



Mountview Middle School

270 Shrewsbury Street, Holden, Massachusetts

MSBA Feasibility Study Preferred Schematic Report (PSR)

September 27, 2012

MSBA

Massachusetts School Building Authority
40 Broad Street, Suite 500, Boston, MA 02111

OWNER

Town of Holden, MA
1204 Main Street, Starbard Building, Holden, MA 01520

Wachusett Regional School District
1745 Main Street, Jefferson, MA 01522

OPM

Gary Kaczmarek
Town of Holden
1384 Main Street, Holden, MA 01520

DESIGNER

Lamoureux Pagano & Associates, Inc.
108 Grove Street, Suite 300, Worcester, MA 01605

Prepared by:

 LAMOUREUX • PAGANO
ASSOCIATES, ARCHITECTS

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3.3.2.1 INTRODUCTION

A. Narrative Summary

3.3.2.1 INTRODUCTION

A. Narrative Summary

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3.3.2.1 INTRODUCTION

A. Narrative Summary

FEASIBILITY STUDY

Since the submittal of the Preliminary Design Program (PDP) to the MSBA on August 15, 2012 the School Committee, the OPM and Lamoureux Pagano & Associates, with its consultants, have continued to develop the 2nd Phase of the Feasibility Study, the Preferred Schematic Report (PSR).

These developments include refining the three preliminary alternatives for items such as the duration of construction, requirements for temporary classrooms to augment the reno/addition construction sequence, and development of potential site and floor plans.

The following report includes updates to reports previously incorporated in the P.D.P. The MA-CHPS scorecard and statement from the designer relative to the MSBA High Efficiency Green School program is included within this report.

The project team has continued the community outreach effort as previously described in the PDP:

1. The project website has been updated regularly with presentations made to the SBC and others, and meeting minutes.
2. The group prepared and distributed a factual information sheet during "Holden Days", a town wide festival.
3. A Green Design Charrette was conducted by the design team and was attended by representatives of the SBC, District, OPM, and the public.
4. A presentation was made to a joint meeting of the School Building Committee, Wachusett Regional School District, and School Committee; to bring the School Committee up to date.
5. A presentation was made to a joint meeting of the Selectmen, Finance Committee, School Building Committee and the public to bring all parties up to date.

An updated Project Schedule, prepared by the Owner's Project Manager is included in section 3.3.2.4 Preferred Solution. The key dates are:

1. Projected MSBA Board Approval to proceed into Schematic Design phase is October 3, 2012.
2. Completion of Feasibility Study including Schematic Design/Final Program is November 2012. (Actual date to be determined)
3. Project Scope and Budget Conference/Execution of Project Scope and Budget Agreement is March 2013. (Actual date to be determined)



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A. Narrative Summary

FEASIBILITY STUDY

4. Projected Town vote for Project Scope and Budget Agreement to be between January 2013 and May 2013.

Three preliminary design options were presented to the School Building Committee. The three alternatives include one Addition/Renovation, one New Construction option on the existing site, and one New Construction option on the alternate site, Malden Street. After studying the merits and limitations of each option, the School Building Committee voted to support the construction of a new school on the existing site option.

This Option consists of a new three-story building and associated site development located behind the existing Mountview Middle School on Shrewsbury Street. The proposed design assumes continued use of the school building until the new school building is completed, then the existing building will be demolished, and the area used for play fields. The Option is described in greater detail under section 3.3.2.4 Preferred Solution.



3.3.2.2 EVALUATION OF EXISTING CONDITIONS

- A. Narrative
- B. Supporting Documents

3.3.2.2 EVALUATION OF EXISTING CONDITIONS

A. Narrative Summary

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3.3.2.2 EVALUATION OF EXISTING CONDITIONS

A. Narrative Summary

FEASIBILITY STUDY

The preceding portion of the Study, the PDP, addressed the existing conditions of the school. There have been no changes as to the status of the building

The further study of the renovation/addition opinion during this PSR Phase has resulted in the need to revise the associated "Study Cost Estimate" for both renovation and addition areas. (See 3.3.2.3.B. "Preliminary Design Options: Renovation/Addition Option" for revised cost estimate). Updated cost estimates for the New Building/Existing Site and New Building Alternate are included in 3.3.2.3.C. and 3.3.2.3.D. of this report.

Attached is a report titled "Food Service Report Narrative" which was inadvertently omitted from the original information provided. The concluding paragraph "Recommendations" has been integrated into the following studies of both the renovation/addition option and new building.

Additionally, the development of programming plans for the new construction options resulted in deviations to the "Proposed Space Summary" (3.1.3.B.) submitted. Those changes are:

1. Five self-contained sped classrooms of 1,060 s.f. each instead of two self-contained sped classrooms of 1,200 s.f. each previously listed in the PDP.
2. Five sped resource and three sped reading rooms instead of the six resource and four sped reading rooms previously listed in the PDP. Resource rooms' area has increased to 630 s.f. instead of 500 s.f.

In both the renovation/addition and new building options, small deviations in room sizes from the PDP after the development of preliminary plans. Refer to the revised "MSBA Space Summary" in Section 3.3.2.4.B of the Preferred Solution chapter for connections to previously submitted "MSBA Space Summary" submitted in the PDP.

Also included is additional correspondence from the Superintendent of Schools supplementing the argument for the requested variances to MSBA guidelines and for the reduced size of the Media Center to his previous letter included in the PDP variances (3.1.3.C. "Narrative for Variance"), and minutes for the WRSD Education Subcommittee (8/15/12) endorsing the decentralization of the Media Center.

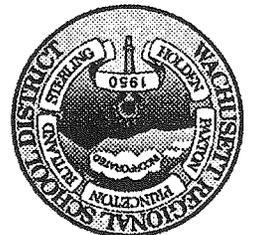


3.3.2.2 EVALUATION OF EXISTING CONDITIONS

B. Supporting Documents

1. District Letter
2. District Space Summary
Variances
3. WRSD Education
Subcommittee Minutes
4. C&G Foodservice Narrative

*Wachusett Regional School District
Stalen, Saxton, Swinerton, Suttland, Sterling*



August 29, 2012

To Whom it May Concern:

RE: Mountview Middle School, Holden, Massachusetts

I am writing in order to follow up on a letter that I had sent to the MSBA previously on behalf of the Mountview Building Committee. As stated in that letter, it is the strong opinion of the Wachusett Regional School District that the MSBA allow the Mountview Building Committee to deviate from the square footage recommendation for a Middle School Media Center as we enter the design phase of our project. I want to assure you that this decision has been made with the benefit of a great deal of thought and input from our School Committee. It is also made with the knowledge that we plan to build a school with a strong team focus that will be accentuated by the construction of Team Pods throughout the building. Among other things, we envision these pods to serve as "Internet Cafes" that will allow students even more access to information than the traditional media center. In fact, it is in these spaces that we plan to efficiently utilize the space we take from the media center in our proposed design.

Our district is certainly not alone in our search for a meaningful solution to information access in the digital age. Below you will find links to websites that describe the library in a modern school. The first describes the design dilemmas in building the library of the future <http://www.designshare.com/index.php/articles/school-library-future>. I am compelled by one designer who states that we need to build small, intimate spaces within which students can research and access information. We are doing so with wireless classrooms and pods that will be decentralized throughout the building.

The second link from Simsbury High School captures the essence of what we are doing with our smaller space <http://thejournal.com/Articles/2012/01/11/The-Library-as-a-Digital-Learning-Space.aspx>. Like them, we are choosing to house our collection in the smaller space and are using wireless technology to access information from sites across the building. This concept is fully supported by our School Committee by the vote of Education Subcommittee on August 15, 2012 and our District's AIM21 initiative which is described on the following website <http://aim21.org/>. It should be noted that Cushing Academy in Ashburnham has digitized its entire collection and has eliminated library services altogether. Our approach is more centrist and represents an attempt to maintain a print collection while entering the 21st century.

Finally, we have included the following standards from the New England Association of Schools and Colleges regarding library services. Clearly these standards speak to space but one would be hard pressed to argue that wireless access to information from virtually every corner of the building is "inadequate." The District intends to meet each and every standard listed below as we implement our new media center program.

Library/Media Services:

10. The library and media services program is housed in an area with adequate physical space and is staffed by professionally trained and qualified personnel and supervised by a certified library/media specialist.
11. The library and media services program is readily accessible to students as an integral part of their educational experience, fostering independent and collaborative learning, and supporting the research needs of the students.
12. Library and media services personnel are knowledgeable about the curriculum and support its implementation and integration.
13. A wide range of materials and information resources is available to students and faculty in a variety of formats, to meet the learning needs of the middle level child and to improve teaching and learning.
14. Policies are in place for the selection and removal of resources and materials and the use of technologies and the Internet.

Thank you for considering our request . Please contact me if you require additional information.

Sincerely,



Thomas G. Pandiscio, Ed.D.
Superintendent of Schools

TGP:rlp



Wachusett Regional School District

Holden, Paxton, Princeton, Rutland, Sterling

General Classrooms:

Mountview Middle School is organized into six grade level teams. Language is taught in a double block while Math, Social Studies, and Foreign Language are taught in single periods. This configuration yields a need for thirty general classroom spaces. This can be readily demonstrated by taking the equivalent of five classes detailed above and multiplying the number of classes by the number of teams. Six teams times five classes results in a need for thirty classrooms. These classrooms will allow the school to run 36 sections of each subject in a 7 period day

Science Classrooms:

Following the same logic as above, Mountview actually one less Science Room than the MSBA guidelines call for. Each team requires one Science Room which allows the school to run thirty sections of Science which will dovetail with the other major subjects as specified above. Logically related to this is the reduction of one Science Prep Room.

Self-Contained Sped Classrooms:

The Wachusett Regional School District has a strong commitment to inclusion. Therefore, Mountview School will use of the Commons and the small special education resource spaces that are scattered around the building to provide pull out support services for students who are otherwise included. The District also has a commitment to educating students with more severe disabilities who would otherwise be placed in out of district facilities. The District has programs for students with learning disabilities, autism, and developmental delay and will make good use of these self-contained spaces to educate these students with their peers in the least restrictive environment.

Art Classrooms:

The MSBA guideline calls for two Art rooms and four Tech Rooms. This configuration of rooms does not match our program. While not requiring additional rooms beyond these six spaces, we do require a different configuration of rooms. As stated above, Mountview is organized into six teams and three grades. Therefore, to match this organization and the classroom designation specified above, special purpose classrooms like Art, Technology and even the Gymnasium should be allotted in increments of three in order to efficiently interact with the classroom plan already specified. In this case, we need an Art room per grade for a total of three, and our Tech Rooms, while utilized by each grade, would also be most efficiently utilized if numbered at three. It is important to note that two Art rooms would result in one grade of students having Art eliminated from their program of studies. Instead these students would take an additional year of Teach Ed. This does not match our program.

Gymnasium:

The Gymnasium space is larger than MSBA guidelines for two reasons. First, we need three teaching stations for reasons specified above. In order to run Physical Education classes of normal size, we need three spaces as one group from each grade will have Physical Education each period of the day. Also, in that we will house substantially separate Special Education Programs in the building, we will have a need to run Adaptive Physical Education programs in this space. Second, we have proposed utilizing of the Gym as an assembly and performance space which clearly adds to the square footage requirement.

Cafeteria:

Because we have utilized the Gym as an assembly space, we have proposed to size the Cafeteria smaller than MSBA guideline. The proposed square footage of 4,500 square feet allows for three seatings of three hundred students, which matches our team structure and master schedule.

Media Center: sent previously**Music:**

We currently hold our Band, Chorus and Orchestra classes in two general purpose classrooms and a teacher break room. Due to overcrowded conditions and the impact that the noise has on surrounding classrooms, we seek to provide Band, Chorus and Stringed Orchestra instruction using three distinct instructional spaces. Students in Band and Chorus have music three times per week throughout the year. Our Band and Chorus classes currently include as many as 32 students per class throughout the day which are significantly higher than the District's standard for class size. Therefore we seek to allocate 3,000 square feet, or 1,500 square feet each to the Band and Chorus room compared to the 1,500 square feet allowed by MSBA. Students in Orchestra have two music blocks per week throughout the year. Music is taught in two instructional classrooms, and in a teacher lunchroom converted to an orchestra classroom. Our Orchestra classes are smaller with an average of 15 students per class. We seek to allocate 800 square feet to the Orchestra room.

Teachers' Workroom:

Do to the configuration of our school with three grades and two academic teams per grade, we are asking for three small teacher workrooms instead of single 550 square foot room specified by MSBA guidelines. Each workroom would be used in common with the two grade level teams.

Administration and Guidance:

MSBA guidelines call for four Guidance Counselor offices. Mountview currently has one guidance counselor and would want the capacity to add one additional office in the future. We are asking to utilize the space set aside for the two remaining guidance counselor offices as an additional conference room so that we can will have the ability to hold meetings at the same time throughout the day for special education purposes, discipline and parent meetings.

WACHUSETT REGIONAL SCHOOL DISTRICT

HOLDEN ♦ PAXTON ♦ PRINCETON ♦ RUTLAND ♦ STERLING

EDUCATION SUBCOMMITTEE

Wednesday, August 15, 2012

7:00 PM

Curriculum Center
District Central Office
1745 Main Street, Jefferson

Minutes

In Attendance: Steven Hammond, Chair, Cynthia Bazinet, Lance Harris, Norman Plourde, Margaret Watson

Absent: Robert Imber, Kenneth Mills, Robert Pelczarski

Administration: Kelley Gangi

I. Call to Order

Subcommittee Chair Hammond called the meeting to order at 7:18 PM

II. Election of Vice-chair

At Subcommittee Chair Hammond's suggestion, the election of the Education Subcommittee Vice-chair was deferred until the September meeting, due to low attendance at this meeting.

III. Approval of Meeting Minutes of April 2, 2012

Motion: To approve the minutes of the meeting of April 2, 2012.

(N. Plourde)

(M. Watson)

The minutes were approved, by consensus.

IV. Educational Plan – Mountview Middle School

Member Watson, who sits on the Mountview Building Committee as the School Committee representative, reported on the status of the feasibility study and

explained the background on the question of the media center being proposed for Mountview Middle School. Discussion ensued about the benefits of common, pod-like, decentralized research and collaboration spaces in lieu of a large media center. Discussion ensued, with numerous benefits being noted.

Motion: To endorse decentralized research and collaboration spaces at Mountview Middle School.

(C. Bazinet)
(M. Watson)

Roll call vote:

In favor:

Steven Hammond
Cynthia Bazinet
Lance Harris
Norman Plourde
Margaret Watson

Opposed:

None

The motion passed unanimously.

V. Old Business

There was no old business brought before the subcommittee.

VI. New Business

Members requested the following business be addressed by the Education Subcommittee in the coming year:

1. **Policy Relating to Pupil Services** *Administration of Medication P6617*
(Member Harris)
2. Methods for improving parent communications (Member Harris)
3. Need for public relations/communication relating to the Mountview Middle School building project (Member Watson)
4. Controls and processes for what is communicated by School Committee members (Member Bazinet)

VII. Adjournment

Motion: To adjourn.

(M. Watson)
(N. Plourde)

Motion passed unanimously.

The meeting adjourned at 8:30 PM.

Respectfully submitted,

Kelley Gangi
Director of Curriculum

KG:rlp



MOUNTVIEW MIDDLE SCHOOL

FOODSERVICE REPORT NARRATIVE

June 27, 2012

Prepared by :



Colburn & Guyette
Foodservice Designers & Consultants

Colburn & Guyette Consulting Partners, Inc.
201 Oak Street, Suite 12
Pembroke, MA 02359
800-343-3310

INTRODUCTION

On May 30, 2012, in collaboration with the office of LPA, Colburn & Guyette performed a site visit of the existing foodservice operation in the Mountview Middle School. Our goal for this exercise is to give a high level overview of the operation and to identify the current existing building conditions as it relates to foodservice, equipment condition and conformance with health codes. The intent of our report is to provide assistance with the decision making process for future renovations or new construction to the foodservice facilities, as they relate to the overall proposed school project.

SITE OBSERVATION

The typical back of house functions are in place. This includes items such as one walk-in cooler, freezer (2) and a dry storage room. One freezer is original and accessed through the cooler. The other freezer was installed sometime after the original construction and set on the finished floor. It is located in what appeared to be previous dry storage space. It has no ramp for deliveries, or a heater in the door which makes it difficult to open. Both freezers are very small and in rough condition. The Foodservice staff stated the freezers have had issues holding temperature and in constant need of repair. This is apparent by the ice build-up on the interior of the box and condensastion dripping from ceiling. The Health Department has noted that the storage overall is lacking and would like to see more provided in any renovation to the kitchen. The dry storage room has CMU walls that are not easily washable, acoustical ceiling tiles that are not washable, inefficient shelving and the storage appears to be undersized for the facility. The walk-in cooler is original to the kitchen. It is undersized and do to the age of materials constructing the box, it is difficult to clean. This is similar for all walk-in's on site. The basic food preparation tables, sinks, associated equipment, cooking equipment, exhaust hoods, pot washing, dishwashing and bakery work areas are provided. The amount of work space in the kitchen is very limited and isle space is less than desirable in certain areas. The amount of handsinks in the kitchen were not sufficient to meet current code. Currently there is one dedicated handsink in the kitchen, current codes call for one at each work area within the kitchen and serving space. Also, no dedicated mop sink is present for the foodservice operation. A clothes washer is located adjacent to the prep sinks in the kitchen. This function should be separated from the food prep area in it's own dedicated space. The dryer is located in the adjacent mechanical/storage room at receiving.

The kitchen serves three seatings (twenty minutes each) to a population of 800 students. Students enter through the single doors on the ends and exit at the double door in the center. This flow is not uncommon in a middle school environment. The seating is confined and outdated. There is one restroom in the kitchen adjacent to the office. It is our understanding that two restrooms are required by the current plumbing code. The office is small (approx. 6x10) and not ideally located. Proper placement is typically located by the receiving area with views through the kitchen. Lockers are not

available for staff and are required by the current health code, quantities should match employee counts per shift.

The ceiling is low, not easily cleanable, without access to the plenum above and lacks adequate lighting for a foodservice environment. The floors are original 1" square tiles which were missing in areas throughout the kitchen. Due to the size of the tiles, there is extensive grout lines which makes the floor difficult to clean. The walls are ceramic tile and cleanable unlike the block in the dry storage. Some wall is broken or cracked. The operation has very limited receiving area. Therefore, many deliveries are broken down outside of the building and then brought to storage. This is not best practice due to the lack of food control and sanitation.

The existing straight-line servery includes three points of service consisting of one hot food station, one utility food station and a ala carte service station. The POS system is centered in the serving line and at one end for ala carte. No cold food serving is provided, this is not typical for a school facility. The existing serving counter is constructed from all stainless steel on legs. Tops are solid stainless steel with a solid inverted V tray slide mounted on a curb wall in front.

Most of the existing equipment is said to be original to the school. Although the existing equipment works, it has ongoing service issues and has reached its life expectancy. The exhaust hood is outdated and does not meet current mechanical and health codes. The ductwork interior should be examined for grease build-up on the interior and the mechanical system to be evaluated for current mechanical code compliance. There was no evidence of fire suppression in the ductwork. The exhaust air quantities require testing to ensure they are meeting necessary air volumes for current cooking equipment below and in consideration of any changes made in the cooking line with a renovation.

The dishmachine utilizes a conveyor with racks which is appropriate for this school foodservice operation. The Foodservice Staff stated the dishmachine required frequent repair. The dish drop is located in a small isle off of the seating area. It is limited in size, has broken tile under the stainless steel top and wood wall/doors directly connected to the wet drop-off area.

RECOMMENDATIONS

The MSBA will provide 2100 square feet under the current guidelines. To accommodate the needed larger walk-in refrigeration and freezer, larger dry storage, additional work space, larger office space and receiving area, we estimate approximately 2,500 square feet would be required for the kitchen. Based on \$200.00 per square foot, the estimated foodservice equipment budget would be \$500,000.00. This is for all new equipment delivered and set-in place, it does not include hard construction costs or final connections by trades.

Based on the observation, it is apparent the foodservice facility is in need of a complete renovation or new space. Both the kitchen and seating areas will benefit from a more open, clean and ventilated

space. The kitchen should be planned to provide a proper flow from receiving, storage, prep, cooking and serving. Trash and recycling should have dedicated space for proper storage between pick-up. Renovated or new construction, the facility will have the ability to provide a full-service kitchen/servery with all the typical aspects of a foodservice program. There will be improved control over deliveries, storage (dry and refrigerated), preparation of food product, work flow, cooking of meals, disposal of waste and ware washing. In addition, current plumbing, electrical, HVAC, fire protection and health codes can all meet current standards and codes.

The following pages include photos which were taken during our site visit. The photos are intended to help support descriptions within the report.

Finally, we have attached a preliminary utility schedule based on a similar sized school project. The information in the schedule will change, it is provided for order of magnitude only to assist other design team members in their work for this study.

END OF REPORT



Washer at prep sinks



Ceiling at walk-in cooler



Typical representation of equipment



Floor Tile



Ice build-up at freezer



Broken tile/wood at dish-drop



Inadequate lighting



Receiving area

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

- A. Narrative Summary
- B. Preliminary Design:
Renovation/Addition Option
- C. Preliminary Design:
New Construction Existing Site Option
- D. Preliminary Design:
New Construction at Alternate "Malden
Street" Site Option
- E. Cost Comparison Chart – Table 1

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

A. Narrative Summary

Mountview Middle School

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3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

FEASIBILITY STUDY

A. Narrative Summary

The PDP identified the following three options for further development during the Preliminary Schematic Report (PSR) phase of this Feasibility study:

- Renovation/Addition Option
- New Construction on Existing Site Option
- New Construction on Alternate Site Option

Following the submission of the PDP, LPA developed design schemes for each of the three options above. These represented methods of solving the design problem while meeting, to varying degrees of success, the Educational Program requirements.

The MSBA Space Guidelines will need to be adjusted for the Renovation/Addition Option Design. Most existing classroom sizes marginally meet the minimum size required by the guidelines with others slightly below minimum size.

The resultant overall size of this option, 148,395 s.f., exceeds the maximum allowable size of 128,000 s.f. for a new building due to the inefficiencies of the existing floor plans.

The educational plan developed by the District is substantially satisfied in the Reno/Add Option. For the Renovation/Addition Option, the following supporting documents are attached:

1. Narrative Description of Option
2. Preliminary Site Plan
3. Preliminary Floor Plans: 1st, 2nd, and 3rd
4. Final Evaluation of Site – Brassard Design & Engineering
5. Traffic Study – Nitsch Engineering
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3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

FEASIBILITY STUDY

A. Narrative Summary

Preliminary building plan layout for a new school building on both the existing site and the alternative Malden Street site meets the Educational Program and the resultant rooms comply with the MSBA Guidelines for room size. The overall size of the building meets the maximum 128,000 s.f. per MSBA. Due to the configuration and topography of each of these two sites the same preliminary building layout has been employed.

For the new construction on the Existing Site Option (3.3.2.3.C.) and New Construction on Alternate Site Option (3.3.2.3.D.) the following supporting documents are attached to each.

1. Narrative Description of Option
2. Preliminary Site Plan
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- B. Preliminary Design:
Renovation/Addition Option
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FEASIBILITY STUDY

B. Preliminary Design Options: Renovations/Addition Option Narrative

The existing middle school, located on Shrewsbury Street, is an edifice in excellent physical and structural condition albeit the existing mechanical and electrical systems have met their useful life. Existing window and insulation levels are not compliant with current energy code requirements and should be replaced in order to increase the efficiency and comfort of the inhabitants.

The presence of both asbestos and PCB bearing materials mandates their complete removal, resulting in the potential removal of a significant quantity of masonry at window and door openings due to PCB migrating from caulking into adjacent masonry, both on interior and exterior surfaces of the original 1964 building.

It should be noted that the construction of both the original building (1964) and subsequent addition (1987) is that of steel frame and masonry infill at the exterior and concrete masonry interior partitions. The reconfiguration of interior partitions would prove difficult as well as enlarging doorways (e.g. enlarging existing toilet room doors to comply with AAB Regulations). Reconfiguration of rooms should therefore be limited. Existing rooms which may not meet exact size requirements of the MSBA Guidelines will have to be reviewed for acceptability by the agency, cost for reconstruction would be prohibitive.

It should be further noted that compliance with the AAB process and regulations will be required. The 1987 addition for the most part is compliant with the original 1964 building requiring upgrades mostly within toilet room accessibility. Existing floor level change in the original main entrance area would need to be addressed by either a new ramp, or wheelchair lift if a variance cannot be obtained for the reuse of the existing inclined wheelchair lift.

Existing floor to floor heights of 11'-4" may not provide sufficient space to accommodate new ducted HVAC systems.

The most significant need for the new school is for a substantially larger gymnasium and cafeteria than which exists, essentially a doubling of area for each use. Reconfiguration of the existing facilities would be a major endeavor, requiring the demolition and reframing of one third of the existing building. By expanding the gym and dining areas, the existing kitchen, stage and locker rooms can be renovated for reuse.



Mountview Middle School

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3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

FEASIBILITY STUDY

B. Preliminary Design Options: Renovations/Addition Option Narrative

The expansion of these areas of the building opens the possibility to enclose the existing courtyard which is a constant maintenance issue, in particular, keeping the main entrance and other egress doors clear of snow buildup.

The accompanying site and floor plans and supporting documents for the renovation/addition alternative seek to address the aforementioned deficiencies.

1. General:

The option consists of the phased construction of renovation to 3 stories of 109,524 s.f. including the existing courtyard and a new floor system for the 2nd Floor Science rooms within the existing school, the renovation/ addition of the existing gymnasium and cafeteria section of the school and the construction of a new 3 Story 38,870 s.f. addition connected directly behind the existing building.

Note that after developing the preliminary floor plans for this option, the required area has increased by 7,053 s.f. over the original projected area of 141,342 within the PDP study cost estimate (3.1.6.G).

The renovated area within the existing floors of Pod "B" (refer to floor plans for Pod designations) basically is comprised of retaining the existing classrooms, mechanical room, media center and renovating existing administration area to medical and guidance uses. Common teaching areas to be created by the demolition of two undersized classrooms. Pod "C" will be reconfigured from existing classrooms and satellite gymnasium area to house science labs, art rooms and technology classrooms on each of the 3 floors. Note that the double height of the gym has been infilled at the 2nd Floor. The existing gymnasium and cafeteria in Pod "A" will be completely renovated and added to as required to meet the educational program. Support spaces such as kitchen and lunch rooms will be renovated and added to as required. The existing open area courtyard is planned to be roofed providing new building area for the administration. Additional area will be provided for the school Music Department. Pod "D" is the three story addition. Each floor is planned for classroom, common teaching area, self-contained SPED classroom and support spaces.



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FEASIBILITY STUDY

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2. Educational Program:

The District's Educational Program is basically met by the proposed option. Pods "B" and "D" provide the required classrooms for each of the two teaching teams for each of the three grades, each grade solely located on individual floors.

Pod "C" provides each grade with the required areas for science, art and technology within the Ed Program, on their respective floor. Pod "C" functions are readily accessed from Pod "B" and "D". Supplement SPED classrooms (reading and resource), teacher's workrooms are located within the Pod.

The expansion of the gymnasium allows for 3 teachers stations and slight expansion of the cafeteria will accommodate separate sittings for each of the grades in Pod "A". Repositioning the Administrative functions into the open courtyard capitalizes on using new functional existing area, as well as eliminating the problems of maintaining access to the main entrance during the winter months. New Music Department spaces occupy the original stage and new addition. A new stage is constructed allowing access from the Cafeteria and Music Department.

3. Site:

Refer to attached site work narratives.

4. Vehicular Circulation:

The current site circulation of buses and parent drop off and pick up will remain essentially the same with buses circling the school in a clockwise direction, dropping and picking up students at the east side driveway and the parents concern to drop off and pick up directly in front of the school (refer to attached Traffic Impact and Access Study).

5. Service:

Existing service for kitchen and maintenance area are maintained.



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B. Preliminary Design Options: Renovations/Addition Option Narrative

6. Parking:

Existing parking spaces have been addressed by additional 60 parking spaces. This new total meets the requested parking availability of 125 spaces.

7. Athletic Fields:

The construction of the addition (Pod "D") and extension of the Ring Road behind the existing building eliminates the existing softball field. This field can be replaced with a new field constructed to the north end of the site.

8. Phasing:

The option will require several phasing sequences.

- A. Phase One would be the construction of Pod "D" which would provide the needed classrooms for a second team for each grade with the loss of Pod "C" classrooms.
- B. Phase Two would be the complete renovation of Pod "C". Temporary science labs, art rooms and ten classrooms would need to be provided through the leasing of modular trailers. Initial quantity and length of lease is estimated at 6 double sized modulares (1,200 s.f.) for up to 18 months. Modulares would be installed on either side of Pod "B".
- C. Phase Three would be the work required in Pod "B" to convert existing administration area into new Nurse/Guidance area and required demolition and renovation for common teaching areas. Existing classroom would be refurbished only.

Phase Three would also begin construction in the gymnasium and cafeteria areas. It is anticipated that construction of the addition to both the gym and cafeteria (Pod "A") would begin during the school year with the time during summer recess to complete the new roof and finishes, along with the renovation work in Pod "B".

The area to the north of the building (existing softball field and practice field) would be used for construction material storage, construction trailers, etc.



The existing little league baseball, soccer/football and Phys. Ed. field to the west of the school will remain open as well as the existing tennis and basketball courts also located on the west side during construction. It may be necessary to temporarily reduce traffic on the drive around the school. The presence of the "boulevard" style entrance and egress drives effectively eliminate any problems that could occur with a single drive in/out from the site.

The above phasing outline recognizes that construction work will need to be scheduled and possibly 3rd shift work in order to complete certain segments of work during summer and holiday vacations. These segments include closing of exit stairways for reconstruction, and hallways material abatement.

The anticipated construction schedule of 30 months is aggressive and the phasing sequence is complex, and as such, a CM at Risk Construction Format is proposed for this option.

9. The existing building would require seismic reinforcing at all interior walls (being unreinforced masonry), additional shear walls and bracing of the steel frame for seismic forces. The lack of expansion joints between the existing pods require additional dedicated seismic resisting systems. The requirement for reinforcing the existing roof structure will be made necessary with addition of roof top equipment (for additional information on the subject, refer to attached Structural evaluation).

10. Fire Protection:

Presently only the 1987 addition is sprinklered. The entire renovated areas and all new additions will be fully sprinklered.

11. Plumbing:

Existing plumbing fixtures are aged and for the most part in the original 1964 building do not comply with accessibility regulations, although compliant in the 1987 addition it is intended that all toilet rooms will be completely renovated including new fixtures and piping.



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The existing underslab sanitary drain lines will be maintained and supplemented to achieve the required layouts. (Refer to attached for additional information on this subject HVAC/Plumbing Evaluation).

12. HVAC:

Complete demolition of existing systems and installation of new systems (refer to attached additional information of the subject HVAC/Plumbing evaluation).

13. Electrical:

All electrical systems are required to be replaced. Except for the primary service, all wiring is in poor condition and requires reinstallation. Systems to be replaced are general power, emergency lighting and power, lighting and lighting controls, telephone and data. Fire alarm, public address, audio-video and surveillance and detection systems. (Refer to attached Electrical Systems Review for additional information)

14. Code and Zoning:

The project will require a variance for the 30 foot zoning regulation on maximum building height.

15. Hazardous Materials require the submission and acceptance of a work plan by the Environmental Protection Agency. Additional testing is required for extent of PCB's migration into masonry and soil. Additional soil investigation, including borings and test pits, are required in the areas of the new additions. (Refer to hazardous materials identification survey in the PDP 3.1.4.I)

16. Insulating the existing exterior walls as not possible without constructing new partitions within existing rooms. New walls would further reduce the marginally sized rooms and potentially establish a second vapor barrier which would be extremely detrimental to the school interior environment. Additional insulation can be readily installed on the existing building roofs during the reroofing phase.



Mountview Middle School

270 Shrewsbury Street, Holden, MA 01520

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

B. Preliminary Design Options: Renovations/Addition Option Narrative

FEASIBILITY STUDY

Merits	Limitations
<ul style="list-style-type: none">▪ No land acquisition required.▪ Currently a school site – less public pressure against building.▪ Utilizes existing structure.▪ Utilizes existing school site minimizing sitework.	<ul style="list-style-type: none">▪ Unforeseen problems causing slippage in the construction schedule.▪ Must pass through other grades and Pods to access gymnasium and cafeteria.▪ Disruption to the academic activities for the entire duration of construction.▪ Lose some fields for use during construction.▪ Majority of existing classrooms will marginally meet current standards for size once renovated.▪ Will require modular classrooms.▪ Low floor to floor height will be difficult to work with for ducted HVAC system.▪ All interior partitions are concrete masonry construction making reconfiguration of spaces and cutting or enlarging door openings difficult and expensive.▪ Not possible to add insulation to existing exterior masonry walls.▪ Carry higher contingencies.▪ Highest long term annual operating cost.

