fans. Return air will be drawn back to the unit by ceiling return air registers located within each space and will be routed back to the rooftop unit by a galvanized sheetmetal return air ductwork distribution system. Supplemental hot water ceiling mounted radiant heating panels will be provided along exterior walls.

I. District Offices (Full Air Conditioning):

The District Offices will be provided with a roof mounted recirculation style air handling unit capable of 100% outside air economizer mode. The unit will be approximately 2,500 CFM and will include supply and exhaust fans with VFDs, 150 MBH gas fired heating section with modulating capacity control, MERV 13 filtration, 12 ton capacity DX cooling section with hot gas reheat, and energy recovery wheel to serve a new full air conditioning displacement ventilation system. Supply air will be provided to the space through a galvanized steel supply duct distribution system connected to wall mounted displacement ventilation diffusers located within each space. Each space shall be provided with a variable volume (VAV) terminal box with combination temperature, humidity, and CO2 sensor controls. The controls will reduce outside air as allowed to maintain a maximum of 800 PPM while providing sufficient ventilation to meet the required heating or cooling load of each space. As the VAV boxes modulate, the supply and return air fans associated Variable Frequency Drives (VFD) on the rooftop unit will adjust the fan speed based on system static pressure, reducing the energy consumed by the fans. Return air will be drawn back to the unit by ceiling return air registers located within each space and will be routed back to the rooftop unit by a galvanized sheetmetal return air ductwork distribution system. Supplemental hot water ceiling mounted radiant heating panels will be provided along exterior walls.

J. Cafeteria (Dehumidification):

The Cafeteria will be provided with dehumidification displacement ventilation by rooftop air handling units of the recirculation design capable of 100% outside air economizer mode with supply and return fans with VFDs, energy recovery wheels, demand ventilation, gas fired heating sections with modulating capacity control, DX cooling systems with hot gas reheat, and MERV 13 filtration. Supply air will be provided to each space through a galvanized steel supply duct distribution system and shall be connected to wall mounted displacement ventilation diffusers located within each space. Return air will be drawn back to each unit by ceiling return air registers located within each space and will be routed back to the rooftop unit by galvanized sheetmetal return air ductwork distribution systems. In addition, carbon dioxide controls will be installed which will monitor the overall level of carbon dioxide at a threshold level of 800 ppm. As levels drop generally relating to a reduction in population the air handling unit outside air damper will modulate to reduce air flow and ventilation while always maintaining a maximum of 800 ppm. Supplemental hot water fin tube radiation heating will be provided along exterior walls.

It is estimated that the following rooftop air handling equipment will be required to serve the Cafeteria:

Cafeteria: Recirculation rooftop air handling unit with a capacity of 5,000 CFM (20 tons cooling, 240 MBH heating), serving the Cafeteria/Servery.

K. Kitchen:

The kitchen areas shall be provided with a new kitchen exhaust air fan and make-up air rooftop unit (MAU-1). Make-up air shall be provided by a 5,000 CFM roof mounted heating and ventilation air handling unit with modulating 200 MBH gas fired heating. The exhaust fan will be sized at 5,500 CFM.

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.

The kitchen area will be heated by a 4,000 CFM roof mounted heating and ventilation air handling unit (HV-1) with modulating 200 MBH gas fired heating.

L. Auditorium (Full Air Conditioning):

The auditorium will be provided with heating, ventilation and air conditioning by one rooftop unit of the 100% outside air design. The unit will be approximately 10,000 CFM for auditorium and will include a supply and exhaust fan with VFD's, gas fired furnace heating section with modulating control, MERV 13 filtration, DX direct expansion cooling and dehumidification with hot gas reheat control, exhaust air fan, and demand ventilation controls.

Supply air will be provided to the space through galvanized steel metal ductwork with ceiling type diffusers. Return air will be drawn back to the unit through a galvanized sheet metal ductwork terminating with ceiling mounted return air. In addition, carbon dioxide (CO2) controls will be installed which will monitor the overall level of carbon dioxide at a threshold level of 800 ppm. As levels drop generally relating to a reduction in population the air handling unit outside air damper will modulate to reduce air flow and ventilation while always maintaining a maximum of 800 ppm.

Auditorium Heating:

It is proposed that a continuous length of fin tube radiation or radiation heating panels will be installed along the entire length of the exterior walls. The fin tube radiation will be controlled by a space mounted thermostat to maintain overall space temperature control.

M. Media Center:

Media Center will be provided with full air conditioning displacement ventilation by rooftop air handling units of the recirculation design capable of 100% outside air economizer mode with supply and return fans with VFDs, energy recovery wheels, demand ventilation, gas fired heating sections with modulating capacity control, DX cooling systems with hot gas reheat, and MERV 13 filtration. Supply air will be provided to each space through a galvanized steel supply duct distribution system and shall be connected to wall mounted displacement ventilation diffusers located within each space. Return air will be drawn back to each unit by ceiling return air registers located within each space and will be routed back to the rooftop unit by galvanized sheetmetal return air ductwork distribution systems. In addition, carbon dioxide controls will be installed which will monitor the overall level of carbon dioxide at a threshold level of 800 ppm. As levels drop generally relating to a reduction in population the air handling unit outside air damper will modulate to reduce air flow and ventilation while always maintaining a maximum of 800 ppm. Supplemental hot water fin tube radiation heating will be provided along exterior walls.

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

RTU: Recirculation rooftop air handling unit with a capacity of 3,000 CFM (10 tons cooling, 150 MBH heating), serving the Media Center.

N. IT Data Rooms:

IT Data Rooms shall be air conditioned by dedicated variable refrigerant flow Ductless Cooling unit systems.

O. Lobby, Corridor, and Entry Way Heating:

Lobby, corridor and entry ways shall be heated by a combination of new hot water convectors, cabinet unit heaters and fin tube radiation heating equipment.

P. Testing, Adjusting, Balancing and Commissioning:

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

Q. Automatic Temperature Controls – Building Energy Management System:

A new DDC (direct digital control) automatic temperature control (ATC) and energy management system (EMS) shall be installed to control all new HVAC systems and equipment.

Flow and BTU meters will be installed on the domestic, heating, and cold systems to determine energy consumption and water usage. Electrical meters will be placed on the main service to determine and quantify usage. Lighting controls will be interfaced with EMS system to provide a central location where all building components can be viewed, adjusted, modified, and controlled

ELECTRICAL SYSTEMS NARRATIVE REPORT

NEW CONSTRUCTION OPTION

The following is the Electrical Systems 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.

1. CODES

   A. All work installed under Section 260000 shall comply with the Massachusetts State Building Code and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   A. The work of Section 260000 is as described in this Narrative. 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 networked controls. The control of the relays will be by automatic means, such as an occupancy sensor in each classroom. The system will have a BACnet gateway and will be interfaced with the DDC control system for schedule functions. The controllability shall be in conformance with associated LEED credit in indoor environmental quality.

   B. Automatic control of receptacles based on occupancy will be provided for at least 50% of the receptacles. Installed in private offices, open offices, and computer classrooms. Controlled receptacles will be marked per NEC 406.3 (E).

   C. Exterior lighting will be controlled by photocell “ON” and “scheduled” for “OFF” operation. The parking area lighting will be controlled by “zones” with dimmable capability.

   D. Emergency and Exit lighting will be run through life safety panels to be “ON “during normal power conditions, as well as, power outage conditions. The emergency lighting system will have time control so that lights are “ON” only when building is occupied.

4. DESCRIPTION OF THE SYSTEMS

   A. Utilities:

      1. The new building will be supplied with utility power from the utility company Eversource. The new service will be fed via underground primary duct bank to a pad mounted utility company owned liquid filled transformer. The metering will be done at the transformer.

2. The service electrical transformer will be furnished, installed, owned and maintained by Eversource, and it will be located adjacent to the building. The transformer will be of the pad- mounted type with a primary voltage of 13.8 kV and a secondary voltage of 480Y/277 volts. The transformer will be sized by the utility company based on the load data provided by the design team.

3. Concrete pad and grounding grid for the pad-mounted transformer is provided by the Contractor per the Eversource standards.

4. Concrete encased duct bank of the two 5" PVC conduits will be provided by the Electrical Contractor for the primary feeder installation from a utility pole riser to the pad-mounted transformer. Pre-cast concrete manholes 12' x 9' will be provided by the Contractor to facilitate the primary cables field installation.

5. Utility company will provide a primary feeder cable from the utility manhole to the pad-mounted transformer via the new manhole and terminate the feeder cable on the both ends.

6. Transformer secondary feeder of the copper conductors will be installed underground in the duct bank of eight (8) 4" PVC conduits from the pad-mounted transformer to the main electrical switchboard located in the Main Electrical Room. The secondary feeder and terminations at the switchboard side will be provide by the Electrical Contractor, and terminated at the transformer side by Eversource. The new service will be metered at the transformer secondary voltage.

7. The Eversource metering CTs will be installed in a CT section of the switch board, the meter will be located at the direction of the utility company.

8. Telephone, Cable TV, and City Fiber will be fed underground into the buildings Main Distribution Frame/Head end room.

B. Electrical Distribution System:

1. Service ratings for the Main Building are designed for a connected load of 10 watts/s.f. The service capacity will be sized for 3,000 amperes at 277/480 volt, 3∅, 4 wire with 100% rated main breaker. The main buss will be sized at 4,000 amperes and will have an available space provision at the end of the gear to accommodate a future grid connected photovoltaic array. The switchboard will be furnished with a service entrance transient voltage surge protection device (SPD) rated 240 kA and digital metering unit to monitor voltage, current, power factor, demand kW and with a data communication port for interface with BMS. Main switchboard's short circuit rating shall be coordinated with Eversource, but it is estimated to be 65 KAIC.

2. The building connected electrical load estimate is based on the preliminary building systems design:

Load Type	KVA
Site lighting	10 KVA
HVAC Loads (including chiller and pumps, RTUs, MAUs, exhaust fans, etc.)	600 KVA

Load Type	KVA
Boilers and Pumps	35 KVA
Interior Lighting Load	240 KVA
Classrooms, Labs, Office Power	780 KVA
Kitchen (full-service)	75 KVA
Miscellaneous Power	50 KVA
Elevator	90 KVA
Auditorium Lighting	150 KVA
Total Connected Load	**2,030 KVA**

3. Electrical power distribution equipment will be installed in the Main Electrical Room and in the electrical closets. There is one Main Electric Room that also contains a 2 hour rated Emergency Electric Room for life safety electrical switchgear. Sub-panels with shunt trip main breakers will be provided within maker space and labs which require emergency off operation.

4. A typical Electric Room will serve interior lighting, HVAC equipment, and receptacle loads in the academic core areas. Each closet will house a 250 Amp 120/208 volt power panel (double tub) via a 75KVA dry-type transformer, a 100 Amp 277/480 panel for lighting, and a 150Amp 120/208 volt mechanical panel via a 45KVA transformer.

5. The panels in the Gym electrical closet will serve local HVAC equipment, lighting, receptacles and Gym equipment. The closet will house a 225 Amp 277/480 volt power distribution panel to feed a lighting 100 Amp, 277/480 volt 3 phase panel and a dry-type 75 kVA transformer with a double-tub 250 Amp,120/208 volt 3 phase receptacle panel. Provide 20 amp, 120 volt circuits for the basketball backboards, shot clocks, scoreboards, divider curtains and 20Amp, 208 volt, 3 phase circuit and disconnect for a mat lifter. Provide control stations and wiring for the all Gym equipment.

6. The panels in the Administration area electrical closet will serve local HVAC equipment, lighting, receptacles and equipment serving this area and also the Band room and Art classrooms. The closet will house a 250 Amp 277/480 volt power distribution panel to feed a lighting 100 Amp, 277/480 volt 3 phase panel and a dry-type 75 kVA transformer with a double-tub 250 Amp,120/208 volt 3 phase receptacle panel.

7. Auditorium lighting electrical closet will house a dedicated transformer 225 kVA and 800 Amp 120/208 volt, 3 phase panel for the Auditorium lighting dimming system.

8. A dry-type 112.5 kVA transformer and 400 Amp,120/208 volt, 3 phase panels will be provided for the Cafeteria and Kitchen loads. The kitchen refrigeration equipment will be power fed from the standby power panel.

9. Roof-mounted HVAC equipment will be power fed from the 400 Amp 480 volt 3 phase power panels located in the nearest fourth or fifth floor electrical closets.

10. HVAC equipment serving data communication rooms, a boiler plant equipment including boilers and pumps, a sewage pump station, and an elevator will be supported by the standby generator power panels.

C. Interior Lighting System:

1. The intent of the lighting design is to provide a visual environment for the students and faculty that is supportive of the educational activities within the building. The lighting system will be designed in compliance with the applicable Energy Code and be eligible for the Utility company rebate program.

2. Interior lighting illumination levels will meet the IES recommended values for applicable activity type, be in compliance with the IECC 2012 energy allowances and LEED for Schools control requirements.

PROPOSED ILLUMINATION LEVELS

Location	Average Illumination Levels
Classrooms	30-35 FC
Science Labs	40 FC
Offices, Conference Rooms, Library	30-35 FC
Kitchen	40-50 FC
Gymnasium	50 FC
Cafeteria	30-35 FC
Corridors	20-25 FC
Utility and Storage Rooms	20-25 FC

3. Classroom lighting fixtures will consist of pendant mounted indirect luminaries with LED lamps and electronic dimmable drivers. The fixtures will be pre-wired for continuous dimming control where natural daylight is available and also for multi-level switching. Two daylight dimming zones will be provided in each classroom.

4. Office lighting fixtures will consist of pendant mounted indirect LED luminaries and electronic drivers for dual-level switching. Offices on the perimeter with windows will have daylight dimming controls similar to classrooms.

   In general, lighting power density will be 30-40% less than ASHRAE 90.1-2010. The power density reduction relates to associated LEED credit in energy and atmosphere.

5. Lighting levels will be approximately 30 foot candles in classrooms and offices. The daylight dimming foot-candle level will be in compliance with associated LEED credit in indoor environment quality.

6. Gymnasium lighting will be comprised of direct fixtures with LED lamps and electronic drivers. The fixtures will be provided with clear lens and protective wire guards. The light level will be designed for approximately 50 foot candles. Multi-level switching will be provided.

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

7. Corridor lighting will be comprised of recessed acrylic fixtures with LED lamps and electronic drivers. The Corridor light level will be designed for approximately 20 foot candles. Corridor lighting will be on time clock control and only "ON" during occupied hours. The Corridor lighting will be dual-level controlled by schedule.

8. Cafeteria lighting will be a combination of pendant direct/indirect fixtures and linear recessed fixtures with LED lamps and electronic drivers. The light levels will be designed for approximately 30 foot candles. Daylighting controls will be provided on perimeter light fixtures with 15 feet of glazing

9. Stage and Auditorium theatrical lights with connector strips and a dimming system will be provided for performances. House lighting in Auditorium will be dimmable LED and controlled by theatrical dimming system.

10. Kitchen and Servery lighting will consist of recessed 2'x4' acrylic lensed gasketed troffers with aluminum frame doors with LED lamps and electronic drivers. Light levels will be approximately 50 foot candles.