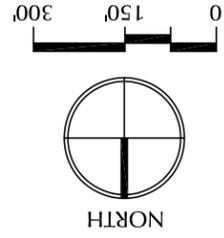


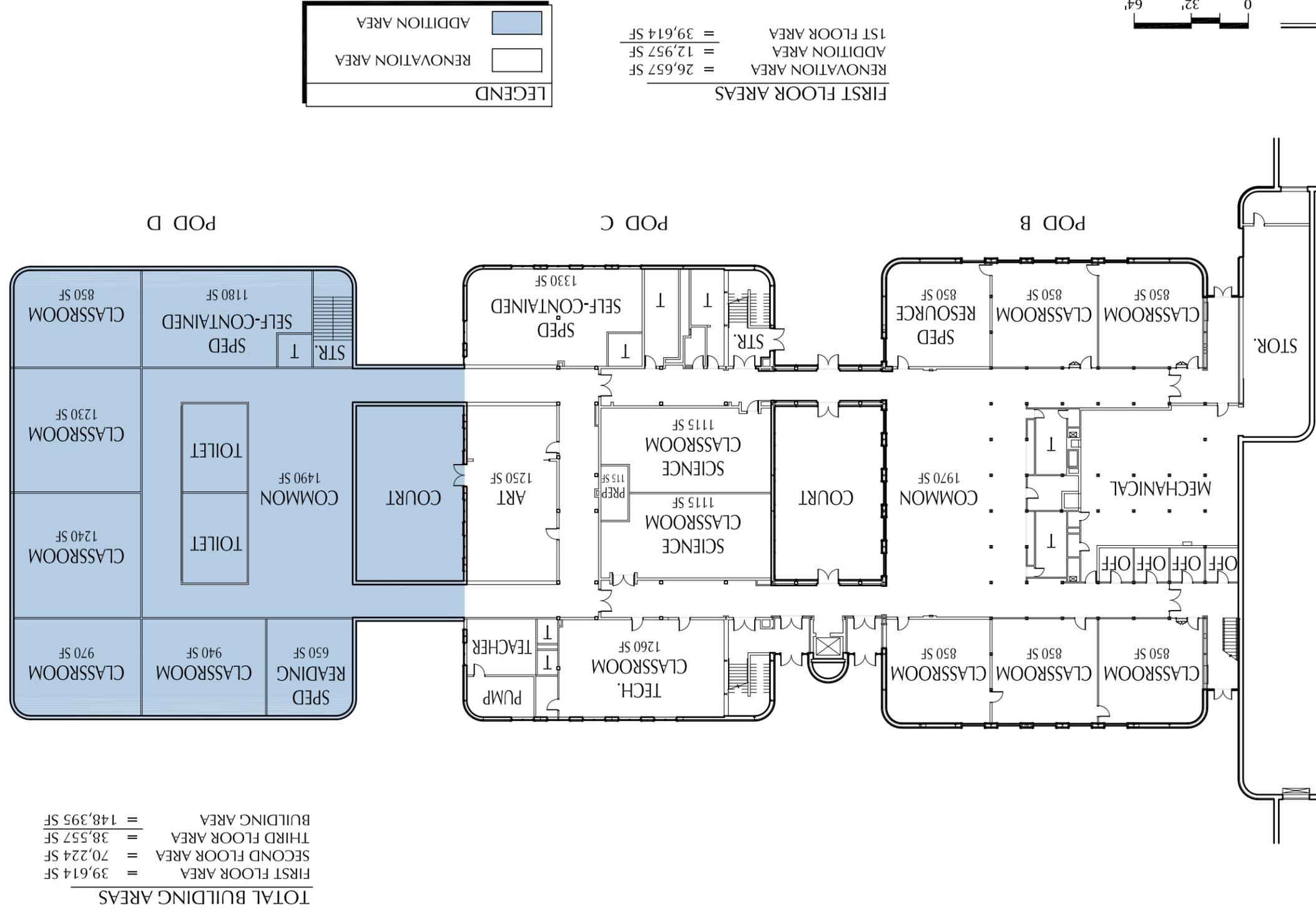


Residential-R-15 Zoning Requirements

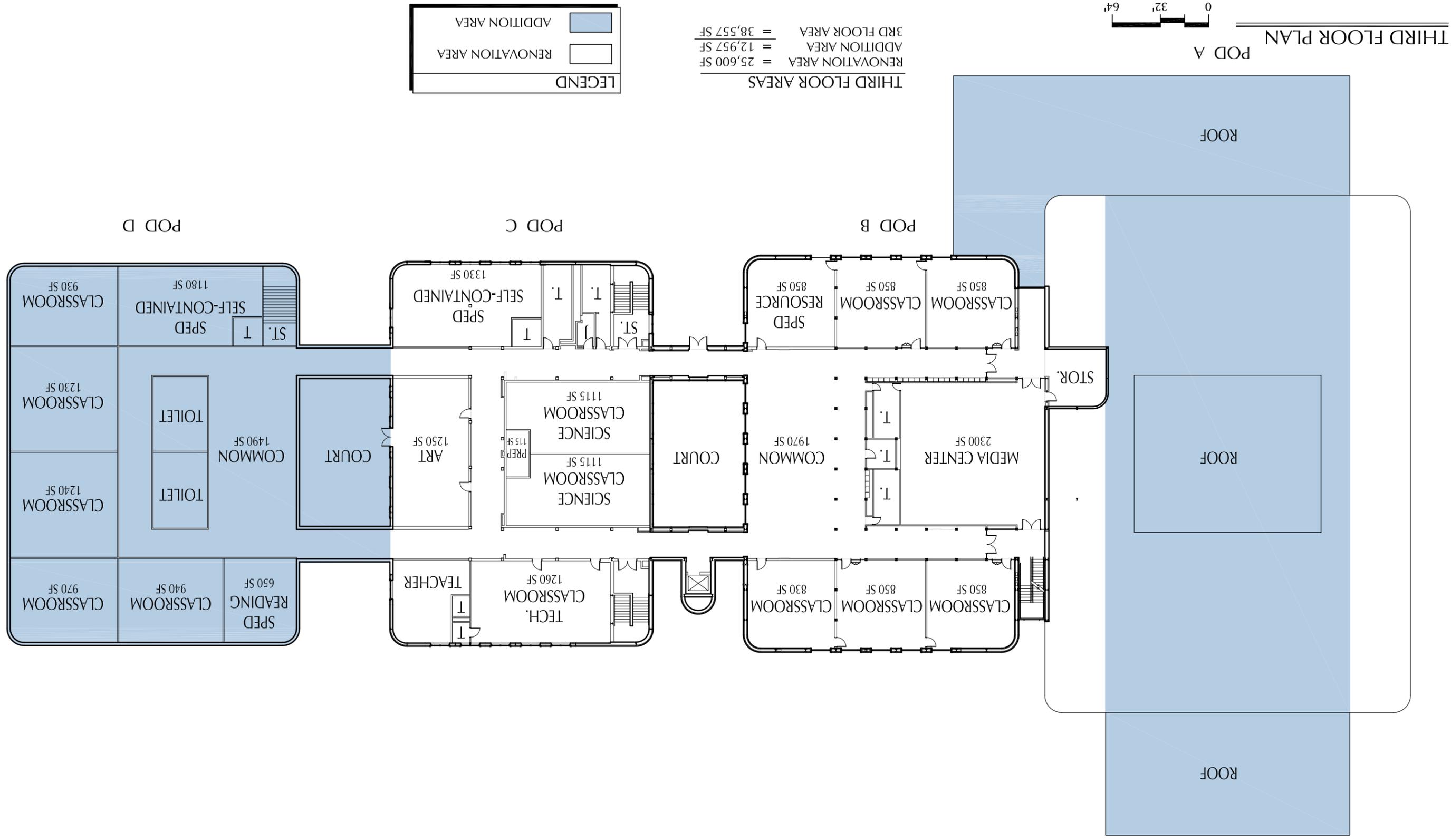
Lot Area Square Footage	1,222,570sf
Lot Frontage	80'
Front Yard	30'
Side Yard	20'
Rear Yard	20'
Maximum height	30'
Maximum building coverage	25%

NOTES:
Information compiled in this drawing was taken from several sources including, but not limited to:
1. Town of Holden Assessor Map
2. Mass GIS, USGS Topographic Maps
3. Google Map





FIRST FLOOR PLAN



September 4, 2012

Mr. William Senecal
Lamoureux Pagano Architects
108 Grove Street
Worcester, MA 01605

RE: Mountview Middle School Feasibility Study – Site Work
Addition/Renovation Alternative

Dear Bill:

Per your request, Brassard Design & Engineering, Inc. has conducted an evaluation of the existing Mountview Middle School site, previously submitted under separate cover. Based on the results of the evaluation, and on the general redevelopment program for the Addition/Renovation design option that you provided, we have estimated the associated scope of site work required to advance the project.

The Addition and Renovation alternative includes infill and expansion additions to the southerly wing of the existing school. A substantial building addition would also be constructed off of the northern end of the existing 1987 building addition. The existing site access would remain intact and the existing parking areas unaffected by the building construction would be unchanged in terms of extent and orientation.

To accommodate the northerly building addition, the existing rear access drive would be relocated and additional parking constructed to bring the parking capacity into line with programming requirements. The existing softball field located on the northerly end of the site would be relocated to the north and a currently undeveloped portion of the site would need to be cleared and filled for the relocated athletic field. Other impacts of the building addition include the need to relocate sections of existing water and sewer utility systems. Also, new stormwater management facilities would presumably be constructed to provide up-to-date flow control and water quality treatment for stormwater discharges from the site.

In addition to site work needed in response to direct impacts of the building construction, the Addition/Renovation design option would also include repairs and upgrades to existing site pavements, signage, lighting, and landscaping.

The site improvements would likely involve the following specific work items:

Pavements and Access

- Reconfigure the rear access drive and construct additional parking areas (0.75ac. +/-) to replace spaces lost to the building construction and to augment the total parking count to meet the building programming needs;

- Repair, seal, and/or partially resurface and the existing parking lot;
- Restripe (stalls and directional painting) the existing parking areas and establish new, or relocate existing, designated accessible parking spaces with updated signage;
- Reconstruct the existing site entrance to replace and/or remove & reset existing curbing and update site identification signage;
- Update / upgrade existing parking and access signage and other informational signage;
- Evaluate and selectively repair/replace existing sidewalks;
- Evaluate and potentially replace handrails at existing accessible ramp at main building entry;
- Construct new sidewalks to improve pedestrian access around the existing building and for access to the building additions;

Site Utilities

- Evaluate and potentially remediate/remove the existing underground fuel storage tank (this assumes that gas service will be provided to the building);
- Install an exterior grease trap on the cafeteria discharge pipe;
- Relocate existing water/fire protection (300LF+/-) and sewer (500LF+/-) utility systems at the rear of the existing building to accommodate building addition construction;
- Augment the existing stormwater system to include provisions for water quality treatment and to promote groundwater recharge per the MA DEP Stormwater Standards. This would likely include redirection of a portion of the existing storm drain piping system to direct flow to a water quality treatment chamber and subsequently to some form of subsurface detention/infiltration system prior to discharge at an existing outlet point;

Landscape

- Clear approximately 1 acre+/- of wooded area on the northern end of the site, and import adequate fill to construct a new softball field.
- Improve the existing baseball and soccer fields including installation of additional and replacement of existing perimeter fencing, general turf improvements, installation of new and replacement of existing playing field benches and other appurtenances;
- Implementation of moderate landscaping improvements including addition of existing ornamental shrubs and installation of new trees, shrubs, and groundcover.
- Campus-wide landscape/planting improvements.

The above is not intended to be an exhaustive list, but provides a general frame of reference for the scale of site construction necessary for the implementation of the Addition/Renovation design alternative.

Permitting

In order to complete the site work, municipal permitting would be required including:

- Site Plan Review / Special Permit application to the Holden Planning Board per section XI of the Holden Zoning Bylaw, for verifying compliance with municipal design standards and zoning requirements.
- Although not explicitly required, the extent of the wetland area on the westerly side of the site should be delineated and defined via an Abbreviated Notice of Resource Area Delineation application to the Holden Conservation Commission.

Under the Addition/Renovation design option, the proposed construction would not trigger any state application filings including any filings related to the Massachusetts Environmental Policy Act (MEPA).

Because size of the construction site will exceed 1 acre, a Notice of Intent application to EPA will be required per the National Pollutant Discharge Elimination System (NPDES). The application is related to control of stormwater discharges from the construction site and must be filed at least 14 days prior to initiation of construction activities.

Other construction-related permit applications and processes that will be the responsibility of the general contractor are not listed.

If you have any questions or require additional information please contact me at your convenience.

Sincerely,
BRASSARD DESIGN & ENGINEERING, INC.



Matthew T. Brassard, PE



Nitsch Engineering

Traffic Impact & Access Study (Existing Site)

Mountview Middle School
Holden, MA

June, 2012

Prepared for:

Lamoureux Pagano Associates
108 Grove Street, Suite 300
Worcester, MA 01605

Submitted by:

Nitsch Engineering
186 Lincoln Street, Suite 200
Boston, MA 02111

Nitsch Engineering Project #9111

Executive Summary

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INTRODUCTION

Nitsch Engineering has been retained by Lamoureux Pagano Associates to prepare a qualitative assessment of the parent pick-up/drop-off, bus circulation, parking, and site circulation for the proposed reconstruction of the Mountview Middle School (MVMS) in Holden, Massachusetts. The school is located at the southeast corner of the Town between the intersections of Shrewsbury Street at Doyle Road/Mountview Drive and Shrewsbury Street at Chapel Street/Holden Street. Figure 1 shows an aerial image of the school location.

Figure 1 – School Location



As seen in Figure 1, MVMS is located on Shrewsbury Street near the signalized intersection of Shrewsbury Street at Doyle Road/Mountview Drive. The school zone is surrounded primarily by residential uses to the east, west, and south. The speed limit on Shrewsbury Street is 35 miles per hour (mph) posted in both the eastbound and westbound directions. School zone speed limit signs of 20 mph are also posted for school pick-up and drop-off periods. The average daily traffic on Shrewsbury Street is approximately 15,000 vehicles.

In its Statement of Interest to the Massachusetts School Building Authority (MSBA), the Town cited overcrowding as one (1) of the purposes of the school reconstruction. MVMS had an enrollment of 761 students as of October 1, 2008, for a building designed for a capacity of 600 students. The proposed school is expected to adequately accommodate students that are currently enrolled and the supporting staff. School authorities project that the enrollment will remain level in the future.

EXISTING CONDITIONS

On June 7th, 2012, Nitsch Engineering conducted a field reconnaissance of the study area intersections, reviewed site access and egress conditions, inventoried parking supply, and conducted parking counts at MVMS. The following section is a summary of the existing conditions as observed during the site visits.

Intersections

Nitsch Engineering completed an assessment of the intersections that serve the existing MVMS site. These are:

- Shrewsbury Street at East School Driveway; and
- Shrewsbury Street at West School Driveway.

Both the intersections are unsignalized.

Shrewsbury Street and East School Driveway

This is a three-legged intersection with Shrewsbury Street approaching from the east and west, and East School Driveway approaching from the north. East School Driveway is a one-way exit onto Shrewsbury Street. The intersection is located 300 feet from the signalized intersection of Shrewsbury Street and Doyle Road.

Shrewsbury Street consists of an 11.5-foot lane and a 6-foot shoulder in the eastbound direction, and a 12-foot lane and a 4.9-foot shoulder in the westbound direction. Five (5)-foot-wide sidewalks are present on both sides of Shrewsbury Street. There is no sidewalk on East School Driveway. A double-yellow centerline separates two-way travel on Shrewsbury Street. Single white edge lines separate the traveled way from the shoulder on both sides. Advance pavement markings include “YIELD” to pedestrians, and “SCHOOL SLOW” imprints to the east of the intersection. A crosswalk is marked on East School Driveway with pedestrian ramps at both ends. Parking is prohibited on both sides of Shrewsbury Street.



Looking East on Shrewsbury Street



Looking West on Shrewsbury Street

The pavement and sidewalks on Shrewsbury Street are in moderate condition with minor cracks. Signing includes a flashing school zone speed limit sign to the east of the intersection, and a symbolic yield to pedestrians sign to the west of the intersection on Shrewsbury Street. An “Exit Only” and “Do Not Enter” signs are present on East School Driveway. During the site visit, a large puddle was seen on the East

School Driveway, which could be a hindrance to pedestrians walking along the northerly sidewalk on Shrewsbury Street.



Puddle on East School Driveway



Looking at East School Driveway

Shrewsbury Street and West School Driveway

This is a three-legged intersection with Shrewsbury Street approaching from the east and west, and West School Driveway approaching from the north. West School Driveway is a one-way entrance only from Shrewsbury Street.



Looking East on Shrewsbury Street



Looking West on Shrewsbury Street



Looking at West School Driveway



Crosswalk between East & West School Dwy

Sidewalks are present on both sides of Shrewsbury Street. A double-yellow centerline separates two-way travel. Single white edge lines separate the traveled way from the shoulder on the west side of the intersection. Advance pavement markings include “YIELD” to pedestrians, “SCHOOL SLOW” imprints to the west of the intersection. There are two (2) crosswalks at the intersection – one (1) on West School Driveway and the other on Shrewsbury Street between the East School Driveway and West School Driveway. A single yellow centerline separates the traffic on West School Driveway headed to the front of the school, and the administrative/visitor parking vehicles headed to the back of the school.

The pavement and the sidewalk are in moderate condition with minor cracks. Signing includes a flashing school zone speed limit sign to the west of the intersection, and a symbolic yield to pedestrians sign opposite to the West School Driveway entrance on Shrewsbury Street.

Sight Distance

Stopping Sight Distance (SSD) is the distance necessary for a vehicle traveling at the design speed to stop before reaching a stationary object in its path. Intersection Sight Distance (ISD) is the minimum visibility needed at an intersection to allow drivers to perceive the presence of potentially conflicting vehicles. The Project Development and Design Guide¹ was used to establish the recommended SSD and ISD. The sight distances measured during the June 2012 site visit are as shown in Table 1.

Table 1 – Sight Distance Evaluation

Intersection	Speed Limit	Stopping Sight Distance	Intersection Sight Distance (ISD)		
	Speed ¹ (mph)	Recommended (Feet)	Recommended (Feet)	EB Available (Feet)	WB Available (Feet)
Shrewsbury Street/East School Dwy					
Shrewsbury St. Eastbound (Downgrade)	20 (35)	116 (257)			
Shrewsbury St. Westbound (Upgrade)	20 (35)	115 (250)			
Left turn from East School Dwy	20 (35)		225 (390)	450 appx**	>500
Right turn from East School Dwy	20 (35)		195 (335)	450 appx**.	>500
Shrewsbury Street/West School Dwy					
Shrewsbury St. Eastbound (Downgrade)	20 (35)	116 (257)			
Shrewsbury St. Westbound (Upgrade)	20 (35)	115 (250)			
Left turn from West School Dwy	20 (35)		225 (390)	325 appx**	>500
Right turn from West School Dwy	20 (35)		195 (335)	325 appx**	>500
1. Speed based on reduced speed limit of 20 mph for a School Zone. At other times, speed is based on 35 mph posted speed limit on Shrewsbury Street and is shown in parenthesis; ** Approximate values, to be verified by a survey					

The posted speed limit on Shrewsbury Street is 35 mph for which the recommended SSD is 257 feet and ISD is 390 feet. The recommended SSD and ISD for a school zone with a speed limit of 20 mph are 116 feet and 225 feet, respectively. As seen in Table 1, the available ISD at the East School Driveway intersection exceeds the recommended ISD in both directions on Shrewsbury Street. The available ISD at the West School Driveway looking left at westbound traffic is more than required but looking right at eastbound traffic is slightly less than the recommended value for the 35 mph design speed. This may be one of the reasons why the existing site is designed to have a clockwise traffic pattern. Vehicles enter from the West School Driveway and exit from the East School Driveway as is further discussed in the Circulation section.

¹ Project Development and Design Guide, Massachusetts Highway Department, 2006

Parking

Nitsch Engineering conducted a parking inventory during the site visit on June 7, 2012. Figure 2 shows the location of parking lots on the site. The availability of parking spaces, utilization and recommendation for the proposed school are included in this section.

Figure 2 – Parking



As seen in Figure 2, there are five (5) parking lots within the school site – lot P1 is used by administrative staff and visitors, P2 is reserved parking for administrators, P3 consists of parking for teachers and visitors, P4 represents the overflow parking for teachers, and P5 is handicap parking only. Handicap accessible parking spaces are also available in lot P2. The following is the parking utilization of the lots as observed during the site visit on June 7, 2012:

Table 2 – Parking Utilization

Lot Description	Percentage Of General Spaces Occupied	Available		Occupied	
		General	Handicap	General	Handicap
Lot P1 (Teachers/Administrators)	68%	38	0	26	0
Lot P2 (Administrators)	89%	9	0	8	0
Lot P3 (Teachers/Visitors)	86%	21	2	18	0
P4 (unmarked spaces, Teachers/Visitors)	-	-	-	14*	-
Lot P5 (Handicap Accessible Spaces)	0%	0	4	0	0
Total	76%	68	6	52	0

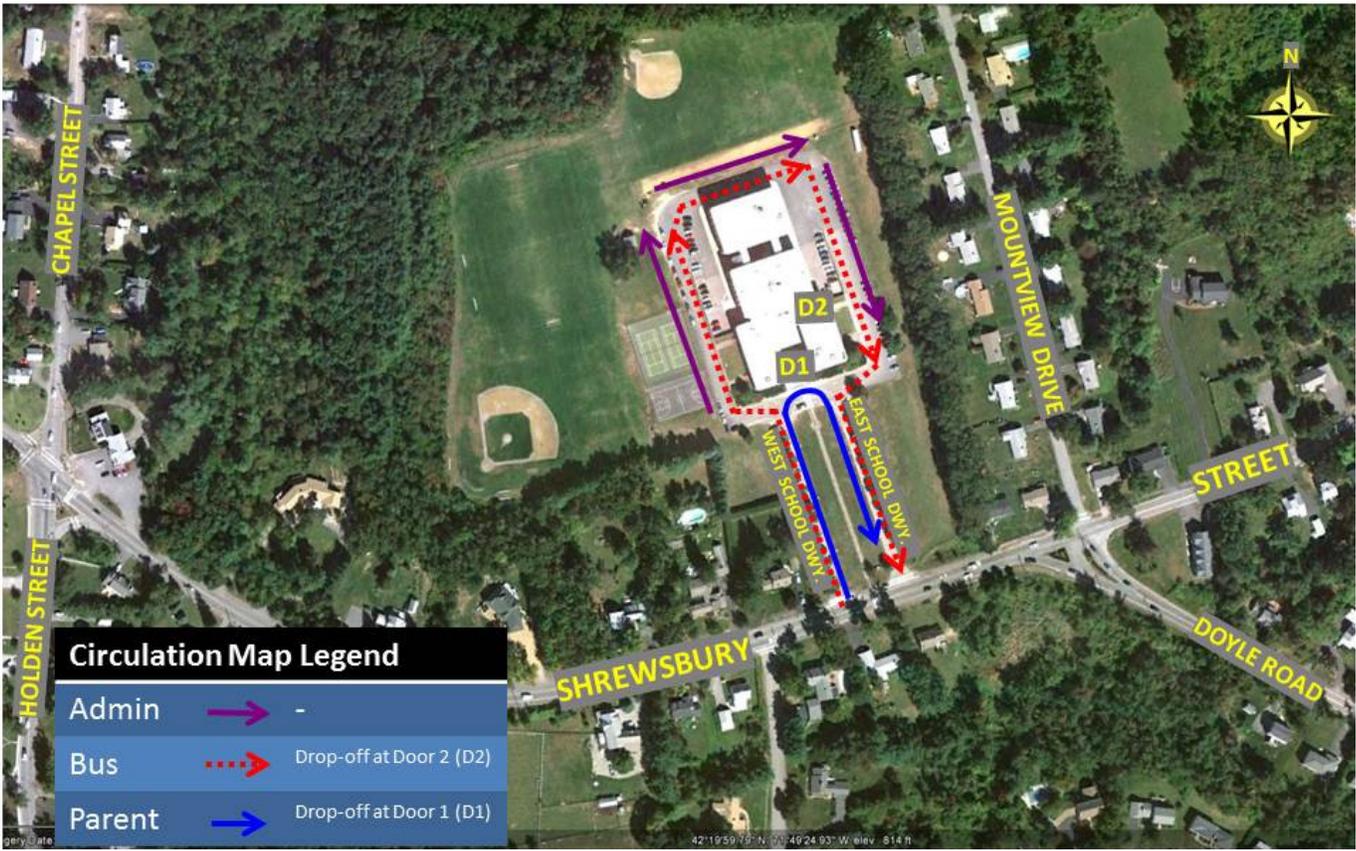
*Vehicles marked in unmarked spaces, not counted towards Total

As seen in Table 2, there is reserve parking available in lot P1 (east of the building); however, the teachers' entrance is located on the west side of the building where there is no reserve parking except the handicap accessible spaces. As a result, teachers park on the grass along the periphery of the fields (P4) for easy access into the building.

There were two (2) handicap accessible spaces available in P3; however, neither had an access aisle as required by the American for Disabilities Act (ADA). A 5-foot-wide access aisle is required for an accessible space. Two (2) spaces can share a common access aisle per the ADA. The ADA requires a minimum of three (3) accessible spaces for parking lots with 51-75 spaces. By these standards, the existing school has more accessible spaces than the required minimum.

Circulation

Figure 3 – Circulation



As seen in Figure 3, parent drop-offs take place in front of the school building (D1). Vehicles enter from the West School Driveway and exit from the East School Driveway. Buses enter from the West School Driveway and loop around the school building to drop off children at the southeast entrance to the building (D2). Teachers and administrative staff use the same circulation path as buses.

The circulation at the existing school is contrary to what normal driver expectation would be, which is to flow counter-clockwise around the building. Nitsch Engineering anticipates that the limited sight distance at the West School Driveway looking onto Shrewsbury Street west, and the proximity of East School Driveway to the traffic signal at Doyle Road/Mountview Drive may be one of the reasons for this design. Due to the flow pattern, children get dropped off on the opposite side of the school entrance, which increases the service time for each drop-off. Additionally, the flow is confusing to new drivers as there are no pavement markings or signs to indicate the direction of traffic flow.

Traffic Volumes

Automatic Turning Recorders (ATRs) were installed on Wednesday, June 6 and Thursday, June 7, 2012, to collect volume of vehicles, classification, and speed data on Shrewsbury Street. Precision Data Inc., a sub-consultant of Nitsch Engineering for traffic counts, collected the data for 48-hours on Shrewsbury Street using pneumatic tubes. The following is a summary of the data collected:

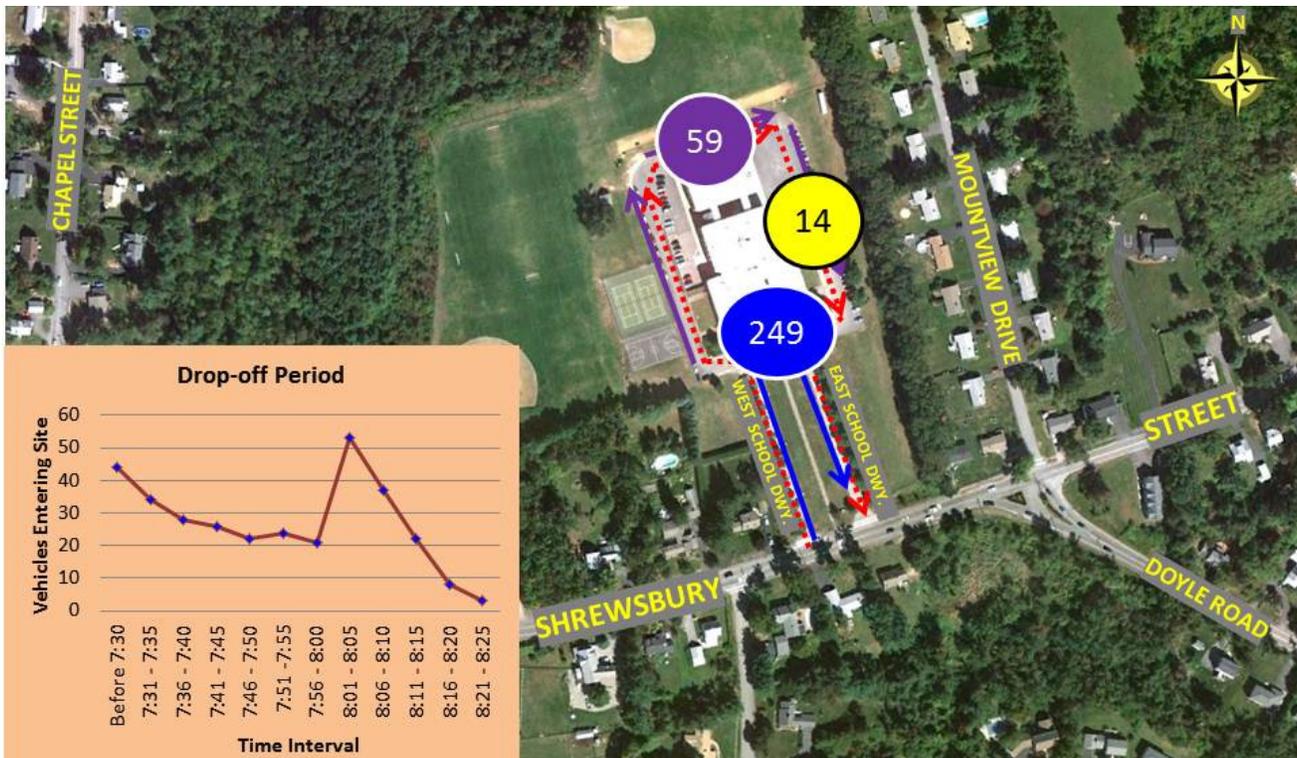
Table 3 – Shrewsbury Street Traffic Volumes

Location	Morning Peak (AM)		Midday peak (Afternoon) (PM)		Daily (vpd) ²
	Period	Volume (vph) ¹	Period	Volume (vph)	
Shrewsbury Street EB	7:15-8:15	736	2:30-3:30	490	7,617
Shrewsbury Street WB	7:30-8:30	407	2:30-3:30	576	7,638

1 vph: vehicles per hour; 2 vpd vehicles per day

As seen in Table 3, the daily traffic on Shrewsbury Street is approximately 15,300 vehicles with a 50-50 distribution in the eastbound and westbound directions. The AM or morning peak period is between 7:15 am and 8:30 am, which coincides with the school start time at 7:55 am. The midday peak period was between 2:30 and 3:30 pm, which coincides with the school release time at 2:30 pm. The peak volume on Shrewsbury Street is about 1150 vehicles during the morning peak hour, which is 7.5% of the daily traffic. In addition to the ATR counts, we counted the number of vehicles that entered the school site during the morning peak period, shown in the figure below.

Figure 4 – Site Volumes, Morning



As seen in Figure 4, a total of 322 vehicles entered the site between 7:00 am and 8:25 am. Of these, 59 vehicles were those of administrators, teachers or visitors, 14 were school buses and 249 were drop-off vehicles. The majority of vehicles entered the site between 7:55 am and 8:10 am. During the midday peak hour, there were far fewer vehicles onsite with a maximum of 21 cars observed waiting to pick-up students at 2:55 pm. A majority of the pick-up vehicles and buses exited the site by 3:07 pm.

Speed Data

In addition to the ATR data, speed data was also collected on Shrewsbury Street. The speed data was collected simultaneously with the ATR counts. Table 4 shows the speed on the roadway over the course of the day.

Table 4 – Speed Data

	Shrewsbury Street, between Doyle Road and East School Driveway	
	Eastbound	Westbound
Average Speed (mph)	27	28
85th Percentile/Design Speed (mph)	31	32
10 mph Pace Speed	23-32	24-33

As shown in Table 4, the average speed on Shrewsbury Street was 27 mph in the eastbound direction and 28 mph in the westbound direction. The 85th percentile speed was 31 mph in the eastbound direction and 32 mph in the westbound direction, which is below the posted speed limit of 35 mph. The 10-mile pace speed of vehicles in the eastbound direction was 23-32 mph and the pace speed in the westbound direction was 24-33 mph. The pace speed indicates the range of speed in which a majority of vehicles travel. The pace in both directions is lower than the speed limit indicating that a majority of drivers comply with the speed limit.

Flashing school zone speed limit signs of 20 mph are installed on Shrewsbury Street approximately 105 feet east of East School Driveway and 105 feet west of West School Driveway. The school zone speed limit signs inform drivers that the normal legal speed limit has been reduced to 20 mph during those times when the sign is flashing. However, their current location does not give drivers sufficient time to reduce their vehicle speed. Per Section 7B.15 of the Manual on Uniform Traffic Control Devices (MUTCD), *“the beginning point of a reduced school speed limit zone should be at least 200 feet in advance of the school grounds, a school crossing, or other school related activities.”*

Additionally, Nitsch Engineering did not observe ‘End School Zone’ signs on Shrewsbury Street that should be installed in conjunction with the reduced speed limit signs per the MUTCD (Section 7B.15, 04).

Pedestrians and Bicyclists

Nitsch Engineering observed 13 school children walking to school in the morning. A crossing guard was present until 8:05 am assisting children who crossed Shrewsbury Street. While no data was collected, Nitsch Engineering observed that many more children walked from school in the afternoon when compared to the morning. Children who biked to school were far fewer than children who walked, with only one (1) bicyclist observed riding to school in the morning. Bicycle racks provided in front of the school remained largely empty.



Bicycle Racks in front of school

Service Time and Queuing:

The design of the parent drop-off loop is such that children getting dropped off must walk around the vehicle to enter the school. Service time is the time interval from when a vehicle stops in front of the school to when it leaves after dropping off a student. The service time at MVMS is an average of 12.6 seconds, based on 16 drop-off observations. Longer service time usually results in longer queues. A preferred design would be one where drop-off takes place on the school side, which would reduce queuing on and offsite.

Queuing during the morning peak hour peaked at 8:00 am when queues from the parent drop-off queue blocked vehicles from entering the West School Driveway. Additionally, buses that were unable to enter due to the queues temporarily blocked the eastbound traffic on Shrewsbury Street, which resulted in stagnant traffic extending approximately 700 feet from West School Driveway. The backup was temporary and dissipated quickly. A majority of vehicles exiting from East School Driveway turned left at the intersection with Shrewsbury Street causing merging delays to through traffic waiting for the green signal at the intersection of Shrewsbury Street and Doyle Road. During the midday peak hour, queues from pick-up vehicles were contained onsite and did not block traffic on Shrewsbury Street.

CONCLUSIONS & RECOMMENDATIONS

Based on the existing conditions at the Mountview Middle School, the following are Nitsch Engineering's recommendations for the future design of the site:

1. Design the site to have a counter-clockwise traffic flow, such that students get dropped off on the school side of the driveway;
2. Provide pavement markings and signs indicating the direction of onsite vehicle flow;
3. Design parking lots so that teachers and administrators have sufficient marked spaces in proximity to the entrance most used by them;
4. Provide access aisle for handicap parking spaces;

5. Maintain separate parent drop-off and bus drop-off loops similar to the existing condition to reduce conflicts;
6. Remove and relocate the flashing school zone signs 200 feet from the school entrance on both sides;
7. Provide 'End School Zone' signs for traffic in both directions;
8. Provide sufficient queuing space onsite to avoid spillover onto Shrewsbury Street; and
9. Keep the exit for the school driveway as far east within the project site as possible to increase sight distance for vehicles approaching from the west.

P:\9111 Mountview MS\Transportation\Project Data\TIAS.doc

Addition and Renovation

We have reviewed the “Addition and Renovation” option presented for the Mountview Middle School feasibility study by Lamoureux Pagano and Associates, and will present a description of the new structural system, as well as, the structural work required at the renovated portion of the building. The “Renovation and Addition” option includes demolition and expansion of the existing Gymnasium and Cafeteria Building (1966), renovation of the existing Administration/Classroom Building (1966), renovation of the existing Classroom Building (1987) and addition of a structurally isolated Classroom Building. Due to the substantial renovation work involved within the existing building, the renovation portion of the “Addition and Renovation” option will need to conform to the International Existing Building Code for Level 3 Work, as modified by Chapter 34 of the Massachusetts State Building Code. The new construction portion of the project will need to conform to the International Building Code, as modified by the Massachusetts State Building Code.

Existing Structural Systems:

- 1966 Building (55,000 ft²)
 - Concrete foundation walls and spread footings.
 - 4” Concrete slabs on grade.
 - Steel columns, typically W6 & W8 wide flange shapes with fire shells on select columns. Column lines are typically spaced 10 feet apart.
 - Floors framed with composite steel beams and 5” concrete one-way slabs spanning between beams.
 - 10” Concrete 1-way slab at Auditorium Stage.
 - Roof framed with steel beams, long span joists, and 3” metal roof deck.
 - Unreinforced concrete masonry partitions on slabs.
 - Brick veneer backed up by unreinforced concrete masonry walls.
 - Lateral Force Resisting System: No designated system. Unreinforced masonry walls provide current resistance to lateral loads.

- 1987 Classroom Addition (36,000 ft²)
 - Concrete foundation walls and spread footings.
 - 5” & 6” Concrete slabs on grade.
 - Steel columns, typically W8 wide flange shapes with fire shells on select columns.
 - Floor- 4” Concrete slab on form deck and steel beams and joists.
 - Roof- 1 ½” Steel deck on steel beams and joists.
 - Lateral Force Resisting System: No designated system. Unreinforced masonry walls provide current resistance to lateral loads.

New Addition Structural Systems:

- Foundations:
 - Interior concrete spread footings
 - Continuous reinforced concrete frost wall and footing at exterior walls
- Columns:
 - Wide flange steel column (W8) or steel tube column (HSS6x6)
- Framed Floors:
 - Wide flange composite steel beams
 - Composite metal deck
 - Concrete fill

- Roof:
 - Wide flange steel beams
 - Metal roof deck
- Lateral Force Resisting System:
 - Ordinary steel moment frames and concentrically braced steel frames

Structural Scope at Existing Buildings:

- Install structural steel framing at top of existing masonry partitions at roof level to brace existing walls for out-of-plane seismic loads; including new steel beams and angle framing secured to the roof diaphragm at each existing partition.
- Remove 2-3 interior masonry partitions, in each orthogonal direction, at the Administration/Classroom Building (1966) and Classroom Building (1987) and replace with new reinforced masonry shear walls, including new strip footings.
- Structurally isolate the existing Gymnasium/Cafeteria Building from the existing Administration/Classroom Building to facilitate demolition and addition to the Building. Install new structural framing and lateral-force-resisting system (reinforced CMU shear walls) at the limits of the Cafeteria and Gymnasium.
- Install new reinforced CMU wall and strip footing at existing building/demolition interface to close off existing space during construction and provide frost protection.
- Install new framing at any new roof equipment.
- Repair of steel channels at the base of the masonry walls in the 1966 building, especially at locations where the channel is in contact with grade and has deterioration.
- Interior CMU walls with vertical and stepped cracks should be repointed or have sawn control joints installed and caulked as part of regular maintenance.

From a structural point of view, the “Addition and Renovation” option is the most involved due to the significant renovation of the existing building, phasing of construction, and the integration of the new construction. At a minimum, the existing building will need to be brought into compliance with the International Existing Building Code, as modified by Chapter 34 of the MSBC to increase basic life safety to the minimum requirements of the Code. Also, any modifications to the existing room configurations or change in loading will require significant structural modification to the building.

It should be noted that the renovation will increase the life safety of the existing building, but it will not bring the existing building up to standards of the current Building Code due to lesser quality materials and design practices used at the time of original construction. Also, even though the renovation will extend the life of the existing building, the building should not be expected to last as long or perform as well as the newly constructed additions or a new building. Interior CMU walls with cracks should be repointed or have control joints sawn and caulked as part of regular maintenance. Existing metal roof deck will need to be reviewed after ceilings are removed to verify water damage or deteriorated conditions can be corrected due to previous water leaks.

We have reviewed the “Addition and Renovation” design option and it our professional opinion that the option is structurally feasible, but will require reusing the existing structure, which does not conform to current building code standards for seismic loads and will require structural upgrades during any substantial renovation. Since the existing building was constructed in 1966, prior to the development of current seismic requirements, the “Renovation and Addition” option will require substantial structural modifications just to meet the current Massachusetts State Building Code requirements for existing buildings to reduce seismic hazards caused by the unreinforced masonry walls throughout the building. The 1966 building, and 1987 addition, was built without expansion joints separating the different sections of the building, so any renovation that includes demolition or modification any portion of the existing structure will require a full seismic review of the existing building, and likely will require new reinforced masonry walls or steel bracing systems that conform

to current seismic requirements. The Addition portion of the project will be structurally isolated from the existing building and will be designed to meet the current Massachusetts State Building Code.

Christopher Tutlis, PE
Bolton & DiMartino, Inc.

Mount View Middle School Holden, Ma.
Final Evaluation of the Major Renovation – Addition Option – Fire Protection
9-4-12

BUILDING DESCRIPTION

General: The Mount View Middle School is located at 270 Shrewsbury St, Holden, Ma. It is a 3-level, 3-wing building of non-combustible, steel, concrete and brick construction with flat roofs. Gross building area is 91,137 square feet (including the original, 1967 building and a 1989 addition).

For additional comments on the existing layout, hazards, school flammability standards, and storage issues, see the Existing Conditions – Preliminary Design Program report, dated 6-27-12

CONSTRUCTION OPTIONS:

Based on the preliminary design program submission, the school and MSBA have concurred that 3 options should be evaluated in more detail. These are:

1. A full renovation of the existing building (including enclosure of the existing, 5,171 sqft courtyard) with a 52,087 sqft addition (Renovation-Addition)
2. Demolition of the existing building, with construction of a new, 128,000 sqft building on the existing site,
3. Construction of a new, 128,000 sqft building on a town-owned parcel on Malden St. The fate of the existing school to be determined by the Town.

This document discusses the renovation-addition option.

Full renovation with additions to building.

This would fall under the IEBC definition of a level 3 renovation, which is, the work area exceeds 50% of the aggregate building area. Both because of the addition, and the re-configurations, this would certainly be considered “major alterations”, and would require that all current FP code requirements be met by the existing building as well as any addition. Fire Protection work includes:

1. *Replace existing FP:* The Architect has directed that all existing Fire Protection would be removed and replaced in its entirety, due to conflicts with proposed HVAC work. This is a major change from the PDP report, and significantly increases the cost of this option.
2. *New FP:* Provide a new, NFPA 13 fire protection system thru-out the original building and new addition.
3. *Standpipes:* Since current code would not require stairwell standpipes in the existing building, we recommend eliminating the existing stairwell hose stations if “renovation” is the chosen option. Standpipes require a much higher water-pressure

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and flow than a sprinkler system. Thus, eliminating the standpipes could potentially eliminate the need for fire pumps (see “fire pumps” below).

New stage standpipe hose-stations will be required, but this system is permitted to be a “manual” stand-pipe, fed from the fire dept. pumper. Thus they have minimal impact on whether fire pumps are required or not.

4. *Fire Dept. Connection:* The local fire department is changing their Fire Dept. Connection (FDC) standard from “2-1/2” Siamese” to “4” Storz”. The existing Siamese FDC should be replaced with a 4” Storz, to maintain compatibility with the fire department requirements.
5. *Fire Pump:* A new flow test will be required to confirm available water pressure and flow (and fire pump status) at the site, but the Town’s water line upgrades will certainly have improved flow and pressure since the 1989 addition. A 2010 FP inspection report noted 2 issues with the less-than-10-year-old fire pump. These must be addressed (unless the flow test indicates the fire pumps can be eliminated).

RECOMMENDATIONS AND COSTS

The fire-protection requirements for this options are summarized above, and their budget costs are shown in Table 1 - based on building square-footage only.

The following “other” general recommendations apply to *all options* being considered:

- renovation-addition,
- new-construction-existing site, and
- new-construction-alternate site.
- **Flow test:** Prior to schematic design, provide a flow-test at the selected site.
- **General Storage issues:** Plan for all storage heights to be less than 12’. Review available storage areas and storage needs. Organize storage to keep it confined to designated storage rooms, with appropriate FP coverage.
- **Special Storage Issues:** Provide listed flammable storage cabinets for the storage of all flammable or combustible liquids or chemicals. Do not permit any plastic shelving. Metal shelving has the best fire resistance, wood shelving is acceptable.
- **Flammability Standards:** Ensure that all (existing and) new furniture and window coverings meet 527 CMR flammability standards.
- **Fire Signaling:** Connect all new FP system alarms to a new central Fire Alarm Control Panel (FACP - provided under electrical).

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- **Maintenance Training and inspections:** Train in-house personnel, and provide required monthly inspections using in-house inspectors
- **FP Maintenance Contract:** Provide additional code-required maintenance and testing of FP systems alarms and flow via maintenance contract.

**Table 1 - Mt. View Middle School Fire Protection
PSR Cost Estimates**

	Major Renovation with Addition	New Construction Existing site	New Construction Alternate Site
ITEM	Budget Cost	Budget Cost	Budget Cost
Total Square Ft. Renovation <i>NO</i> Exist FP	57,308	0	0
Total Square Ft. Renovation w/ Exist FP	39,000	0	0
Total Square Footage - New Construction	52,087	128,000	128,000
Budget FP Cost per Sqft - No Exist FP	\$5.78	0	0
Budget FP Cost per Sqft - W/ Exist FP *	\$5.78	0	0
Budget FP Cost per Sqft - New Constr.	\$4.19	\$4.19	\$4.19
Budget FP Total Installed Cost	\$774,654	\$536,000	\$536,000
<i>Increase in Annual Maintenance Costs **</i>	\$5,010	\$7,040	\$7,040
* Per Architect - Existing FP to be removed and replaced in its entirety due to conflicts with proposed HVAC			
* Maint. Cost per sqft assumed:	0.055		



Date: September 4, 2012

To: William Senecal – Architect

Co: Lamoureux-Pagano Assoc. Architects, Inc. (via email)

From: Kevin Seaman. P.E. LEED® AP

Re: Mountview Middle School: **Feasibility Study HVAC & Plumbing Narrative – Additions & Renovations Option**

The following narrative describes the proposed scope of work pertaining to the heating, ventilation and air conditioning (HVAC) systems and the plumbing systems at the Mountview Middle School for the Additions & Renovations option. As noted in our earlier existing Mechanical conditions report, several of the HVAC systems and most of the plumbing systems within the existing building have exceeded their useful expected service life and as such have been proposed for replacement as described herein.

HVAC

Central Heating Plant:

Natural gas availability to the site is still being reviewed however it is understood that natural gas service is available near the current project site. If the service cannot be extended to the site and underground LP tank(s) are required we highly recommend a hybrid system be used which can incorporate air source and/or geothermal based heat pumps. The below recommendations presume that adequate natural gas can be brought to the site.

At fuel prices of \$3.30 per gallon for fuel oil and \$1.20 per Therm for natural gas, converting from fuel oil to natural gas could result in the following savings presuming the current building utilizes an estimated 31,200 Gallons of fuel oil per year for heat (excluding domestic hot water):

- **Base Line:** Simple conversion of the current boilers from #2 fuel oil to natural gas could lead to a drop in heating costs from \$102,960 to \$52,416 for an annual savings of \$50,544 (approx.. 50% reduction).
- **New 90%+ Eff. Gas Boilers:** Replacement of the boiler plant and associated heating terminals with new high efficiency condensing gas boilers the annual heating energy cost would be expected to be \$42,271.
- **New 90%+ Eff. Gas Boilers with Thermal Improvements:** to the building by new windows and roof insulation would be expected to generate an estimate of 20% in savings thereby dropping the annual heating cost to an estimate of \$33,817

The proposed 50,000 SF addition would be expected to add approximately 40% to the above annual fuel cost projections.

Proposed Heating Plant Improvements are as follows:

1. The buildings heating requirements would be satisfied via high efficiency (93%+) gas-fired condensing hot water boiler plant. Maximum design hot water supply temperature of between 140°F to 180°F depending on extent of heating terminal renovation in existing structure. Pending final load calculations and system design, initially the boiler plant shall consist of two (2) new gas-fired condensing fire-tube style boilers each with a gross input capacity of 3,500,000 BTUH similar to Lochinvar Crest or equal by Aerco or Viessman. Boilers shall be located within the existing lower level mechanical room with combustion air and flue venting for the new boiler running up within the existing chimney to the roof. This option presumes the domestic hot water heater shall also be vented independently up the existing chimney.
2. Provide 2-pipe hydronic hot water system complete with end-suction system pumps as manufactured by Taco or Bell & Gossett rated for 500 GPM. Hydronic system shall connect to 2-pipe fan coil units, unit ventilators, unit heaters, coils and fin-tube radiation located throughout the building. All new terminals connected to the new system shall be designed to operate with a maximum water temperature of 140°F to maximize plant capacity. Pumps shall have premium efficient motors and be fitted with variable speed drives so that pump energy matches system flow demand.

Distribution and Ventilation:

Proposed Air Distribution and Ventilation Improvements are as follows:

1. In the 1987 structure provide high efficiency packaged rooftop units to provide outdoor air and exhaust to the classroom spaces. Units shall utilize variable speed compressor technology for dehumidification control coupled with hot gas DX reheat and hot water coils tied to the central boiler plant. Units shall also be equipped with total energy recovery (ERU) wheels to utilize waste exhaust to temper incoming fresh air. In addition, units shall be provided with variable speed drive (VSD) supply fans which can modulate based on room ventilation demand. Units shall be as manufactured by Aeon, McQuay or Trane.
2. For the 1966 building classroom areas supported by two (2) central air handlers installed in 1997, provide two (2) roof mounted ERU ventilation units tied to the main return ducts of each of the air handlers. New ERU units shall pretreat outdoor air into each unit thereby reducing the heating energy costs and complying with current energy code requirements. New units shall also be provided with variable speed compressor technology for dehumidification control coupled with hot gas DX reheat. Provide EMS controls for associated systems. This improvement shall also consider the option to remove the existing air handlers and support them with the proposed new rooftop equipment.

3. In the proposed addition classrooms provide rooftop total energy recovery ventilators to support multiple classrooms as manufactured by Aaon or equal by McQuay or Greenheck. Units shall come compete with supply and exhaust fans on variable speed drives, total energy recovery wheel, digital scroll compressors, hot gas reheat coil for dehum. cycle and hot water coil (heat pump if no natural gas). Each units shall be rated to provide the minimum amount of outside air required for all the space supported. Units shall be ducted to supply and exhaust air from each space with each space having its own VAV control box on the supply branch and zone damper on the return/exhaust branch. Distribution shall connect to displacement style diffusers in each classroom space. Units shall provided tempered and dehumidified air to all the classroom spaces.
4. For other area as noted below rooftop air handling units are proposed to facilitate ease of service and economy. For area requiring cooling, provide high efficiency packaged rooftop units which utilize variable speed compressor technology and hot water coils tied to the central boiler plant. Units supporting high occupancy areas shall be equipped with ERU wheels to utilize waste exhaust to temper incoming fresh air. In addition units shall be provided with variable speed drive (VSD) supply fans which can modulate based on load and ventilation demand. Units shall be as manufactured by Aaon, McQuay or Trane. Areas supported by such equipment shall be as follows:
 - Cafeteria – Unit with VSD and ERU (option for high efficiency cooling)
 - Media Center – Unit with VSD and ERU and high efficiency cooling
 - Gymnasium – Unit with VSD
 - Office – Unit with VSD with high efficiency cooling (option for ERU) supporting variable air volume boxes with reheat coils.
5. The computer classrooms as well as the MDF room shall be cooled via high efficiency ductless split units (one per room) with fan coil mounted within ceiling and condensing unit on roof.
6. In all addition classrooms, provide multi-tier high output fin–tube radiation in each room. Radiation shall be piped and controlled so that each room shall have its own temperature control zone.
7. Provide two (2) total energy recovery ventilators, one for the girls locker room and one for the boys locker room to support ventilation of these areas as manufactured by Greenheck model ERCH or equal by Aaon or McQuay. Units shall come compete with supply and exhaust fans, total energy recovery wheel, electric frost preheater and hot water coil. Units shall be ducted to exhaust and supply air to the respective locker room areas.
8. All other bathrooms not supported by these systems shall be exhausted by roof mounted centrifugal exhaust fans and/or local exhaust fans controlled by space occupancy sensors.
9. Replace existing kitchen hood and associated ductwork and fan with new constructed and listed for kitchen hood duty. Provide chemical based suppression system at all cook line equipment requiring such. Fit hood with energy saving smoke/heat detection system coupled

to variable speed fan. Provide new roof mounted make-up air system which shall also have the ability reset make-up air system volume in unison with kitchen hood.

10. All classroom exhaust fans not supported by central air handlers or ERU systems noted above shall be replaced with new fans with premium efficiency motors. For fans serving multiple rooms, the branch ducts shall be fitted with control dampers and the fans shall be equipped with variable speed drives so as to modulate fan speed based on number of rooms which are occupied.

Controls:

Proposed Control Improvements are as follows:

1. The school shall incorporate a direct digital control (DDC) energy management system (EMS) that monitors and controls the HVAC equipment for efficient use. The system is designed on PC based architecture and adjustments are made on a graphics based presentation of building systems. The system also supports maintenance and record keeping needs of the facility. Occupancy of the school is based on the standard school year with occupied/unoccupied conditions based on current school day practice. This is an adjustable feature that can be made to reflect additional operating needs and use of the school building by staff or others.
2. The HVAC systems are generally operated on a school day basis coinciding with the occupied/unoccupied schedule of the standard 180-day school year. Adjustments can be made through the DDC system to allow for usage during periods other than the usual school operating periods.
3. Space temperature is monitored by individual space sensors that transmit data to the central monitoring and control station. Space conditions are adjustable through DDC system and can be modified to meet individual needs. Local control of space conditions is limited to predefined adjustments in space temperature and to facilitate a 3-hour occupied override feature.
4. All classroom systems shall incorporate space occupancy sensors to reset ventilation levels when room is unoccupied during a regularly scheduled occupied period. Systems serving high occupancy areas such as the cafeteria and media center shall also include carbon dioxide (CO₂) indoor air quality (IAQ) sensors which optimize the fresh outdoor air ventilation levels in response to variations in space occupancies.
5. The building shall be connected to emergency power source for operation of heating boilers, pumps and other systems determined to be critical during loss of primary power.

Sustainable Opportunities:

Many of the proposed system and control sequences noted above minimize energy consumption however, further optimization may be obtained by investigating the use of more advanced

efficient equipment. In addition, if natural gas is not available on site a hybrid system utilizing either air based heat pumps and/or geothermal based option could be considered. A geothermal chiller/heater could support building cooling loads in the summer as well as provide supplemental heating to the building by preheating both the heating water and domestic hot water thereby reducing the demand on the building fossil fuel boilers. A geothermal well field analysis as well as a life cycle cost would need to be performed to verify economic viability.

Two solar based options to consider would be passive solar wall design using air passing through a wall assembly facing South to preheat air and/or vacuum tube thermal solar panels mounted on the roof to directly supplement the building heating and domestic hot water systems.

Plumbing

Distribution & Conveying Systems

Proposed Distribution System Improvements are as follows:

1. As noted in the conditions report, the water distribution system have been experiencing failures oddly more so in the newer 1987 section. This coupled with the age of the older 1966 piping make it probable that the piping may have some lead containing piping, fittings and/or solder. As such, we suggest the entire domestic water distribution system be replaced in its entirety. The new distribution system would consist of copper piping and lead-free fittings and products. The new system would be sized to support both the existing building and new additions.
2. In the 1966 building, all sanitary sewer and rain water conductors located above the grade floor slab shall be replaced in their entirety. Underground waste piping shall be examined via camera inspection and if found to be in good condition shall be retained and reused. In the 1987 building most of the waste and storm piping should be in good condition and not need replacement. The addition(s) shall be tied into new sanitary and storm system mains located outside of the building envelope. All waste from the science labs generating acidic waste shall be run through a passive acid neutralizing tank with outflow PH monitor.
3. All waste from the kitchen shall be piped to a large (1,000 gallon+/-) exterior grease trap prior to discharge to the municipal sewer system.

Domestic Hot Water

Proposed Domestic Hot Water System Improvements are as follows:

1. A high efficiency (93%+) gas-fired condensing boiler/water heaters shall be used to support the buildings domestic hot water needs. Water heater(s) shall be located in the existing lower level boiler room with flue gas and combustion air venting up through the existing chimney and combustion air chase ways.

2. Dual water tempering valve stations shall be provided at the water heater to maintain water heater temperatures above 140°F to prevent bacterial growth in the tank while delivering 125°F water to service fixtures for sanitation and 110°F hot water to public lavatory sinks and other student and public use fixtures to prevent scalding.
3. A recirculating 70°F tempered water loop shall be provided to support the emergency shower eyewash fixtures in the science and chemistry labs.

Fixtures

Planned renovations and additions will most likely require removal of the existing fixtures. Once removed the fixtures shall be replaced with code compliant water conserving fixtures. In addition, to achieve improved MA-CHPS compliance and further water savings we highly recommend ultra low flush water closets and urinals be utilized in both the renovation and addition areas. The ultra low flush water closets use 1.28 gallons per flush as opposed to the 1.6 gallon per flush allowed by today's code and the urinals use 1 pint (0.13 gallons) per flush as opposed to the current 1 gallon per flush allowed. The combination of these two can result in substantial savings overtime.

Lavatory faucets shall be of the low flow metered type controlled by either a wired or battery powered sensor operated faucet. Use of these faucets promotes good hygiene as well as water conservation.

Sustainable Opportunities:

Many of the proposed fixtures and control sequences noted above minimize water usage and conserve energy however, further optimization may be obtained by investigating the use of storm water recovery systems. These systems collect, filter and utilize storm water to supply water to water closets and urinals throughout the building. A life cycle evaluation must be performed to ascertain the initial first costs, annual operating costs and projected savings associated with such a system.

End of Narrative

Attached:

- Proposed Heating Boiler Type
- Proposed ERU Unit Type
- Proposed Displacement Diffuser Types



ART Engineering Corp.

ELECTRICAL ENGINEERS

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**Recommendations – Electrical Systems
Renovation/Addition Option
Mountview Middle School
Holden, MA**

Date: August 28, 2012
Prepared by: Azim Rawji, P.E.

The electrical systems included in our study were found to have fair or poor overall ratings. There are many reasons for this, including the age and systems and that they do not meet current code requirements. The majority of the electrical systems in the building are either obsolete or outdated; however, these systems are functioning as originally designed and operate under “grandfathered” code conditions.

1. Renovation/Addition Option

- a. Demolish power/communications to existing modular classrooms.
- b. Temporary Power:
 - i. Provide power for new temporary classrooms to facilitate renovation/addition of the structure in phases.
- c. Electrical Service:
 - i. Upgrade electrical service and provide new main switchgear and distribution equipment.
 - ii. The existing service will remain operational; and the existing panelboards will be replaced during subsequent renovation phases.
 - iii. Once all the existing panelboards are replaced, the existing service will be disconnected and removed.
- d. Emergency Power:
 - i. Provide new emergency/standby generator, transfer and power equipment. Emergency equipment must be separated from normal and standby power equipment per the Massachusetts Electrical Code.
 - ii. All emergency equipment and feeders must be installed in 2-hour rated rooms or must be 2-hour rated.
- e. Lighting:
 - i. Provide new egress lighting and exit signage.
 - ii. Provide new light fixtures with high efficient fluorescent and LED lamps.

- iii. Provide new lighting control system including occupancy sensors and daylight harvesting.
- iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.
- f. Fire Alarm:
 - i. Provide new voice evacuation fire alarm system.
 - ii. Provide new public safety radio distributed antenna system.
- g. Data Communications:
 - i. Provide new telecommunications cabling infrastructure per the BICSI standards. Utilize Category 6 cabling infrastructure. Install telecommunications equipment in dedicated rooms.
 - ii. Provide new wired and wireless data communications equipment.
 - iii. Provide new VoIP telephone system.
- h. Audio-Video Systems:
 - i. Provide new public address and clock systems.
 - ii. Provide new media distribution system.
 - iii. Provide new audio-video systems in classrooms and common areas.
 - iv. Provide new sound system in the gym/cafetorium.
- i. Security Systems:
 - i. Provide new video surveillance, access control and intrusion detection systems.

**MA-CHPS Criteria 2009 Edition
Project Checklist - Renovation/Addition**

MA-CHPS Project Numbers (Must be consistent throughout the application)

Project Name: **Mountview Middle School**
Project Address: 270 Shrewsbury Street, Holden, MA
Date Updated: 21-Aug-12

Bldg Area:	
Parking:	
Site Area:	
FTE:	
Students:	
Visitors:	

Yes	?	No	
48	46	31	TOTAL

4	6	0
Y		
Y		
1		
2	2	
	3	
	1	
1		

Integration & Innovation - need 2 points NC, 1 point Ren.		Points	Abridged Requirements
Y	II.p1	Required	Conduct a min of 2 integrated design team workshops (1 in SD, 1 prior to CD) that identify the project's high performance goals
Y	II.p2	Required	Provide a permanent display on the school site that describes the high performance features that are part of the school's design.
1	II.c1	1	Create demonstration areas for 3 out of the 5 major MACHPS categories: Site, Water, Energy, Materials & IAQ
2	II.c2	1-4	Points are awarded for highly innovative or creative actions or measure that are not already contained in MACHPS OR exceptional performance in an existing credit.
	II.c3	3	As part of the design process, perform a life cycle cost analysis showing net present value over 30 yrs of the major building systems considered for the project that are anticipated to consume significant amount of energy, water or other natural resources.
	II.c4	1	1) Provide a site on campus for one or more school gardens with a min of 100sf four every 4 classrooms. 2) Provide signage to designate the areas as a school garden. 3) Develop a long-term maintenance plan. 4) For existing sites the soil must be tested to ensure there are no contaminants.
1	II.c5	1	Develop a School Master Plan for the site and facilities of an individual school in collaboration with school board members and community stakeholders that: 1) Supports the continued compliance with high performance strategies. 2) Assess and plan for future transportation impacts. 3) Assess and plan for possible change in student enrollment. 4) Assess using the school for emergency preparedness. 5) Ass and plan for future high performance upgrades and renovations by documenting the life cycle of major materials and systems.