11. Media Center lighting will be a combination of pendant direct/indirect fixtures and linear recessed fixtures with LED lamps and electronic drivers. The light levels will be designed for approximately 30 foot candles. Daylighting controls will be provided on perimeter light fixtures with 15 feet of glazing

12. Each area will be locally switched and designed for multi-level controls. Each Classroom, Office space, and Toilet room will have occupancy sensors to turn lights off when unoccupied. Occupancy sensors will be set to vacancy mode where required by Energy Code.

13. The maker spaces will have industrial grade strips with LED lamps and protective wireguards. Light levels will be approximately 50 foot-candles.

14. Daylight dimming sensors will be installed in each room where natural light is available for continuous dimming of light fixtures. The control system will be in accordance with associated LEED credit in indoor environmental quality.

15. The entire school will be controlled with an automatic lighting control system for programming of interior and exterior lights "on and off". Lighting control system will be interfaced with DDC system, and will be demand response capable in accordance with associated LEED credit in Energy and atmosphere.

D. Emergency Lighting System:

1. An exterior 275 kW diesel emergency generator with sound attenuated enclosure and base tank with alarms will be provided. An integral 100 kW resistive load bank will be provided for generator testing under load. 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 power system has been sized to support emergency (life safety), and optional standby building loads.

   a. Emergency (life safety) power loads as required by the Code:
      - Emergency exit and egress lighting (interior and building exterior at the exits)
      - Fire alarm system

   b. Standby power loads:
      - Heating system boilers with associated pumps and controls
      - Telephone/ data closets and associated A/C equipment
      - Communication systems (telephone and public address systems)
      - Building DDC system control panels
      - Kitchen refrigeration equipment
      - Lighting and power in the nurse/medical area
      - Security system equipment
      - Sewage pump station
      - Elevator

E. Site Lighting System:

1. Fixtures for area lighting will be pole mounted cut-off ‘LED’ luminaries in the parking area and roadways. Pole heights will be 20 feet. The exterior lighting will be connected to the automatic lighting control system for photocell “ON” and timed “OFF” operation. The site lighting fixtures will be dark sky compliant. The illumination level will be 0.5fc for parking areas in accordance with Illuminating Engineering Society. Lighting will be designed in accordance with associated LEED credit in sustainable sites.

2. Building perimeter fixtures will be ‘LED’ wall mounted cut-off over exterior doors for Exit discharge.

F. 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.

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 25-40 foot intervals.

4. Exterior weatherproof receptacles with lockable enclosures will be installed at exterior doors.

5. A system of computer grade panelboards with double neutrals and surge protective devices will be provided for receptacle circuits.

G. Fire Alarm System:

1. A fire alarm and detection system will be provided with 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.

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.

5. Manual pull stations will be provided at Exit discharge doors and at each egress stairwell not located at grade level.

6. The system will be remotely connected to automatically report alarms to fire department via an approved method by the fire department.

7. The generator status panel will be located at the Fire Command Center.

H. Uninterruptible Power Supply (UPS):

1. One (1) 30 kVA, 3 phase centralized UPS system will be provided with eight minutes of battery back-up. One (1) will be located in the MDF Room and one (1) will be located in a remote IDF Room.

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 and communication systems during a prolonged power outage.

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

I. Lightning Protection System:

1. A system of lightning protection devices will be provided.

2. The lightning protection equipment will include air terminals, roof and down conductors, conduits, fasteners, connectors, ground rods, etc.

3. The facility will be issued a UL Mater Label Certificate.

J. Renewable Energy System Provisions:

1. The base project will include:

- Electrical provisions will be made for a roof mounted renewable energy system consisting of photovoltaic panels covering 80% of the roof area. The system will be grid connected photovoltaic PV system intended to reduce the facilities demand for power.

K. Two-Way Communications System:

A Two-Way Communications System will be provided at the elevator lobbies that do not have grade access. Area of rescue assistance call boxes will be provided at Elevator Lobbies with no grade access. The call boxes connect to a main panel located adjacent to the Fire Alarm annunciator panel.

L. Distribution Antennae System (DAS):

1. A public safety radio distributed antenna system (DAS) which consists of bi-directional amplifiers (BDA), donor antennas, coverage antennas, coax cable, coax connectors, splitters, combiners and couplers. These devices will be used as part of a system for in-building public safety 2-way radio system communication.

5. CCTV

A. 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).

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

C. 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.

6. INTRUSION SYSTEM

A. 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.

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

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

7. CARD ACCESS

A. 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.

B. 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.

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

8. TESTING REQUIREMENTS

A. 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.
- Uninterruptible Power System, UPS.
- Lightning protection system.

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

9. OPERATION MANUALS AND MAINTENANCE MANUALS

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

10. 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.

11. COMMISSIONING

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

TECHNOLOGY SYSTEMS NARRATIVE REPORT

NEW CONSTRUCTION OPTION

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

1. CODES

   A. All work installed under Section 270000 shall comply with the Massachusetts Building Code 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 6 UTP Plenum rated cabling for both data and telephone systems for gigabit connectivity. The telephone infrastructure will accommodate PBX, or VOIP based voice systems.

   B. Each classroom will have 2 data outlets for student computers. Two data, one voice with video and audio connections to a wall mounted projector will be provided at teacher's station with interconnectivity to a interactive whiteboard. A wall phone outlet with 2 way ceiling speaker will be provided for communications with administration. Wireless access points will be provided in all classrooms and other spaces and consist of (2) CAT6A.cables and multimode fiber.

   C. A central paging system will be provided and integrated with the telephone system.

   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 10 Gbps Ethernet.

   F. Two-way communication call boxes will be provided adjacent to each elevator that is above or below grade level. The base station will be located at a control point on the first floor.

4. TESTING REQUIREMENTS

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

- Telephone and data cabling
- Fiber optic backbone cabling
- 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.

FIRE PROTECTION SYSTEMS NARRATIVE REPORT

NEW CONSTRUCTION OPTION

The following is the Fire Protection Systems narrative, which defines the scope of work and capacities of the Fire Protection Systems, 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 new school building of greater than 12,000s.f. must be protected with an automatic sprinkler system.

4. DESCRIPTION

   A. The building will be served by a new 8-inch fire service, double check valve assembly, wet alarm valve 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. A total of seven (7) wet type sprinkler zones will be provided.

   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 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.

   F. Fire department valves and cabinets will be provided on each side of the Stage in the Building.

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 hydrant flow test must be performed to confirm the Municipal water supply capacity.

6. 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.

7. 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.

8. 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.

9. 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

PLUMBING SYSTEMS NARRATIVE REPORT

NEW CONSTRUCTION OPTION

The following is the Plumbing Systems narrative, which defines the scope of work and capacities of the Plumbing Systems, as well as, the Basis of Design. The Plumbing Systems shall be designed and constructed for ***LEED V4 for Schools*** 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 6-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. Domestic hot water heating will be provided with a combination of two gas fired, high efficiency, condensing water heaters (400,000 BTUH input each), with separate storage tank (500 gallon). System is to be equipped with thermostatically controlled mixing devices to control water temperature to the fixtures.

D. A pump will re-circulate hot water from the piping system. Water temperature will be 120 deg. to serve general use fixtures. A 140 deg. F hot water will be supplied to the kitchen dishwasher.

E. 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.

F. A dedicated non-potable cold and hot water system will be provided to Science Classrooms. Water system will be protected with a reduced pressure backflow preventer. A dedicated tank type water heater will be provided to deliver hot water to all Science Classroom sinks.

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

6. GAS SYSTEM

A. Natural gas service will be provided for the building and will serve the boilers, domestic water heaters, kitchen cooking equipment, roof top equipment and generator.

B. Gas piping will be Schedule 40 black steel pipe with threaded gas pattern malleable fittings for 2 in. and under and butt welded fittings for 2-1/2 in. and larger.

7. FIXTURES ***LEED for Schools Credit WEp1***

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. Each Art Classroom sink shall include a plaster trap.

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 or equal.

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

8. 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.

9. 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.

10. INSULATION

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

11. 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.

12. 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.

13. WATER HEATER

A. Gas fired, high efficiency, two condensing water heaters (400,000 BTUH input each), with separate storage tank (500 gallon).

Appendix F: Structural Option Narratives

STONEHAM HIGH SCHOOL
Stoneham, Massachusetts

Structural Narrative
October 22, 2017 - Estimating

INTRODUCTION

Foley Buhl Roberts & Associates, Inc. (FBRA) is collaborating with *HMFH Architects (HMFH)* and their consultants in the evaluation of renovation, renovation/addition and new construction options for the Stoneham High School in Stoneham, Massachusetts. The purpose of this narrative is to outline the basis of the structural design, describe the proposed structural systems and summarize the anticipated scope of structural work for required for the proposed renovations and new construction. Outline Structural Specifications are also included. This report should be used in conjunction with the preliminary Architectural Drawings and the documents of the other disciplines, in preparing the preliminary cost estimate.

Stoneham High School is located at 149 Franklin Street in Stoneham. The original one and two-story building, designed as a Junior High school, was constructed on a steeply sloping site in 1968. The original, cast-in-place concrete/precast concrete framed building was renovated in 1981 and re-opened as the High School. A one-story, steel framed academic addition (designed by HMFH) was constructed to the south of the original building at that time; the Gymnasium was also expanded to the south by approximately 40 feet. A new elevator, serving the Ground, First and Second Floors of the building was also constructed. Foundations for the original building and the addition are conventional spread footings. It appears that a considerable volume of ledge was removed during the construction of the original building.

The combined, gross floor area of the original building and the 1981 additions is approximately 211,000 square feet. The current enrollment is approximately 695 students in Grades 9-12.

The 35+/- acre site is bordered by Franklin Street to the north and by residential developments on the other three sides. In addition to the High School building, the site includes various playing fields, tennis courts, parking lots and a system of access/drop-off roadways.

The original school building includes a central, two-story Classroom Wing (“B” Wing; First Floor Elevation 192.0’) which surrounds an open Courtyard. The Auditorium and Kitchen/Cafeteria spaces (“A” Wing; First Floor Elevation 192.0’) and a two-story, Gymnasium/Shop Wing (“C” Wing; Ground Floor Elevation 176’-8”) flank the Classroom Wing on the east and west sides, respectively. The Library is located on the east side of the Classroom (B) Wing, at the First Floor level. An additional five (5) classrooms were provided in the 1981 academic addition.

Exterior walls in the original building are brick veneer, with an (unreinforced) masonry backup wall. Exterior walls of the 1981 addition are brick veneer with a steel stud backup. Beginning in 2004, sections of the original roof were replaced with a new membrane roofing system. However, certain sections of the original tar and gravel roof have not been replaced (e.g. the Auditorium, Kitchen/Cafeteria and Gymnasium),

Structural conditions at the Stoneham High School were reviewed at the site by FBRA on July 6, 2017. Our observations were limited to those areas which were not obscured by finishes. No exploratory building demolition or structural materials testing was conducted in conjunction with the preparation of this report. Only limited subsurface soils information was available.

Refer to FBRA's, *Existing Conditions Structural Report* (dated August 7, 2017) and the reports prepared by HMFH and their consultants for additional information.

I. PROPOSED OPTIONS

With reference to the September 2017 Preliminary Architectural Drawings prepared by HMFH, the following options are under consideration:

Option 1: Full Renovation:

The full renovation of the Stoneham High School would be conducted in two phases, with 48+/- months of construction, spread out over 4 to 5 years. In Phase One, modular classrooms would be installed in the parking lot on the east side of the existing building, connected by site-built walkways and vestibules. Limited structural alterations would be required to relocate Science Labs/Classrooms to the First and Second Floors of the "B" Wing. The front brick façade of the building will be replaced with a curtain wall system. In Phase Two, the modular classrooms would be removed. Structural work would include the construction of a new stage with a fly loft and an automatic rigging system. Refer to the HMFH Narrative and Phasing Diagrams for additional scope and phasing information. Refer to **Section V** of this narrative for a summary of the scope of anticipated structural/structurally related work for this option.

Option 2: Addition/Renovation - Gymnasium Reuse:

Option 2 would be a phased, addition/renovation project conducted in two phases, with 39 to 42 months of construction. In Phase One, a new, three-story classroom/administration addition would be built directly in front of the existing school. The existing Gymnasium would be renovated over two summers and would include a new curtain wall system. The shop spaces below the Gymnasium would be renovated and repurposed for Locker Rooms, a Weight Room and an Alternate PE space. In Phase Two, the existing building (excluding the Gymnasium) would be abated and demolished. A new Pre-K Wing would be constructed adjacent to the renovated Gymnasium. Ledge removal will likely be required to construct the new addition. Refer to **Section V** of this narrative, for a summary of the scope of anticipated structural/structurally related work required for the renovated Gymnasium in this option.

Option 3: New High School:

A new, three-story High School would be constructed in the parking lot to the east of the existing school building.

Refer to the HMFH Architectural documents for additional information and plans of the three options.

II. BASIS OF DESIGN - NEW CONSTRUCTION (ALL OPTIONS)

The basis of the structural design for new construction (Options 2 and 3) is described in this section.

Codes and Design Standards

Building Code:	Massachusetts State Building Code and Massachusetts Existing Building Code (780 CMR - Ninth Edition).
Concrete:	ACI 318 and ACI 301; latest editions.
Masonry:	ACI 530 and ACI 530.1; latest editions.
Structural Steel:	AISC "Specification for Structural Steel Buildings" and AISC "Code of Standard Practice"; latest editions
Steel Deck:	Steel Deck Institute (SDI) - Referenced Standards; latest editions.

Design Loads/Parameters

Live Loads:

Classrooms (with partition allowance):	65 PSF
Upper Floor Corridors:	80 PSF
Open plan areas and Gymnasium:	100 PSF
Stairs and First Floor Corridors:	: 100 PSF
Library/Media Center:	100 PSF
Mechanical Areas:	150 PSF

Snow Loads (Stoneham):

Basic Ground Snow Load:	40 PSF
Minimum Flat Roof Snow Load:	30 PSF

Photovoltaic (PV) Panels (Ballasted Racking): 15 PSF

Wind Loads (Stoneham):

Wind Speed (Risk Category III):	137 MPH (Ultimate)

Seismic Parameters (Stoneham):

Spectral Response – Short Periods:	S_S = 0.229g
Spectral Response – 1-Second Periods:	S_1 = 0.071g
Risk Category:	III
Seismic Design Category:	B
Site Class:	C (Assumed)
Structural System:	Building Frame System
Lateral Load Resisting System:	Steel Braced Frames (*Not Specifically Detailed for Seismic Resistance*)
Response Modification Factor (R):	3.0
System Overstrength Factor (Ω_0):	3.0
Deflection Amplification Factor (C_d):	3.0

Subsurface Soils Conditions/Foundations

Subsurface Soils/Foundations: Limited subsurface explorations were conducted for the 2014 *Synthetic Turf Study*. Eight (8) test pits and seven (7) test borings were taken in the area of the present fields, to the north and west of the present school building. Generally speaking, refusal was encountered in the borings and test pits at relatively shallow depths (2.7 feet to 12.0 feet below the ground surface in the borings and .9 feet to 3.0 below the ground surface in the test pits). Rock outcroppings are visible in a number of locations. A comprehensive evaluation of ledge conditions/elevations (borings, test pits, probes, ground penetrating radar, etc.) should be undertaken, where new construction is planned for these areas. The preliminary cost estimate should include an allowance for ledge removal in all areas of proposed new construction (primarily Option 2).

The original building is supported on conventional spread footing foundations. Columns are supported on individual spread footings and perimeter foundation walls rest on continuous wall footings. The design allowable bearing pressure is noted on the Drawings to be 5 tons per square foot on natural soils or on ledge. The Drawings suggest that a considerable amount of ledge removal was required to level the side and prepare the pad for the building. A conventional spread footing foundation has been assumed for new construction options presented in this narrative. The preliminary foundation design is based on an assumed allowable bearing pressure of 2½ tons per square foot on natural soils, compacted structural fill or a compacted structural fill "cushion" placed over ledge.

Drainage: It does not appear that perimeter foundation drains or underslab drains were typically provided for the existing building. Footing drains are shown at the perimeter of the First Floor Courtyard; however, none are indicated at the Ground Floor in the Gymnasium/Shop (C) Wing. This is the lowest section of the building and foundations appear to be resting directly on ledge. Infiltration of perched water would potentially be a concern; however, there are no reports of significant groundwater issues. The preliminary cost estimate should carry and allowance for perimeter and underslab drainage at all areas where the interior floor elevation is below the exterior finished grade.

Construction Classification

New construction (Options2 and 3) is assumed to be Type 2A (Noncombustible, Protected (to be confirmed)). Floor construction (except concrete slabs on steel deck) and roof construction (including the roof deck) will require applied fireproofing to achieve the required fire resistance rating. In all options, the new construction will be fully sprinklered.

Sustainable Design Considerations:

Sustainable design considerations will be incorporated in the building design (LEED v4).

III. STRUCTURAL SYSTEMS DESCRIPTION - NEW CONSTRUCTION (OPTIONS 2 & 3)

Structural systems for new construction in Options 2 and 3 are described in this section. The anticipated scope of structural work in the existing building (Options1 and 2) is described in **Section V** below.

Structural Bays/Spans: Structural bays/spans vary; however, the typical structural bay will be square or rectangular, approximately 750 square feet to 950 square feet in area (25 to 35 feet typical spans). Roof construction over the new Gymnasium Option 3) will clear span the space; approximately 100 feet. The Auditorium roof spans are approximately 70 and 85 feet in Options 2 and 3, respectively.

Story Heights/Floor Elevations: Typical story heights will be 14+/ feet, except at the First Floor, which will be higher. Refer to the Preliminary Architectural Drawings for additional information.

Foundations: As noted earlier in this report, the preliminary foundation design for Options 2 and 3 (conventional reinforced concrete spread footings) is based on an allowable bearing capacity of 2½ tons per square foot (5.0 kips per square foot). A reinforced concrete frost wall will be constructed around the entire building perimeter. Reinforced concrete grade beams will interconnect/tie columns in lateral bracing bays. See **Section IV** of this narrative for preliminary estimated structural quantities.

Drainage: Foundation and underslab drainage systems are recommended in cases where an occupied floor level will be located below the exterior finished grade (Basement Level of Option 2). Perimeter and underslab drainage will not be required for new construction Option 3.

Lowest Level Floor Construction: 5" thick concrete slab on grade, reinforced with *6x6-W2.9xW2.9 WWF* welded wire fabric. Slabs on grade will be underlain by a heavy duty vapor barrier, 2" of rigid insulation and 9" of imported, compacted gravel fill. Saw cut control joints (1¼" deep) will be provided in each direction along each column line. Full depth isolation joints will be constructed around columns.

Upper Level Floor Construction: Composite structural steel framing: 4" thick (minimum), normal weight concrete topping slab on a 2" deep, 18 gauge, composite type, galvanized steel floor deck (6" minimum total slab thickness), reinforced with welded wire fabric, spanning to composite wide flange steel beams. Steel beams span to composite wide flange steel girders that are supported by wide flange steel columns or HSS (tube) steel columns. All composite steel beams and girders will be *unshored.* Composite action will be achieved by field welding ¾" diameter x 4½" long headed shear studs through the deck, to the top flanges of the beams and girders. To avoid compromising composite action, conduit or other, similar embedded items *should not* be placed in the concrete slab on steel deck construction. Slabs on composite steel floor deck will be placed at the required elevation, adding concrete to compensate for the deflection of the (unshored) steel framing (assume an approximate average of ¾" additional concrete required over the bay area).

Roof Construction: Typical roof construction for all new construction will consist of a 3" deep, 18 gauge, Type DR galvanized steel roof deck spanning to wide flange steel beams. Steel beams are typically supported by wide flange steel girders, which span to wide flange steel columns or HSS (tube) steel columns.

Steel framing over the Auditorium space in Options 2 and 3 will consist a 3" deep, 18 gauge, Type DR galvanized steel roof deck, spanning 10+/- feet to deep, clear-spanning wide flange steel beams.

Steel roof deck over the Gymnasium in Option 3 will be the cellular acoustic type; 3" deep, 18/20 gauge (galvanized). Steel roof deck will span to steel purlins, which are supported by steel trusses that clear span the space. Trusses will be spaced at approximately 25 feet on centers. Exposed steel roof framing over the Gymnasium will be classified as Exposed to View Structural Steel (E.V.S.S.). All E.V.S.S. will be surface prepped and shop painted with a primer that is compatible with the finished paint. Primary roof structural members over the Gymnasium that are exposed to view will require intumescent paint to achieve the required fire resistance rating.

Where practical, roof drainage will be achieved by sloping the steel to the internal drains. Some areas of tapered insulation should be anticipated, at locations where it is not practical to slope the steel.

Concrete slabs on composite steel deck will be provided below rooftop mechanical units, for acoustical purposes. Screens will be provided around rooftop equipment for acoustic and aesthetic purposes.

Steel Framing Connections: Type 2 simple framing connections (shear only); double clip angles typically.

Columns: Typical columns will be wide flange steel sections or HSS (tube) steel sections.

Lateral Force Resisting System: Lateral (wind and seismic) forces will be resisted by steel bracing, for reasons of economy, stiffness, reduced structural depth and smaller column sizes. Bracing members will be square or rectangular HSS sections. Brace configurations may include chevrons, inverted chevrons ("V"), or single diagonals in short bays, as required by architectural considerations. The bases of all braced frames will be tied together below the lowest level slab on grade with 2'-0" wide x 2'-6" deep reinforced concrete grade beams.

Expansion (Seismic) Joints: No internal expansion joints are proposed for the new High School in Option 3. The three-story addition in Option 2 will be separated from the existing Gymnasium (to remain) and the Phase Two Pre-K wing by and expansion/seismic joint. The Pre-K wing will also be separated from the existing Gymnasium by an expansion/seismic joint.

Elevator Shafts: New elevator shafts will be 8" thick, 100% solid grouted, reinforced concrete masonry unit (CMU) construction, supported on 12" thick reinforced concrete elevator pit walls and a 2'-0" thick reinforced concrete elevator pit mat.

Exterior Walls: Exterior walls will typically be masonry veneer (cavity wall construction), with areas of glazed curtainwall and architectural panels. A galvanized, light gauge steel stud backup wall (16 gauge minimum thickness) will be constructed at masonry veneer areas. Vertical slip joints will be provided in the metal stud backup system at each level. In areas where the height of the masonry veneer exceeds 30+/- feet, continuous relieving angles will be required. Intermediate, HSS steel girts will be provided at the Auditorium exterior walls (Options 2 and 3), to laterally support the wall construction at 14+/- feet intervals.

IV. ESTIMATED STRUCTURAL QUANTITIES - NEW CONSTRUCTION (OPTIONS 2 & 3)

Approximate structural quantities for new construction in Options 2 and 3 are presented in this section. Refer to the Structural Systems Descriptions in **Section III** above for steel floor and roof deck types/gauges, slab on grade and slab on steel deck information, and elevator shaft construction.

FOUNDATIONS/CONCRETE:

The estimated quantities of foundation concrete and reinforcing for new construction are summarized below.

Typical Perimeter Frost Walls, Footings and Pilasters:

*14" thick, including an 8" wide masonry shelf, with horizontal and vertical reinforcing each face (**4.0+/- psf**). The outside surface of perimeter foundation walls will receive a troweled-on bituminous mastic. Typical perimeter frost wall continuous footing: 2'-6" wide, by 12" deep, with continuous reinforcing bars, plus dowels to the foundation wall (**10.0+/- plf**). The bottom of the footing will be a minimum of 4'- 0" minimum below the exterior finish grade for frost protection. Pilasters at perimeter column locations will be 24 inches square, with **40 plf** reinforcing.*

Typical Perimeter Basement Walls and Footings (Option 2 Only):

Typical, full height foundation wall: *16" thick including an 8" wide masonry shelf, with horizontal and vertical reinforcing each face (**6.0+/- psf**). The outside surface of perimeter foundation walls should receive a troweled-on bituminous mastic dampproofing.* Typical, full height foundation wall continuous footing: *2'-6" wide, by 12" deep, with continuous reinforcing bars, plus dowels to the foundation wall (**15.0+/- plf**). The bottom of the footing will be approximately 2'-4" minimum below the Basement Level slab on grade. Pilasters at perimeter column locations will be 24 inches square, with **40 plf** reinforcing.*

Typical Interior Column Footings:

10'- 0" x 10'- 0" x 28" deep with 950 pounds of reinforcing. The bottom of the footing will be approximately 3'- 4" below the First Floor slab on grade.

Typical Perimeter Column Footings:

7'- 0" x 7'- 0" x 22" deep, with 350 pounds of reinforcing. The bottom of the footing will be approximately 4'- 6" below the exterior finish grade.

Grade Beams at Lateral Bracing Bays:

2'-0" wide x 2'-6" deep with 45 pounds of reinforcing per foot.

Assume 60 linear feet of grade beam required for each 5,000 square feet of new building footprint.

STRUCTURAL STEEL/SHEAR CONNECTORS:

The estimated total weight of structural steel (including beams, columns, trusses, bracing, plates, equipment screens, relieving angles, frames, connections, etc., but excluding entry canopies and miscellaneous metal components).is summarized below:

Option 2: Average Weight: ***14.5 psf***

Option 3: Average Weight: ***15.0 psf***

The estimated total weight of structural steel for either option can be determined by multiplying the unit weight number noted above, times the total gross floor area of that option (including both Phase One and Phase Two construction in Option 2).

Shear Connectors shall be ¾" diameter, 4½" long, headed Nelson studs; *assume 25 shear connectors per 100 square feet of slab on composite deck area (including mechanical equipment pads).*

V. ANTICIPATED SCOPE OF STRUCTURAL WORK - RENOVATION (OPTIONS 1 & 2)

Renovations, alterations, repairs and additions to existing buildings in Massachusetts are governed by the provisions of the Massachusetts State Building Code (780 CMR - 9th Edition) and the Massachusetts Existing Building Code (MEBC). These documents are based on amended versions of the 2015 International Building Code (IBC) and the 2015 International Existing Building Code (IEBC), respectively.

The MEBC defines three (3) compliance methods for the repair, alteration, change of occupancy, addition or relocation of an existing building. The method of compliance is chosen by the Design Team (based on the project scope and cost considerations) and cannot be combined with other methods.

The *Work Area Compliance Method* (IEBC Chapters 4 through 12) is the most commonly chosen method of compliance and is appropriate for this project. This method is based on a proportional approach to compliance, where upgrades to an existing building are triggered by the type and extent of work. The Work Area Compliance Method includes requirements for three levels of alterations (*Levels 1, 2 and 3*), in addition to requirements for repairs, changes in occupancy, additions, historic buildings or moved buildings. A complete seismic evaluation of the existing building is required under the following conditions: *Level 2* alterations where the demand (mass/lateral force) to capacity (lateral force resistance) ratio of lateral load resisting elements has been increased by more than 10%, all Level 3 alterations, a change in occupancy to a higher category (not applicable) and where structurally attached additions (vertical or horizontal) are planned (no structurally attached additions are proposed).

The Full Renovation Option (Option 1) will likely be classified as a *Level 2* Alteration. Modifications to existing masonry walls which contribute to the lateral force resistance will be minimized. Accordingly, the demand-to-capacity ratio of lateral load resisting elements in each of the buildings will not be increased by more than 10%; a seismic retrofit of the building to withstand full or reduced seismic loads required by the current code would not be required.

The Gymnasium renovation of Renovation/Addition Option 2 will likely be classified as a *Level 3* Alteration. As a significant portion of this wing will be demolished (resulting in a *substantial structural alteration)*, compliance with IEBC seismic requirements will be necessary. Accordingly, the remaining Gymnasium section will need to be seismically strengthened and upgraded.

No change in use is proposed and live load requirements throughout the buildings are expected to be generally unchanged.

Based on the Preliminary Architectural Drawings, our review of the original construction documents and the existing structural conditions observed at the site (refer to FBRA's *Existing Conditions Structural Report)*, the anticipated scope of structural/structurally related work required for Option 1 is summarized below.

1. Address all building and envelope conditions/deficiencies noted in *Section II* of FBRA's *Existing Conditions Structural Report*.

2. Evaluate all low roof conditions of the original (1968) building and the 1981 additions, which are adjacent to higher roofs. It appears that the low roofs of the original building were not designed for snow drift loading. It is possible that reinforcing of the existing low roof structure in these drift areas will be required (the entire, immediately adjacent structural bay); however, as the low roof construction is either cast-in-place or prestressed concrete construction, sufficient reserve strength may be present. Preliminary cost estimates should include an allowance for limited, local structural reinforcing of low roof areas ($10.00/SF, over the reinforced area).

3. Anchor the top of all interior masonry partitions scheduled to remain, to the underside of the floor or roof structure above. Not all masonry partition extend to the floor/roof structure above; additional effort will be required to properly brace these conditions. Note that this work is not required for the *Level 2 /Option 1* Alteration (but mandatory for the *Level 3/Option 2* Alteration); however, FBRA recommends that it be done on a voluntary basis in Option 1. Anchorage would consist of steel angle clips with adhesive anchors, spaced at approximately 4 feet on centers.

4. Anchor floor and roof diaphragms to all bearing and non-bearing masonry wall construction in the original (1968) building. Note that this work is not required for a *Level 2/Option 1* Alteration (but mandatory for a *Level 3/Option 2* Alteration); however, FBRA recommends that it be done on a voluntary basis in Option 1. Anchorage would consist of steel angle clips with adhesive anchors, spaced at approximately 4 feet on centers at all perimeter walls.

5. Evaluate the roof diaphragm capacity at the precast tee roof sections (Auditorium and Kitchen/Cafeteria (A) Wing and Gymnasium/Shop (C) Wing); supplement tee to tee connections if required. *Preliminary cost estimates should include an allowance for limited, local structural reinforcing of these diaphragms.*

6. Provide miscellaneous structural supports and/or reinforcing to support new MEP equipment.

7. Provide new floor and roof openings, as required to accommodate new MEP/FP work.

8. Provide racks, hangers, etc. for new plumbing and fire protection work, as recommended by the Architect and MEP/FP Engineers.