Yes	?	No	
7	12	4	

Indoor Environmental Quality - need 5 points NC, 3 points Ren.		Points	Abridged Requirements
Y	EQ.p1	Required	EQp1.1 Minimum OA Ventilation Requirement - Design all spaces to meet ASHRAE 62.1-2007 Section 6.2 outdoor air requirements. In areas having significant pollutants shall be exhausted directly to the outside and not re-circulated. HVAC systems and equipment shall meet the requirements of ASHRAE 62.1 Section 5. EQp1.2 To maintain clean ducts and avoid particulate accumulation and/or mold in the ductwork, duct liners must meet the ASTM standards C1071 or UL 181 for surface erosion resistance and ASTM standards C 1104 or C 209 for water vapor sorption.
Y	EQ.p2	Required	EQp2.1 During construction meet the recommended Design Approaches of the SMACNA IAQ Guidelines for Occupied Building Under Construction, 2007, Chapter 3. EQp2.2 If installing a new duct system, follow SMACNA guidelines for "Duct Cleanliness for New Construction Guidelines" according to advanced levels of cleanliness. EQp2.3 Building Flush Out - Develop a plan and include it in the specification to flush out the building with OA
Y	EQ.p3	Required	EQp3.1 Off-Gassing - Where chemical use occurs use deck-to-deck partitions with dedicated outside exhaust at a rate of at least 0.50 cubic feet/min/sd. Doors to these areas must be secured with self-locking and closing mechanisms. EQp3.2 Walk off Mats - Provide a 2 part walk-off mat system for all high volume entryways. EQp3.3 Electric Ignitions for Gas-Fired Equipment - Specify electric ignitions for water heaters, boilers, AHUs and cooking stoves. EQp3.4 Air intake locations shall follow ASHRAE 62.1-2007. All intakes must be 6 ft above landscaped grade. EQp3.5 No Mobile Fossil-Fuel Power Equipment Indoors.
Y	EQ.p4	Required	EQp4.1 Drainage - Design surface grades to slope away from the building. Evaporation drip pans are prohibited for HVAC systems. EQp4.2 Lawn irrigation shall be designed to prevent spray on building. EQp4.3 Mold Prevention - Building materials shall be kept dry.
Y	EQ.p5	Required	Replace filtration media immediately prior to occupancy. Filtration media shall be MERV 10 or higher, excluding unit ventilators, which can have MERV 7.
Y	EQ.p6	Required	Comply with the current ASHRAE 55 thermal comfort standards.
Y	EQ.p7	Required	Provide direct line of site to view glazing from 70% of the combined floor areas of classrooms, library and administration areas. View glazing area shall be =>7% of floor area.
Y	EQ.p8	Required	Design spaces to optimize daylight while preventing glare by controlling direct sunlight ingress. Unoccupied classrooms must meet: 1) Classroom and core learning spaces must reverberation time meets ANSI S12.60. 2) All walls, roof-ceiling and floor-ceiling assemblies must meet the STC ANSI S12.60-2002. 3) For enclosed core learning areas the exterior windows may comprise no more than 25% of the area of the partition. Floor-ceiling assemblies over classrooms must meet ICC of 50.
Y	EQ.p10	Required	EQp10.1 Paints & Coatings - All paints and architectural coatings totaling 90% or more of the total volume of such products applied shall meet SCAQMD Rule 1113 & comply with Safe Drinking Water & Toxic Enforcement Act of 1986. EQp10.2 Composite Wood - At least 90% by area of the composite wood shall meet either or both CARB ATCM Sections 93120-93120.12 and shall have no added formaldehyde.
	EQ.c1	1-2	Provide direct line of site to view glazing for at least 80% of the combined floor area of the classrooms and admin areas.
	EQ.c2	1-6	For all classroom spaces choose Multiple Point in Time Approach average fc requirements OR Daylight Autonomy Approach (1-4points). For support spaces choose Multiple Point in Time Approach average fc requirements OR Daylight Autonomy Approach (1-2points)
2	EQ.c3	1-4	EQc3.1 (1 point) All adhesives and sealants used in quantities of 2.5 gal or more and totaling 90% or more of the total shall meet SCAQMD Rule 1168 or CDPH Standard Practice. EQc3.2 (1 point) Flooring Systems totaling 90% or more of the total floor area shall be tested following CDPH Standard Practice. EQc3.3 (1 point) Ceiling and Wall Systems totaling 90% or more of the total area of such systems shall be tested following CDPH Standard Practice. EQc3.4 Furniture and Furnishings totaling 90% or more of the total shall meet ANSI/BIFMA M7.1-2007
1	EQ.c4	1	Install ducted HVAC returns throughout the school in occupied spaces to avoid dust and microbial growth issues.
1	EQ.c5	1	Design HVAC system with particle arrestance filtration rate MERV 13.
1	EQ.c6	1	EQc6.1 Vacuum carpeted and soft surfaces with a HEPA filter vacuum that meets CRI Seal of Approval/Green Label Vacuum. EQc6.2 Prior to flushout, filters must be replaced with MERV 10.
	EQ.c7	1-4	EQc7.1 (1 point) Classrooms and core learning spaces with volumes greater than 20,000 cubic feet must have a 1.5 second reverberation time max. EQc7.2 (2 points) Unoccupied classrooms must have a max background noise level of no more than 35 dBA Leq. EQc7.3 (1 point) Add to school commissioning requirements (in EEP2) that background HVAC noise is tested to reqs of EQ.p9 and EQ.c7.2.
2	EQ.c8	1-2	EQc8.1 (1 point) 90% of all classrooms shall have a minimum of one operable window that is accessible to occupants. EQc8.2 (1 point) Provide separate temperature and ventilation controls for each classroom or provide each classroom with an independent temp sensor that automatically adjust to the conditions. And provide lighting controls for each classroom.
	EQ.c9	1	Provide access doors for cleaning all supply and return ductwork and execute a plan for cleaning ductwork prior to occupancy.
	EQ.c10	1	EQc10.1 Provide multi-scene indirect/direct lighting systems for all classrooms. EQc10.2 The lighting system shall operate in general illumination and A/V modes. EQc10.3 In general illumination mode, achieve an avg illumination at desk level of 35 to 50 fc w/ min of 25fc at any point more than 3ft from any wall. EQc10.4 In A/V mode achieve a avg illumination at desk level of between 10 and 20 fc. EQc10.5 In indirect mode, controls shall provide at least two levels of uniform lighting both at night and when daylight is available.

Yes	?	No			
11	8	17	Energy - need 10 points NC, 7 points Ren.		
			Points	Abridged Requirements	
Y			EE.p1	Minimum Energy Performance, 20%	Required Follow the current MA Stretch Energy Code (780 CMR Appendix 120 AA, Chapter 5) to achieve energy savings either through the Performance based approach (20% better than the current ASHRAE 90.1 on an energy cost basis) OR the Prescriptive based approach as explained in the reference guide.
Y			EE.p2	Commissioning	Required Implement ALL of the fundamental best practice commissioning procedures, as described in the reference guide and contained in the Massachusetts School Building Authority's Standard Scope of Commissioning Services.
Y			EE.p3	Facility Staff & Occupant Training	Required EE.P3.1 Facility Staff Training: Facility staff must receive training and operation and maintenance documentation on all building systems included in the commissioning scope of work. EE.P3.2 Teacher/Administrative Staff Training: Teachers, administrators, and support staff must be offered training on operations of lighting, heating, and cooling systems in classrooms, offices, gyms, auditoriums etc. A User's Guide, explaining basic systems operations, should be developed and posted in each room of the school.
0	0	11	EE.c1(A)	Superior Energy Performance (Performance)	2-15 Performance approach: Utilize the Performance Approach from Energy Prerequisite EE.P1 for quantifying energy cost savings. Points are awarded according to the percentage saved over a baseline building.
2	2		EE.c1(B)	Superior Energy Performance (Prescriptive)	2-4 Prescriptive approach: Meet the requirements of EQ.C2, Daylighting in Classrooms AND ensure that 40% of the installed electrical lighting wattage throughout the school is dimmed or turned off when sufficient natural light is present. (2 points) Install an energy recovery ventilation (ERV) system to recover waste heat into the incoming fresh air stream. (2 points)
2	1		EE.c2	Minimize Air Conditioning	1-3 1 Point: Design and install a dehumidification system, which tempers air but does not act as a full air conditioning system. Spaces such as computer classrooms and server rooms are exempt. 2 Points: Design 80% of permanent classrooms without air conditioning. 3 Points: Design 90% of permanent classrooms without air conditioning.
4	2	6	EE.c3	Renewable Energy	1-12 EE.C3.1: Use renewable energy sources for electricity production that are on-site or allocated to the school facility through net metering. EE.C3.2: Use on-site renewable energy sources for heating/cooling.
		1	EE.c4	Plug Load Reduction & ENERGystar Equipment	1 Pass a resolution to require ENERGY STAR equipment and appliances, where available, for all new purchases for the school and to prohibit the purchase of low efficiency products. Develop a plug load reduction plan that identifies all potential plug loads in the school. Plug loads identified should be incorporated into the energy model in EE.P1 Minimum Energy Performance, if the performance option is followed.
2	1		EE.c5	Energy Management System & Sub metering	1-3 EE.C5.1: Install an energy management system (EMS) to monitor and trend the energy consumed by the following systems throughout the school: Lighting (interior and exterior), HVAC, and Domestic hot water systems. Meter all energy sources provided by utility sources and trend the data against outside air temperature. Provide a plan addressing trendlogging, operator training, and data analysis. EE.C5.2: During design, circuit the electric loads to designated lighting and general power panels so that a true energy measurement of these systems can be achieved. Take either approach for two points: Submeter Major Electrical Equipment Loads OR Boiler System.
1	1		EE.c6	Flex Energy	1-2 Design the school so that the following technologies can be easily incorporated: 1) Photovoltaic electricity systems, 2) Solar thermal systems, 3) Electric vehicles. 1 Point: Identify the locations where one or more of these technologies can be incorporated and what steps must be taken to make them possible. 2 Points: Identify the locations that will be constructed to be ready for one or more of these technologies.
8	3	5	Water - need 5 points NC, 3 points Ren.		
			Points	Abridged Requirements	
Y			WE.p1	Irrigation System Performance on Recreational Fields	Required Any in-ground irrigation systems used for recreational fields must have soil moisture meters, weather station, or ET controllers.
Y			WE.p2	Indoor Water Use Reduction, 20%	Required Employ strategies that, in aggregate, reduce potable water use by 20% beyond the baseline calculated for the building after meeting EPA 1992 fixture requirements.
1	1	1	WE.c1	Indoor Water Use Reduction, 30-50%	1-3 Exceed the potable water use reduction beyond the calculated baseline determined in WE.p2
		4	WE.c2	Reduce Potable Water Use for Sewage Conveyance	4 Reduce the use of potable water for building sewage conveyance by a minimum of 50% through the utilization of water-efficient fixtures, use of rainwater catchment systems, or both.
3			WE.c3	No Potable Water Use for Non-Recreational Landscaping Areas	3 Do not install permanent irrigation systems for watering non-playing field landscaped areas AND specify drought tolerant plants or grasses in these areas.
2			WE.c4	Reduce Potable Water Use for Recreational Landscaping Areas	2 Reduce the irrigation needs of athletic fields by specifying appropriate soils and drought tolerant grasses for all sports fields. Specify soils and seed mixes that meet requirements.
1			WE.c5	Irrigation System Commissioning	1 Create an irrigation commissioning plan and complete installation review during construction, performance testing after installation, and documentation for ongoing operations and maintenance.
1	2		WE.c6	Water Management System	1-3 WEC6.1 (1 point) Install a Water Management System to monitor water for any equipment or system that exceeds 20% of the total amount of water used. At a minimum submeter domestic water and exterior irrigation. WEC6.2 (3 points) Install a Water Management System to monitor water use of all indoor and outdoor water uses. Water meters should have a pulsed output for AMR. Submeter: all indoor water usage except gyms with showers, gyms with showers, landscaping irrigation, recreation irrigation, swimming pool, cooling tower.
10	3	3	Site - need 5 points NC, 3 points Ren.		
			Points	Abridged Requirements	
Y			SS.p1	Joint Use of Facilities & Parks	Required Design, with community involvement on one or more spaces (2,500sf min) for use by community or other appropriate organization. Share park or recreation space with the community.
5			SS.c1	Sustainable Site Selection	1-5 SSc1.1 (1 point) Do not modify land with prior to project was public parkland, conservation land, or land acquired for water supply protection. SSc1.2 (1 point) Do not develop on land lower than 5' above the 100 yr flood elevation. SSc1.3 (1 point) Do not develop school site that are within wetland resource areas. SSc1.4 (1 point) Do not develop on greenfields.
		1	SS.c2	Central Location/Smart Growth	1 Site the school with 1/2 mile of at least 8 basic services OR verify that municipality has a current Commonwealth Capital score
1			SS.c3	Reduced Building Footprint	1 Increase the FAR of the school to be at least 1.4.
	1		SS.c4	Building Layout & Microclimates	1 Implement four of the following: 1) Orient the building to maximize daylighting 2) Consider prevailing winds. 3) Take advantage of existing formations to provide shelter from extreme weather. 4) Plant appropriate trees in appropriate areas. 5) Minimize importation of non-native soils. 6) Create physical connections to bike paths, natural features or adjacent buildings. 7) Site building to maximize opportunities for renewable technology.
1			SS.c5	Public Transportation	1 Locate building within 1/2 mile of a commuter rail, light rail or subway OR within 1/4 mile of one or more bus lines.
1		1	SS.c6	Pedestrian/Bike/Human Powered Transportation	2 SSc6.1 (1 point) Provide sidewalks and bike lanes that extend at least to the school entrance AND provide lanes that connect to residential areas at least 1/4 mile from the school entrance AND provide suitable means to secure bicycles for 5% or more of the building occupants. For elementary schools, count only students in the 4th grade and above as building occupants. SSc6.2 (1 point) Provide bike lanes that extend at least 2 miles into neighboring communities
		1	SS.c7	Parking Minimization	1 New Construction: Size parking capacity 1) To meet, but not exceed, local zoning OR 2) not to exceed a) HS - 2.25 spaces per classroom plus parking for 20% of students b) Elementary & Middle - 3 spaces per classroom. Major Renovations: Add no new parking AND provide preferred parking spaces for 52% of total parking for carpools and LEFE vehicles.
1			SS.c8	Post-Construction Stormwater Management	1 Exceed the MA Stormwater Standards by implementing a stormwater management plan that results in a 25% decrease in stormwater runoff volume for existing conditions.

	1	SS.c9	Reduce Heat Islands - Landscaping	1	Provide shade (within 5 yrs) on at least 20% of non-roof, impervious surfaces on site OR use light colored (SRI 29) materials for 20% of the impervious area. OR use a combination.
1		SS.c10	Reduce Heat Islands - Cool Roofs	1	Use roofing materials that have a SRI of 78 low-sloped roof, 29 steep-sloped roof for a minimum of 75% of roof area.
	1	SS.c11	Light Pollution Reduction	1	Meet the Uplight, light trespass and glare requirements as described in sections SSC11.2-11.3

Yes ? No

5 9 0

Materials & Waste Management - need 5 points NC, 3 points Ren. Points **Abridged Requirements**

Y		MW.p1	Storage & Collection of Recyclables	Required	Meet local ordinances for recycling space, and provide both an easily accessible areas dedicated to the separation collection and storage of recyclables. Provide a plan for the removal of these recyclables.
Y		MW.p2	Minimum Construction Site Waste Management, 75%	Required	Recycle, reuse, and/or salvage at least 75% (by weight) of non-hazardous construction and demolition waste, not including land clearing and associated debris.
	1	MW.c1	Minimum Construction Site Waste Management, 90%	1	Recycle, reuse, and/or salvage an additional 15% for a total of 90% (by weight) of non-hazardous construction and demolition waste, not including land clearing and associated debris.
1	1	MW.c2	Single Attribute - Recycled Content Materials	1-2	Prescriptive: Specify and install at least four major materials from Table 15-Minimum Recycled Content Levels for 1 point, or eight major materials for 2 points. Performance: The weighted average recycled-content value is at least 10% (post-consumer + 1/2 secondary), or at least 20% for 2 points.
	1	MW.c3	Single Attribute - Rapidly Renewable Materials	1	Use rapidly renewable materials, excluding wood fiber, for 2.5% of the total value of all products used in the project. OR Specify rapidly renewable materials for 50% of the major interior finishes or structural material listed in criteria.
	1	MW.c4	Single Attribute - Certified Wood	1	Specify that a minimum of 50% of the wood-based materials are FSC Certified.
1	1	MW.c5	Single Attribute - Regional Materials	1-2	Specify that a minimum of 10% of building materials (based on cost) that are extracted, and manufactured regionally for 1 point. 2 points for 20%.
	1	MW.c6	Materials Reuse	1	Performance: Specify re-used, salvaged or refurbished materials obtained off-site for 5% of building materials. Prescriptive: Specify re-used, salvaged or refurbished materials for 25% of one of the following major finish materials: Flooring, casework, acoustical ceiling tiles, wall finishes, tile, roofing materials.
1		MW.c7	Durable & Low Maintenance Flooring	1	Choose flooring products for 50% of the interior surface that are: Impermeable to moisture and air, 15 year non-prorated life time warranty, Provide documentation showing life cycle (15 year) initial costs and maintenance needs of all flooring in the project have been assessed.
2	2	MW.c8	Building Reuse - Exterior	1-4	Reuse large portions of existing structure during renovatin or redevelopment projects. 50% - 1 point, 65% - 2 points, 80% - 3 points, 95% - 4 points.
	1	MW.c9	Building Reuse - Interior	1	Maintain 50% non-structural elements (walls, floor coverings and ceiling systems).

Yes ? No

3 5 2

Operations & Maintenance **Abridged Requirements**

Y		OM.p1	Maintenance Plan	Required	The district must create a school maintenance plan that includes an inventory of all equipment (electrical, mechanical, plumbing and envelope) in the school and its preventative and routine maintenance needs.
Y		OM.p2	Anti-Idling Measures	Required	Adopt a no idling policy that applies to all school buses operating in the school district and all vehicles operating in the school zone.
Y		OM.p3	Green Cleaning	Required	The school committee must pass a resolution adopting a comprehensive green cleaning policy that ensures only environmentally preferable cleaning products and practices are used.
1		OM.c1	Work Order & Maintenance Management System	1	The school district shall develop or purchase a work order and maintenance management system (MMS)
	2	OM.c2	Indoor Environmental Management Plan	1-3	Option 1 (3 points) Implement EPA's Tools for Schools Program or equivalent. Option 2 (2 points) Custodial/Facility Staff Training using MA Facility Admin. Ass. Modules on IAQ, IPM, radon, drinking water and "Cleaning for Health". Option 3 (1 point) Arrange a presentation on Tools for Schools or MA Healthy Schools Checklist to the school committee.
	1	OM.c3	Green Power	1	Commit to purchasing RECs or a power through a PPA equivalent to 15% of the projected annual electricity needs.
	1	OM.c4	Climate Change Action: Diesel Bus Retrofit	1	Retrofit buses by participating in the DEP MassCleanDiesel Initiative.
	1	OM.c5	Carbon Footprint Reporting	1	Join the Climate Action Registry to commit to calculate, report and verify annual GHG emissions using The Climate Action Registry online tool.
2	1	OM.c6	Energy Benchmarking	3	OMc6.1 (2 points) The school must adopt a policy of benchmarking its energy use over time to track building performance. OMc6.2 (1 point) Commit to conduct a post-occupancy analysis of the building's performance after 1-2 yrs or recommissioning after 2-5 yrs.

Yes ? No

48 46 31

TOTAL 125

Total Possible Points=125
Eligibility Levels
 New Construction MA-CHPS Verified - 40 points - REQUIRED
 New Construction MA-CHPS Verified Leader - 50 points - 2% reimbursement
 Renovation MA-CHPS Verified - 35 points - REQUIRED
 Renovation MA-CHPS Verified Leader - 45 points - 2% reimbursement

Mountview Middle School
Holden, MA
Study Cost Estimate
 31-Aug-12

RENOVATION AND ADDITION

	GSF		COST PER S.F.	TOTAL
ADDITION	52,087	GSF	\$237.88	\$12,390,574
RENOVATION	96,308	GSF	\$150.84	\$14,526,927
BUILDING DEMOLITION	26,692	GSF	\$7.50	\$200,190
SITework				\$3,290,622
TEMPORARY TRAILORS				\$1,500,000
HAZARDOUS WASTE REMOVAL				\$745,000

		TOTAL DIRECT COST		\$32,653,313
GENERAL CONDITIONS	30	MOS	\$77,500	\$2,325,000
GENERAL REQUIREMENTS		3%		\$1,049,349
P&P BOND & INSURANCE		2%		\$720,553
FEE		3%		\$1,102,446
DESIGN CONTINGENCY		12%		\$4,542,079
GMP CONTINGENCY		3%		\$1,271,782
ESCALATION (summer 2013)		7%		\$2,967,492

		TOTAL CONSTRUCTION COST		\$46,632,016
		COST PER SF		\$314.24

PROJECT: Mountview Middle School
 LOCATION: Holden, MA
 CLIENT: Lamoureux - Pagano Associates, Architects
 DATE: 31-Aug-12

NO. OF SQ. FT.: 52,087
 COST PER SQ. FT.: \$237.88

**ADDITION
 MIDDLE SCHOOL**

No.: 12043

SUMMARY

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
A. SUBSTRUCTURE			
A10 - FOUNDATIONS			
A1010 STANDARD FOUNDATIONS	389,975	3%	7.49
A1020 SPECIAL FOUNDATIONS	0	0%	0.00
A1030 SLAB ON GRADE	242,629	2%	4.66
A20 - BASEMENT CONSTRUCTION			
A2010 BASEMENT EXCAVATION	0	0%	0.00
A2020 BASEMENT WALLS	0	0%	0.00
B. SHELL			
B10 - SUPERSTRUCTURE			
B1010 FLOOR CONSTRUCTION	857,294	7%	16.46
B1020 ROOF CONSTRUCTION	837,925	7%	16.09
B20 - EXTERIOR ENCLOSURE			
B2010 EXTERIOR WALLS	2,267,430	18%	43.53
B2020 EXTERIOR WINDOWS	577,482	5%	11.09
B2030 EXTERIOR DOORS	23,557	0%	0.45
B30 - ROOFING			
B3010 ROOF COVERINGS	489,817	4%	9.40
B3020 ROOF OPENINGS	18,200	0%	0.35
C. INTERIORS			
C10 - INTERIOR CONSTRUCTION			
C1010 PARTITIONS	676,862	5%	12.99
C1020 INTERIOR DOORS	84,340	1%	1.62
C1030 FITTINGS	279,300	2%	5.36
C20 - STAIRS			
C2010 STAIR CONSTRUCTION	55,380	0%	1.06
C2020 STAIR FINISHES	6,096	0%	0.12
C30 - INTERIOR FINISHES			
C3010 WALL FINISHES	354,643	3%	6.81
C3020 FLOOR FINISHES	539,757	4%	10.36
C3030 CEILING FINISHES	326,777	3%	6.27
D. SERVICES			
D10 - CONVEYING			
D1010 ELEVATORS & LIFTS	25,000	0%	0.48
D1010 ESCALATORS & MOVING WALKS	0	0%	0.00
D1090 OTHER CONVEYING SYSTEMS	0	0%	0.00
D20 - PLUMBING			
D2010 PLUMBING	546,914	4%	10.50

Mountview Middle School - Addition

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
D30 - HVAC			
D3010 HVAC	1,510,523	12%	29.00
D40 - FIRE PROTECTION			
D4010 SPRINKLERS	232,348	2%	4.46
D4020 STANDPIPES	0	0%	0.00
D4030 FIRE PROTECTION SPECIALTIES	0	0%	0.00
D4090 OTHER FIRE PROTECTION SYSTEMS	0	0%	0.00
D50 - ELECTRICAL			
D5010 ELECTRICAL SERVICE & DISTRIBUTION	1,354,262	11%	26.00
D5020 LIGHTING & BRANCH WIRING	0	0%	0.00
D5030 COMMUNICATION & SECURITY	0	0%	0.00
D5090 OTHER ELECTRICAL SYSTEMS	0	0%	0.00
E. EQUIPMENT & FURNISHINGS			
E10 - EQUIPMENT			
E1010 COMMERCIAL EQUIPMENT	0	0%	0.00
E1020 INSTITUTIONAL EQUIPMENT	0	0%	0.00
E1030 VEHICULAR EQUIPMENT	0	0%	0.00
E1090 OTHER EQUIPMENT	260,650	2%	5.00
E20 - FURNISHINGS			
E 2010 FIXED FURNISHINGS	372,814	3%	7.16
E2020 MOVABLE FURNISHINGS	0	0%	0.00
F. SPECIAL CONSTRUCTION & DEMOLITION			
F10 - SPECIAL CONSTRUCTION			
F1010 SPECIAL STRUCTURES	0	0%	0.00
F1020 INTEGRATED CONSTRUCTION	0	0%	0.00
F1030 SPECIAL CONSTRUCTION SYSTEMS	0	0%	0.00
F1040 SPECIAL FACILITIES	0	0%	0.00
F1050 SPECIAL CONTROLS & INSTRUMENTATION	0	0%	0.00
F20 - SELECTIVE BUILDING DEMOLITION			
F2010 BUILDING ELEMENTS DEMOLITION	0	0%	0.00
F2020 HAZARDOUS COMPONENTS ABATEMENT	0	0%	0.00
G. BUILDING SITEWORK			
G10 - SITE PREPARATION			
G1010 SITE CLEARING	10,000	0%	0.19
G1020 SITE DEMOLITION & RELOCATIONS	0	0%	0.00
G1030 SITE EARTHWORK	0	0%	0.00
G1040 HAZARDOUS WASTE REMEDIATION	0	0%	0.00
G20 - SITE IMPROVEMENTS			
G2010 ROADWAYS	0	0%	0.00
G2020 PARKING LOTS	0	0%	0.00
G2030 PEDESTRIAN PAVING	0	0%	0.00
G2040 SITE DEVELOPMENT	35,100	0%	0.67
G2050 LANDSCAPING	2,500	0%	0.05

Mountview Middle School - Addition

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
G30 - SITE MECHANICAL UTILITIES			
G3010 WATER SUPPLY	0	0%	0.00
G3020 SANITARY SEWER	8,500	0%	0.16
G3030 STORM SEWER	0	0%	0.00
G3040 HEATING DISTRIBUTION	0	0%	0.00
G3050 COOLING DISTRIBUTION	0	0%	0.00
G3060 FUEL DISTRIBUTION	0	0%	0.00
G3090 OTHER SITE MECHANICAL UTILITIES	0	0%	0.00
G40 - SITE ELECTRICAL UTILITIES			
G4010 ELECTRICAL DISTRIBUTION	4,500	0%	0.09
G4020 SITE LIGHTING	0	0%	0.00
G4030 SITE COMMUNICATIONS & SECURITY	0	0%	0.00
G4090 OTHER SITE ELECTRICAL UTILITIES	0	0%	0.00
G90 - OTHER SITE CONSTRUCTION			
G9010 SERVICE AND PEDESTRIAN TUNNELS	0	0%	0.00
G9090 OTHER SITE SYSTEMS	0	0%	0.00
TOTAL DIRECT COST	----- 12,390,574	----- 100%	----- 237.88

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
<u>A. SUBSTRUCTURE</u>				
A10 - FOUNDATIONS				
A1010 STANDARD FOUNDATIONS				
<u>033000 CAST IN PLACE CONCRETE</u>				
Wall Footing 1' X 3' (932 LF): 4000 psi, NW, (incl. placement)	104	CY	146.00	15,184
Formwork	1,864	SFCA	6.50	12,116
Rebar	7,020	LBS	1.09	7,652
<i>*unit cost \$336.08</i>				
Column Footing: 4000 psi, NW, (incl. placement)	160	CY	148.00	23,680
Formwork	2,650	SFCA	8.00	21,200
Rebar	8,400	LBS	1.09	9,156
<i>*unit cost \$337.73</i>				
Foundation Frost Wall 1'-4" x 4'0" Deep (932 LF): 4000 psi, NW, (incl. placement)	185	CY	155.00	28,675
Formwork	7,456	SFCA	11.00	82,016
Brick shelf	936	LF	12.00	11,232
Reinforcing steel	24,975	LBS	1.09	27,223
<i>*unit cost \$806.19</i>				
Piers & pilasters	20	CY	775.00	15,500
Equipment pads	1	LS	5,000.00	5,000
Stage int. wall footing 1' x 2'	9	CY	345.00	3,105
Stage int. found. wall	18	CY	800.00	14,400
Stage stair (2 flts)	36	LFR	85.00	3,060
Stage ramp		NIC		
<u>072100 INSULATION</u>				
2" Rigid ext. found. insul w/prot.bd	3,728	SF	2.60	9,693
<u>071000 DAMPPROOF., WATERPROOF. & CAULKING*</u>				
Dampproof frost wall	3,728	SF	1.90	7,083
<u>310000 EARTHWORK</u>				
Foundation Earthwork:				
Foundation excavation	3,800	CY	7.00	26,600
Foundation backfill (on site mat'l)	2,800	CY	8.00	22,400
Ledge removal - allow	1	LS	25,000.00	25,000
Misc. Earthwork	1	LS	20,000.00	20,000

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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389,975

A1030 SLAB ON GRADE

310000 EARTHWORK

12" Gravel base @SOG	967	CY	22.00	21,274
Excavate plumbing trenches	1	LS	5,000.00	5,000

033000 CAST IN PLACE CONCRETE

5" Slab on Grade:				
4000 psi, NW, (incl. placement)	406	CY	146.00	59,276
6x6 W1.4 X W1.4	26,107	SF	1.02	26,629
Control Joint	1,300	LF	3.10	4,030
Trowel Finish	26,107	SF	1.25	32,634
*unit cost \$4.69				

Thicken slab @ cols & CMU	20	CY	225.00	4,500
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072100 INSULATION

2" Rigid Slab Insul.	26,107	SF	2.92	76,232
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072616 BELOW GRADE VAPOR RETARDER

Stegro vapor barrier	26,107	SF	0.50	13,054
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242,629

TOTAL A10 FOUNDATIONS				632,603
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A20 - BASEMENT CONSTRUCTION

A2010 BASEMENT EXCAVATION		N/A		
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0

TOTAL A20 - BASEMENT CONSTRUCTION				0
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B. SHELL

B10 - SUPERSTRUCTURE

B1010 FLOOR CONSTRUCTION

051200 STRUCTURAL STEEL

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
T.S. brace frame (1 lbs/sf)	13	TONS	3,950.00	51,350
T.S. column (2 lbs/sf)	26	TONS	3,600.00	93,600
Wide flange beam (10 lbs/sf)	130	TONS	3,400.00	442,000
H.S.S. beam	5	TONS	3,600.00	18,000
Moment connection	15	EA	750.00	11,250
Shear stud (10/100)	2,598	EA	5.30	13,769
<u>033000 CAST IN PLACE CONCRETE</u>				
3 1/2" NW Deck fill	25,980	SF	3.85	100,023
<u>053100 STEEL DECKING</u>				
2" x 20 Ga. comp deck	25,980	SF	2.70	70,146
<u>072100 INSULATION</u>				
Spray on fireproofing	25,980	SF	2.20	57,156

				857,294
<u>B1020 ROOF CONSTRUCTION</u>				
<u>051200 STRUCTURAL STEEL</u>				
T.S. brace frame (1 lbs/sf)	13	TONS	3,950.00	51,350
T.S. column (2 lbs/sf)	26	TONS	3,600.00	93,600
Wide flange beam (10 lbs/sf)	130	TONS	3,400.00	442,000
H.S.S. beam	10	TONS	3,600.00	36,000
Moment connection	10	EA	750.00	7,500
Galv. RTU dunnage - allow	4	TONS	3,650.00	14,600
Galv. TS roof screen support	10	TONS	3,700.00	37,000
Entry canopy frame	600	SF	20.00	12,000
<u>033000 CAST IN PLACE CONCRETE</u>				
3 1/2" NW Conc. Deck fill -roof	500	SF	6.00	3,000
<u>053100 STEEL DECKING</u>				
1 1/2" x 20 Ga Typ. Flat roof deck	20,613	SF	2.55	52,563
2" x 20 Ga. Comp deck	500	SF	2.70	1,350
3" x 18 Ga acoustical roof deck - gym	3,134	SF	7.15	22,408
3" x 18 Ga acoustical roof deck - stage	1,860	SF	7.15	13,299
1 1/2" x 20 Ga canopy roof deck	600	SF	2.25	1,350
<u>072100 INSULATION</u>				

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Spray-on Fireproofing (NIC gym & stage)	21,113	SF	2.25	47,504
<u>090007 PAINTING*</u>				
Paint steel canopy structure	600	SF	4.00	2,400

				837,925
TOTAL B10 SUPERSTRUCTURE				1,695,219

B20 - EXTERIOR ENCLOSURE

B2010 EXTERIOR WALLS

040001 MASONRY*

12" CMU backup - gym	3,840	SF	22.00	84,480
8" CMU backup - stage wing	4,176	SF	20.00	83,520
Masonry Veneer:				
Brick veneer - 60% of exterior	17,218	SF	30.00	516,540
Precast window head	600	LF	65.00	39,000
Precast window sill - typ	650	LF	45.00	29,250
Precast trim allowance	1	LS	75,000.00	75,000
Misc. Masonry detailing	1	LS	25,000.00	25,000
Masonry flashing	1,500	LF	9.00	13,500
Building staging - 100%	32,000	SF	2.00	64,000

054000 COLD FORMED METAL FRAMING

3" Soffit framing	2,796	SF	5.25	14,679
1/2" Dens glass sheathing -soffit	2,796	SF	3.00	8,388
8" x 16 Ga stud @ typ	20,680	SF	9.80	202,664
1/2" Dens glass sheathing-ext. wall	20,680	SF	2.75	56,870

050001 MISCELLANEOUS & ORNAMENTAL IRON*

Downspout boot - canopy	4	EA	650.00	2,600
Galv, loose lintel	975	LF	32.00	31,200
*Relieving angle carried w/Structure				

071000 DAMPPROOF., WATERPROOF. & CAULKING*

Control joint - allow	60	LF	9.50	570
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071326 AIR & VAPOR BARRIERS

Adhered air & vapor barrier - wall	28,696	SF	3.10	88,958
Adhered air & vapor barrier - soffit	2,796	SF	3.10	8,668