9. Review and evaluate the existing Construction Type (Type IIB; Non Combustible, Unprotected) and required fire resistance ratings; locally protect structural elements supporting rated enclosures, as may be required.

10. Science Lab/Classroom Relocation: Science Labs/Classrooms that are presently located in the 1981 addition will be relocated to the First and Second Floors of the original building, between the Gymnasium and the Courtyard. Structural modifications will be required to accommodate this change; including the installation of new columns and footings and the removal of certain existing columns. Preliminary cost estimates should carry an allowance of **$100,000** for structural work in this area.

11. ADA upgrades: Structural work relating to ADA upgrades (ramps, etc.) will be required. Refer to the Architectural documents for further information.

12. New Stage/Fly Loft: The entire stage area (including the cast-in-place concrete/precast concrete tee roof construction, supporting columns and exterior walls) will be demolished and a new stage with a fly loft, new lighting, an automatic rigging system, and a smoke control system with be constructed. New roof construction will be a 3” deep, 18 gauge Type DR roof deck, supported by steel beams spanning in the east-west direction. Steel beams will be supported by new steel columns. Horizontal steel tube girts will be provided to limit the span of exterior wall backup studs. Lateral stability will be provided by steel bracing on three (3) sides. Assume that ***37.5 Tons*** of structural steel will be required.

13. Future PV Panels: The existing roof will need to be further evaluated for the weight of future (ballasted) PV arrays. The existing roof structure likely has adequate capacity to support PV panels in non-snow drift areas; however, certain restrictions may be necessary to limit the additional PV loading (the existing cast-in-place concrete/precast concrete tee roof construction is difficult to reinforce).

14. Seismic Reinforcing/Upgrade of the Gymnasium (Option 2 Only): A significant section of this wing will be removed in Renovation/Addition Option 2; accordingly, the renovation would be classified as a *Level 3/Substantial Structural Alteration.* New shear walls or bracing (with new/supplemental foundations) would be required on all four sides of the Gymnasium, and wall/diaphragm anchorage would need to be supplemented. Preliminary cost estimates should carry an allowance of **$175,000** for seismic reinforcing/upgrades to the existing Gymnasium.

VI. STRUCTURAL OUTLINE SPECIFICATIONS:

Concrete:

- All concrete shall be normal weight, 4,000 psi at 28 days, except foundation walls and footings, which shall be normal weight, 3,000 psi and exterior (exposed) concrete (paving) which shall be normal weight, 4,500 psi.
- Portland Cement: ASTM C150, Type I or II.
- Fly Ash: ASTM C618, Class F. Replacement of cement content with fly ash is limited to 20% (by weight). Fly ash is not permitted in exterior, exposed concrete, slabs on grade or slabs on steel deck.
- All concrete shall be proportioned with 3/4" maximum aggregate, ASTM C 33, except 3/8" maximum aggregate shall be used at toppings less than 2" thick (e.g. metal pan stairs).
- All reinforcing shall be ASTM A 615 deformed bars, Grade 60.
- All welded wire fabric shall conform to ASTM A 185.
- Reinforcing bars, steel wire, welded wire fabric, and miscellaneous steel accessories shall contain a minimum of 25% (combined) post-industrial/post-consumer recycled content (the percentage of recycled content is based on the weight of the component materials). Certification of recycled content shall be in accordance with Submittal Requirements.
- Concrete products manufactured within 500 miles (by air) of the project site shall be documented in accordance with Submittal Requirements.
- Cure all concrete by moisture retention methods, approved by Architect; curing compounds shall not be used.

Reinforced Concrete Masonry (New Elevator Shafts):

- Masonry construction shall conform to ACI 530/ASCE 5/TMS 402 "Building Code Requirements for Masonry Structures", latest edition.
- Masonry strength, f'm shall not be less than 1350 psi.
- Requirements for load bearing block strength shall be as required for specified masonry strength (f'm) but shall not be less than 2000 psi on the net area of the block.
- Grout shall conform to ASTM C476, Type Fine, and shall be of strength required for specified masonry strength (F'm) but not less than 3000 psi.

- Mortar for reinforced masonry shall conform to ASTM C 270 Type S and shall be of strength required for specified masonry strength (f'm) but not less than 1800 psi.

- Reinforcing bars shall conform to ASTM A 615 Grade 60 deformed bars. Lap all continuous bars 48 diameters and provide bar positioners. Assume No. 5 bars at 2'-8" o.c. vertically and horizontal bond beams with 2 - No. 5 continuous at 4'-0" o.c.

- Joint reinforcing shall be 9 gauge ladder type conforming to ASTM A 82. Provide prefabricated corners and tees. Walls shall be reinforced horizontally with joint reinforcing at 16 inches on centers unless otherwise noted.

- Reinforcing bars, steel wire and miscellaneous accessories shall contain a minimum of 25% (combined) post-industrial/post-consumer recycled content (the percentage of recycled content is based on the weight of the component materials). Certification of recycled content shall be in accordance with Submittal Requirements.

- Elevator shaft walls shall be 100% solid grouted (all cores); low lift grouting.

- Masonry products manufactured within 500 miles (by air) of the project site shall be documented in accordance with Submittal Requirements.

Structural Steel:

- Structural steel shapes shall conform to ASTM A 992, Fy = 50 ksi.

- Steel tubes (HSS) shall conform to ASTM A 500, Grade B, Fy=46 ksi.

- Structural steel plates and bars shall conform to ASTM A 36, Fy = 36 ksi.

- Steel members shall contain a minimum of 25% (combined) post-industrial/post-consumer recycled content (the percentage of recycled content is based on the weight of the component materials). Certification of recycled content shall be in accordance with the Submittal Requirements.
- Steel manufactured within 500 miles (by air) of the project site shall be documented in accordance with the Submittal Requirements.

- Anchor Bolts: Anchor bolts at column base plates shall conform to ASTM F1554 – Grade 36 and shall be headed type. Provide a minimum of four (4), ¾" diameter anchor bolts at all columns; additional bolts and/or larger diameter will be required at bracing locations.

- Bolted connections shall be ASTM A 325, Type N (bearing) bolts, except slip-critical bolts shall be used at lateral brace beam connections.

- Shear connectors shall be ¾" diameter, 4½" long, headed Nelson studs conforming to ASTM A 108.

- Shop and field welding shall be AWS D1.1 E70XX electrodes.

- Surface treatment for typical structural steel: SSPC Surface Preparation No. 3 (Power Tool Cleaning). Structural steel shall be left unprimed.

- Surface treatment for Exposed to View Structural Steel (E.V.S.S.) in the new Gymnasium (Option 3) shall be SSPC Surface Preparation No. 6. All exposed steel shall receive one coat of shop primer that is compatible with the finish paint.

- All exterior, exposed structural steel shall be hot-dipped galvanized.

Steel Deck:

- Typical steel roof deck shall be 3" deep, 18 gauge, Type DR, conforming to ASTM A653, Grade 33 (minimum), galvanized in accordance with ASTM A 653, coating class G-60.

- Acoustic steel roof deck (over the new Gymnasium (Option 3)) shall be 3" deep, 18/20 gauge cellular type, conforming to ASTM A653, Grade 33 (minimum), galvanized in accordance with ASTM A 653, coating class G-60. Acoustic steel roof deck shall be shop treated and painted with a primer that is compatible with the finish paint.

- Typical steel floor deck shall be 2" deep, 18 Gauge, composite type, conforming to ASTM A 653, Grade 33, galvanized in accordance with ASTM A 653, coating class G-60.

- All steel floor deck and roof deck accessories (pour stops, finish strips, closures, etc.) shall be the same finish as the deck; 18 gauge minimum.

- Steel deck shall contain a minimum of 25% (combined) post-industrial/post-consumer recycled content (the percentage of recycled content is based on the weight of the component materials). Certification of recycled content shall be in accordance with the Submittal Requirements.

- Steel deck manufactured within 500 miles (by air) of the project site shall be documented in accordance with the Submittal Requirements.

- Provide 14 gauge sump pans at roof drains.

End of Structural Narrative

Traffic Study
by Nitsch Engineering

Nitsch Engineering

Stoneham Middle School

Transportation Impact Study

May 26, 2011

Prepared for:

Tappe Associates
6 Edgerly Place
Boston, MA 02116

Submitted by:

Nitsch Engineering
186 Lincoln Street, Suite 200
Boston, MA 02111

Nitsch Engineering Project #8528

Building better communities with you.

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

GENERAL/SITE LOCATION 3

PHYSICAL CONDITIONS 5

INTERNAL CIRCULATION 6

Existing Stoneham Middle School/Central Elementary School Site 6
Proposed Stoneham Middle School/Central Elementary School Site 8
Existing Stoneham High School Site 9
Proposed Stoneham High School Site 11

PARKING 14

CRASH DATA 18

TRAFFIC VOLUMES 19

Pick-Up/Drop-Off Operations 20

2011 EXISTING INTERSECTION OPERATIONS 21

TRIP GENERATION 24

2021 NO BUILD INTERSECTION OPERATIONS 25

2021 BUILD INTERSECTION OPERATIONS 26

RECOMMENDATION 28

LIST OF TABLES

Table 1 - Existing Parking Inventory Stoneham Middle School/Central Elementary School Site 16
Table 2 - Existing Parking Inventory Stoneham High School Site 16
Table 3 - Proposed Parking Central School Site 17
Table 4 - Proposed Parking High School Site 17
Table 5 - Crash Summary 18
Table 6 - Stoneham Middle School Survey Results 20
Table 7 - Pick-Up/Drop-Off Volumes from ATR counts 21
Table 8 - 2011 Existing LOS Stoneham Middle School/Central Elementary School Site 22
Table 9 - 2011 Existing LOS Stoneham High School Site 23
Table 10 - Proposed Trip Generation 24
Table 11 - 2021 No Build LOS Stoneham Central School Site 25
Table 12 - 2021 No Build LOS Stoneham High School Site 26
Table 13 - 2021 Build LOS Central School Site 27
Table 14 - 2021 Build LOS High School Site 28

LIST OF FIGURES

Figure 1 – Locus Map 4
Figure 2 – Internal Circulation Existing Stoneham Middle School/Central Elementary School Site 6
Figure 3 – Internal Circulation Central School Site 8
Figure 4 – Internal Circulation Existing Stoneham High School Site 9
Figure 5 – Internal Circulation Proposed Stoneham High School Site 11
Figure 6 – Internal Circulation Proposed Stoneham High School Site – Additional Eastern Access 12
Figure 7 – Internal Circulation Proposed Stoneham High School Site – Additional Western Access 13
Figure 8 – Parking Stoneham Middle School/Central Elementary School Site 14
Figure 9 – Parking Stoneham High School Site 15

General/Site Location

Two locations are being evaluated to determine the recommended site for the construction of a new Stoneham Middle School. The first location is the existing Stoneham Middle School/Central Elementary School site. The existing Stoneham Middle School serves 589 students in grades 6 through 8. The Stoneham Middle School currently shares a site with Central Elementary School, which serves 343 students in Kindergarten through grade 5. In the event that the new Middle School is constructed on this site, the combined student enrollment of both schools is projected to be 785 students in grades 5 through 8. This represents a reduction of 147 students from the existing site.

The second site under consideration for the reconstruction of the Middle School is the existing Stoneham High School site. The existing Stoneham High School currently serves 736 students in grades 9 through 12.
Under this scenario, the projected enrollment for the proposed Stoneham Middle School will be 585 students in grades 6-8, while the High School is projected to serve 750 students in grades 9-12. This represents an increase of 599 students from the current High School site. The design team considered multiple schemes for both sites, and the ones presented here were believed to represent the optimal conceptual design for each location.

The existing Stoneham Middle School is located at 101 Central Street, between Elm Street and William Street, and a block from Main Street (Route 28). Main Street is a high volume roadway that serves the business district in Stoneham. The school access road runs in the east/west direction between Central Street and Pomeworth Street. The Stoneham Middle School is located on the western end of the site adjacent to Central Street, while Central Elementary School is located on the eastern end of the site adjacent to Pomeworth Street.

The existing Stoneham High School is located on Franklin Place, off Franklin Street in Stoneham, MA. Franklin Street runs in the east/west direction and connects Main Street in Stoneham (Route 28) to Main Street in Melrose. Main Street in Stoneham (Route 28), Franklin Street, and Main Street in Melrose are all Urban Principal Arterials. This means that they are all high volume roadways that serve critical paths in the transportation network. However, Franklin Street is used more for through traffic, while Main Street (Route 28) contains a high number of local businesses, so traffic in that area drives more slowly, and is generally more congested.

Figure 1 shows the location of the Stoneham Middle School, Central Elementary School, and Stoneham High School.

Figure 1 – Locus Map

Physical Conditions

Nitsch Engineering conducted field reconnaissance on Monday, March 28, 2011 and Tuesday, March 29, 2011 to observe traffic operations, geometric conditions, parking activity, pedestrian accommodations, signing, pavement markings, local site access/egress, and overall roadway and intersection conditions.

The following signalized intersections were included in the study area:

- Main Street (Route 28)/Elm Street
- Main Street (Route 28)/William Street
- Central Street/Elm Street
- Central Street/William Street
- Franklin Street/Franklin Place (Stoneham High School Access Drive)

The following unsignalized intersection was also included in the study area:

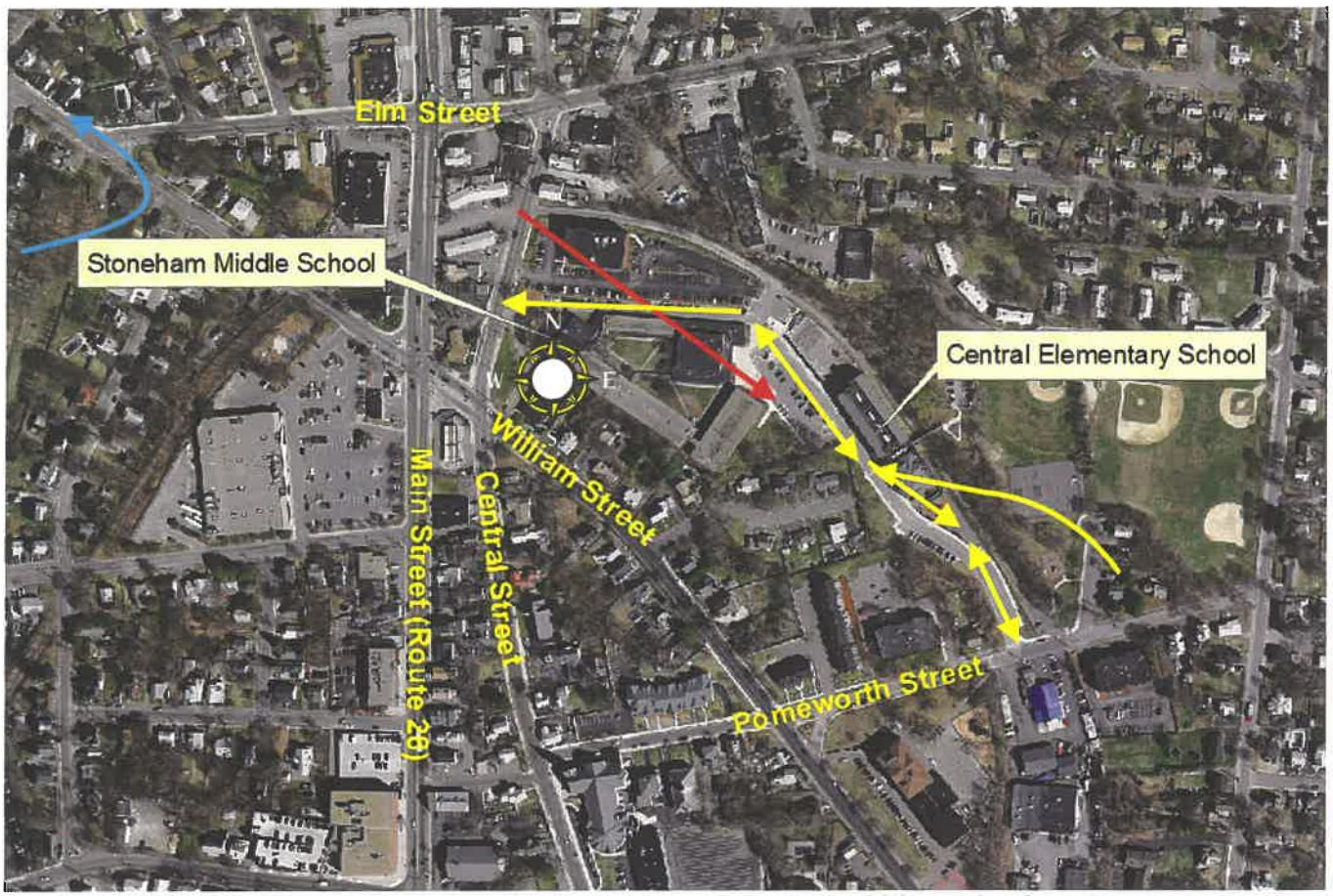
- Pomeworth Street/School Access Road

A description of each of the study area intersections with corresponding photos of those locations can be found in the technical appendix.

Internal Circulation

Existing Stoneham Middle School/Central Elementary School Site

Figure 2 – Internal Circulation Existing Stoneham Middle School/Central Elementary School Site



A red arrow indicates a time restricted movement. A blue arrow indicates a vehicle restricted movement.

There are three key access points to the Stoneham Middle School and Central Elementary School site, one is off Pomeworth Street, and the other two are off Central Street. The School Access Road off of Pomeworth Street provides two-way access into and out of a parking lot located adjacent to the intersection. Just north of this parking lot, the School Access Road becomes one-way in the northbound direction during pick-up/drop-off hours (7:00 AM - 8:00 AM and 2:00 PM - 3:00 PM). This means that there is no access for vehicles going south from Central Street to Pomeworth Street during the pick-up/drop-off hours.

The access points off Central Street provide one-way access into and out of the site. This creates a longer travel distance, where traffic coming into the site enters on the southern end of the school site, and it exits to the south of an adjacent bank. The one-way loop connects to a two-way internal drive that connects the Stoneham Middle School to Central Elementary School. All of the parking and pick-up/drop-off traffic access the site from these locations. The multiple access and egress points to the site allow vehicles to enter the site, pick-up their students, and exit the site in a very streamlined fashion. During the site visit, we observed some congestion at the parking lot between the two schools after dismissal; however, it dissipated quickly and did not back-up to the school or block vehicles from maneuvering the site.

There is an additional access roadway located off Central Street, to the north of the main access road. This is a small loop road directly in front of Stoneham Middle School, and does not provide access to any of the parking on site. This road is for school personnel only and is not open for general traffic.

There are a number of existing issues with the condition of the internal roadway. The pavement is in poor condition and there are potholes in a few locations. Some of the signs along the roadway have been bent or are covered in graffiti rendering them illegible. The exit onto Central Street does not appear to be part of a school campus, and the roadway is surrounded by fencing and jersey barriers, giving it the feel of a location under construction. Below are some photos that highlight these concerns:

In front of Stoneham Middle School

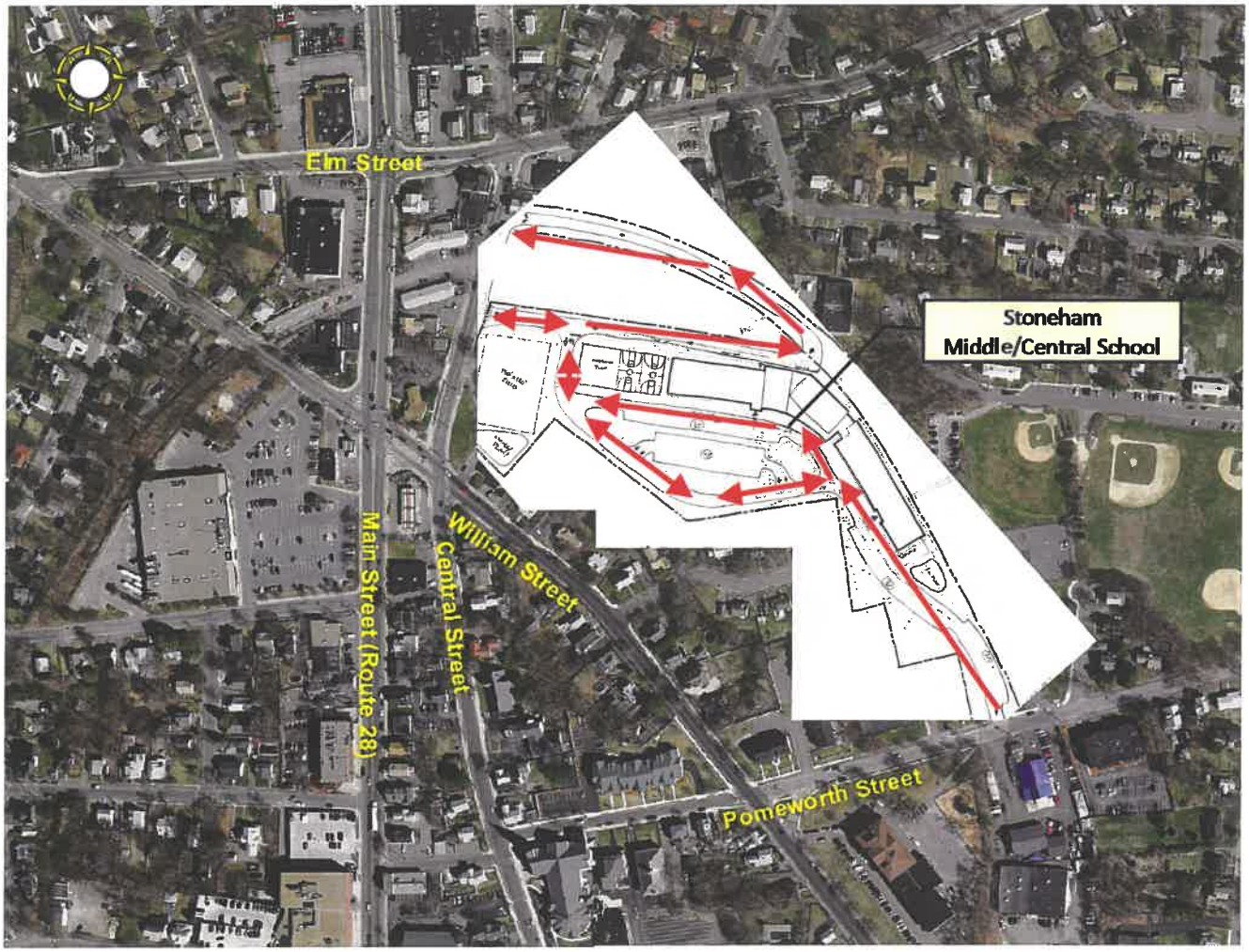
In front of Central Elementary School

Along Access Road

Exit from Access Road to Central Street

Proposed Stoneham Middle School/Central Elementary School Site

Figure 3 – Internal Circulation Central School Site



There are three access points at the proposed Stoneham Middle School/Central Elementary School Site. Two of these access drives are one-way, with one of them for incoming traffic and one for outgoing traffic. The third access drive allows two-way traffic into and out of the site. The incoming traffic can enter the site off of Pomeworth Street and Central Street, while the outgoing traffic can exit the site onto Central Street at two locations.

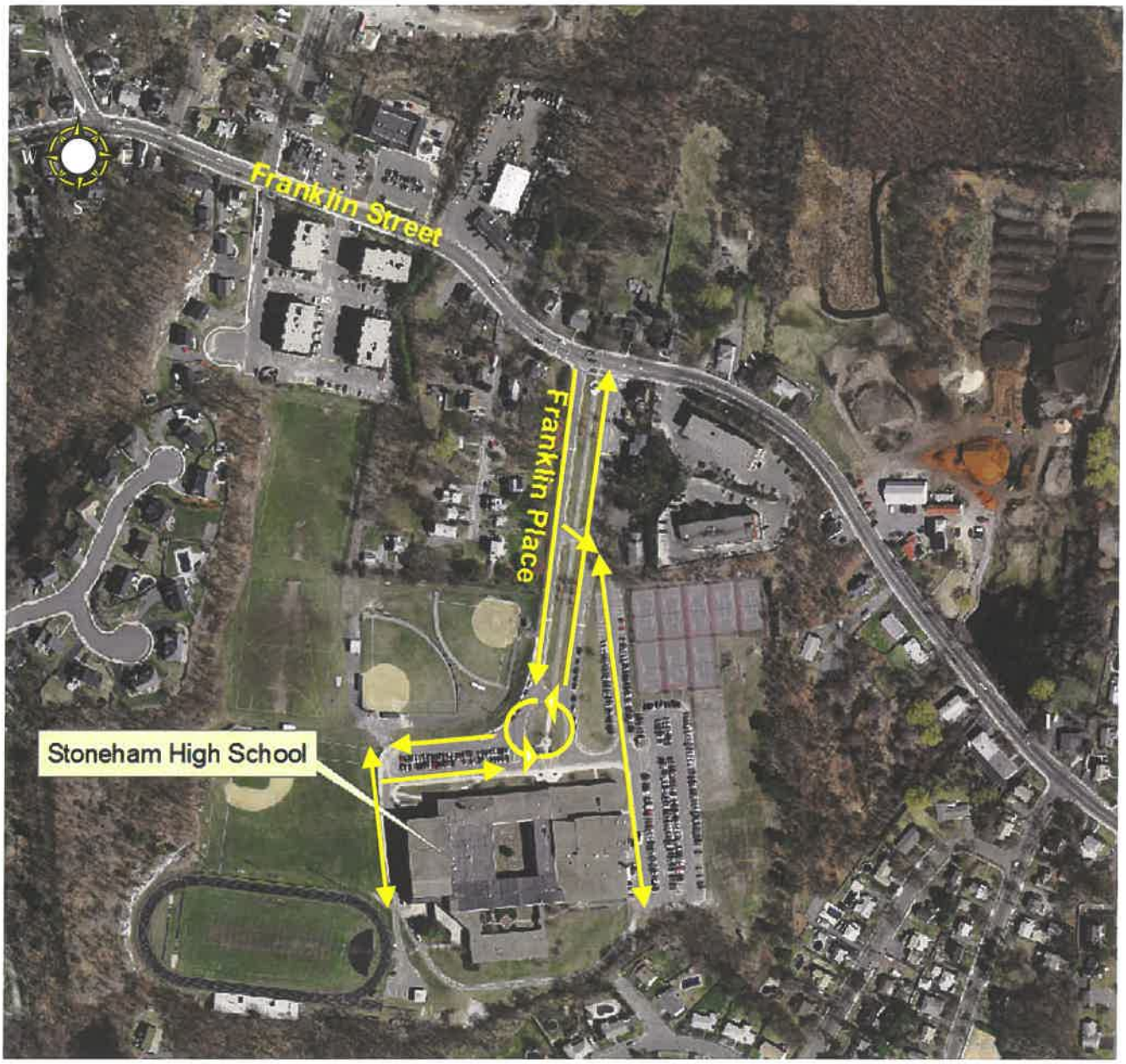
The entrance and exit onto Central Street still provide access to a second pick-up/drop-off lane on the north side of the school, providing significant additional space for vehicles to queue.

Under this alternative, the entrance drive from Pomeworth Street remains the same and the site drive exits onto Central Street at the location of the existing entry way. The two site drives meet at what becomes a T-intersection just east of Central Street. Traffic coming from the site drive off of Pomeworth Street must turn left at this intersection, to reduce the amount of traffic going through the second pick-up/drop-off area. However, vehicles can now enter the site from Central Street to access the parking areas. The creation of this intersection between the two site drives may cause internal queuing for vehicles exiting the site.

However, this queuing will occur completely onsite, and should not affect intersection operations at the site entry and exit points.

Existing Stoneham High School Site

Figure 4 – Internal Circulation Existing Stoneham High School Site



There is only one access point to the Stoneham High School site, located off of Franklin Street, and called Franklin Place. Franklin Place provides two-way access to the site. This access road travels straight to the High School main entrance, where the roadway ends at a small traffic circle in front of the school. However, within the site there are a few auxiliary drives that intersect with Franklin Place and provide access to the parking areas.

One auxiliary drive is located about half-way up Franklin Place between Franklin Street and the High School. This provides access to parking on the east side of the site. This creates a T-intersection condition, where Franklin Place is the through movement, and the auxiliary drive operates under "STOP" control. This was originally intended as an exit-only, however, there are no signs indicating you cannot turn into this drive, and many cars do so during the pick-up/drop-off periods in order to access the parking in these locations. This causes some back-up on Franklin Place due to cars attempting to turn left into the drive while vehicles are leaving the school from the main pick-up/drop-off area.

There is another auxiliary drive located adjacent to the main entrance of the high school. This drive services additional parking areas, and generally functions without conflicts, since the entrance to the drive is a right-turn rather than a left-turn, and there is no left-turn allowed out of the drive, since it intersects Franklin Place at the traffic circle in front of the high-school where there is a one-way condition.