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
<u>072100 INSULATION</u>				
3" Icyene - wall	20,680	SF	3.20	66,176
3" Rigid Insul - wall	28,696	SF	2.85	81,784
*Excludes soffit insulation				
<u>074213 PERFORMED CLADDING</u>				
Alum. Panel:				
Canopy ceiling	600	SF	25.00	15,000
Soffit panel - typical - 12"	2,796	SF	25.00	69,900
Wall panel - 40% ext.	11,478	SF	55.00	631,290
Equip roof screen	500	SF	32.00	16,000
<u>092116 GYPSUM WALLBOARD</u>				
1 Lyr 5/8" gyp @ ext. wall	20,680	SF	2.05	42,394
<u>101400 IDENTIFYING DEVICES (EXT. BLD MTD SIGNAGE)</u>				
24" Alum bldg mtd letter - allow		w/Reno		

				2,267,430
B2020 EXTERIOR WINDOWS				
<u>061000 ROUGH CARPENTRY</u>				
P.T. - perim blocking	3,945	LF	4.10	16,175
<u>071326 AIR & VAPOR BARRIERS</u>				
Flex flashing - perim	3,945	LF	7.50	29,588
<u>071000 DAMPPROOF., WATERPROOF. & CAULKING*</u>				
Exterior sealants - perim.	3,945	LF	6.25	24,656
<u>080001 METAL WINDOWS*</u>				
Curtain wall - 7"	2,000	SF	88.00	176,000
Typ. alum. window - 4 1/2"	4,304	SF	66.00	284,064
<u>109000 MISCELLANEOUS SPECIALTIES</u>				
Alum louvers - allow	100	SF	65.00	6,500
Sun screen (3'6")	150	LF	195.00	29,250

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Int. light shelf	75	LF	150.00	11,250

				577,482
 B2030 EXTERIOR DOORS				
<u>061000 ROUGH CARPENTRY</u>				
P.T. - perim blocking - HM open	20	LF	4.10	82
<u>071000 DAMPPROOF., WATERPROOF. & CAULKING*</u>				
Exterior sealants - perim. HM open	20	LF	6.25	125
<u>080001 METAL WINDOWS*</u>				
7' Alum. Doors (Incl. Hardware):				
Rear lobby - dbl	2	EA	7,150.00	14,300
Stair hall egress - dbl	1	PR	7,150.00	7,150
Classroom - sgl		N/A		
<u>081113 HOLLOW METALWORK</u>				
Insulated HM Doors and Frame (Incl. Hdw):				
Roof stair - sgl	1	EA	1,800.00	1,800
<u>083323 SPECIAL DOORS</u>				
		N/A		
<u>087100 DOOR HARDWARE</u>				
		With Doors		
<u>090007 PAINTING*</u>				
Paint HM Door & frame - sgl	1	EA	100.00	100

				23,557
TOTAL B20 - EXTERIOR ENCLOSURE				2,868,469

B30 - ROOFING**B3010 ROOF COVERINGS****061000 ROUGH CARPENTRY**

Typ. Flat roof edge blocking (3 BF/LF)	2,796	BF	3.20	8,947
Base flashing blocking (3 BF/LF)	822	BF	3.20	2,630
Mechanical equip blocking	1	LS	5,000.00	5,000

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
<u>070002 ROOFING AND FLASHING*</u>				
PVC roof - canopy	600	SF	10.00	6,000
PVC roof w/ 6" rigid insul	26,107	SF	11.85	309,368
Green roof sys.		n/a		
1/2" Gyp prot. bd w/glass mat facing	26,107	SF	1.55	40,466
Poly vapor barrier	26,107	SF	0.35	9,137
Tapered insul premium - allow	3,000	SF	4.00	12,000
Base flashing - bldg. tie	274	LF	32.00	8,768
Membrane flashing	1	LS		0
Walkway paver (2'x2')	100	EA	24.00	2,400
Aluminum Trim & Flashing:				
Canopy roof fascia	100	LF	35.00	3,500
Typical roof fascia and projection	932	LF	50.00	46,600
Misc. flashing	1	LS	35,000.00	35,000

				489,817

B3020 ROOF OPENINGS

077200 ROOF ACCESSORIES

Roof guardrail
 *Mechanical equip screen is included with B1020 & B2010

NIC

075423 ROOFING & FLASHING*

Skylights	1	LS	15,000.00	15,000
Roof hatch	1	EA	3,200.00	3,200
Stage vent		N/A		

				18,200

TOTAL B30 ROOFING				508,017
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C. INTERIORS

C10 - INTERIOR CONSTRUCTION

C1010 PARTITIONS

040001 MASONRY* N/A

061000 ROUGH CARPENTRY

Interior blocking	52,087	GSF	0.50	26,044
Misc. rough carpentry	52,087	GSF	0.50	26,044

072100 INSULATION

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Firestopping	52,087	GSF	0.35	18,230
<u>081113 HOLLOW METALWORK</u>				
Interior H.M Windows, Sidelites and Transoms :				
Classroom sidelight (23 ea)	322	SF	35.00	11,270
Misc. window/sidelight & transom	300	SF	35.00	10,500
<u>083323 SPECIAL DOORS</u>				
Access panels	1	LS		0
<u>080002 GLASS AND GLAZING*</u>				
Glass & Glazing - HM Frame:				
Classroom sidelight	322	SF	14.00	4,508
Misc. window/sidelight & transom	300	SF	14.00	4,200
*Excludes fire rated stair hall glazing				
<u>090007 PAINTING*</u>				
Paint window/sidelight & transom	622	SF	5.00	3,110
<u>092116 GYPSUM WALLBOARD</u>				
1 Lyr 5/8" gyp @ ext. wall frame		w/B2010		
Drywall partitions and assemblies	52,087	GSF	11.00	572,957
*Partitions include sound attenuation, tape & joint compound finish				

				676,862

C1020 INTERIOR DOORS

081113 HOLLOW METALWORK081416 WOOD AND PLASTIC DOORS

Interior Door, Frame, Hds., Glass & Glazing:

Typ. classroom - sgl	21	EA	1,100.00	23,100
Interconnecting classroom - sgl	16	EA	850.00	13,600
Storage - sgl	3	EA	700.00	2,100
Storage - dbl	3	EA	1,250.00	3,750
Toilet rm - sgl user	3	EA	950.00	2,850
Toilet rm - sgl multi user	6	EA	950.00	5,700
Stair/corridor - dbl	3	EA	3,500.00	10,500
Mech/elec. - sgl	3	EA	800.00	2,400
Mech/elec. - dbl	3	EA	1,600.00	4,800
Office - sgl	3	EA	1,100.00	3,300
Music class - sgl	2	EA	1,500.00	3,000
Stage - sgl	2	EA	1,800.00	3,600

087100 DOOR HARDWARE

With Doors

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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080001 METAL WINDOWS*

Aluminum (Frame, Door, Glass, Glazing and Hdw): N/A

Aluminum Storefront: N/A

083323 SPECIAL DOORS N/A090007 PAINTING*

Paint door frame - sgl	59	EA	75.00	4,425
Paint door frame - dbl	9	EA	135.00	1,215

84,340

C1030 FITTINGS

050001 MISCELLANEOUS & ORNAMENTAL IRON*

Gym equip. support & frame	1	LS	5,000.00	5,000
Misc. metals	52,087	GSF	0.50	26,044

062000 FINISH CARPENTRY

Utility & closet shelving	1	LS		0
Typ. window sill/apron (nic cw-gym)	900	LF	30.00	27,000
Built - in corridor benches - allow	50	LF	300.00	15,000
Proscenium trim @ stage front panel	1	LS	10,000.00	10,000
Misc. wood trim	52,087	GSF	0.50	26,044

Custom Casework:

Commons	3	LOC		0
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102113 COMPARTMENTS & CUBICLES

Solid Plastic Toilet Rm. Partitions (8 Rms):

Std. partition	12	EA	1,150.00	13,800
HC partition	6	EA	1,350.00	8,100
Urinal screen	12	EA	275.00	3,300

102813 TOILET & BATH ACCESSORIES

Toilet Accessories	1	LS		0
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Janitor shelf	3	EA	200.00	600
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*Excludes classroom accessories

101100 MARKERBOARDS & TACKBOARDS

5' Smart board		NIC		
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DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Markerboards 4' h	2,000	SF	18.00	36,000
Tackboards 4' h	2,000	SF	13.00	26,000
Display cases - allow	1	LS	10,000.00	10,000
Class/mtg space flag pole - allow	25	EA	35.00	875
<u>105113 METAL LOCKERS</u>				
Student Mtl corridor locker	225	EA	245.00	55,125
<u>109000 MISCELLANEOUS SPECIALTIES</u>				
Wall & corner guards - allow	1	LS	5,000.00	5,000
Fire extinguisher and cab - allow	8	EA	450.00	3,600
<u>101400 IDENTIFYING DEVICES</u>				
Dedication plaque		EA	3,500.00	0
Door signage plaque	52,087	GSF	0.15	7,813
<u>106000 OPERABLE PARTITION</u>				
		N/A		
				----- 279,300
TOTAL C10 - INTERIOR CONSTRUCTION				1,040,503

C20 - STAIRS

C2010 STAIR CONSTRUCTION

050001 MISCELLANEOUS & ORNAMENTAL IRON*

Metal Pan Stair w/Rails:

Monumental lobby		N/A		
Stair hall switch back	2	FLT	25,000.00	50,000
Roof access ladder	1	EA	1,500.00	1,500
Interior Rails:				
Stage stairs wall rail	12	LF	115.00	1,380

033000 CAST IN PLACE CONCRETE

Conc stair pan fill	2	FLTS	1,250.00	2,500
				----- 55,380

C2020 STAIR FINISHES

090005 RESILIENT FLOORING*

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Rubber treads and risers - full flt.	2	FLT	1,100.00	2,200
Rubber stair landing tile	216	SF	6.00	1,296
<u>062000 FINISH CARPENTRY</u>				
<u>090007 PAINTING*</u>				
Paint stair & rails	2	FLTS	1,300.00	2,600

				6,096
TOTAL C20 - STAIRS				61,476

C30 - INTERIOR FINISHES

C3010 WALL FINISHES

071000 DAMPPROOF., WATERPROOF. & CAULKING*

Joint sealants - interior	52,087	GSF	0.55	28,648
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098400 ACOUSTICAL WALL TREATMENT

Tectum Wall Panel: 2" Gymnasium	500	SF	20.00	10,000
Fabric Wrapped Acoustical Panels - Allow:				
Stage	500	SF	27.00	13,500
Corridor	500	SF	27.00	13,500
Music class rm	500	SF	27.00	13,500
Music practice rm		N/A		

090002 TILE*

Ceramic Wall Tile:				
8' toilet rm	5,040	SF	14.00	70,560
4' Wainscot janitor closet @ mop sink	300	SF	14.00	4,200
7'4" Wainscot corridor/stair hall - allow	7,500	SF	16.00	120,000

090007 PAINTING*

Vinyl wall covering		NIC		
Interior painting- walls	52,087	GSF	1.55	80,735

*Includes Section 09770

354,643

C3020 FLOOR FINISHES

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
<u>033000 CAST IN PLACE CONCRETE</u>				
Sealed Concrete	500	SF	0.95	475
<u>090002 TILE*</u>				
Toilet Room (sgl user) 3 EA:				
Ceramic floor tile - thin set	192	SF	15.00	2,880
Ceramic base	90	LF	6.00	540
Waterproof - upper floor	128	SF	7.00	896
Marble threshold	3	EA	50.00	150
Toilet Room (multi user):				
Ceramic floor tile - thin set	2,850	SF	15.00	42,750
Ceramic base	540	LF	6.00	3,240
Waterproof - upper floor	1,900	SF	7.00	13,300
Marble threshold	6	EA	50.00	300
Janitor Closet (3 EA):				
Ceramic floor tile - thin set	93	SF	15.00	1,395
Ceramic base	55	LF	6.00	330
Waterproof - upper floor	93	SF	7.00	651
Marble threshold	3	EA	50.00	150
Porcelain Tile:		N/A		
<u>090005 RESILIENT FLOORING*</u>				
Gym base	160	LF	2.50	400
Resilient sports floor at gym	3,134	SF	19.00	59,546
Café linoleum sheet-hvy duty	26	SY	82.00	2,132
Linoleum sheet - corridor	2,025	SY	82.00	166,050
Linoleum tile - classroom/storage	25,000	SF	5.75	143,750
Rubber base	52,087	GSF	0.40	20,835
Concrete moisture barrier	52,087	SF	1.00	52,087
<u>095000 WOOD FLOOR</u>				
Stage wood flooring - maple	1,860	SF	15.00	27,900
*Includes 6 mil poly, resilient pads, sealant & finish				
<u>096800 CARPET</u>				
		N/A		
<u>124813 MATS</u>				
		N/A		
				----- 539,757

C3030 CEILING FINISHES

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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092116 GYPSUM WALLBOARD

Gyp ceiling - toilet rm	3,042	SF	8.00	24,336
2 Hr. gyp ceiling	500	SF	13.00	6,500
Typ. gyp ceiling	2,500	SF	8.00	20,000
Stage acoustical reflector	750	SF	25.00	18,750
Gyp soffits & light coves	1	LS	25,000.00	25,000

090003 ACOUSTICAL TILE*

Ceiling System:				
Music classroom	1,930	SF	5.50	10,615
Corridor /classroom	38,621	SF	4.75	183,450

090007 PAINTING*

Paint gyp ceiling	6,042	SF	0.85	5,136
Paint gyp soffits & light coves	1	LS	25,000.00	25,000
Paint exposed structure - gym	3,134	SF	1.50	4,701
Paint exposed structure - mech/elec.	500	SF	1.00	500
Paint exposed structure - stage	1,860	SF	1.50	2,790

326,777

TOTAL C30 - INTERIOR FINISHES				1,221,177
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D. SERVICES

D10 - CONVEYING

D1010 ELEVATORS & LIFTS

140001 ELEVATORS*

Stage lift	1	LS	25,000.00	25,000
Passenger elevator		N/A		

25,000

TOTAL D10 - CONVEYING				25,000
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D20 - PLUMBING

D2010 PLUMBING

220001 PLUMBING*

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Plumbing	52,087	GSF	10.50	546,914

				546,914
TOTAL D20 - PLUMBING		/SF		546,914

D30 - HVAC

D3010 HVAC

230001 HVAC*

HVAC	52,087	GSF	29.00	1,510,523

				1,510,523

TOTAL D30 - HVAC		\$29.00 /sf		1,510,523
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D40 - FIRE PROTECTION

D4010 SPRINKLERS

210001 FIRE SUPPRESSION*

Fire pump		w/Reno		
8" Check valve assembly	1	LS	8,600.00	8,600
6" Wet valve alarm assembly	1	EA	4,500.00	4,500
4" Check valve	1	EA	2,200.00	2,200
Siamese connection	1	EA	1,200.00	1,200
Sprinkler sys - wet	52,087	GSF	4.00	208,348
Test , drawings, misc gc	1	LS	7,500.00	7,500

				232,348

TOTAL D40 - FIRE PROTECTION		\$4.46 /sf		232,348
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D50 - ELECTRICAL

D5010 ELECTRICAL SERVICE & DISTRIBUTION

260001 ELECTRICAL*

Electrical	52,087	GSF	26.00	1,354,262
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DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL

				1,354,262
TOTAL D50 - ELECTRICAL	\$26.00	/sf		1,354,262

E. EQUIPMENT & FURNISHINGS

E10 - EQUIPMENT

E1010 COMMERCIAL EQUIPMENT

114000 FOOD SERVICE EQUIPMENT

Kitchen equipment & casework		w/Reno		-----
				0

E1090 OTHER EQUIPMENT

113100 APPLIANCES

Life Skill Rm/Care Classroom - Allow:

Dishwasher		NIC		
Refrigerator		NIC		
Range		NIC		
Range hood		NIC		

116600 ATHLETIC & SPORTS EQUIPMENT

Basketball backstops - electric	6	EA	9,500.00	57,000
Wall padding - 6'	1,250	SF	15.00	18,750
Motorized gym divider curtain	1,900	SF	18.00	34,200
Volley ball court equip.	1	EA	700.00	700
Scoreboard		w/Electrical		
Folding bleachers	1	LS	40,000.00	40,000
PT floor mats		NIC		

116143 STAGE DRAPERY

Stage curtains	1	LS	30,000.00	30,000
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115213 PROJECTION SCREENS

Projection screen - stage	1	EA	10,000.00	10,000
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119000 MISC. EQUIPMENT

Metal storage shelving		NIC		
Kiln		N/A		

116100 THEATRE EQUIPMENT

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Audio & video	1	LS	30,000.00	30,000
Dimming, stage, rigging	1	LS	40,000.00	40,000
<u>115300 LABORATORY EQUIPMENT</u>		N/A		
				----- 260,650
TOTAL E10 - EQUIPMENT				260,650

E20 - FURNISHINGS

E 2010 FIXED FURNISHINGS

129000 MISC. FURNISHINGS

Meco shade - manual	4,304	SF	5.25	22,596
Int. office/class window shades	1	LS	5,000.00	5,000

123553 CLASSROOM CASEWORK

Architectural casework	52,087	SF	2.50	130,218
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Casework (Epoxy Counter w/Wood Cabinets):

Art room		N/A		
Science room		N/A		
Prep room		N/A		
Tech room		N/A		

Typical Classroom Casework:

Sped classroom	3	EA	7,500.00	22,500
Sped resource room	3	EA	7,500.00	22,500
Typical classroom	15	EA	10,000.00	150,000
Band classroom	1	EA	10,000.00	10,000
Chorus classroom	1	EA	10,000.00	10,000

372,814

E2020 MOVABLE FURNISHINGS

NIC

0

TOTAL E20 - FURNISHINGS				372,814
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PROJECT: Mountview Middle School
 LOCATION: Holden, MA
 CLIENT: Lamoureux - Pagano Associates, Architects
 DATE: 31-Aug-12

NO. OF SQ. FT.: 96,308
 COST PER SQ. FT.: \$150.84

SUMMARY

MAJOR - RENOVATION

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
A. SUBSTRUCTURE			
A10 - FOUNDATIONS			
A1010 STANDARD FOUNDATIONS	105,000	1%	1.09
A1020 SPECIAL FOUNDATIONS	0	0%	0.00
A1030 SLAB ON GRADE	67,500	0%	0.70
A20 - BASEMENT CONSTRUCTION			
A2010 BASEMENT EXCAVATION	0	0%	0.00
A2020 BASEMENT WALLS	0	0%	0.00
B. SHELL			
B10 - SUPERSTRUCTURE			
B1010 FLOOR CONSTRUCTION	232,616	2%	2.42
B1020 ROOF CONSTRUCTION	101,000	1%	1.05
B20 - EXTERIOR ENCLOSURE			
B2010 EXTERIOR WALLS	139,640	1%	1.45
B2020 EXTERIOR WINDOWS	436,052	3%	4.53
B2030 EXTERIOR DOORS	103,878	1%	1.08
B30 - ROOFING			
B3010 ROOF COVERINGS	1,112,100	8%	11.55
B3020 ROOF OPENINGS	15,000	0%	0.16
C. INTERIORS			
C10 - INTERIOR CONSTRUCTION			
C1010 PARTITIONS	828,382	6%	8.60
C1020 INTERIOR DOORS	402,724	3%	4.18
C1030 FITTINGS	397,209	3%	4.12
C20 - STAIRS			
C2010 STAIR CONSTRUCTION	25,200	0%	0.26
C2020 STAIR FINISHES	7,500	0%	0.08
C30 - INTERIOR FINISHES			
C3010 WALL FINISHES	673,926	5%	7.00
C3020 FLOOR FINISHES	931,725	6%	9.67
C3030 CEILING FINISHES	542,336	4%	5.63
D. SERVICES			
D10 - CONVEYING			
D1010 ELEVATORS & LIFTS	25,000	0%	0.26
D1010 ESCALATORS & MOVING WALKS	0	0%	0.00
D1090 OTHER CONVEYING SYSTEMS	0	0%	0.00
D20 - PLUMBING			
D2010 PLUMBING	770,464	5%	8.00

Mountview Middle School - Major Renovation

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
D30 - HVAC			
D3010 HVAC	2,792,932	19%	29.00
D40 - FIRE PROTECTION			
D4010 FIRE PROTECTION	556,540	4%	5.78
D50 - ELECTRICAL			
D5010 ELECTRICAL	2,504,008	17%	26.00
E. EQUIPMENT & FURNISHINGS			
E10 - EQUIPMENT			
E1010 COMMERCIAL EQUIPMENT	0	0%	0.00
E1020 INSTITUTIONAL EQUIPMENT	0	0%	0.00
E1030 VEHICULAR EQUIPMENT	0	0%	0.00
E1090 OTHER EQUIPMENT	551,000	4%	5.72
E20 - FURNISHINGS			
E 2010 FIXED FURNISHINGS	627,348	4%	6.51
E2020 MOVABLE FURNISHINGS	0	0%	0.00
F. SPECIAL CONSTRUCTION & DEMOLITION			
F10 - SPECIAL CONSTRUCTION			
F1010 SPECIAL STRUCTURES	0	0%	0.00
F1020 INTEGRATED CONSTRUCTION	0	0%	0.00
F1030 SPECIAL CONSTRUCTION SYSTEMS	0	0%	0.00
F1040 SPECIAL FACILITIES	0	0%	0.00
F1050 SPECIAL CONTROLS & INSTRUMENTATION	0	0%	0.00
F20 - SELECTIVE BUILDING DEMOLITION			
F2010 BUILDING ELEMENTS DEMOLITION	577,848	4%	6.00
F2020 HAZARDOUS COMPONENTS ABATEMENT	0	0%	0.00
G. BUILDING SITEWORK			
G10 - SITE PREPARATION			
G1010 SITE CLEARING	0	0%	0.00
G1020 SITE DEMOLITION & RELOCATIONS	0	0%	0.00
G1030 SITE EARTHWORK	0	0%	0.00
G1040 HAZARDOUS WASTE REMEDIATION	0	0%	0.00
G20 - SITE IMPROVEMENTS			
G2010 ROADWAYS	0	0%	0.00
G2020 PARKING LOTS	0	0%	0.00
G2030 PEDESTRIAN PAVING	0	0%	0.00
G2040 SITE DEVELOPMENT	0	0%	0.00
G2050 LANDSCAPING	0	0%	0.00
G30 - SITE MECHANICAL UTILITIES			
G3010 WATER SUPPLY	0	0%	0.00
G3020 SANITARY SEWER	0	0%	0.00
G3030 STORM SEWER	0	0%	0.00
G3040 HEATING DISTRIBUTION	0	0%	0.00
G3050 COOLING DISTRIBUTION	0	0%	0.00
G3060 FUEL DISTRIBUTION	0	0%	0.00
G3090 OTHER SITE MECHANICAL UTILITIES	0	0%	0.00
G40 - SITE ELECTRICAL UTILITIES			
G4010 ELECTRICAL DISTRIBUTION	0	0%	0.00
G4020 SITE LIGHTING	0	0%	0.00

Mountview Middle School - Major Renovation

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
G4030 SITE COMMUNICATIONS & SECURITY	0	0%	0.00
G4090 OTHER SITE ELECTRICAL UTILITIES	0	0%	0.00
G90 - OTHER SITE CONSTRUCTION			
G9010 SERVICE AND PEDESTRIAN TUNNELS	0	0%	0.00
G9090 OTHER SITE SYSTEMS	0	0%	0.00

TOTAL	14,526,927	100%	150.84

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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A. SUBSTRUCTURE

A10 - FOUNDATIONS

A1010 STANDARD FOUNDATIONS

033000 CAST IN PLACE CONCRETE

New foundation at shear wall brace frame	1	LS	75,000.00	75,000
Misc. Foundation repairs - ALLOWANCE	1	LS	30,000.00	30,000

				105,000

A1020 SPECIAL FOUNDATIONS

N/A

0

0

A1030 SLAB ON GRADE

033000 CAST IN PLACE CONCRETE

Patch and Repair slab at :				
Bathroom Renovations	2,500	SF	10.00	25,000
Café and Kitchen Rework	750	SF	10.00	7,500
Patch at shear wall	1	LS	25,000.00	25,000
Misc. slab patching	1	LS	10,000.00	10,000

				67,500

TOTAL A10 FOUNDATIONS				172,500
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A20 - BASEMENT CONSTRUCTION

N/A

A2010 BASEMENT EXCAVATION

NOT USED

0

TOTAL A20 - BASEMENT CONSTRUCTION				0
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B. SHELL

B10 - SUPERSTRUCTURE

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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B1010 FLOOR CONSTRUCTION051200 STRUCTURAL STEEL FRAMING

Seismic lateral restraints	96,308	GSF	2.00	192,616
Structurally isolate gym café building	1	LS	40,000.00	40,000

				232,616

B1020 ROOF CONSTRUCTION051200 STRUCTURAL STEEL FRAMING

Galv. roof top equip. support - allow	10	TONS	3,800.00	38,000
Reinforce roof at mechanical	15	TONS	4,200.00	63,000

				101,000

TOTAL B10 SUPERSTRUCTURE				333,616
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B20 - EXTERIOR ENCLOSURE**B2010 EXTERIOR WALLS**042001 MASONRY*

Masonry Restoration: Cut and point allowance	5,000	SF	25.00	125,000
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090009 PAINTING*

Misc. Exterior painting	1	LS	7,500.00	7,500
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101400 IDENTIFYING DEVICES (EXT. BLD MTD SIGNAGE)

24" Alum bldg mtd letter - allow	21	EA	340.00	7,140

				139,640

B2020 EXTERIOR WINDOWS061000 ROUGH CARPENTRY

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
7 1/2" P.T. - perim. blocking	4,200	SF	4.10	17,220
<u>071000 DAMPPROOF., WATERPROOF. & CAULKING*</u>				
Window and door caulking	4,200	LF	8.00	33,600
<u>080005 METAL WINDOWS*</u>				
Alum. window and storefront	96,308	GSF	4.00	385,232

				436,052
 B2030 EXTERIOR DOORS				
<u>061000 ROUGH CARPENTRY</u>				
7 1/2" P.T. - perim. blocking	86	LF	4.10	353
<u>081100 METAL DOORS AND FRAMES</u>				
Receiving - dbl	1	EA	2,500.00	2,500
Receiving - sgl	1	EA	1,500.00	1,500
Gym storage - sgl	1	EA	1,200.00	1,200
 <u>084000 ENTRANCES, STOREFRONTS & CURTAIN WALLS</u>				
Exist. Opening Alum. Doors, Frames, Glass, Glazing & Hdw:				
Alum. storefront @ entries	350	SF	72.00	25,200
Alum Entry Door - dbl	9	EA	6,850.00	61,650
New exterior sealants perim.	450	LF	5.50	2,475
Auto opener	1	EA	4,500.00	4,500
Replace Overhead Coiling Doors:				
Loading dock	1	EA	4,500.00	4,500

				103,878
TOTAL B20 - EXTERIOR ENCLOSURE				679,570

B30 - ROOFING

B3010 ROOF COVERINGS

070002 ROOFING AND FLASHING*

Demo Roofing and Flashing	50,000	SF	1.75	87,500
New PVC Roofing System	50,000	SF	15.00	750,000

076200 FLASHING AND SHEET METAL

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Aluminum Flashing:				
Gravel stop and fascia	3,200	LF	30.00	96,000
Base flashing	800	LF	32.00	25,600
Perim. blocking	4,000	LF	12.00	48,000
Roof blocking @ mech equip.	1	LS	20,000.00	20,000
Walkway pads	1	LS	10,000.00	10,000
Misc. flashing	1	LS	75,000.00	75,000

				1,112,100

B3020 ROOF OPENINGS**077200 ROOF ACCESSORIES**

Replace roof ladders - allow	2	EA	2,500.00	5,000
Misc. roof accessories	1	LS	10,000.00	10,000

				15,000

TOTAL B30 ROOFING				1,127,100
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C. INTERIORS**C10 - INTERIOR CONSTRUCTION****C1010 PARTITIONS****042001 MASONRY***

Interior Masonry Partitions - shear wall	96,308	GSF	2.50	240,770
Cut & patch @ mep	96,308	GSF	0.35	33,708
Patch, chases and misc masonry	96,308	GSF	0.25	24,077

050001 MISCELLANEOUS & ORNAMENTAL IRON*

Angle brace frame - 4' OC	465	EA	98.00	45,570
Loose lintels	230	LF	22.00	5,060

061000 ROUGH CARPENTRY

Misc. Rough Carpentry	96,308	GSF	0.50	48,154
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071000 DAMPPROOF., WATERPROOF. & CAULKING*

Joint sealants	96,308	GSF	0.20	19,262
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081113 HOLLOW METAL DOORS AND FRAMES

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Misc. Interior Windows	450	SF	45.00	20,250
<u>088000 GLAZING*</u>				
Misc. Interior Windows	450	SF	14.00	6,300
<u>092900 GYPSUM BOARD ASSEMBLIES</u>				
Minor New Partitions	96,308	GSF	4.00	385,232

				828,382
C1020 INTERIOR DOORS				
<u>081100 METAL DOORS AND FRAMES</u>				
Interior door, frame and Hardware	96,308	GSF	3.00	288,924
<u>083326 OVERHEAD COILING GRILLES</u>				
Overhead fire grill	2	EA	8,000.00	16,000
Dish drop ctr grille	1	LS	3,000.00	3,000
<u>084000 ENTRANCES, STOREFRONTS & CURTAIN WALLS</u>				
Alum Vestibule Door - dbl	8	EA	6,850.00	54,800
Aluminum storefront sidelight and transom	500	SF	70.00	35,000
<u>083100 ACCESS DOORS AND PANELS</u>				
Access panels	1	LS	5,000.00	5,000

				402,724
C1030 FITTINGS				
<u>050001 MISCELLANEOUS & ORNAMENTAL IRON*</u>				
Misc. metals	96,308	GSF	0.25	24,077
<u>102113 TOILET COMPARTMENTS</u>				
Solid Plastic Toilet Partitions: Std. partition	14	EA	1,200.00	16,800

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
HC partition	14	EA	1,350.00	18,900
Urinal screen	14	EA	275.00	3,850
Locker Rm Partitions (2 RMS):				
Std. partition	2	EA	1,150.00	2,300
HC partition	2	EA	1,350.00	2,700
Urinal screen	2	EA	275.00	550
Changing stall w/bench	5	EA	1,500.00	7,500
<u>102813 TOILET ROOM ACCESSORIES</u>				
Replace Toilet Accessories	1	LS	55,000.00	55,000
<u>101100 VISUAL DISPLAY BOARDS</u>				
Replace Marker and Tackboards:				
Markerboards 4' h	4,200	SF	18.00	75,600
Tackboards 4' h	3,800	SF	13.00	49,400
Display cases	1	LS	10,000.00	10,000
Smart board - 6'		NIC		
Class/mtg space flag pole - allow	25	EA	35.00	875
<u>104400 FIRE PROTECTION SPECIALTIES</u>				
Science rm fire extinguisher & access	4	EA	450.00	1,800
Fire extinguisher and cabinet	8	EA	375.00	3,000
<u>101400 SIGNAGE</u>				
Int. ADA signage	96,308	GSF	0.08	7,705
<u>105113 METAL LOCKERS</u>				
Locker rm bench	7	EA	800.00	5,600
Gym lockers	100	EA	270.00	27,000
Student Mtl corridor locker	225	EA	245.00	55,125
Kitchen staff locker - allow	6	EA	225.00	1,350
<u>109000 MISCELLANEOUS SPECIALTIES</u>				
Health office cubicle w/track	2	EA	2,000.00	4,000
Misc. specialties	96,308	GSF	0.25	24,077

				397,209
TOTAL C10 - INTERIOR CONSTRUCTION				1,628,315

C20 - STAIRS

C2010 STAIR CONSTRUCTION

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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050001 MISCELLANEOUS & ORNAMENTAL IRON*

AAB Stair Hall Modifications:

Stair rail modification	6	EA	4,200.00	25,200

				25,200

C2020 STAIR FINISHES

090006 RESILIENT FLOORING*

Rubber tread and riser	6	FLT	1,250.00	7,500

				7,500

TOTAL C20 - STAIRS				32,700
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C30 - INTERIOR FINISHES

C3010 WALL FINISHES

090003 TILE*

Ceramic Wall Tile:

Shower rm 7'4"	2,500	SF	14.00	35,000
Locker rm	1,500	SF	14.00	21,000
New toilet rm wall 7'4"	7,000	SF	14.00	98,000
Corridors	12,000	SF	14.00	168,000

062000 FINISH CARPENTRY

Carpentry:

Lobby paneling	2,000	SF	30.00	60,000
Media Center paneling	1,200	SF	30.00	36,000
Misc. wood trim work	96,308	GSF	0.25	24,077

092116 GYPSUM WALLBOARD

FRP Panel:

Kitchen - 10'	2,500	SF	8.25	20,625
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098413 ACOUSTIC PANELS

Music classroom (1 EA)	400	SF	25.00	10,000
Music practice room (4 EA)	400	SF	25.00	10,000
Drama/TV studio (1 EA)	200	SF	25.00	5,000
Media center	500	SF	25.00	12,500
Cafeteria	400	SF	25.00	10,000

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
<u>090009 PAINTING*</u>				
Renovation:				
Interior painting walls	96,308	GSF	1.70	163,724

				673,926
C3020 FLOOR FINISHES				
<u>090003 TILE*</u>				
Ceramic Floor Tile (Thin-set New Toilet Rm):				
Marble threshold	18	EA	48.00	864
Ceramic Floor Tile	2,510	SF	15.00	37,650
Ceramic base	920	LF	7.00	6,440
Waterproof membrane	2,100	SF	7.00	14,700
Kitchen:				
Quarry tile	2,054	SF	15.50	31,837
Quarry tile base	275	LF	7.00	1,925
<u>090006 RESILIENT FLOORING*</u>				
Gym base	200	LF	2.50	500
Resilient sports floor at gym	4,814	SF	19.00	91,466
Café linoleum sheet-hvy duty	456	SY	82.00	37,392
Linoleum sheet - corridor	3,000	SY	82.00	246,000
Linoleum tile - classroom/storage	43,200	SF	5.75	248,400
Rubber base	96,308	GSF	0.40	38,523
Rubber flooring:				
Locker rm	2,280	SF	7.00	15,960
Stair Hall	2,111	SF	7.00	14,777
Floor Prep - allow	90,000	SF	1.35	121,500
<u>096500 WOOD FLOORING</u>				
Refinish stage floor	920	SF	2.00	1,840
<u>096813 CARPETING</u>				
Carpet	4,226	SF	4.50	19,017
<u>033000 CAST IN PLACE CONCRETE</u>				
Mech/elec rm (seal conc.)	3,088	SF	0.95	2,934

				931,725

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
C3030 CEILING FINISHES				
<u>092900 GYPSUM BOARD ASSEMBLIES</u>				
Gyp Ceiling	7,500	SF	7.75	58,125
Misc. Gyp soffits	96,308	GSF	0.80	77,046
<u>095100 ACOUSTICAL CEILINGS*</u>				
Cafeteria ceiling system	4,100	SF	10.00	41,000
2x2 ACT typical	69,839	SF	4.75	331,735
2x2 MR ACT kitchen	2,054	SF	5.00	10,270
<u>090009 PAINTING*</u>				
Paint gyp ceiling	7,500	SF	1.00	7,500
Paint exposed structure mech/ elec	8,000	SF	1.30	10,400
Paint exposed structure gym	4,815	SF	1.30	6,260

				542,336
TOTAL C30 - INTERIOR FINISHES				2,147,987

D. SERVICES**D10 - CONVEYING**

D1010 ELEVATORS & LIFTS

142424 HYDRAULIC ELEVATORS*

Wheelchair lift and patch	1	LS	25,000.00	25,000
Passenger elevator (3 stop)	Existing to remain			

				25,000

D1010 ESCALATORS & MOVING WALKS

D20 - PLUMBING

D2010 PLUMBING

220000 PLUMBING*

Plumbing rework	96,308	GSF	8.00	770,464
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*roof drainage system is existing to remain

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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* underslab drainage is existing to remain

770,464

TOTAL D20 - PLUMBING	\$8.00	/sf		770,464
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D30 - HVAC

D3010 HVAC

230000 HVAC*

HVAC - VAV System	96,308	GSF	29.00	2,792,932
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2,792,932

TOTAL D30 - HVAC	\$29.00	/SF		2,792,932
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D40 - FIRE PROTECTION

D4010 FIRE PROTECTION

210000 FIRE SUPPRESSION

New wet system	96,308	GSF	5.00	481,540
Fire Pump	1	LS	75,000.00	75,000

556,540

TOTAL D40 - FIRE PROTECTION	\$5.78	/SF		556,540
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D50 - ELECTRICAL

D5010 ELECTRICAL

260000 ELECTRICAL*

Replace Electrical System	96,308	SF	26.00	2,504,008
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2,504,008

TOTAL D50 - ELECTRICAL	\$26.00	/SF		2,504,008
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E. EQUIPMENT & FURNISHINGS

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
E10 - EQUIPMENT				
E1010 COMMERCIAL EQUIPMENT				
<u>113100 APPLIANCES</u>				
Gym laundry appliances	1	RM	2,500.00	2,500
Teacher work rm appliances	2	RM	2,500.00	5,000
Health office appliances	1	LS	2,500.00	2,500
Teachers dining appliances	1	LS	2,500.00	2,500
<u>116623 GYMNASIUM EQUIPMENT</u>				
Gymnasium equipment		w/Addition		
<u>115213 PROJECTION SCREENS</u>				
Projection screen - café	1	EA	10,000.00	10,000
<u>114000 FOOD SERVICE EQUIPMENT</u>				
Kitchen equipment & casework	1	LS	450,000.00	450,000
<u>115300 LABORATORY EQUIPMENT</u>				
Science Lab equipment	5	EA	7,500.00	37,500
Science Prep rm appliance	3	EA	5,000.00	15,000
Science fume hood	4	EA	6,500.00	26,000

				551,000
TOTAL E10 - EQUIPMENT				551,000

E20 - FURNISHINGS123000 CASEWORK

Replace all casework	96,308	GSF	6.00	577,848
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122400 WINDOW SHADES

Manual roller shades - typ.	9,000	SF	4.50	40,500
Vert. blinds @ int. offices	1	LS	5,000.00	5,000

124813 ENTRANCE FLOOR MATS & FRAMES

Surface mat	4	EA	1,000.00	4,000
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DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL

				627,348
E2020 MOVABLE FURNISHINGS		NIC		0

				0
TOTAL E20 - FURNISHINGS				627,348

=====

627,348

E2020 MOVABLE FURNISHINGS

NIC

0

0

TOTAL E20 - FURNISHINGS

627,348

F. SPECIAL CONSTRUCTION & DEMOLITION

F10 - SPECIAL CONSTRUCTION

F1010 SPECIAL STRUCTURES

N/A

0

F1020 INTEGRATED CONSTRUCTION

F20 - SELECTIVE BUILDING DEMOLITION

F2010 BUILDING ELEMENTS DEMOLITION

024116 STRUCTURE DEMOLITION

Interior Demolition

96,308

GSF

6.00

577,848

577,848

F2020 HAZARDOUS COMPONENTS ABATEMENT

022820 ASBESTOS REMEDIATION

Hazardous waste removal

see summary page

0

TOTAL F20 - SELECTIVE BUILDING DEMOLITION

577,848

G. BUILDING SITEWORK

SEE SITEWORK ESTIMATE

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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G10 - SITE PREPARATION

PROJECT: Mountview Middle School
 LOCATION: Holden, MA
 CLIENT: Lamoureux - Pagano Associates, Architects
 DATE: 31-Aug-12

No.: 11100

**RENOVATION & ADDITION
 EXISTING SITE -SITWORK**

SUMMARY

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
G. BUILDING SITWORK			
G10 - SITE PREPARATION			
G1010 SITE CLEARING	76,825	2%	0.00
G1020 SITE DEMOLITION & RELOCATIONS	158,750	5%	0.00
G1030 SITE EARTHWORK	314,361	10%	0.00
G1040 HAZARDOUS WASTE REMEDIATION	0	0%	0.00
G20 - SITE IMPROVEMENTS			
G2010 ROADWAYS	558,750	17%	0.00
G2020 PARKING LOTS	0	0%	0.00
G2030 PEDESTRIAN PAVING	121,503	4%	0.00
G2040 SITE DEVELOPMENT	439,225	13%	0.00
G2050 LANDSCAPING	375,000	11%	0.00
G30 - SITE MECHANICAL UTILITIES			
G3010 WATER SUPPLY	170,895	5%	0.00
G3020 SANITARY SEWER	104,404	3%	0.00
G3030 STORM SEWER	643,500	20%	0.00
G3040 HEATING DISTRIBUTION	0	0%	0.00
G3050 COOLING DISTRIBUTION	0	0%	0.00
G3060 FUEL DISTRIBUTION	43,750	1%	0.00
G3090 OTHER SITE MECHANICAL UTILITIES	0	0%	0.00
G40 - SITE ELECTRICAL UTILITIES			
G4010 ELECTRICAL DISTRIBUTION	154,560	5%	0.00
G4020 SITE LIGHTING	94,100	3%	0.00
G4030 SITE COMMUNICATIONS & SECURITY	35,000	1%	0.00
G4090 OTHER SITE ELECTRICAL UTILITIES	0	0%	0.00
G90 - OTHER SITE CONSTRUCTION			
G9010 SERVICE AND PEDESTRIAN TUNNELS	0	0%	0.00
G9090 OTHER SITE SYSTEMS	0	0%	0.00
TOTAL	3,290,622	100%	0.00

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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G. BUILDING SITEWORK

G10 - SITE PREPARATION

G1010 SITE CLEARING

311000 SITE PREPARATION & CLEARING

Erosion control	4,500	LF	3.65	16,425
Drain inlet protection - allow	8	EA	50.00	400
Construction entrance and staging	1	LS	10,000.00	10,000
Misc. site preparation	1	LS	50,000.00	50,000

				76,825

G1020 SITE DEMOLITION & RELOCATIONS

311000 SITE PREPARATION & CLEARING

Site Preparation	635,000	SF	0.25	158,750

				158,750

G1030 SITE EARTHWORK

310000 EARTHWORK

Cut and Fill	25,500	CY	7.00	178,500
Site Rough Grading	70,555	SY	0.65	45,861
Ledge Removal - allowance	2,000	CY	45.00	90,000

*Site utilities include excavation & backfill

314,361

G1040 HAZARDOUS WASTE REMEDIATION

N/A

0

TOTAL G10 - SITE PREPARATION				549,936
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G20 - SITE IMPROVEMENTS

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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G2010 ROADWAYS

320000 PAVEMENT, CURBING & EDGING

4 1/2" Vehicular Bituminous Pavement:

New Parking and drive	12,300	SY	26.00	319,800
12" Gravel base @ drive	4,100	CY	19.50	79,950
Granite curb - straight	3,920	LF	29.50	115,640
Granite curb - radial	980	LF	29.50	28,910
Tactile warning paver at HC Cut	6	EA	325.00	1,950
Traffic signage	1	LS	5,000.00	5,000
Misc. pavement markings	1	LS	7,500.00	7,500

				558,750

G2020 PARKING LOTS

*Included with G2010

0

G2030 PEDESTRIAN PAVING

320000 PAVEMENT, CURBING & EDGING

4" Concrete pavement	12,000	SF	4.25	51,000
8" Gravel base @ walk	300	CY	21.00	6,300
3" Bituminous walk	1,500	SY	23.00	34,500
8" Gravel base @ walk	333	CY	21.00	6,993
Specially Entry Pavement	3,500	SF	6.00	21,000
8" Gravel base @ walk	90	CY	19.00	1,710

				121,503

G2040 SITE DEVELOPMENT

323100 SITE IMPROVEMENTS

6" Concrete dumpster pad	500	SF	10.00	5,000
Dumpster enclosure	85	LF	65.00	5,525
Dumpster gate	1	EA	2,500.00	2,500
Baseball Field	1	EA	65,000.00	65,000
Softball Field	1	EA	65,000.00	65,000
Tennis court	2	EA	55,000.00	110,000
Basketball court	1	EA	40,000.00	40,000
Fencing	1	LS	60,000.00	60,000
Bollards @ transformer/generator	6	EA	550.00	3,300

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Vehicular access gate	2	EA	2,200.00	4,400
Bike rack - allow	5	EA	450.00	2,250
Bench - allow	10	EA	1,800.00	18,000
Trash receptacle - allow	3	EA	1,250.00	3,750
Flag pole	1	EA	4,500.00	4,500
Misc. site improvements	1	LS	50,000.00	50,000

				439,225

G2050 LANDSCAPING

329000 LANDSCAPING

Landscaping - allow	1	LS	100,000.00	100,000
Loam and Seed disturbed area	50,000	SY	5.50	275,000
Irrigation system		NIC		

				375,000

TOTAL G20 - SITE IMPROVEMENTS				1,494,478
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G30 - SITE MECHANICAL UTILITIES

G3010 WATER SUPPLY

330000 UTILITIES

Site connection	1	LS	7,500.00	7,500
4" Domestic	25	LF	51.00	1,275
6" Fire service line	200	LF	58.00	11,600
10" Main	1,200	LF	89.00	106,800
Hydrant	5	EA	1,850.00	9,250
10" Gate valve	4	EA	1,150.00	4,600
6" Gate valve	2	EA	850.00	1,700
4" Gate valve	1	EA	670.00	670
Ledge removal	500	CY	55.00	27,500

				170,895

G3020 SANITARY SEWER

330000 UTILITIES

Grease trap (5,000 gal)	1	EA	7,000.00	7,000
8" PVC Sanitary main	1,200	LF	48.00	57,600
6" Cast Iron	42	LF	62.00	2,604
Sanitary manhole	3	EA	2,500.00	7,500
Clean out	4	EA	550.00	2,200
Ledge removal	500	CY	55.00	27,500

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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104,404

G3030 STORM SEWER

330000 UTILITIES

Storm Sewer:

Site Drainage :

Area drain	7	EA	1,250.00	8,750
Drainage manhole	18	EA	2,250.00	40,500
Catch basin	25	EA	2,250.00	56,250
24" RCP	1,500	LF	56.00	84,000
12" RCP	2,500	LF	38.00	95,000
18" RCP	2,000	LF	46.00	92,000
15" RCP	500	LF	42.00	21,000
Water quality structure	3	EA	12,000.00	36,000

Detention Systems	5,000	SF	20.00	100,000
Ledge removal - allow	2,000	CY	55.00	110,000

643,500

G3060 FUEL DISTRIBUTION

330000 UTILITIES

Fuel Distribution:

Gas main trenching and backfill	1,200	LF	25.00	30,000
Ledge removal	250	CY	55.00	13,750

43,750

G3090 OTHER SITE MECHANICAL UTILITIES

N/A

0**TOTAL G30 - SITE MECHANICAL UTILITIES****962,549****G40 - SITE ELECTRICAL UTILITIES**

G4010 ELECTRICAL DISTRIBUTION

260000 ELECTRICAL*

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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SPARE OR EMPTY RACEWAYS

PVC Underground:

4"	5,000	LF	14.20	71,000
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GROUNDING:

Ground rod 3/4" x 10'

	1	EA	77.00	77
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Bare copper wire #1/0	25	LF	3.30	83
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330000 UTILITIES

Transformer pad	1	EA	2,000.00	2,000
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Emergency generator pad (15'x30')	1	EA	2,500.00	2,500
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Conc. ductbank	1,200	LF	42.00	50,400
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Tele/data duct bank	750	LF	38.00	28,500
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*Primary cabling - By Others

154,560

G4020 SITE LIGHTING

260000 ELECTRICAL*

Parking light pole	20	EA	3,500.00	70,000
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Pedestrian lighting	12	EA	1,800.00	21,600
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Flag pole lighting	1	LS	2,500.00	2,500
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94,100

G4030 SITE COMMUNICATIONS & SECURITY

330000 UTILITIES

Security Cameras	10	EA	3,500.00	35,000
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35,000

G4090 OTHER SITE ELECTRICAL UTILITIES

N/A

0

0**TOTAL G40 - SITE ELECTRICAL UTILITIES****283,660****G90 - OTHER SITE CONSTRUCTION**

N/A

TOTAL G90 - OTHER SITE CONSTRUCTION**0**

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

C. Preliminary Design: New Construction at Existing Site Option

1. Narrative Description of Option
2. Preliminary Site Plan
3. Preliminary Floor Plans: 1st, 2nd, and 3rd
4. Final Evaluation of Site – Brassard Design & Engineering
5. Traffic Study – Nitsch Engineering
6. Structural Study – Bolton & DiMartino
7. Fire Protection Report – Sensible Solutions
8. Plumbing and HVAC Study – Seaman Engineering
9. Recommendations – Electrical Systems – ART Engineering
10. MA-CHPS Scorecard
11. Revised Estimate of the Cost of Construction

Mountview Middle School

270 Shrewsbury Street, Holden, MA 01520

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

FEASIBILITY STUDY

C. Preliminary Design Options: New Construction at Existing Site Option Narrative

1. General:

A new three story school located to the North of the existing school in the area currently used for a softball and practice field.

2. Educational Program:

The District's Educational Plan is fully supported by the preliminary floor plan layout. The academic wings are 3 stories each, each level divided into two distinct and matching clusters of general classrooms, SPED classrooms, Science Labs and common teaching areas. Each cluster is adjacent to Art and Technology classrooms dedicated to each grade on each of the three floors. Faculty work spaces are located on each floor central to the 2 clusters. Administration, Cafeteria, Gymnasium and Music Suite are located away from the academic clusters allowing for independent access for after school functions as well as segregating the noisy activities of the Music Suite, Gymnasium, etc. away from the quieter academic functions.

3. Site:

Refer to attached site work narrative.

4. Vehicular Circulation:

The pattern for buses and parent pick up and drop off separates each with distinct routes for their respective functions. Buses will use a dedicated bus loop for delivery and retrieving students at the lobby's Main Entrance. Parents will use the Ring Road behind the building for Drop-off and Pick-up at the rear entrance to the Main Lobby. Both parents and buses will access the site on the same entrance driveway and exit on the same separate exit drive. This circulation pattern will enable the fourteen buses to readily access and vacate the site while providing ample queuing and separate drop-off area for the 250 parent drop off automobiles. (Refer to attached Traffic Study).

5. Parking:

The design provides for the required 125 parking spaces in two main areas, allows for easy access to the school and athletic fields.



Mountview Middle School

270 Shrewsbury Street, Holden, MA 01520

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

FEASIBILITY STUDY

C. Preliminary Design Options: New Construction at Existing Site Option Narrative

6. Service Access:

Service to the Mechanical Room and Cafeteria kitchen is located within a screen service yard containing a tailgate height loading dock, dumpster location, transformer and other service or building related mechanical items.

7. Athletic Fields:

The previously mentioned displaced softball field and practice fields (Item #1 above) will be rebuilt after the existing school building is demolished. These fields are planned to be relocated to the area now occupied by the existing school. New Phys Ed field to be developed to the west side of new school.

8. Phasing:

The new building will be constructed while the existing school remains occupied. There will be minimal impact on the school day, current vehicular circulation and parking. Minor impact would be limited to the possible reduction of width to one lane of the existing ring road behind the existing school to allow for a construction fence. The existing football/soccer field will be used for construction activities of material storage, markers, etc. Tennis and basketball courts as well as the Little League field will not be impacted by the construction. Outdoor Physical Education classes will continue to use the baseball field outfield for outdoor exercise. After completion of the new school fields will be re-established both in the previous material staging area and the new area obtained from demolishing the existing building.

9. Code/Zoning:

The project will require a variance from the 30ft zoning regulation on maximum building height.

10. Structural, Plumbing, Fire Protection, HVAC, Electrical and Data/Communications refer to attached narratives. (Refer to attached narratives).



Mountview Middle School

270 Shrewsbury Street, Holden, MA 01520

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

C. Preliminary Design Options:

New Construction at Existing Site Option Narrative

FEASIBILITY STUDY

Merits	Limitations
<ul style="list-style-type: none">▪ No land acquisition required.▪ Currently a school site – less public pressure on building new school.▪ Level site – easier build.▪ Will provide for team teaching style.▪ Educationally preferred layout.▪ Addresses separate bus and parent pick up/drop off access.▪ Minimum risk for unforeseen conditions.▪ Simplified construction process.▪ Lower annual operating cost.▪ No change to traffic volume on Shrewsbury Street.	<ul style="list-style-type: none">▪ Lose some fields for use during construction.▪ Some disruption and noise issues during school operations.

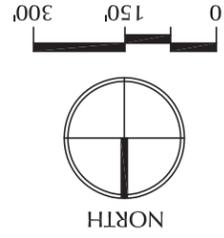




Residential-R-15 Zoning Requirements

Lot Area Square Footage	1,222,570sf
Lot Frontage	80'
Front Yard	30'
Side Yard	20'
Rear Yard	20'
Maximum height	30'
Maximum building coverage	25%

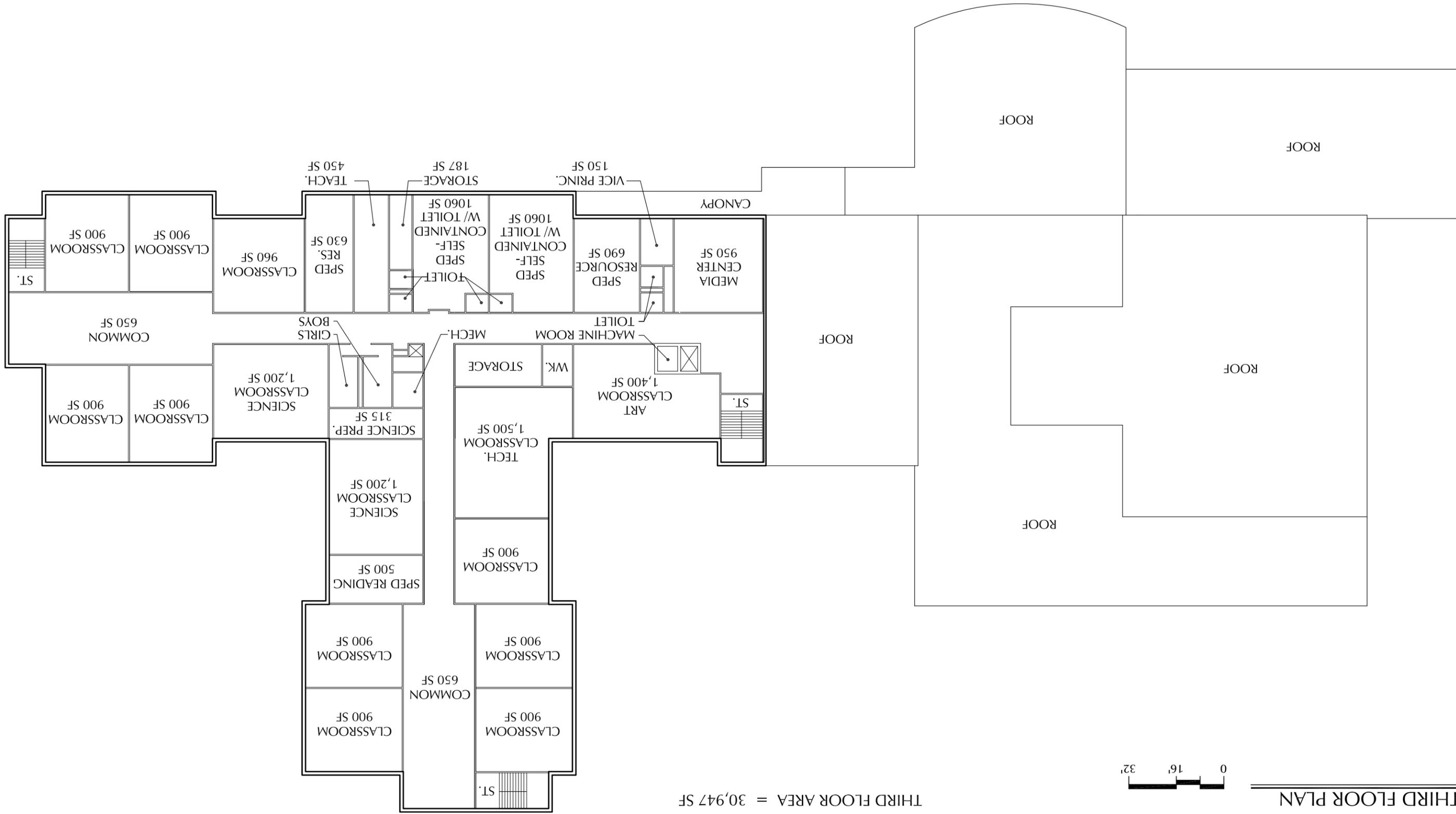
NOTES:
Information compiled in this drawing was taken from several sources including, but not limited to:
1. Town of Holden Assessor Map
2. Mass GIS, USGS Topographic Maps
3. Google Map



THIRD FLOOR PLAN



THIRD FLOOR AREA = 30,947 SF



September 4, 2012

Mr. William Senecal
Lamoureux Pagano Architects
108 Grove Street
Worcester, MA 01605

RE: Mountview Middle School Feasibility Study – Site Work
New Construction / Existing Site Alternative

Dear Bill:

Per your request, Brassard Design & Engineering, Inc. has conducted an evaluation of the existing Mountview Middle School site, previously submitted under separate cover. Based on the results of the evaluation, and on the general redevelopment program that you provided for the construction of a new school on the existing site (New Construction / Existing Site), we have estimated the associated scope of site work required to advance the project.

The New Construction / Existing Site alternative would be a phased project that would include construction of a new school building and parking area in the vicinity of the existing northerly athletic fields while the existing school remains in use. Upon completion of the new school and following demolition of the existing school, additional parking and primary building access drives would be constructed and new athletic fields would be installed in the general location of the existing school building.

The entire site access layout including curb cut locations and pedestrian walks would be replaced/reconfigured. With the exception of the existing baseball and soccer field on the westerly side of the property, a new landscaping and lighting program would be required for the entire site.

New water / fire protection and sanitary sewer utility systems would be extended from corresponding existing service connections on the eastern side of the site. The stormwater management system will be completely replaced with updated facilities providing peak flow control and water quality treatment.

The site improvements would likely involve the following specific work items:

Pavements and Access

- Establish new curb cut location on Shrewsbury Street for new site access drive (and construction access);
- Replace all parking and access areas with new parking lots and looped site drive;

- Replace all existing pedestrian walks with new and construct additional pedestrian access ways to existing and new athletic fields and facilities;
- Replace all site access signage and other informational signage;
- Repair/replace existing sidewalks along Shrewsbury Street frontage;

Site Utilities

- Remove the existing underground fuel storage tank (this assumes that gas service will be provided to the building)
- Remove all existing building utility services exclusive of sections required to make connections to new school building;
- Install new water/fire protection services and new service main for hydrant locations (1,000LF+/-)
- Connect new building to existing sewer service connection (200LF+/-);
- With the exception of the existing outfall location, replace the existing stormwater system and include provisions for water quality treatment and groundwater recharge per the MA DEP Stormwater Standards;

Landscape

- Clear approximately 1 acre +/- of wooded area on the northern end of the site, and import adequate fill to accommodate building and parking lot construction;
- Construct a new softball field and additional soccer field in the general location of the existing school;
- Improve the existing baseball and soccer fields including installation of additional and replacement of existing perimeter fencing, general turf improvements, installation of new and replacement of existing playing field benches and other appurtenances;
- Implementation of site-wide landscaping improvements including installation of new trees, shrubs, and groundcover.

The above is not intended to be an exhaustive list, but provides a general frame of reference for the scale of site construction necessary for the implementation of the Addition/Renovation design alternative.

Permitting

In order to complete the site work, municipal permitting would be required including:

- Site Plan Review / Special Permit application to the Holden Planning Board per section XI of the Holden Zoning Bylaw, for verifying compliance with municipal design standards and zoning requirements.
- Although not explicitly required, the extent of the wetland area on the westerly side of the site should be delineated and defined via an Abbreviated Notice of Resource Area Delineation application to the Holden Conservation Commission.

Because size of the construction site will exceed 1 acre, a Notice of Intent application to EPA will be required per the National Pollutant Discharge Elimination System (NPDES). The application is related to control of stormwater discharges from the construction site and must be filed at least 14 days prior to initiation of construction activities.

Under the Addition/Renovation design option, the proposed construction would not trigger any state application filings including any filings related to the Massachusetts Environmental Policy Act (MEPA).

Other construction-related permit applications and processes that will be the responsibility of the general contractor are not listed.

If you have any questions or require additional information please contact me at your convenience.

Sincerely,
BRASSARD DESIGN & ENGINEERING, INC.



Matthew T. Brassard, PE



Nitsch Engineering

Traffic Impact & Access Study (Existing Site)

Mountview Middle School
Holden, MA

June, 2012

Prepared for:

Lamoureux Pagano Associates
108 Grove Street, Suite 300
Worcester, MA 01605

Submitted by:

Nitsch Engineering
186 Lincoln Street, Suite 200
Boston, MA 02111

Nitsch Engineering Project #9111

Executive Summary

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INTRODUCTION

Nitsch Engineering has been retained by Lamoureux Pagano Associates to prepare a qualitative assessment of the parent pick-up/drop-off, bus circulation, parking, and site circulation for the proposed reconstruction of the Mountview Middle School (MVMS) in Holden, Massachusetts. The school is located at the southeast corner of the Town between the intersections of Shrewsbury Street at Doyle Road/Mountview Drive and Shrewsbury Street at Chapel Street/Holden Street. Figure 1 shows an aerial image of the school location.

Figure 1 – School Location



As seen in Figure 1, MVMS is located on Shrewsbury Street near the signalized intersection of Shrewsbury Street at Doyle Road/Mountview Drive. The school zone is surrounded primarily by residential uses to the east, west, and south. The speed limit on Shrewsbury Street is 35 miles per hour (mph) posted in both the eastbound and westbound directions. School zone speed limit signs of 20 mph are also posted for school pick-up and drop-off periods. The average daily traffic on Shrewsbury Street is approximately 15,000 vehicles.

In its Statement of Interest to the Massachusetts School Building Authority (MSBA), the Town cited overcrowding as one (1) of the purposes of the school reconstruction. MVMS had an enrollment of 761 students as of October 1, 2008, for a building designed for a capacity of 600 students. The proposed school is expected to adequately accommodate students that are currently enrolled and the supporting staff. School authorities project that the enrollment will remain level in the future.

EXISTING CONDITIONS

On June 7th, 2012, Nitsch Engineering conducted a field reconnaissance of the study area intersections, reviewed site access and egress conditions, inventoried parking supply, and conducted parking counts at MVMS. The following section is a summary of the existing conditions as observed during the site visits.

Intersections

Nitsch Engineering completed an assessment of the intersections that serve the existing MVMS site. These are:

- Shrewsbury Street at East School Driveway; and
- Shrewsbury Street at West School Driveway.

Both the intersections are unsignalized.

Shrewsbury Street and East School Driveway

This is a three-legged intersection with Shrewsbury Street approaching from the east and west, and East School Driveway approaching from the north. East School Driveway is a one-way exit onto Shrewsbury Street. The intersection is located 300 feet from the signalized intersection of Shrewsbury Street and Doyle Road.

Shrewsbury Street consists of an 11.5-foot lane and a 6-foot shoulder in the eastbound direction, and a 12-foot lane and a 4.9-foot shoulder in the westbound direction. Five (5)-foot-wide sidewalks are present on both sides of Shrewsbury Street. There is no sidewalk on East School Driveway. A double-yellow centerline separates two-way travel on Shrewsbury Street. Single white edge lines separate the traveled way from the shoulder on both sides. Advance pavement markings include “YIELD” to pedestrians, and “SCHOOL SLOW” imprints to the east of the intersection. A crosswalk is marked on East School Driveway with pedestrian ramps at both ends. Parking is prohibited on both sides of Shrewsbury Street.



Looking East on Shrewsbury Street



Looking West on Shrewsbury Street

The pavement and sidewalks on Shrewsbury Street are in moderate condition with minor cracks. Signing includes a flashing school zone speed limit sign to the east of the intersection, and a symbolic yield to pedestrians sign to the west of the intersection on Shrewsbury Street. An “Exit Only” and “Do Not Enter” signs are present on East School Driveway. During the site visit, a large puddle was seen on the East

School Driveway, which could be a hindrance to pedestrians walking along the northerly sidewalk on Shrewsbury Street.



Puddle on East School Driveway



Looking at East School Driveway

Shrewsbury Street and West School Driveway

This is a three-legged intersection with Shrewsbury Street approaching from the east and west, and West School Driveway approaching from the north. West School Driveway is a one-way entrance only from Shrewsbury Street.



Looking East on Shrewsbury Street



Looking West on Shrewsbury Street



Looking at West School Driveway



Crosswalk between East & West School Dwy

Sidewalks are present on both sides of Shrewsbury Street. A double-yellow centerline separates two-way travel. Single white edge lines separate the traveled way from the shoulder on the west side of the intersection. Advance pavement markings include “YIELD” to pedestrians, “SCHOOL SLOW” imprints to the west of the intersection. There are two (2) crosswalks at the intersection – one (1) on West School Driveway and the other on Shrewsbury Street between the East School Driveway and West School Driveway. A single yellow centerline separates the traffic on West School Driveway headed to the front of the school, and the administrative/visitor parking vehicles headed to the back of the school.