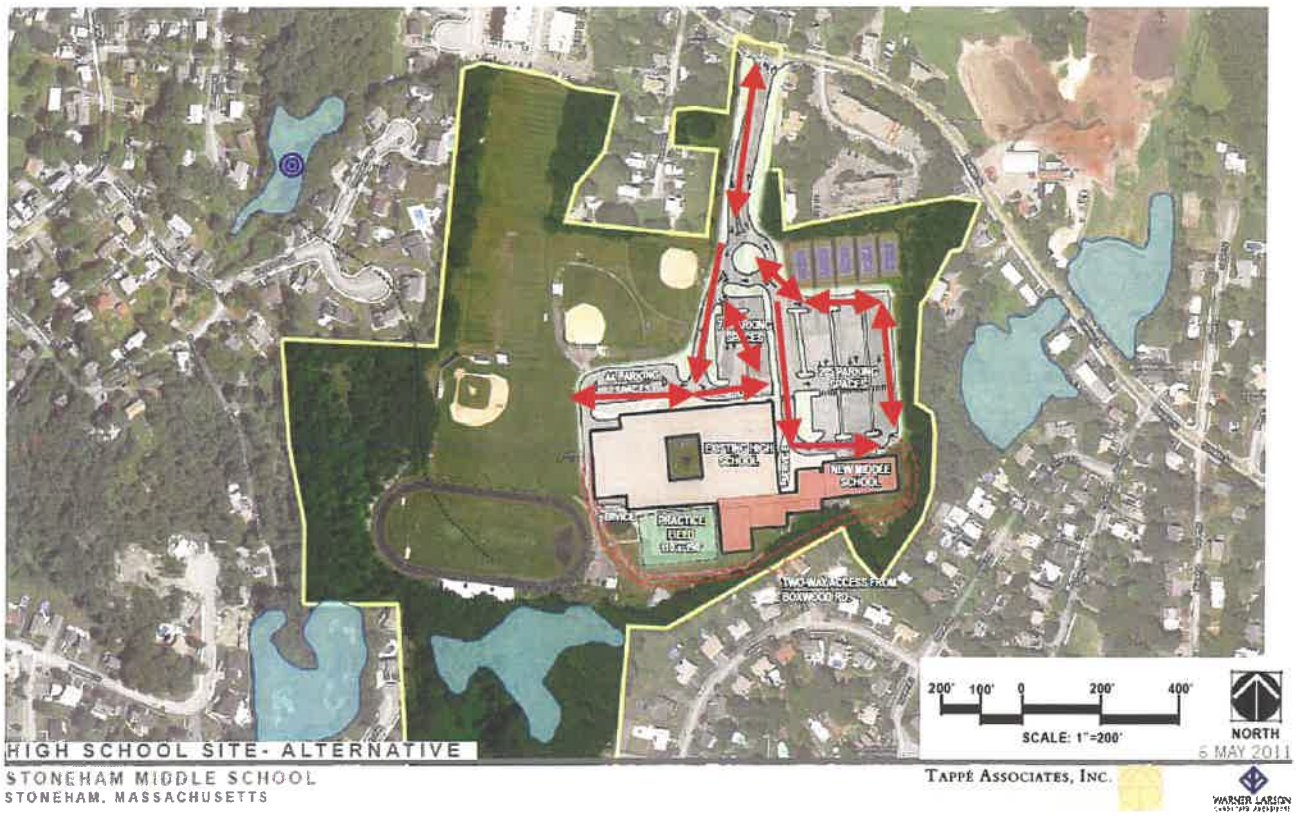
There are a number of existing issues with the physical condition of the high school roadway system: The pavement is in poor condition and is cracking in many locations. Pedestrian ramps are missing in many locations, are not in compliance with ADA, and are deteriorating along with the sidewalks. The signs are generally in good condition. Below are some photos that highlight these concerns:

In front of High School, looking North

In front of High School, looking west

Proposed Stoneham High School Site

Figure 5 – Internal Circulation Proposed Stoneham High School Site



Under this option the Stoneham Middle School will be relocated to the Stoneham High School Site. There would only be one access point for all vehicles at the location of Franklin Street and Franklin Place. This access point would provide two-way access to the site, and end in two separate drop-off loops with parking access on either side

The pick-up/drop-off for the High School would be separated from the pick-up/drop-off for the Middle School, to provide enough internal roadways to accommodate the additional queue from the Middle School traffic. At the intersection of the two roadway sections a roundabout will be provided to control access, this will allow vehicles to move efficiently to their destinations. However, the existing queue on Franklin Place extends past this point.

This option would greatly increase the levels of traffic using the intersection of Franklin Street and Franklin Place, which is already experiencing significant queuing within the school boundaries as observed during the site visit.

A number of alternatives for this site were also considered in conjunction with the one shown above. These alternatives provided additional access off of the site onto the nearby local roadways, either Robert's Way to the west of the site, or Boxwood Road to the east of the site. This would help dissipate the traffic leaving the site, as vehicles would be split between the two exits. The alternative access to Robert's Way would handle more traffic than the access to Boxwood Road, as most vehicles are currently travelling west as they exit the site. The potential new outlets from the site would go onto residential streets in the neighborhoods adjacent to the site. These streets currently end in cul-de-sacs and experience very limited traffic. Introducing a new roadway from the school would change the character of the street and increase traffic during school hours by a significant margin. In addition, the land directly adjacent to the school has some grade and wetland concerns that could make building a new road expensive. The alternative site configuration is shown in Figures 6 and 7.

Figure 6 – Internal Circulation Proposed Stoneham High School Site – Additional Boxwood Road Access

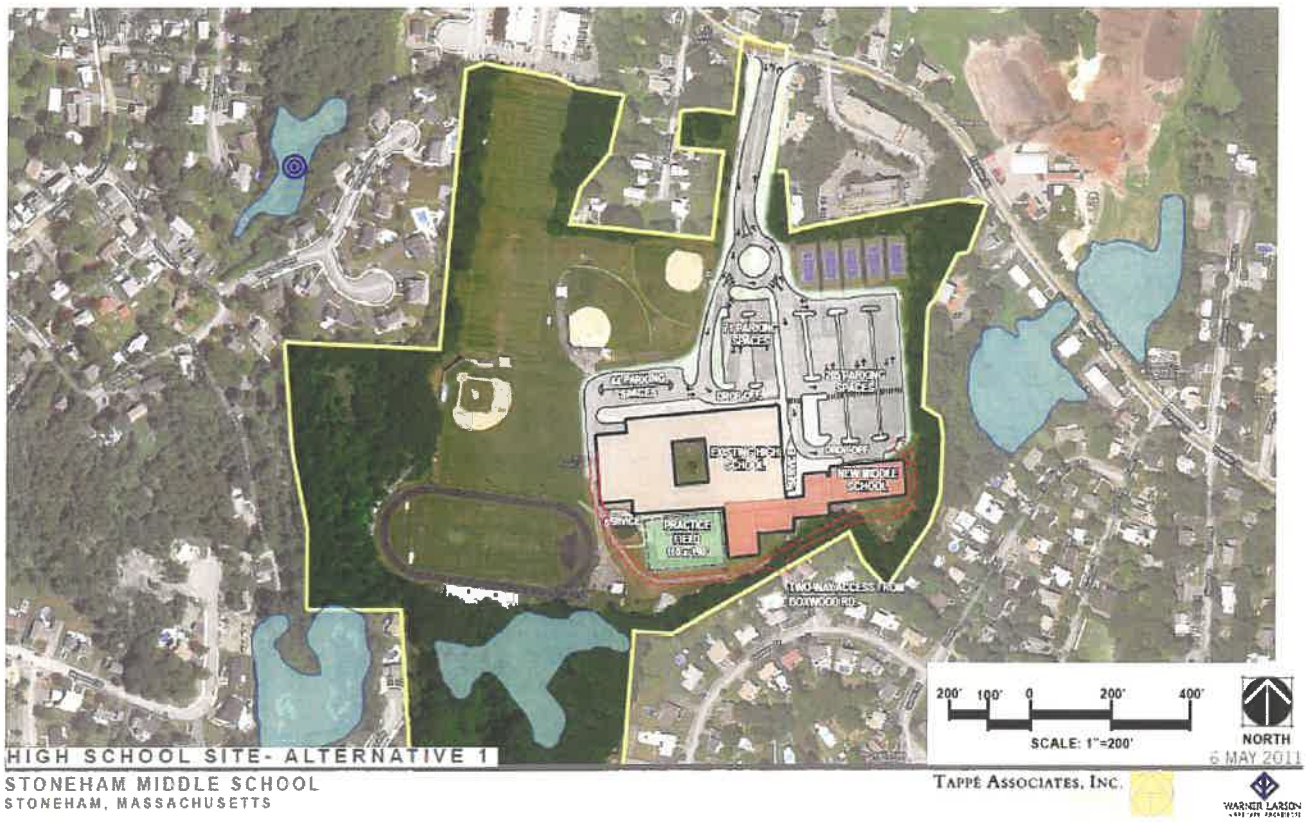
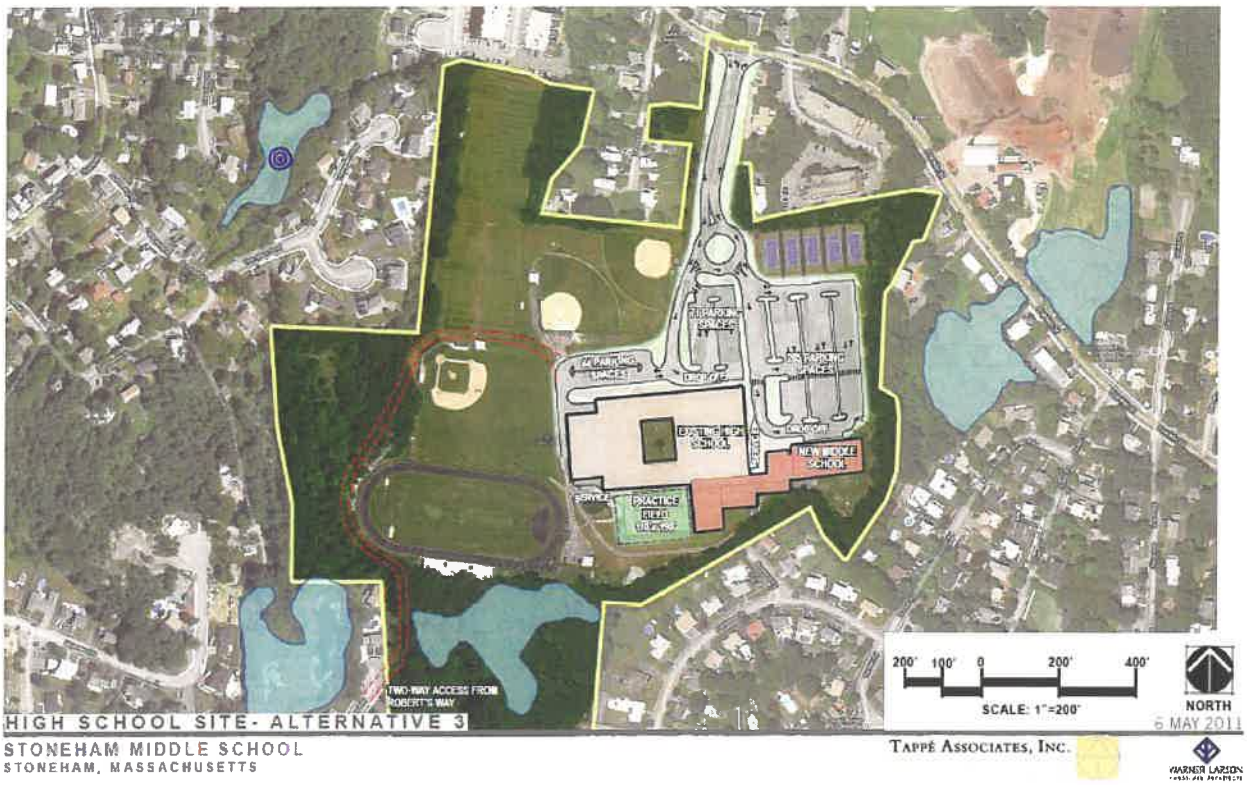


Figure 7 – Internal Circulation Proposed Stoneham High School Site – Additional Robert's Way Access



Parking

A parking inventory was performed on Monday March 28th, 2011 between 9:30 AM and 12:00 PM for both sites. This represents the people who come to school, park all day, and leave at the end of the day. It does not include those who temporarily park during the pick-up/drop-off period. The parking lot locations are shown in Figures 8 and 9, and the parking inventory, including the parking type, is shown in Tables 1 and 2.