The pavement and the sidewalk are in moderate condition with minor cracks. Signing includes a flashing school zone speed limit sign to the west of the intersection, and a symbolic yield to pedestrians sign opposite to the West School Driveway entrance on Shrewsbury Street.

Sight Distance

Stopping Sight Distance (SSD) is the distance necessary for a vehicle traveling at the design speed to stop before reaching a stationary object in its path. Intersection Sight Distance (ISD) is the minimum visibility needed at an intersection to allow drivers to perceive the presence of potentially conflicting vehicles. The Project Development and Design Guide¹ was used to establish the recommended SSD and ISD. The sight distances measured during the June 2012 site visit are as shown in Table 1.

Table 1 – Sight Distance Evaluation

Intersection	Speed Limit	Stopping Sight Distance	Intersection Sight Distance (ISD)		
	Speed ¹ (mph)	Recommended (Feet)	Recommended (Feet)	EB Available (Feet)	WB Available (Feet)
Shrewsbury Street/East School Dwy					
Shrewsbury St. Eastbound (Downgrade)	20 (35)	116 (257)			
Shrewsbury St. Westbound (Upgrade)	20 (35)	115 (250)			
Left turn from East School Dwy	20 (35)		225 (390)	450 appx**	>500
Right turn from East School Dwy	20 (35)		195 (335)	450 appx**.	>500
Shrewsbury Street/West School Dwy					
Shrewsbury St. Eastbound (Downgrade)	20 (35)	116 (257)			
Shrewsbury St. Westbound (Upgrade)	20 (35)	115 (250)			
Left turn from West School Dwy	20 (35)		225 (390)	325 appx**	>500
Right turn from West School Dwy	20 (35)		195 (335)	325 appx**	>500
1. Speed based on reduced speed limit of 20 mph for a School Zone. At other times, speed is based on 35 mph posted speed limit on Shrewsbury Street and is shown in parenthesis; ** Approximate values, to be verified by a survey					

The posted speed limit on Shrewsbury Street is 35 mph for which the recommended SSD is 257 feet and ISD is 390 feet. The recommended SSD and ISD for a school zone with a speed limit of 20 mph are 116 feet and 225 feet, respectively. As seen in Table 1, the available ISD at the East School Driveway intersection exceeds the recommended ISD in both directions on Shrewsbury Street. The available ISD at the West School Driveway looking left at westbound traffic is more than required but looking right at eastbound traffic is slightly less than the recommended value for the 35 mph design speed. This may be one of the reasons why the existing site is designed to have a clockwise traffic pattern. Vehicles enter from the West School Driveway and exit from the East School Driveway as is further discussed in the Circulation section.

¹ Project Development and Design Guide, Massachusetts Highway Department, 2006

Parking

Nitsch Engineering conducted a parking inventory during the site visit on June 7, 2012. Figure 2 shows the location of parking lots on the site. The availability of parking spaces, utilization and recommendation for the proposed school are included in this section.

Figure 2 – Parking



As seen in Figure 2, there are five (5) parking lots within the school site – lot P1 is used by administrative staff and visitors, P2 is reserved parking for administrators, P3 consists of parking for teachers and visitors, P4 represents the overflow parking for teachers, and P5 is handicap parking only. Handicap accessible parking spaces are also available in lot P2. The following is the parking utilization of the lots as observed during the site visit on June 7, 2012:

Table 2 – Parking Utilization

Lot Description	Percentage Of General Spaces Occupied	Available		Occupied	
		General	Handicap	General	Handicap
Lot P1 (Teachers/Administrators)	68%	38	0	26	0
Lot P2 (Administrators)	89%	9	0	8	0
Lot P3 (Teachers/Visitors)	86%	21	2	18	0
P4 (unmarked spaces, Teachers/Visitors)	-	-	-	14*	-
Lot P5 (Handicap Accessible Spaces)	0%	0	4	0	0
Total	76%	68	6	52	0

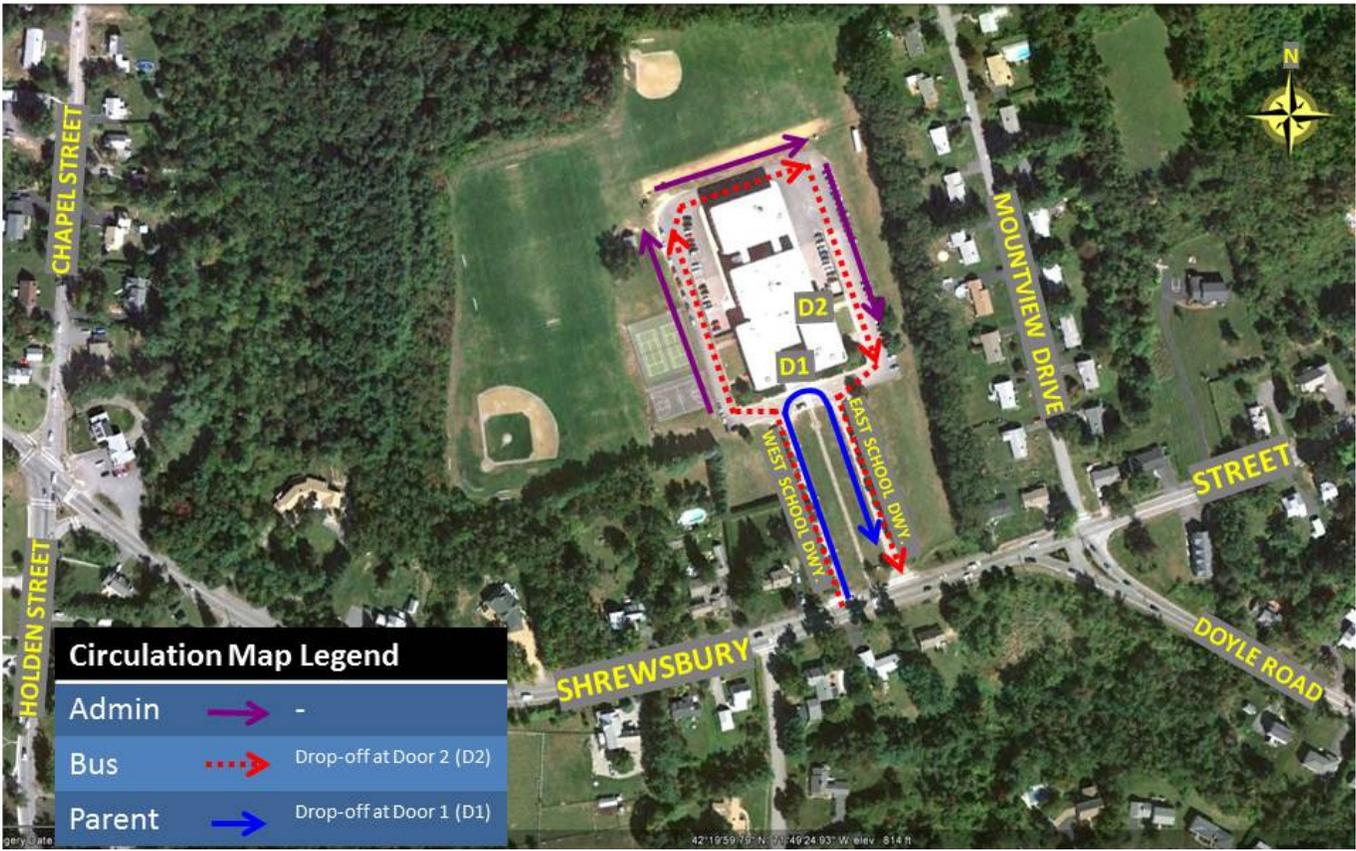
*Vehicles marked in unmarked spaces, not counted towards Total

As seen in Table 2, there is reserve parking available in lot P1 (east of the building); however, the teachers' entrance is located on the west side of the building where there is no reserve parking except the handicap accessible spaces. As a result, teachers park on the grass along the periphery of the fields (P4) for easy access into the building.

There were two (2) handicap accessible spaces available in P3; however, neither had an access aisle as required by the American for Disabilities Act (ADA). A 5-foot-wide access aisle is required for an accessible space. Two (2) spaces can share a common access aisle per the ADA. The ADA requires a minimum of three (3) accessible spaces for parking lots with 51-75 spaces. By these standards, the existing school has more accessible spaces than the required minimum.

Circulation

Figure 3 – Circulation



As seen in Figure 3, parent drop-offs take place in front of the school building (D1). Vehicles enter from the West School Driveway and exit from the East School Driveway. Buses enter from the West School Driveway and loop around the school building to drop off children at the southeast entrance to the building (D2). Teachers and administrative staff use the same circulation path as buses.

The circulation at the existing school is contrary to what normal driver expectation would be, which is to flow counter-clockwise around the building. Nitsch Engineering anticipates that the limited sight distance at the West School Driveway looking onto Shrewsbury Street west, and the proximity of East School Driveway to the traffic signal at Doyle Road/Mountview Drive may be one of the reasons for this design. Due to the flow pattern, children get dropped off on the opposite side of the school entrance, which increases the service time for each drop-off. Additionally, the flow is confusing to new drivers as there are no pavement markings or signs to indicate the direction of traffic flow.

Traffic Volumes

Automatic Turning Recorders (ATRs) were installed on Wednesday, June 6 and Thursday, June 7, 2012, to collect volume of vehicles, classification, and speed data on Shrewsbury Street. Precision Data Inc., a sub-consultant of Nitsch Engineering for traffic counts, collected the data for 48-hours on Shrewsbury Street using pneumatic tubes. The following is a summary of the data collected:

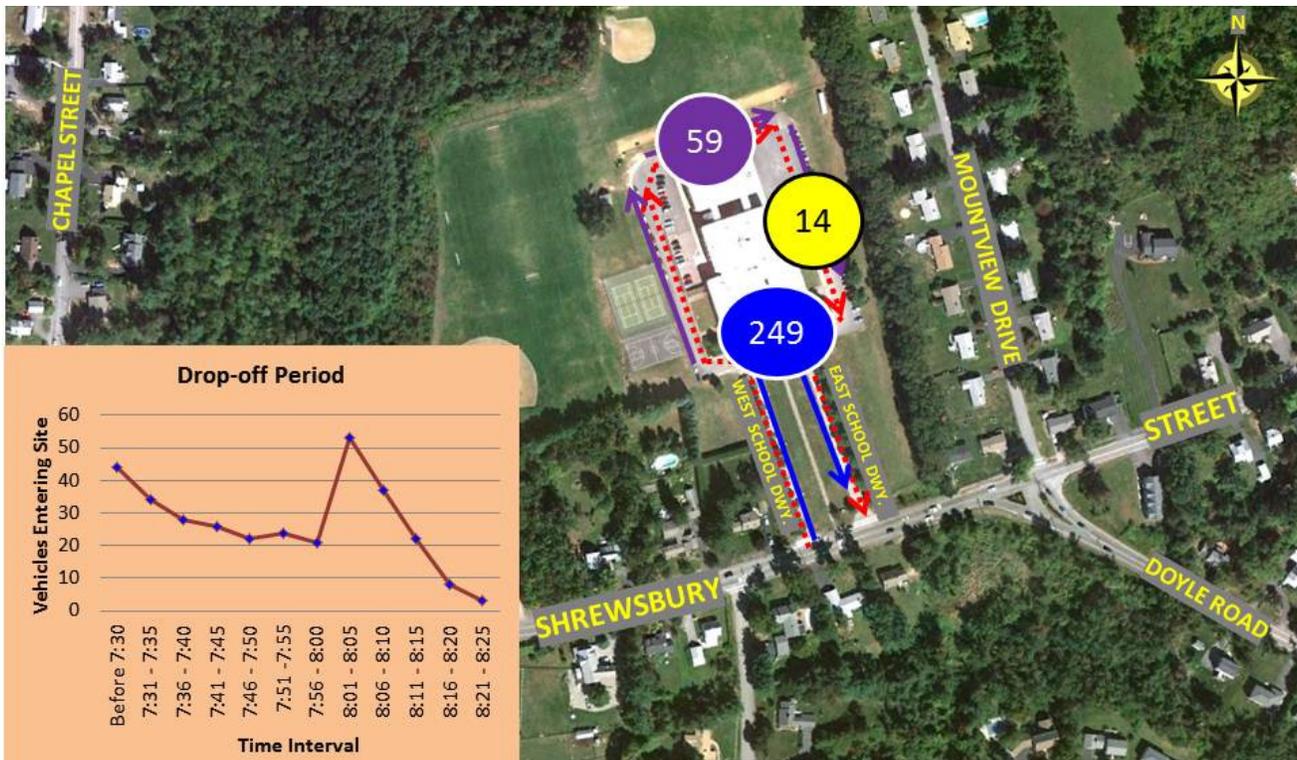
Table 3 – Shrewsbury Street Traffic Volumes

Location	Morning Peak (AM)		Midday peak (Afternoon) (PM)		Daily (vpd) ²
	Period	Volume (vph) ¹	Period	Volume (vph)	
Shrewsbury Street EB	7:15-8:15	736	2:30-3:30	490	7,617
Shrewsbury Street WB	7:30-8:30	407	2:30-3:30	576	7,638

1 vph: vehicles per hour; 2 vpd vehicles per day

As seen in Table 3, the daily traffic on Shrewsbury Street is approximately 15,300 vehicles with a 50-50 distribution in the eastbound and westbound directions. The AM or morning peak period is between 7:15 am and 8:30 am, which coincides with the school start time at 7:55 am. The midday peak period was between 2:30 and 3:30 pm, which coincides with the school release time at 2:30 pm. The peak volume on Shrewsbury Street is about 1150 vehicles during the morning peak hour, which is 7.5% of the daily traffic. In addition to the ATR counts, we counted the number of vehicles that entered the school site during the morning peak period, shown in the figure below.

Figure 4 – Site Volumes, Morning



As seen in Figure 4, a total of 322 vehicles entered the site between 7:00 am and 8:25 am. Of these, 59 vehicles were those of administrators, teachers or visitors, 14 were school buses and 249 were drop-off vehicles. The majority of vehicles entered the site between 7:55 am and 8:10 am. During the midday peak hour, there were far fewer vehicles onsite with a maximum of 21 cars observed waiting to pick-up students at 2:55 pm. A majority of the pick-up vehicles and buses exited the site by 3:07 pm.

Speed Data

In addition to the ATR data, speed data was also collected on Shrewsbury Street. The speed data was collected simultaneously with the ATR counts. Table 4 shows the speed on the roadway over the course of the day.

Table 4 – Speed Data

	Shrewsbury Street, between Doyle Road and East School Driveway	
	Eastbound	Westbound
Average Speed (mph)	27	28
85th Percentile/Design Speed (mph)	31	32
10 mph Pace Speed	23-32	24-33

As shown in Table 4, the average speed on Shrewsbury Street was 27 mph in the eastbound direction and 28 mph in the westbound direction. The 85th percentile speed was 31 mph in the eastbound direction and 32 mph in the westbound direction, which is below the posted speed limit of 35 mph. The 10-mile pace speed of vehicles in the eastbound direction was 23-32 mph and the pace speed in the westbound direction was 24-33 mph. The pace speed indicates the range of speed in which a majority of vehicles travel. The pace in both directions is lower than the speed limit indicating that a majority of drivers comply with the speed limit.

Flashing school zone speed limit signs of 20 mph are installed on Shrewsbury Street approximately 105 feet east of East School Driveway and 105 feet west of West School Driveway. The school zone speed limit signs inform drivers that the normal legal speed limit has been reduced to 20 mph during those times when the sign is flashing. However, their current location does not give drivers sufficient time to reduce their vehicle speed. Per Section 7B.15 of the Manual on Uniform Traffic Control Devices (MUTCD), *“the beginning point of a reduced school speed limit zone should be at least 200 feet in advance of the school grounds, a school crossing, or other school related activities.”*

Additionally, Nitsch Engineering did not observe ‘End School Zone’ signs on Shrewsbury Street that should be installed in conjunction with the reduced speed limit signs per the MUTCD (Section 7B.15, 04).

Pedestrians and Bicyclists

Nitsch Engineering observed 13 school children walking to school in the morning. A crossing guard was present until 8:05 am assisting children who crossed Shrewsbury Street. While no data was collected, Nitsch Engineering observed that many more children walked from school in the afternoon when compared to the morning. Children who biked to school were far fewer than children who walked, with only one (1) bicyclist observed riding to school in the morning. Bicycle racks provided in front of the school remained largely empty.



Bicycle Racks in front of school

Service Time and Queuing:

The design of the parent drop-off loop is such that children getting dropped off must walk around the vehicle to enter the school. Service time is the time interval from when a vehicle stops in front of the school to when it leaves after dropping off a student. The service time at MVMS is an average of 12.6 seconds, based on 16 drop-off observations. Longer service time usually results in longer queues. A preferred design would be one where drop-off takes place on the school side, which would reduce queuing on and offsite.

Queuing during the morning peak hour peaked at 8:00 am when queues from the parent drop-off queue blocked vehicles from entering the West School Driveway. Additionally, buses that were unable to enter due to the queues temporarily blocked the eastbound traffic on Shrewsbury Street, which resulted in stagnant traffic extending approximately 700 feet from West School Driveway. The backup was temporary and dissipated quickly. A majority of vehicles exiting from East School Driveway turned left at the intersection with Shrewsbury Street causing merging delays to through traffic waiting for the green signal at the intersection of Shrewsbury Street and Doyle Road. During the midday peak hour, queues from pick-up vehicles were contained onsite and did not block traffic on Shrewsbury Street.

CONCLUSIONS & RECOMMENDATIONS

Based on the existing conditions at the Mountview Middle School, the following are Nitsch Engineering's recommendations for the future design of the site:

1. Design the site to have a counter-clockwise traffic flow, such that students get dropped off on the school side of the driveway;
2. Provide pavement markings and signs indicating the direction of onsite vehicle flow;
3. Design parking lots so that teachers and administrators have sufficient marked spaces in proximity to the entrance most used by them;
4. Provide access aisle for handicap parking spaces;

5. Maintain separate parent drop-off and bus drop-off loops similar to the existing condition to reduce conflicts;
6. Remove and relocate the flashing school zone signs 200 feet from the school entrance on both sides;
7. Provide 'End School Zone' signs for traffic in both directions;
8. Provide sufficient queuing space onsite to avoid spillover onto Shrewsbury Street; and
9. Keep the exit for the school driveway as far east within the project site as possible to increase sight distance for vehicles approaching from the west.

P:\9111 Mountview MS\Transportation\Project Data\TIAS.doc

New Construction- Existing Site

We have reviewed the “New Construction- Existing Site” option presented for the Mountview Middle School feasibility study by Lamoureux Pagano and Associates, and will present a description of the structural system. The “New Construction- Existing Site” option consists of building an entirely new 3-story school on the same site as the existing school, using standard construction methods and materials.

Structural Systems:

- Foundations:
 - Interior concrete spread footings
 - Continuous reinforced concrete frost wall and footing at exterior walls
 - Foundation systems are assumed based on existing conditions and must be verified by a qualified Geotechnical Engineer
- Columns:
 - Wide flange steel column (W8) or steel tube column (HSS6x6)
- Framed Floors:
 - Wide flange composite steel beams
 - Composite metal deck
 - Concrete fill
- Roof:
 - Wide flange steel beams
 - Metal roof deck
- Lateral Force Resisting System:
 - Ordinary steel moment frames and concentrically braced steel frames

The “New Construction” option is the most flexible option, from a structural point of view. This option will also allow for increased life safety and more opportunity for sustainable design, compared to the “Addition and Renovation” option. Construction materials and systems will be designed in compliance with the current Massachusetts State Building Code. Based on the proposed location of the new building on the existing site, it appears that the structure can be built prior to the demolition of the existing building.

Christopher Tutlis, PE
Bolton & DiMartino, Inc.

Mount View Middle School Holden, Ma.
Final Evaluation of New Building Existing Site – Fire Protection
9-4-12

BUILDING DESCRIPTION

General: The Mount View Middle School is located at 270 Shrewsbury St, Holden, Ma. It is a 3-level, 3-wing building of non-combustible, steel, concrete and brick construction with flat roofs. Gross building area is 91,137 square feet (including the original, 1967 building and a 1989 addition).

For additional comments on the existing layout, hazards, school flammability standards, and storage issues, see the Existing Conditions – Preliminary Design Program report, dated 6-27-12

CONSTRUCTION OPTIONS:

Based on the preliminary design program submission, the school and MSBA have concurred that 3 options should be evaluated in more detail. These are:

1. A full renovation of the existing building (including enclosure of the existing, 5,171 sqft courtyard) with a 52,087 sqft addition (Renovation-Addition)
2. Demolition of the existing building, with construction of a new, 128,000 sqft building on the existing site,
3. Construction of a new, 128,000 sqft building on a town-owned parcel on Malden St. The fate of the existing school to be determined by the Town.

This document summarizes the requirements for a new building on the existing site

New Construction – existing site

All new Educational use buildings over 12,000 sqft must meet all current FP code requirements, including a new NFPA 13 fire protection system through-out the building. Fire Protection work for this option includes:

1. *New FP:* Provide a new, NFPA 13 fire protection system thru-out the new construction.
2. *Standpipes:* The projected 3rd level height above grade is between 28'7" and 29'2". Stairwell standpipes will only be required if site conditions result in the 3rd level being 30' or more above grade at any fire dept. access point. Stairwell standpipes require a much higher water-pressure and flow than a sprinkler system. Thus, if standpipes became a necessity, it is possible fire pumps would also be required.

New stage standpipe hose-stations will be required, but this system is permitted to be a "manual" stand-pipe, fed from the fire dept. pumper. Thus stage standpipes have minimal impact on whether fire pumps are required or not.

3. *Fire Dept. Connection FDC):* 4" Storz, with a site hydrant within 100' of the FDC

Mount View Middle School Holden, Ma.
Final Evaluation of New Building Existing Site – Fire Protection
9-4-12

4. *Fire Pump:* A new flow test will be required to confirm available water pressure and flow (and fire pump status) at the site, but the Town’s water line upgrades will certainly have improved flow and pressure since the 1989 addition. It is most likely that no fire pump will be required unless the building height triggers a need for stairwell stand-pipes.

RECOMMENDATIONS AND COSTS

The fire protection system requirements are summarized above, and budget costs are shown in Table 1 - based on building square-footage.

The following “other” general recommendations apply to *all options* being considered:

- renovation-addition,
- new-construction-existing site, and
- new-construction-alternate site.

- **Flow test:** Prior to schematic design, provide a flow-test.

- **General Storage issues:** Plan for all storage heights to be less than 12’. Review available storage areas and storage needs. Organize storage to keep it confined to designated storage rooms, with appropriate FP coverage.

- **Special Storage Issues:** Provide listed flammable storage cabinets for the storage of all flammable or combustible liquids or chemicals. Do not permit any plastic shelving. Metal shelving has the best fire resistance, wood shelving is acceptable.

- **Flammability Standards:** Ensure that all (existing and) new furniture and window coverings meet 527 CMR flammability standards.

- **Fire Signalling:** Connect all new FP system alarms to a new central Fire Alarm Control Panel (FACP - provided under electrical).

- **Maintenance Training and inspections:** Train in-house personnel, and provide required monthly inspections using in-house inspectors

- **FP Maintenance Contract:** Provide additional code-required maintenance and testing of FP systems alarms and flow via maintenance contract.

**Table 1 - Mt. View Middle School Fire Protection
PSR Cost Estimates**

	Major Renovation with Addition	New Construction Existing site	New Construction Alternate Site
ITEM	Budget Cost	Budget Cost	Budget Cost
Total Square Ft. Renovation <i>NO</i> Exist FP	57,308	0	0
Total Square Ft. Renovation w/ Exist FP	39,000	0	0
Total Square Footage - New Construction	52,087	128,000	128,000
Budget FP Cost per Sqft - No Exist FP	\$5.78	0	0
Budget FP Cost per Sqft - W/ Exist FP *	\$5.78	0	0
Budget FP Cost per Sqft - New Constr.	\$4.19	\$4.19	\$4.19
Budget FP Total Installed Cost	\$774,654	\$536,000	\$536,000
<i>Increase in Annual Maintenance Costs **</i>	\$5,010	\$7,040	\$7,040
* Per Architect - Existing FP to be removed and replaced in its entirety due to conflicts with proposed HVAC			
* Maint. Cost per sqft assumed:	0.055		



Date: September 4, 2012

To: William Senecal – Architect

Co: Lamoureux-Pagano Assoc. Architects, Inc. (via email)

From: Kevin Seaman. P.E. LEED® AP

Re: Mountview Middle School: **Feasibility Study HVAC & Plumbing Narrative – New Construction Shrewsbury Street Site Option**

The following narrative describes the proposed scope of work pertaining to the heating, ventilation and air conditioning (HVAC) systems and the plumbing systems at the Mountview Middle School for the New Construction Shrewsbury Street Site option.

HVAC

Central Heating Plant:

Natural gas availability to the site is still being reviewed however it is understood that natural gas service is available near the current school site. If the service cannot be extended to the site and underground LP tank(s) are required we highly recommend a hybrid system be used which can incorporate air source and/or geothermal based heat pumps. The below recommendations presume that adequate natural gas can be brought to the site.

1. The buildings heating requirements would be satisfied via high efficiency (93%+) gas-fired condensing hot water boiler plant. Maximum design hot water supply temperature of 140°F shall be utilized obtain maximum boiler efficiency. Pending final load calculations and system design, initially the boiler plant shall consist of two (2) new gas-fired condensing fire-tube style boilers each with a gross input capacity of 3,500,000 BTUH similar to Lochinvar Crest or equal by Aerco or Viessman.
2. Provide 2-pipe hydronic hot water system complete with end-suction system pumps as manufactured by Taco or Bell & Gossett rated for 500 GPM. Hydronic system shall connect to 2-pipe fan coil units, unit heaters, coils and fin-tube radiation located throughout the building. All new terminals connected to the new system shall be designed to operate with a maximum water temperature of 140°F to maximize plant capacity. Pumps shall have premium efficient motors and be fitted with variable speed drives so that pump energy matches system flow demand.

Distribution and Ventilation:

Proposed Air Distribution and Ventilation Systems are as follows:

1. To support most all classroom spaces, provide high efficiency packaged rooftop units to provide outdoor air and exhaust to the classroom spaces. Units shall utilize variable speed compressor technology for dehumidification control coupled with hot gas DX reheat and hot water coils tied to the central boiler plant. Units shall also be equipped with total energy recovery (ERU) wheels to utilize waste exhaust to temper incoming fresh air. In addition, units shall be provided with variable speed drive (VSD) supply fans which can modulate based on room ventilation demand. Air distribution to the classroom spaces shall be via displacement style diffusers. Units shall be as manufactured by Aeon, McQuay or Trane.
2. Each classroom system shall be rated to provide the minimum amount of outside air required for all the spaces supported. Units shall be ducted to supply and exhaust air from each space with each space having its own VAV control box on the supply branch and zone damper on the return/exhaust branch. Distribution shall connect to displacement style diffusers in each classroom space. Units shall provide tempered and dehumidified air to all the classroom spaces.
3. For other area as noted below rooftop air handling units are proposed to facilitate ease of service and economy. For areas requiring cooling, provide high efficiency packaged rooftop units which utilize variable speed compressor technology and hot water coils tied to the central boiler plant. Units supporting high occupancy areas shall be equipped with ERU wheels to utilize waste exhaust to temper incoming fresh air. In addition units shall be provided with variable speed drive (VSD) supply fans which can modulate based on load and ventilation demand. Units shall be as manufactured by Aeon, McQuay or Trane. Areas supported by such equipment shall be as follows:
 - Cafeteria – Unit with VSD and ERU (option for high efficiency cooling)
 - Media Center – Unit with VSD and ERU and high efficiency cooling
 - Gymnasium – Unit with VSD
 - Office – Unit with VSD with high efficiency cooling (option for ERU) supporting variable air volume boxes with reheat coils.
4. The computer classrooms as well as the MDF room shall be cooled via high efficiency ductless split units (one per room) with fan coil mounted within ceiling and condensing unit on roof.
5. In all classrooms, exterior offices, etc... provide multi-tier high output fin–tube radiation in each room. Radiation shall be piped and controlled so that each room shall have its own temperature control zone.
6. For the locker rooms areas provide two (2) total energy recovery ventilators, one for the girls locker room and one for the boys locker room to support ventilation of these areas as manufactured by Greenheck model ERCH or equal by Aeon or McQuay. Units shall come complete with supply and exhaust fans, total energy recovery wheel, electric frost preheater and hot water coil. Units shall be ducted to exhaust and supply air to the respective locker room areas.

7. All other bathrooms not supported by these systems shall be exhausted by roof mounted centrifugal exhaust fans and/or local exhaust fans controlled by space occupancy sensors.
8. The kitchen hood system(s) shall include energy saving smoke/heat detection system coupled to variable speed fan(s). These systems shall be interlocked to new roof mounted make-up air system(s) which shall also have the ability reset make-up air system volume in unison with kitchen hood demand.

Controls:

Proposed Energy Management Controls are as follows:

1. The school shall incorporate a direct digital control (DDC) energy management system (EMS) that monitors and controls the HVAC equipment for efficient use. The system is designed on PC based architecture and adjustments are made on a graphics based presentation of building systems. The system also supports maintenance and record keeping needs of the facility. Occupancy of the school is based on the standard school year with occupied/unoccupied conditions based on current school day practice. This is an adjustable feature that can be made to reflect additional operating needs and use of the school building by staff or others.
2. The HVAC systems are generally operated on a school day basis coinciding with the occupied/unoccupied schedule of the standard 180-day school year. Adjustments can be made through the DDC system to allow for usage during periods other than the usual school operating periods.
3. Space temperature is monitored by individual space sensors that transmit data to the central monitoring and control station. Space conditions are adjustable through DDC system and can be modified to meet individual needs. Local control of space conditions is limited to predefined adjustments in space temperature and to facilitate a 3-hour occupied override feature.
4. All classroom systems shall incorporate space occupancy sensors to reset ventilation levels when room is unoccupied during a regularly scheduled occupied period. Systems serving high occupancy areas such as the cafetorium and library also include carbon dioxide (CO₂) indoor air quality (IAQ) sensors which optimize the fresh outdoor air ventilation levels in response to variations in space occupancies.
5. The building shall be connected to emergency power source for operation of heating boilers, pumps and other systems determined to be critical during loss of primary power.

Sustainable Opportunities:

Many of the proposed system and control sequences noted above minimize energy consumption however, further optimization may be obtained by investigating the use of more advanced efficient equipment. In addition, if natural gas is not available on site a hybrid system utilizing

either air based heat pumps and/or geothermal based option could be considered. A geothermal chiller/heater could support building cooling loads in the summer as well as provide supplemental heating to the building by preheating both the heating water and domestic hot water thereby reducing the demand on the building fossil fuel boilers. A geothermal well field analysis as well as a life cycle cost would need to be performed to verify economic viability.

Two solar based options to consider would be passive solar wall design using air passing through a wall assembly facing South to preheat air and/or vacuum tube thermal solar panels mounted on the roof to directly supplement the building heating and domestic hot water systems.

Plumbing

Distribution & Conveying Systems

Proposed Distribution Systems are as follows:

1. The new distribution system would consist of copper piping and lead-free fittings and products. Approved non-metallic potable water distribution products are currently on and/or entering the market and shall also be considered for further evaluation.
2. Sanitary and storm system mains will discharge to outside of the building envelope. It is anticipated that on-site storm water retention shall be implemented. All waste from the science labs generating acidic waste shall be run through a passive acid neutralizing tank with outflow PH monitor.
3. All waste from the kitchen shall be piped to a large (1,000 gallon+/-) exterior grease trap prior to discharge to the municipal sewer system. This exterior trap is in addition to the interior grease traps required by the plumbing code.

Domestic Hot Water

Proposed Domestic Hot Water System is as follows:

1. A high efficiency (93%+) gas-fired condensing boiler/water heaters shall be used to support the buildings domestic hot water needs. Water heater(s) shall be located in a central boiler room and be direct vented to the exterior of the building.
2. Dual water tempering valve stations shall be provided at the water heater to maintain water heater temperatures above 140°F to prevent bacterial growth in the tank while delivering 125°F water to service fixtures for sanitation and 110°F hot water to public lavatory sinks and other student and public use fixtures to prevent scalding.
3. A recirculating 70°F tempered water loop shall be provided to support the emergency shower eyewash fixtures in the science and chemistry labs.

Fixtures

To achieve improved MA-CHPS compliance and further water savings we highly recommend ultra low flush water closets and urinals be utilized throughout the building. The ultra low flush water closets use 1.28 gallons per flush as opposed to the 1.6 gallon per flush allowed by today's code and the urinals use 1 pint (0.13 gallons) per flush as opposed to the current 1 gallon per flush allowed. The combination of these two can result in substantial savings overtime.