Figure 8 – Parking Stoneham Middle School/Central Elementary School Site

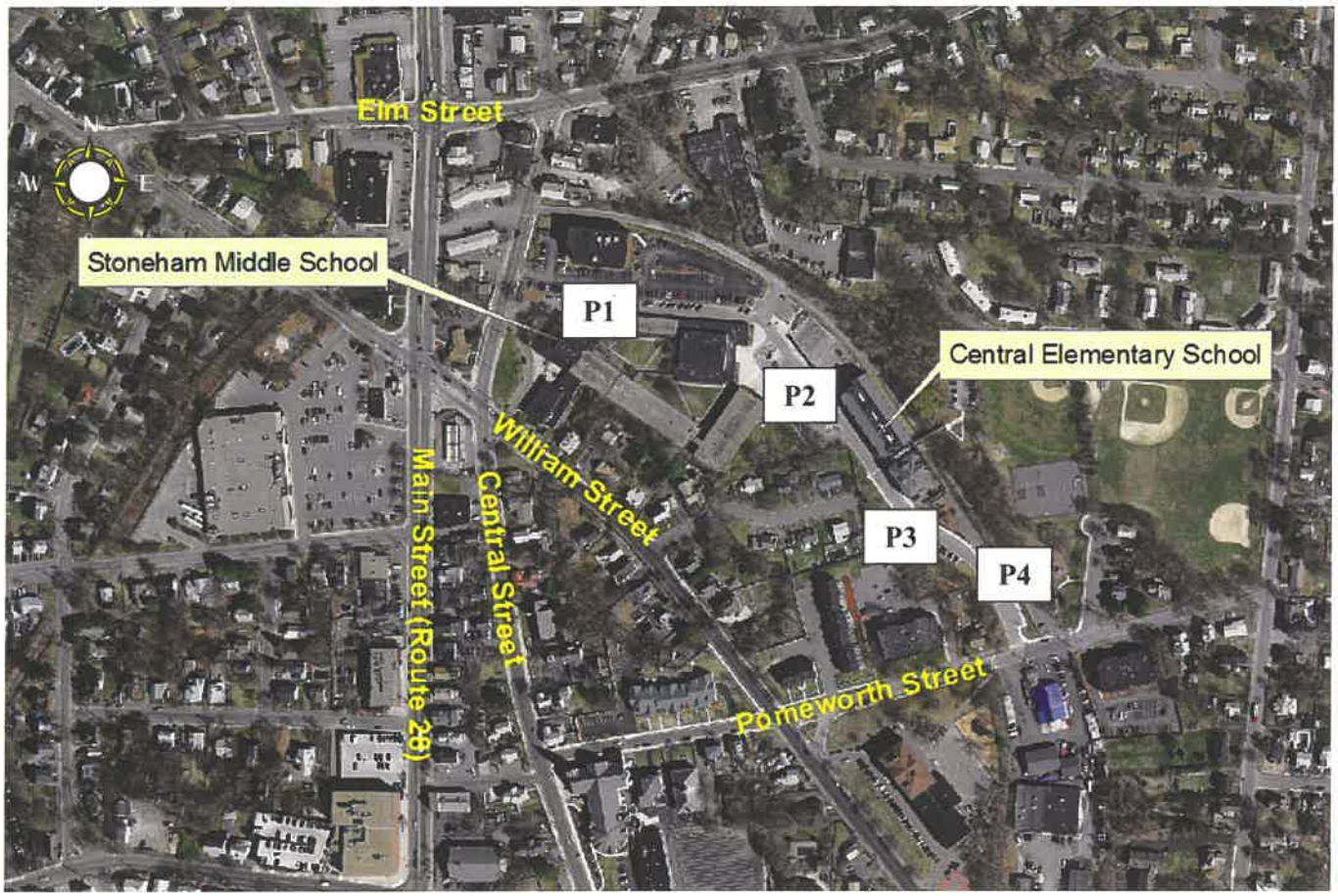


Figure 9 – Parking Stoneham High School Site

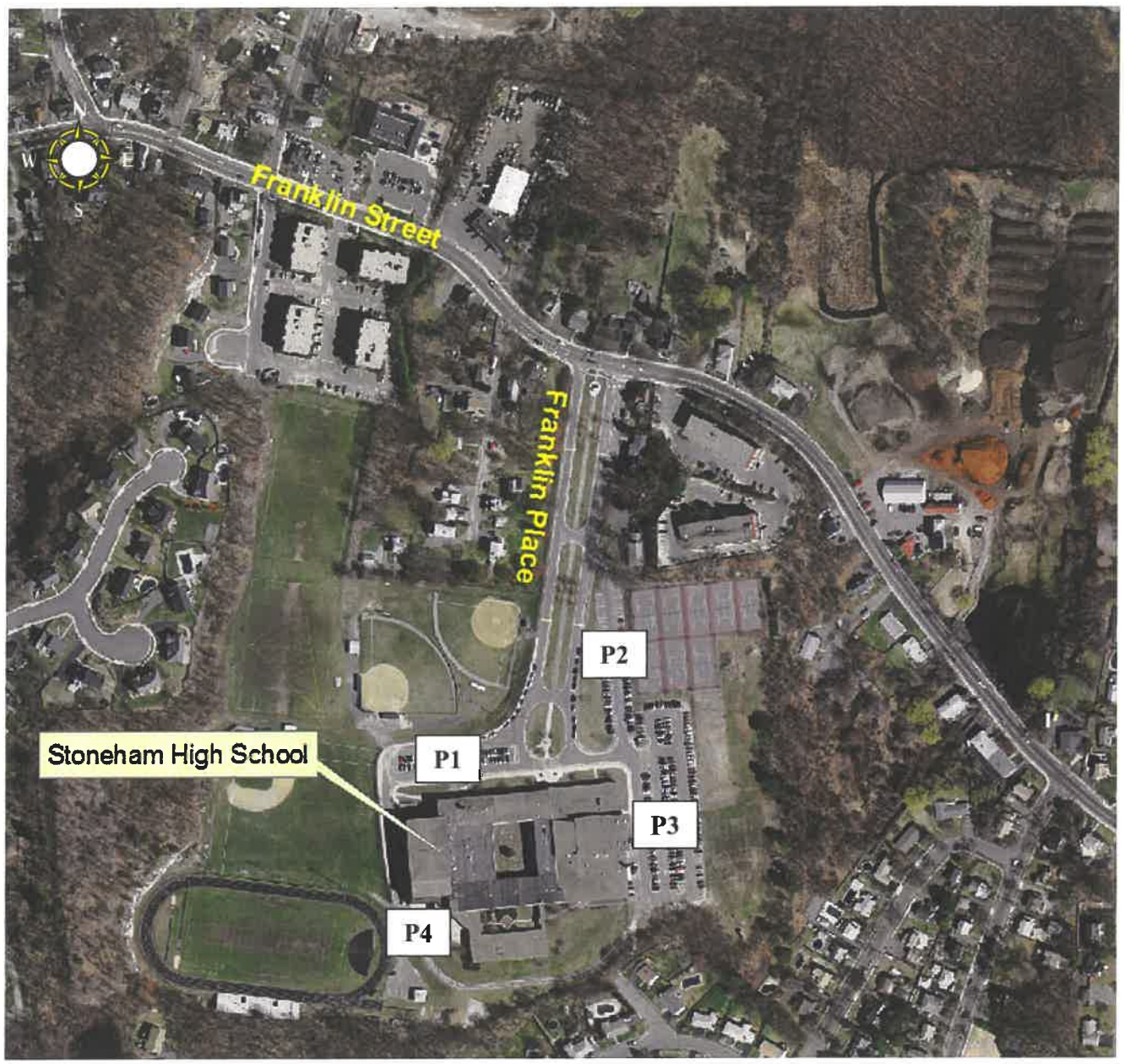


Table 1 - Existing Parking Inventory Stoneham Middle School/Central Elementary School Site

	Total Available	Total Occupied	Handicap Spaces	Restriction
P1	22	20	0	combination of staff only and private parking spaces for specific staff
P2	56	28	2	n/a
P3	16	5	2	combination of staff only and private parking spaces for specific staff
P4	20	0	0	n/a
TOTAL	114	53	4	

Table 2 - Existing Parking Inventory Stoneham High School Site

	Total Available	Total Occupied	Handicap Spaces	Restriction
P1	60	52	4	n/a
P2	74	48	0	n/a
P3	175	108	1	7 spaces "staff only"
P4	8	8	0	private parking spaces for specific staff
TOTAL	317	216	5	

As shown in Tables 1 and 2, there is ample parking available at both sites for the current population of students and staff that choose to park all day. The existing occupancy rate at the Stoneham Middle School/Central Elementary School site is 46.5%, and the occupancy rate at the Stoneham High School site is 68.1%. However, during the pick-up period in the afternoon, all of these spaces fill up since parents wait there for their students. In addition to those parked in the parking lots, there are a few spaces along Franklin Place southbound that are allocated for nurses. At the time of our site visit, three of these spaces were taken. There were an additional 2 cars parked in the restricted access drive in front of the Stoneham Middle School.

According to the American Disabilities Act, for a parking lot with 101 to 150 spaces, a minimum of 5 handicap accessible spaces is required. For a parking lot with 301 to 400 spaces, a minimum of 8 handicap accessible spaces is required. The current parking lots are not in compliance with these standards; however, this can be remediated by re-striping the existing parking lots to accommodate these users.

For the Central School site, the proposed parking will increase from 114 spaces under existing conditions to 135 spaces. Along with the addition of a new pick-up/drop-off lane, this will increase the space available on-site for parents to use during the pick-up/drop-off period. Since the number of students at this site will decrease under these alternatives, we do not anticipate these additional spaces being used throughout the day.

Moving the Middle School to the High School site will increase the student population of the High School site by 599 students. According to the ITE Parking Generation Handbook, 3rd edition, a Middle School with 599 students will generate demand for 64 parking spaces. This only represents the all-day parking spaces required and does not include any pick-up/drop-off traffic that waits in the parking area. Under existing conditions, the Stoneham Middle School/Central Elementary School site only used 33% of the parking spaces that ITE had anticipated. However, the High School site used 103% of what ITE had anticipated. One possible reason for the discrepancy is the relative location of each site. The existing Stoneham Middle School/Central Elementary School site is in close proximity to downtown Stoneham, while the existing High School site is significantly removed from the central business district. The density of the area may greatly increase the number of students and staff who walk to school, versus those who drive. We anticipate that if the Middle School is relocated to the High School site, a greater number of people will drive, and the parking requirements will be much closer to what ITE is predicting as compared to the existing scenario.

There are currently 317 parking spaces on the High School Site, but only 216 were being used at the time of our site visit. If no additional parking was provided, the existing site could accommodate these users,

however the parking occupancy would increase from 68.1% to 88.3%, leaving little room for any additional increase. In order to retain an occupancy rate of 68.1%, 412 spaces would be required, for an increase of 95 spaces.

Table 3 - Proposed Parking Central School Site

	Number of Spaces
Existing Parking Available	114
Existing Parking Used	53
ITE Rate for Existing Parking	161
Proposed Parking Available	135
ITE Rate for Proposed Parking	153

Table 4 - Proposed Parking High School Site

	Number of Spaces
Existing Parking Available	317
Existing Parking Used	216
ITE Rate for Existing Parking	209
Proposed Parking Available	320
ITE Rate for Proposed Parking	276
Proposed Parking Required to Retain Existing Occupancy	412

According to the American with Disabilities Act, for a parking lot with 101 to 150 spaces, a minimum of 5 handicap accessible spaces is required. For a parking lot with 401 to 500 spaces, a minimum of 9 handicap accessible spaces is required. The proposed parking lots should be striped to accommodate these designated spaces.

Crash Data

Nitsch Engineering analyzed crash data for the study area intersections. Massachusetts Department of Transportation (MassDOT) requires that the crash data reviewed for a project include the latest three years of available data to identify safety deficiencies. Accordingly, we queried MassDOT's crash record database for The City of Boston from 2006 to 2008, and identified 41 crashes in 2006, 37 crashes in 2007, and 42 crashes in 2008 in the study area. We also determined the crash rate for each intersection, which is defined as the number of crashes per million vehicles, per year. The crash summary is shown in Table 5.

Table 5 - Crash Summary

Location	Total	Ave per Year	Crash Rate
Main Street/Elm Street	13	11.7	1.09
	7		
	15		
Main Street/William Street	15	15.7	1.42
	17		
	15		
Central Street/Elm Street	1	2.7	0.60
	1		
	6		
Central Street/William Street	4	4.3	0.83
	6		
	3		
Pomeworth Street/School Access Drive	1	0.3	0.28
	0		
	0		
Franklin Street/Franklin Place	4	3.0	0.41
	4		
	1		
Total	**113**	**37.7**	

The statewide average crash rate for signalized intersections is 0.82 and the District 4 (which includes Stoneham) average is 0.78. For unsignalized intersections, the statewide average crash rate is 0.62, and the District 4 average is 0.59.

The crash summary shows that the majority of the crashes occur at the intersections along Main Street, with only a limited number of crashes occurring at the other locations. Both the Main Street crash rates are significantly higher than the state and district averages. Most of the other intersections are well below this average, with the exception of Central Street and William Street, which is slightly higher than the state average. Many of the crashes on Main Street occurred at businesses next to the intersections, indicating that vehicles turning into and out of the businesses conflict with the through traffic on Main Street, which causes some safety concerns. The intersection of Central Street and William Street is very close to the intersection of Main Street and William Street, and the geometry of the two intersections could pose some difficulty to drivers resulting in a slightly higher crash rate. Both of the intersections with William Street (Main Street and Central Street) have higher crash rates than the corresponding intersections with Elm Street.

The crash rates indicate that there are safety issues associated with the intersections on Main Street and William Street. Any potential designs should take this into account, and efforts should be made to shift school related traffic from these locations. This may occur under either proposed scenario, either by moving the middle school to the high school site, by reducing the amount of traffic to the middle school site, or by relocating the middle school from Central Street to Pomeworth Street, and shifting some of the traffic to that end of the site.

Traffic Volumes

Nitsch Engineering completed a data collection effort for the study intersections on Tuesday, March 29, 2011. Data collected included Turning Movement Counts (TMCs) for cars, bicycles, and pedestrians over two hour periods from 7:00 AM to 9:00 AM and 1:30 PM to 3:30 PM. From these two hour counts, a one-hour peak period was calculated for the AM and the PM. The AM peak period occurs between 7:15 AM and 8:15 AM. The PM peak period occurs between 2:30 PM and 3:30 PM. In addition, Automatic Traffic Recorded (ATR) Volumes were collected for a 48-hour period at five locations from March 23 to March 24, 2011.

The TMCs and ATR data counts were performed during March. According to the MassDOT statewide traffic data, the traffic volumes in March are higher than average for this type of area. The March counts were not adjusted downward to represent the average, as the more conservative month is more applicable to school related functions.

Nitsch Engineering gathered traffic data for all the MassDOT permanent count stations located in Stoneham, MA. One count stations on Route 28 (Main Street) contained data from multiple years. This station was used to determine the background growth rate for Stoneham MA:

- 0407L: Route 28, 0.8 km south of Reading town line

Comparing the traffic counts at these stations between 2000 and 2009, the traffic decreased by approximately 13% over this time period. A standard traffic engineering practice is to use a more conservative 0.5% background growth rate if the data indicates a negative or stagnant growth trend. This background growth rate was used to determine a 2021 future no-build scenario.

The traffic volumes are included in the technical appendix.

Pick-Up/Drop-Off Operations

In addition to these traffic counts, Nitsch Engineering visited the sites on Monday, March 28 and Tuesday, March 29, 2011 to observe the pick-up/drop-off period. We also received a survey administered by the Stoneham Public Schools to the Stoneham Middle School students, in order to determine how people are travelling to school, as well as the specific issues associated with these operations internal to each site. Table 6 shows the survey results.

Table 6 - Stoneham Middle School Survey Results

Mode Split	**Number of Students**
Walk/Bike	44
Walk unless weather is poor	47
Ride in Car	391
Ride Sharing	
Carpool with High School Student	100
Carpool with 2 students	42
Carpool with 3 students	64
Carpool with 4 students	32
Carpool with 5 or more students	16
Pick-Up/Drop-Off Location	
School Parking Lot	127
Bank Parking Lot	96
105 Central next to school	102
Gas Station	112
Other	20

As seen in Table 6, a significant number of the students who drive to Stoneham Middle School use adjacent properties as pick-up/drop-off locations. This is a clear indication that there is a lack of adequate space on the existing campus for such an event. During the site visit, we were notified by a bank manager of the issues they are having as a result of parent pick-up/drop-off, which recently resulted in an altercation between a bank employee and a parent of a student at the middle school.

In addition, this survey shows us that about a quarter of all middle school students share a car with a high school student. In the event that the middle school was relocated to the high school site, this would mean that there would be fewer vehicle trips generated from picking-up and dropping-off at the combined site, than there are at the two sites today. Finally, the survey indicates that a significant number of middle school students currently walk to the site. This number may drop if the building is relocated, as the middle school is in a much denser area than the high school, resulting in more students driving to campus. This table also indicates that there are approximately 391 vehicles that participate in the pick-up/drop-off at the existing Stoneham Middle School, with an average occupancy rate of 1.2 people per vehicle.

During our site visit, we observed that while the pick-up/drop-off for the Central Elementary School runs relatively smoothly, with limited impacts to the adjacent streets, the pick-up/drop-off for the Stoneham Middle School was much more hectic. Students were entering and exiting vehicles parked in front of neighboring businesses crossing an active street and local driveways. Traffic was slightly backed up on Central Street due to vehicles stopping. There are a number of crossing guards that control traffic to try and help students cross the street, an indication that the existing roadway network is insufficiently safe for this action. There is significant traffic on the nearby roadways of William Street and Main Street, which also causes some traffic to back-up on Central Street. There was some internal queuing between the Central Elementary School and Stoneham Middle School sites during the pick-up period, due to the single exit from the site onto Central Street. Vehicles that came to pick-up at the Central Elementary School and were able to park in P5, thus

being able to exit onto Pomeworth Street, were able to exit the site much quicker. However, this was only beneficial to the vehicles picking up at Central Elementary School, since P5 is a significant distance away from the Stoneham Middle School.

During the morning drop-off period at the high school site, the operations on Franklin Place run relatively smoothly. It did not appear that there were significant queuing issues for the vehicles dropping students off at the high school. There was some queuing at the intersection of Franklin Street and Franklin Place; however, it was easily contained within the length of Franklin Place. However, during the afternoon pick-up period, there was significant queuing at the intersection of Franklin Street and Franklin Place, where the queue extended all the way to the main entrance of the high school, and prevented people from exiting the site parking lots. This queue condition lasted for about 30 minutes from 2:15 to 2:45, causing significant delays for everyone trying to exit the site.

From the ATR volumes on the school site drives, we were able to estimate the number of students that pick-up and drop-off at the two locations. These volumes are shown in Table 7.

Table 7 - Pick-Up/Drop-Off Volumes from ATR counts

	Stoneham Middle School/Central Elementary School		Stoneham High School	
	IN	OUT	IN	OUT
AM peak hour	281	240	477	281
Drop-off total	304	259	539	310
PM peak hour	70	147	110	254
Pick-up total	180	220	166	296

The highlighted cells represent the estimated pick-up/drop-off volume at each location, not including those vehicles that enter/exit the site for parking. As you can see, traffic volumes during the drop-off period are significantly heavier than the pick-up period. This is typical, and is usually due to the fact that students arrive at school at uniform times but depart school at staggered times due to afterschool activities. Combining this information with the student survey, we can estimate that approximately 127 of the vehicles dropping off on the Stoneham Middle School/Central Elementary School site are destined for the Stoneham Middle School (with the remaining vehicles picking-up/dropping-off at other locations), and the remaining 132 vehicles are destined for the Central Elementary School site. This corresponds to what was observed during our site visit.

The traffic recorded data also indicates that approximately 74% of all traffic enters the site from Pomeworth Street during the morning peak hour, and 70% enters from Pomeworth Street during the evening peak hour. This is most likely due to the fact that vehicles entering the site from Pomeworth Street are destined for Central Elementary School, and the vehicles that would enter the site from Central Street are destined for the Stoneham Middle School. However, as indicated in the survey and observed during our site visit, the majority of these vehicles never enter the site, instead choosing to pick-up/drop-off at other locations. This is also an indication that the preferred access to the site for vehicles is off of Pomeworth Street, away from the Stoneham commercial district on Main Street.

2011 Existing Intersection Operations

A Level of Service (LOS) analysis is a quantitative assessment of traffic operations at an intersection. Nitsch Engineering conducted an LOS analysis at the study area intersections using the procedures outlined in the 2003 Highway Capacity Manual (HCM)[1]. The intersections were analyzed using SYNCHRO Version 6 computer software. The HCM bases its LOS results on average delay experienced by vehicles at intersections. The HCM categorizes LOS by alphabets A through F, with LOS A representing minimum delays and good service, and LOS F representing significant delays and poor service. MassDOT considers,

LOS A, B, C and D as acceptable in urban/suburban areas, and LOS E and LOS F as unacceptable. Nitsch Engineering analyzed the existing year 2011 traffic operations at the study intersections. Table 8 summarizes the existing intersection operations at the Stoneham Middle School/Central Elementary School site. Table 9 summarizes the existing intersection operations at the Stoneham High School site.

Table 8 - 2011 Existing LOS Stoneham Middle School/Central Elementary School Site

INTERSECTION	MOVEMENT	AM PEAK HOUR					PM PEAK HOUR				
		V/C	DELAY	LOS	50th Q	95th Q	V/C	DELAY	LOS	50th Q	95th Q
Main Street (Route 28) & Elm Street	EB L	0.88	117.8	F	40	89	0.69	45.9	D	43	167
	EB TR	0.89	78.6	E	134	211	0.57	32.6	C	99	227
	WB L	0.79	56.7	E	107	63	0.59	28.3	C	58	131
	WB TR	1.81	418.2	F	386	83	0.66	35.6	D	109	287
	NB L	0.56	49.9	D	17	36	0.42	35.6	D	13	34
	NB TR	0.66	25.8	C	234	313	0.68	27	C	173	338
	SB L	0.53	17.4	B	43	102	0.54	19.6	B	30	102
	SB TR	0.98	47.1	D	441	769	1.05	68.5	E	332	705
	Intersection	1.03	88.6	F			0.85	46.1	D		
Main Street (Route 28) & William Street	EB LTR	1.05	100.3	F	127	145	0.81	45.9	D	103	166
	WB LT	1.18	117.1	F	180	237	0.64	38.4	D	116	191
	WB R	0.19	27.6	C	40	42	0.18	31.5	C	0	54
	NB LTR	0.51	16.6	B	133	150	0.59	20.7	C	164	185
	SB L	0.4	10.8	B	40	64	0.33	12.4	B	32	53
	SB TR	0.46	5.1	A	123	157	0.28	4.4	A	55	75
	Intersection	0.62	34	C			0.57	21.8	C		
Central Street & Elm Street	EB LTR	0.8	44.1	D	146	459	1.48	267.2	F	328	670
	WB LTR	3.24	1053.8	F	1242	851	2.29	630.5	F	390	678
	NB LTR	0.66	35.5	D	170	283	0.62	33.5	C	111	215
	SB LTR	0.09	12.7	B	19	27	0.04	8.9	A	3	10
	Intersection	1.44	608.9	F			0.86	325.2	F		
Central Street & William Street	EB TR	0.25	10.8	B	40	51	0.27	15.1	B	84	118
	WB LTR	0.91	44.5	D	353	444	0.88	40.7	D	382	262
	NB LTR	1.13	137.8	F	145	144	0.93	75.3	E	159	269
	SB LT	0.9	65	E	147	195	0.82	51.8	D	171	194
	Intersection	0.88	53.1	D			0.8	40.6	D		
Pomeworth Street & School Access Drive	EB L	0.05	4	A		4	0.02	1.6	A		2
	SB LR	0	10.8	B		0	0	9.4	A		0
	Intersection		1.2	A				1.1	A		

Table 9 - 2011 Existing LOS Stoneham High School Site

INTERSECTION	MOVEMENT	AM PEAK HOUR					PM PEAK HOUR				
		V/C	DELAY	LOS	50th Q	95th Q	V/C	DELAY	LOS	50th Q	95th Q
Franklin Street & Franklin Place	EB T	0.83	24.6	C	255	343	0.88	31.6	C	458	622
	EB R	0.63	17.1	B	69	39	0.12	13	B	19	54
	WB L	0.33	12.7	B	13	28	0.16	14.8	B	10	15
	WB T	0.8	17.1	B	250	413	0.58	12.5	B	256	368
	NB L	0.77	33.5	C	146	247	0.86	48.8	D	218	174
	NB R	0.06	18.4	B	0	2	0.07	23.4	C	0	0
	Intersection	0.79	21	C			0.87	26.7	C		

As shown in Table 8, there are a number of intersections that experience significant delay issues during both peak hours. The four intersections next to the Stoneham Middle School site, Main Street/Elm Street, Main Street/William Street, Central Street/Elm Street, and Central Street/William Street all experience LOS F on at least one approach during the morning peak hour. In addition, the intersection of Central Street/Elm Street experiences LOS F during the afternoon peak hour, and the northbound approach to the intersection of Central Street and William Street experiences a LOS E as does the southbound approach to the intersection of Main Street and Elm Street. The reason that the morning peak hour is worse than the evening peak hour, particularly on Main Street, is due to the fact that the morning peak hour for the schools generally corresponds with peak commute time for the town. However, the afternoon peak hour for the schools occurs earlier than peak commute time for the town, so there is less background traffic on the roadways. In the event that the Stoneham Middle School/Central Elementary School site is chosen for the reconstruction of the new middle school, the proposed enrollment for the site is projected to be reduced by 150 students. This may improve the traffic operations in the vicinity of the site. In addition, Table 8 indicates that there is excess capacity at the existing intersection of Pomeworth Street and the School Access drive, which currently experiences a very good LOS. Traffic could potentially be shifted to this intersection with limited impacts to the roadway operations.

Table 9 indicates that there are no significant delay issues at the intersection of Franklin Street/Franklin Place or Pomeworth Street/ School Access Drive. However, during the site visit, significant queuing was observed at the intersection of Franklin Street/Franklin Place. This is an indication that there are an adequate number of lanes for a functional intersection, but inadequate storage for the queue. This could be mitigated by extending the queue length of the existing storage lanes, or by introducing additional lanes. Any additional traffic that is added to this site from the middle school relocation could potentially cause the LOS at this intersection to worsen.

Trip Generation

To determine the number of trips that will be generated by the proposed sites, Nitsch Engineering compared the existing number of students to the existing number of vehicles entering and exiting each site during the peak hours. This rate was then used to determine the projected increase in traffic based on the student enrollment. There was also a survey given to the students of the existing Stoneham Middle School that indicated a significant number of students currently drive to school with a Stoneham High School student. According to the survey, approximately 100 students are participating in this carpool. The survey also indicated an average vehicle occupancy rate of 1.2 amongst Middle School students. Applying this rate to the 100 students, we anticipate a reduction of approximately 83 cars from the proposed High School option, due to carpooling.

The student survey also indicated that only 28% of all students who participate in the pick-up/drop-off for the Stoneham Middle School are using the current school parking lot for this operation. With the increase in queue space and parking areas for the pick-up/drop-off traffic, we anticipate that these vehicles will now be entering the site, resulting in new trips at the site drives. These are not new vehicles to the surrounding roadway, but they will be new to the site itself. Table 10 shows the trip generation calculations.

Table 10 - Proposed Trip Generation

	Existing Central Site		**Existing High School Site**		**Proposed Central School Site**		**Proposed High School Site**	
Number of Students	932		736		785		1335	
Number of Vehicles	IN	OUT	IN	OUT	IN	OUT	IN	OUT
AM Peak	278	240	460	292	469	437	751	447
PM Peak	68	147	137	242	292	359	165	356
Vehicles / Student								
AM Peak	0.30	0.26	0.63	0.40				
PM Peak	0.07	0.16	0.19	0.33				
Reduction From Carpool								
AM Peak							83	83
PM Peak							83	83
Increase From Pick-Up/Drop-Off								
AM Peak					235	235		
PM Peak					235	235		

As you can see in Table 10, the existing Central site generates significantly fewer trips per person than the existing High School site. This is primarily due to the location of each site, as the Central site is located in a much denser area and attracts a greater percentage of walkers than the High School site.

Under the Central Site alternative, the driveways will experience an increase in trips from existing conditions due to the increased accommodations for pick-up/drop-off traffic. However, all of these trips will only be new to the site drives and the surrounding roadways will see a slight decrease in the number of total trips to the area. The proposed High School Site option will experience a significant increase in trips due to the increase in students at this location.

2021 No Build Intersection Operations

Nitsch Engineering performed a design year traffic analysis to compare traffic operations without the proposed renovations. We based the analyses on a ten-year horizon from the existing year, 2011. Design year 2021 no-build volumes were developed using a 0.5% background growth rate to account for any residential, commercial or other developments within the next ten years. Table 11 summarizes the result of the 2021 No-Build traffic analyses at the Stoneham Middle School/Central Elementary School site and Table 12 summarizes the results of the 2021 No-Build traffic analyses at the Stoneham High School site.

Table 11 - 2021 No Build LOS Stoneham Central School Site

INTERSECTION	MOVEMENT	AM PEAK HOUR					PM PEAK HOUR				
		V/C	DELAY	LOS	50th Q	95th Q	V/C	DELAY	LOS	50th Q	95th Q
Main Street (Route 28) & Elm Street	EB L	0.92	127.7	F	42	95	0.85	75.4	E	46	178
	EB TR	0.95	91.4	F	141	225	0.57	33.5	C	96	218
	WB L	0.82	57.7	E	116	64	0.63	31.1	C	62	140
	WB TR	1.95	480.7	F	415	84	0.71	39	D	116	309
	NB L	0.59	53.1	D	18	38	0.33	29	C	13	35
	NB TR	0.7	27.1	C	254	355	0.74	29.6	C	185	370
	SB L	0.58	19.2	B	45	112	0.63	22.5	C	37	150
	SB TR	1.04	62.7	E	484	821	0.69	28.3	C	172	336
	Intersection	1.08	103.9	F			0.75	31.8	C		
Main Street (Route 28) & William Street	EB LTR	1.15	135.3	F	150	162	0.87	52.8	D	110	181
	WB LT	1.3	162.7	F	228	234	0.68	39.9	D	123	207
	WB R	0.2	28.2	C	37	38	0.19	31.5	C	0	54
	NB LTR	0.56	17.4	B	146	164	0.63	21.5	C	177	199
	SB L	0.43	11.7	B	42	67	0.35	13.6	B	33	55
	SB TR	0.49	5.3	A	134	170	0.29	4.4	A	59	80
	Intersection	0.68	43.5	D			0.61	23.3	C		
Central Street & Elm Street	EB LTR	0.86	47.7	D	155	478	1.57	305.4	F	358	711
	WB LTR	3.5	1169.9	F	1317	894	2.44	700.3	F	419	715
	NB LTR	0.71	37.5	D	186	308	0.66	34.9	C	120	231
	SB LTR	0.09	12.8	B	20	27	0.04	8.9	A	3	10
	Intersection	1.55	674.7	F			0.92	363.9	F		
Central Street & William Street	EB TR	0.27	10.5	B	45	46	0.28	15.3	B	90	125
	WB LTR	0.97	56.5	E	388	490	0.91	44.3	D	413	278
	NB LTR	1.22	170.6	F	167	157	0.97	85.5	F	166	288
	SB LT	0.93	72.4	E	155	210	0.86	57.3	E	182	205
	Intersection	0.94	64.3	E			0.83	44.4	D		
Pomeworth Street & School Access Drive	EB L	0.06	4.1	A		5	0.03	1.7	A		2
	SB LR	0	10.9	B		0	0	9.8	A		0
	Intersection		1.2	A				1.1	A		

Table 12 - 2021 No Build LOS Stoneham High School Site

INTERSECTION	MOVEMENT	AM PEAK HOUR					PM PEAK HOUR				
		V/C	DELAY	LOS	50th Q	95th Q	V/C	DELAY	LOS	50th Q	95th Q
Franklin Street & Franklin Place	EB T	0.86	27.8	C	277	366	0.91	35	D	463	629
	EB R	0.67	18.9	B	88	49	0.12	13.6	B	20	56
	WB L	0.39	14.3	B	14	29	0.18	15.8	B	10	15
	WB T	0.84	20.1	C	275	447	0.59	13.3	B	258	371
	NB L	0.79	35.7	D	167	276	0.86	47.8	D	232	182
	NB R	0.06	19.1	B	0	2	0.08	23.2	C	0	0
	Intersection	0.82	23.5	C			0.88	28.3	C		

As shown in the above tables there are a number of intersections that experience significant capacity issues under 2021 No Build conditions. The LOS highlighted in yellow indicates a movement that had capacity issues under existing conditions. The LOS highlighted in orange indicates a movement that experienced acceptable LOS (D or better) under existing conditions, but under future growth will experience capacity issues. As you can see from Table 11, the intersection of Central Street and William Street would be affected by any increase in traffic with the westbound approach and the overall intersection degrading to a LOS E during the morning peak hour, and the southbound approach degrading to a LOS E during the evening peak hour. The intersection of Main Street and Elm Street would also be affected on the southbound approach, which goes to a LOS E during the morning peak hour, and the eastbound left-turning movement which will go to a LOS E during the PM peak hour. The other intersection operations remain similar to existing conditions, or at an acceptable LOS.