Lavatory faucets shall be of the low flow metered type controlled by either a wired or battery powered sensor operated faucet. Use of these faucets promotes good hygiene as well as water conservation.

Sustainable Opportunities:

Many of the proposed fixtures and control sequences noted above minimize water usage and conserve energy however, further optimization may be obtained by investigating the use of storm water recovery systems. These systems collect, filter and utilize storm water to supply water to water closets and urinals throughout the building. A life cycle evaluation must be performed to ascertain the initial first costs, annual operating costs and projected savings associated with such a system.

End of Narrative

Attached:

- Proposed Heating Boiler Type
- Proposed ERU Unit Type
- Proposed Displacement Diffuser Types



ART Engineering Corp.

ELECTRICAL ENGINEERS

76 Webster Street, Worcester, MA 01603

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**Recommendations – Electrical Systems
New Building on Existing Site Option
Mountview Middle School
Holden, MA**

Date: August 28, 2012
Prepared by: Azim Rawji, P.E.

1. New Building on Existing Site:

a. Electrical Service:

- i. ART is unaware of any deficiencies related to power or telecommunications availability at the site.
- ii. Provide electrical primary and telecommunications underground duct system.
- iii. Provide new electrical service and provide new main switchgear and distribution equipment.

b. Emergency Power:

- i. Provide new emergency/standby generator, transfer and power equipment. Emergency equipment must be separated from normal and standby power equipment per the Massachusetts Electrical Code.
- i. All emergency equipment and feeders must be installed in 2-hour rated rooms or must be 2-hour rated.

c. Lighting:

- i. Provide new egress lighting and exit signage.
- ii. Provide new light fixtures with high efficient fluorescent and LED lamps.
- iii. Provide new lighting control system including occupancy sensors and daylight harvesting.
- iv. Integrate lighting controls with HVAC system to optimize energy performance of the building.

d. Fire Alarm:

- i. Provide new voice evacuation fire alarm system.
- ii. Provide new public safety radio distributed antenna system.

e. Data Communications:

- i. Provide new telecommunications cabling infrastructure per the BICSI standards. Utilize Category 6 cabling infrastructure. Install telecommunications equipment in dedicated rooms.
- ii. Provide new wired and wireless data communications equipment.
- iii. Provide new VoIP telephone system.
- f. Audio-Video Systems:
 - i. Provide new public address and clock systems.
 - ii. Provide new media distribution system.
 - iii. Provide new audio-video systems in classrooms and common areas.
 - iv. Provide new sound system in the gym/cafetorium.
- g. Security Systems:
 - i. Provide new video surveillance, access control and intrusion detection systems.

**MA-CHPS Criteria 2009 Edition
Project Checklist - New Construction**

MA-CHPS Project Numbers (Must be consistent throughout the application)

Project Name: **Mountview Middle School**
Project Address: 270 Shrewsbury Street, Holden, MA
Date Updated: 21-Aug-12

Bldg Area:	
Parking:	
Site Area:	
FTE:	
Students:	
Visitors:	

Yes	Maybe	No	TOTAL
51	42	32	

4	6	0	Integration & Innovation - need 2 points NC, 1 point Ren.		Points	Abridged Requirements
Y			II.p1	Integrated Design	Required	Conduct a min of 2 integrated design team workshops (1 in SD, 1 prior to CD) that identify the project's high performance goals
Y			II.p2	Educational Display	Required	Provide a permanent display on the school site that describes the high performance features that are part of the school's design.
1			II.c1	Demonstration Areas	1	Create demonstration areas for 3 out of the 5 major MACHPS categories: Site, Water, Energy, Materials & IAQ
2	2		II.c2	Innovation	1-4	Points are awarded for highly innovative or creative actions or measure that are not already contained in MACHPS OR exceptional performance in an existing credit.
	3		II.c3	Life Cycle Cost Analysis	3	As part of the design process, perform a life cycle cost analysis showing net present value over 30 yrs of the major building systems considered for the project that are anticipated to consume significant amount of energy, water or other natural resources.
	1		II.c4	School Garden	1	1) Provide a site on campus for one or more school gardens with a min of 100sf four every 4 classrooms. 2) Provide signage to designate the areas as a school garden. 3) Develop a long-term maintenance plan. 4) For existing sites the soil must be tested to ensure there are no contaminants.
1			II.c5	School Master Plan	1	Develop a School Master Plan for the site and facilities of an individual school in collaboration with school board members and community stakeholders that: 1) Supports the continued compliance with high performance strategies. 2) Assess and plan for future transportation impacts. 3) Assess and plan for possible change in student enrollment. 4) Assess using the school for emergency preparedness. 5) Ass and plan for future high performance upgrades and renovations by documenting the life cycle of major materials and systems.

10	13	0	Indoor Environmental Quality - need 5 points NC, 3 points Ren.		Points	Abridged Requirements
Y			EQ.p1	HVAC Design - ASHRAE 62.1	Required	EQp1.1 Minimum OA Ventilation Requirement - Design all spaces to meet ASHRAE 62.1-2007 Section 6.2 outdoor air requirements. In areas having significant pollutants shall be exhausted directly to the outside and not re-circulated. HVAC systems and equipment shall meet the requirements of ASHRAE 62.1 Section 5. EQp1.2 To maintain clean ducts and avoid particulate accumulation and/or mold in the ductwork, duct liners must meet the ASTM standards C1071 or UL 181 for surface erosion resistance and ASTM standards C 1104 or C 209 for water vapor sorption.
Y			EQ.p2	Construction IAQ Management	Required	EQp2.1 During construction meet the recommended Design Approaches of the SMACNA IAQ Guidelines for Occupied Building Under Construction, 2007, Chapter 3. EQp2.2 If installing a new duct system, follow SMACNA guidelines for "Duct Cleanliness for New Construction Guidelines" according to advanced levels of cleanliness. EQp2.3 Building Flush Out - Develop a plan and include it in the specification to flush out the building with OA
Y			EQ.p3	Pollutant & Chemical Source Control	Required	EQp3.1 Off-Gassing - Where chemical use occurs use deck-to-deck partitions with dedicated outside exhaust at a rate of at least 0.50 cubic feet/min/sd. Doors to these areas must be secured with self-locking and closing mechanisms. EQp3.2 Walk off Mats - Provide a 2 part walk-off mat system for all high volume entryways. EQp3.3 Electric Ignitions for Gas-Fired Equipment - Specify electric ignitions for water heaters, boilers, AHUs and cooking stoves. EQp3.4 Air intake locations shall follow ASHRAE 62.1-2007. All intakes must be 6 ft above landscaped grade. EQp3.5 No Mobile Fossil-Fuel Power Equipment Indoors.
Y			EQ.p4	Moisture Management	Required	EQp4.1 Drainage - Design surface grades to slope away from the building. Evaporation drip pans are prohibited for HVAC systems. EQp4.2 Lawn irrigation shall be designed to prevent spray on building. EQp4.3 Mold Prevention - Building materials shall be kept dry.
Y			EQ.p5	Minimum Filtration	Required	Replace filtration media immediately prior to occupancy. Filtration media shall be MERV 10 or higher, excluding unit ventilators, which can have MERV 7.
Y			EQ.p6	Thermal Comfort - ASHRAE 55	Required	Comply with the current ASHRAE 55 thermal comfort standards.
Y			EQ.p7	View Windows, 70%	Required	Provide direct line of site to view glazing from 70% of the combined floor areas of classrooms, library and administration areas. View glazing area shall be =>7% of floor area.
Y			EQ.p8	Eliminate Glare	Required	Design spaces to optimize daylight while preventing glare by controlling direct sunlight ingress. Unoccupied classrooms must meet: 1) Classroom and core learning spaces must have reverberation time meets ANSI S12.60. 2) All walls, roof-ceiling and floor-ceiling assemblies must meet the STC ANSI S12.60-2002. 3) For enclosed core learning areas the exterior windows may comprise no more than 25% of the area of the partition. Floor-ceiling assemblies over classrooms must meet ICC of 50.
Y			EQ.p10	Minimum Low Emitting Materials	Required	EQp10.1 Paints & Coatings - All paints and architectural coatings totaling 90% or more of the total volume of such products applied shall meet SCAQMD Rule 1113 & comply with Safe Drinking Water & Toxic Enforcement Act of 1986. EQp10.2 Composite Wood - At least 90% by area of the composite wood shall meet either or both CARB ATCM Sections 93120-93120.12 and shall have no added formaldehyde.
	2		EQ.c1	View Windows, 80-90%	1-2	Provide direct line of site to view glazing for at least 80% of the combined floor area of the classrooms and admin areas.
3	3		EQ.c2	Daylighting in Classrooms	1-6	For all classroom spaces choose Multiple Point in Time Approach average fc requirements OR Daylight Autonomy Approach (1-4points). For support spaces choose Multiple Point in Time Approach average fc requirements OR Daylight Autonomy Approach (1-2points)
2	2		EQ.c3	Advanced Low-Emitting Materials	1-4	EQc3.1 (1 point) All adhesives and sealants used in quantities of 2.5 gal or more and totaling 90% or more of the total shall meet SCAQMD Rule 1168 or CDPH Standard Practice. EQc3.2 (1 point) Flooring Systems totaling 90% or more of the total floor area shall be tested following CDPH Standard Practice. EQc3.3 (1 point) Ceiling and Wall Systems totaling 90% or more of the total area of such systems shall be tested following CDPH Standard Practice. EQc3.4 Furniture and Furnishings totaling 90% or more of the total shall meet ANSI/BIFMA M7.1-2007
1			EQ.c4	Ducted Returns	1	Install ducted HVAC returns throughout the school in occupied spaces to avoid dust and microbial growth issues.
1			EQ.c5	Enhanced Filtration	1	Design HVAC system with particle arrestance filtration rate MERV 13.
1			EQ.c6	Post-Construction IAQ	1	EQc6.1 Vacuum carpeted and soft surfaces with a HEPA filter vacuum that meets CRI Seal of Approval/Green Label Vacuum. EQc6.2 Prior to flushout, filters must be replaced with MERV 10.
	4		EQ.c7	Enhanced Acoustical Performance	1-4	EQc7.1 (1 point) Classrooms and core learning spaces with volumes greater than 20,000 cubic feet must have a 1.5 second reverberation time max. EQc7.2 (2 points) Unoccupied classrooms must have a max background noise level of no more than 35 dBA Leq. EQc7.3 (1 point) Add to school commissioning requirements (in Eep2) that background HVAC noise is tested to reqs of EQ.p9 and EQc7.2.
2			EQ.c8	Controllability of Systems	1-2	EQc8.1 (1 point) 90% of all classrooms shall have a minimum of one operable window that is accessible to occupants. EQc8.2 (1 point) Provide separate temperature and ventilation controls for each classroom or provide each classroom with an independent temp sensor that automatically adjust to the conditions. And provide lighting controls for each classroom.
	1		EQ.c9	Duct Access & Cleaning	1	Provide access doors for cleaning all supply and return ductwork and execute a plan for cleaning ductwork prior to occupancy.
	1		EQ.c10	Electric Lighting	1	EQc10.1 Provide multi-scene indirect/direct lighting systems for all classrooms. EQc10.2 The lighting system shall operate in general illumination and A/V modes. EQc10.3 In general illumination mode, achieve an avg illumination at desk level of 35 to 50 fc w/ min of 25fc at any point more than 3ft from any wall. EQc10.4 In A/V mode achieve a avg illumination at desk level of between 10 and 20 fc. EQc10.5 In indirect mode, controls shall provide at least two levels of uniform lighting both at night and when daylight is available.

Yes	Maybe	No				
13	6	17	Energy - need 10 points NC, 7 points Ren.		Points	Abridged Requirements
Y			EE.p1	Minimum Energy Performance, 20%	Required	Follow the current MA Stretch Energy Code (780 CMR Appendix 120 AA, Chapter 5) to achieve energy savings either through the Performance based approach (20% better than the current ASHRAE 90.1 on an energy cost basis) OR the Prescriptive based approach as explained in the reference guide.
Y			EE.p2	Commissioning	Required	Implement ALL of the fundamental best practice commissioning procedures, as described in the reference guide and contained in the Massachusetts School Building Authority's Standard Scope of Commissioning Services.
Y			EE.p3	Facility Staff & Occupant Training	Required	<u>EE.P3.1</u> Facility Staff Training: Facility staff must receive training and operation and maintenance documentation on all building systems included in the commissioning scope of work. <u>EE.P3.2</u> Teacher/Administrative Staff Training: Teachers, administrators, and support staff must be offered training on operations of lighting, heating, and cooling systems in classrooms, offices, gyms, auditoriums etc. A User's Guide, explaining basic systems operations, should be developed and posted in each room of the school.
0	0	11	EE.c1(A)	Superior Energy Performance (Performance)	2-15	Performance approach: Utilize the Performance Approach from Energy Prerequisite EE.P1 for quantifying energy cost savings. Points are awarded according the percentage saved over a baseline building.
4			EE.c1(B)	Superior Energy Performance (Prescriptive)	2-4	Prescriptive approach: Meet the requirements of EQ.C2, Daylighting in Classrooms AND ensure that 40% of the installed electrical lighting wattage throughout the school is dimmed or turned off when sufficient natural light is present. (2 points) Install an energy recovery ventilation (ERV) system to recover waste heat into the incoming fresh air stream. (2 points)
2	1		EE.c2	Minimize Air Conditioning	1-3	1 Point: Design and install a dehumidification system, which tempers air but does not act as a full air conditioning system. Spaces such as computer classrooms and server rooms are exempt. 2 Points: Design 80% of permanent classrooms without air conditioning. 3 Points: Design 90% of permanent classrooms without air conditioning.
4	2	6	EE.c3	Renewable Energy	1-12	EE.C3.1: Use renewable energy sources for electricity production that are on-site or allocated to the school facility through net metering. EE.C3.2: Use on-site renewable energy sources for heating/cooling.
	1		EE.c4	Plug Load Reduction & ENERGYSTAR Equipment	1	Pass a resolution to require ENERGY STAR equipment and appliances, where available, for all new purchases for the school and to prohibit the purchase of low efficiency products. Develop a plug load reduction plan that identifies all potential plug loads in the school. Plug loads identified should be incorporated into the energy model in EE.P1 Minimum Energy Performance, if the performance option is followed.
2	1		EE.c5	Energy Management System & Sub metering	1-3	<u>EE.C5.1</u> : Install an energy management system (EMS) to monitor and trend the energy consumed by the following systems throughout the school: Lighting (interior and exterior), HVAC, and Domestic hot water systems. Meter all energy sources provided by utility sources and trend the data against outside air temperature. Provide a plan addressing trendlogging, operator training, and data analysis. <u>EE.C5.2</u> : During design, circuit the electric loads to designated lighting and general power panels so that a true energy measurement of these systems can be achieved. Take either approach for two points: Submeter Major Electrical Equipment Loads OR Boiler System.
1	1		EE.c6	Flex Energy	1-2	Design the school so that the following technologies can be easily incorporated: 1) Photovoltaic electricity systems, 2) Solar thermal systems, 3) Electric vehicles. 1 Point: Identify the locations where one or more of these technologies can be incorporated and what steps must be taken to make them possible. 2 Points: Identify the locations that will be constructed to be ready for one or more of these technologies.
8	3	5	Water - need 5 points NC, 3 points Ren.		Points	Abridged Requirements
Y			WE.p1	Irrigation System Performance on Recreational Fields	Required	Any in-ground irrigation systems used for recreational fields must have soil moisture meters, weather station, or ET controllers.
Y			WE.p2	Indoor Water Use Reduction, 20%	Required	Employ strategies that, in aggregate, reduce potable water use by 20% beyond the baseline calculated for the building after meeting EPA 1992 fixture requirements.
1	1	1	WE.c1	Indoor Water Use Reduction, 30-50%	1-3	Exceed the potable water use reduction beyond the calculated baseline determined in WE.p2
		4	WE.c2	Reduce Potable Water Use for Sewage Conveyance	4	Reduce the use of potable water for building sewage conveyance by a minimum of 50% through the utilization of water-efficient fixtures, use of rainwater catchment systems, or both.
3			WE.c3	No Potable Water Use for Non-Recreational Landscaping Areas	3	Do not install permanent irrigation systems for watering non-playing field landscaped areas AND specify drought tolerant plants or grasses in these areas.
2			WE.c4	Reduce Potable Water Use for Recreational Landscaping Areas	2	Reduce the irrigation needs of athletic fields by specifying appropriate soils and drought tolerant grasses for all sports fields. Specify soils and seed mixes that meet requirements.
1			WE.c5	Irrigation System Commissioning	1	Create an irrigation commissioning plan and complete installation review during construction, performance testing after installation, and documentation for ongoing operations and maintenance.
1	2		WE.c6	Water Management System	1-3	WEc6.1 (1 point) Install a Water Management System to monitor water for any equipment or system that exceeds 20% of the total amount of water used. At a minimum submeter domestic water and exterior irrigation. WEc6.2 (3 points) Install a Water Management System to monitor water use of all indoor and outdoor water uses. Water meters should have a pulsed output for AMR. Submeter: all indoor water usage except gyms with showers, gyms with showers, landscaping irrigation, recreation irrigation, swimming pool, cooling tower.
10	3	3	Site - need 5 points NC, 3 points Ren.		Points	Abridged Requirements
Y			SS.p1	Joint Use of Facilities & Parks	Required	Design, with community involvement onr ore more spaces (2,500sf min) for use by community or other appropriate organization. Share park or recreation space with the community.
5			SS.c1	Sustainable Site Selection	1-5	SSc1.1 (1 point) So not modify land with prior to project was public parkland, conservation land, or land acquired for water supply protection. SSc1.2 (1 point) Do not develop on land lower than 5' above the 100 yr flood elevation. SSc1.3 (1 point) Do not develop school site that are within wetland resource areas. SSc1.4 (1 point) Do not develop on greenfields.
		1	SS.c2	Central Location/Smart Growth	1	Site the school with 1/2 mile of at least 8 basic services OR verify that municipality has a current Commonwealth Capital score
1			SS.c3	Reduced Building Footprint	1	Increase the FAR of the school to be at least 1.4.
	1		SS.c4	Building Layout & Microclimates	1	Implement four of the following: 1) Orient the building to maximize daylighting 2) Consider prevailing winds. 3) Take advantage of existing formations to provide shelter from extreme weather. 4) Plant appropriate trees in appropriate areas. 5) Minimize importation of non-native soils. 6) Create physical connections to bike paths, natural features or adjacent buildings. 7) Site building to maximize opportunities for renewable technology.
1			SS.c5	Public Transportation	1	Locate building within 1/2 mile of a commuter rail, light rail or subway OR within 1/4 mile of one or more bus lines.
1		1	SS.c6	Pedestrian/Bike/Human Powered Transportation	2	SSc6.1 (1 point) Provide sidewalks and bike lanes that extend at least to the school entrance AND provide lanes that connect to residential areas at least 1/4 mile from the school entrance AND provide suitable means to secure bicycles for 5% or more of the building occupants. For elementary schools, count only students in the 4th grade and above as building occupants. SSc6.2 (1 point) Provide bike lanes that extend at least 2 miles into neighboring communities
		1	SS.c7	Parking Minimization	1	New Construction: Size parking capacity 1) To meet, but not exceed, local zoning OR 2) not to exceed a) HS - 2.25 spaces per classroom plus parking for 20% of students b) Elementary & Middle - 3 spaces per classroom. Major Renovations: Add no new parking AND provide preferred parking spaces for 52% of total parking for carpools and LEFE vehicles.
1			SS.c8	Post-Construction Stormwater Management	1	Exceed the MA Stormwater Standards by implementing a stormwater management plan that results in a 25% decrease in stormwater runoff volumen for existing conditions.

	1			SS.c9	Reduce Heat Islands - Landscaping	1	Provide shade (within 5 yrs) on at least 20% of non-roof, impervious surfaces on site OR use light colored (SRI 29) materials for 20% of the impervious area. OR use a combination.
1				SS.c10	Reduce Heat Islands - Cool Roofs	1	Use roofing materials that have a SRI of 78 low-sloped roof, 29 steep-sloped roof for a minimum of 75% of roof area.
	1			SS.c11	Light Pollution Reduction	1	Meet the Uplight, light trespass and glare requirements as described in sections SS.c11.2-11.3
Yes	Maybe	No					
3	6		5	Materials & Waste Management - need 5 points NC, 3 points Ren.			
						Points	Abridged Requirements
Y				MW.p1	Storage & Collection of Recyclables	Required	Meet local ordinances for recycling space, and provide both an easily accessible areas dedicated to the separation collection and storage of recyclables. Provide a plan for the removal of these recyclables.
Y				MW.p2	Minimum Construction Site Waste Management, 75%	Required	Recycle, reuse, and/or salvage at least 75% (by weight) of non-hazardous construction and demolition waste, not including land clearing and associated debris.
	1			MW.c1	Minimum Construction Site Waste Management, 90%	1	Recycle, reuse, and/or salvage an additional 15% for a total of 90% (by weight) of non-hazardous construction and demolition waste, not including land clearing and associated debris.
1	1			MW.c2	Single Attribute - Recycled Content Materials	1-2	Prescriptive: Specify and install at least four major materials from Table 15-Minimum Recycled Content Levels for 1 point, or eight major materials for 2 points. Performance: The weighted average recycled-content value is at least 10% (post-consumer + 1/2 secondary), or at least 20% for 2 points.
	1			MW.c3	Single Attribute - Rapidly Renewable Materials	1	Use rapidly renewable materials, excluding wood fiber, for 2.5% of the total value of all products used in the project. OR Specify rapidly renewable materials for 50% of the major interior finishes or structural material listed in criteria.
	1			MW.c4	Single Attribute - Certified Wood	1	Specify that a minimum of 50% of the wood-based materials are FSC Certified.
1	1			MW.c5	Single Attribute - Regional Materials	1-2	Specify that a minimum of 10% of building materials (based on cost) that are extracted, and manufactured regionally for 1 point. 2 points for 20%.
	1			MW.c6	Materials Reuse	1	Performance: Specify re-used, salvaged or refurbished materials obtained off-site for 5% of building materials. Prescriptive: Specify re-used, salvaged or refurbished materials for 25% of one of the following major finish materials: Flooring, casework, acoustical ceiling tiles, wall finishes, tile, roofing materials.
1				MW.c7	Durable & Low Maintenance Flooring	1	Choose flooring products for 50% of the interior surface that are: Impermeable to moisture and air, 15 year non-prorated life time warranty. Provide documentation showing life cycle (15 year) initial costs and maintenance needs of all flooring in the project have been assessed.
			4	MW.c8	Building Reuse - Exterior	1-4	Reuse large portions of existing structure during renovation or redevelopment projects. 50% - 1 point. 65% - 2 points, 80% - 3 points, 95% - 4 points.
			1	MW.c9	Building Reuse - Interior	1	Maintain 50% non-structural elements (walls, floor coverings and ceiling systems).
Yes	Maybe	No					
3	5		2	Operations & Maintenance			
						Points	Abridged Requirements
Y				OM.p1	Maintenance Plan	Required	The district must create a school maintenance plan that includes an inventory of all equipment (electrical, mechanical, plumbing and envelope) in the school and its preventative and routine maintenance needs.
Y				OM.p2	Anti-Idling Measures	Required	Adopt a no idling policy that applies to all school buses operating in the school district and all vehicles operating in the school zone.
Y				OM.p3	Green Cleaning	Required	The school committee must pass a resolution adopting a comprehensive green cleaning policy that ensures only environmentally preferable cleaning products and practices are used.
1				OM.c1	Work Order & Maintenance Management System	1	The school district shall develop or purchase a work order and maintenance management system (MMS)
	2		1	OM.c2	Indoor Environmental Management Plan	1-3	Option 1 (3 points) Implement EPA's Tools for Schools Program or equivalent. Option 2 (2 points) Custodial/Facility Staff Training using MA Facility Admin. Ass. Modules on IAQ, IPM, radon, drinking water and "Cleaning for Health". Option 3 (1 point) Arrange a presentation on Tools for Schools or MA Healthy Schools Checklist to the school committee.
	1			OM.c3	Green Power	1	Commit to purchasing RECs or a power through a PPA equivalent to 15% of the projected annual electricity needs.
			1	OM.c4	Climate Change Action: Diesel Bus Retrofit	1	Retrofit buses by participating in the DEP MassCleanDiesel Initiative.
	1			OM.c5	Carbon Footprint Reporting	1	Join the Climate Action Registry to commit to calculate, report and verify annual GHG emissions using The Climate Action Registry online tool.
2	1			OM.c6	Energy Benchmarking	3	OMc6.1 (2 points) The school must adopt a policy of benchmarking its energy use over time to track building performance. OMc6.2 (1 point) Commit to conduct a post-occupancy analysis of the building's performance after 1-2 yrs or recommissioning after 2-5 yrs.
Yes	Maybe	No					
51	42		32	TOTAL			

125

Total Possible Points=125

Eligibility Levels**New Construction MA-CHPS Verified - 40 points - REQUIRED****New Construction MA-CHPS Verified Leader - 50 points - 2% reimbursement****Renovation MA-CHPS Verified - 35 points - REQUIRED****Renovation MA-CHPS Verified Leader - 45 points - 2% reimbursement**

Mountview Middle School
Holden, MA
Study Cost Estimate
 31-Aug-12

NEW CONSTRUCTION - EXISTING SITE

	GSF		COST PER S.F.	TOTAL
NEW CONSTRUCTION	128,000	GSF	\$231.75	\$29,663,979
RENOVATION		N/A		
BUILDING DEMOLITION	95,137	GSF	\$5.00	\$475,685
SITWORK				\$3,630,110
TEMPORARY TRAILORS				n/a
HAZARDOUS WASTE REMOVAL				\$1,070,000

		TOTAL DIRECT COST		\$34,839,774
GENERAL CONDITIONS	27	MOS	\$77,500	\$2,092,500
GENERAL REQUIREMENTS		3%		\$1,107,968
P&P BOND & INSURANCE		2%		\$760,805
FEE		3%		\$1,164,031
DESIGN CONTINGENCY		12%		\$4,795,809
GMP CONTINGENCY		3%		\$1,342,827
ESCALATION (summer 2013)		7%		\$3,133,262

		TOTAL CONSTRUCTION COST		\$49,236,977
		COST PER SF		\$384.66

PROJECT: Mountview Middle School
 LOCATION: Holden, MA
 CLIENT: Lamoureux - Pagano Associates, Architects
 DATE: 31-Aug-12

NO. OF SQ. FT.: 128,000
 COST PER SQ. FT.: \$231.75

**NEW CONSTRUCTION
 MIDDLE SCHOOL**

No.: 12043

SUMMARY

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
A. SUBSTRUCTURE			
A10 - FOUNDATIONS			
A1010 STANDARD FOUNDATIONS	651,364	2%	5.09
A1020 SPECIAL FOUNDATIONS	0	0%	0.00
A1030 SLAB ON GRADE	582,685	2%	4.55
A20 - BASEMENT CONSTRUCTION			
A2010 BASEMENT EXCAVATION	0	0%	0.00
A2020 BASEMENT WALLS	0	0%	0.00
B. SHELL			
B10 - SUPERSTRUCTURE			
B1010 FLOOR CONSTRUCTION	2,317,108	8%	18.10
B1020 ROOF CONSTRUCTION	2,347,210	8%	18.34
B20 - EXTERIOR ENCLOSURE			
B2010 EXTERIOR WALLS	4,889,711	16%	38.20
B2020 EXTERIOR WINDOWS	1,312,653	4%	10.26
B2030 EXTERIOR DOORS	79,956	0%	0.62
B30 - ROOFING			
B3010 ROOF COVERINGS	1,292,040	4%	10.09
B3020 ROOF OPENINGS	28,700	0%	0.22
C. INTERIORS			
C10 - INTERIOR CONSTRUCTION			
C1010 PARTITIONS	1,795,662	6%	14.03
C1020 INTERIOR DOORS	255,485	1%	2.00
C1030 FITTINGS	636,380	2%	4.97
C20 - STAIRS			
C2010 STAIR CONSTRUCTION	199,030	1%	1.55
C2020 STAIR FINISHES	18,600	0%	0.15
C30 - INTERIOR FINISHES			
C3010 WALL FINISHES	643,515	2%	5.03
C3020 FLOOR FINISHES	940,877	3%	7.35
C3030 CEILING FINISHES	791,724	3%	6.19
D. SERVICES			
D10 - CONVEYING			
D1010 ELEVATORS & LIFTS	115,500	0%	0.90
D1010 ESCALATORS & MOVING WALKS	0	0%	0.00
D1090 OTHER CONVEYING SYSTEMS	0	0%	0.00
D20 - PLUMBING			
D2010 PLUMBING	1,344,000	5%	10.50

Mountview Middle School - New Construction

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
D30 - HVAC			
D3010 HVAC	3,712,000	13%	29.00
D40 - FIRE PROTECTION			
D4010 SPRINKLERS	611,000	2%	4.77
D4020 STANDPIPES	0	0%	0.00
D4030 FIRE PROTECTION SPECIALTIES	0	0%	0.00
D4090 OTHER FIRE PROTECTION SYSTEMS	0	0%	0.00
D50 - ELECTRICAL			
D5010 ELECTRICAL SERVICE & DISTRIBUTION	3,328,000	11%	26.00
D5020 LIGHTING & BRANCH WIRING	0	0%	0.00
D5030 COMMUNICATION & SECURITY	0	0%	0.00
D5090 OTHER ELECTRICAL SYSTEMS	0	0%	0.00
E. EQUIPMENT & FURNISHINGS			
E10 - EQUIPMENT			
E1010 COMMERCIAL EQUIPMENT	450,000	2%	3.52
E1020 INSTITUTIONAL EQUIPMENT	0	0%	0.00
E1030 VEHICULAR EQUIPMENT	0	0%	0.00
E1090 OTHER EQUIPMENT	355,150	1%	2.77
E20 - FURNISHINGS			
E 2010 FIXED FURNISHINGS	905,030	3%	7.07
E2020 MOVABLE FURNISHINGS	0	0%	0.00
F. SPECIAL CONSTRUCTION & DEMOLITION			
F10 - SPECIAL CONSTRUCTION			
F1010 SPECIAL STRUCTURES	0	0%	0.00
F1020 INTEGRATED CONSTRUCTION	0	0%	0.00
F1030 SPECIAL CONSTRUCTION SYSTEMS	0	0%	0.00
F1040 SPECIAL FACILITIES	0	0%	0.00
F1050 SPECIAL CONTROLS & INSTRUMENTATION	0	0%	0.00
F20 - SELECTIVE BUILDING DEMOLITION			
F2010 BUILDING ELEMENTS DEMOLITION	0	0%	0.00
F2020 HAZARDOUS COMPONENTS ABATEMENT	0	0%	0.00
G. BUILDING SITEWORK			
G10 - SITE PREPARATION			
G1010 SITE CLEARING	10,000	0%	0.08
G1020 SITE DEMOLITION & RELOCATIONS	0	0%	0.00
G1030 SITE EARTHWORK	0	0%	0.00
G1040 HAZARDOUS WASTE REMEDIATION	0	0%	0.00
G20 - SITE IMPROVEMENTS			
G2010 ROADWAYS	0	0%	0.00
G2020 PARKING LOTS	0	0%	0.00
G2030 PEDESTRIAN PAVING	0	0%	0.00
G2040 SITE DEVELOPMENT	35,100	0%	0.27
G2050 LANDSCAPING	2,500	0%	0.02

Mountview Middle School - New Construction

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
G30 - SITE MECHANICAL UTILITIES			
G3010 WATER SUPPLY	0	0%	0.00
G3020 SANITARY SEWER	8,500	0%	0.07
G3030 STORM SEWER	0	0%	0.00
G3040 HEATING DISTRIBUTION	0	0%	0.00
G3050 COOLING DISTRIBUTION	0	0%	0.00
G3060 FUEL DISTRIBUTION	0	0%	0.00
G3090 OTHER SITE MECHANICAL UTILITIES	0	0%	0.00
G40 - SITE ELECTRICAL UTILITIES			
G4010 ELECTRICAL DISTRIBUTION	4,500	0%	0.04
G4020 SITE LIGHTING	0	0%	0.00
G4030 SITE COMMUNICATIONS & SECURITY	0	0%	0.00
G4090 OTHER SITE ELECTRICAL UTILITIES	0	0%	0.00
G90 - OTHER SITE CONSTRUCTION			
G9010 SERVICE AND PEDESTRIAN TUNNELS	0	0%	0.00
G9090 OTHER SITE SYSTEMS	0	0%	0.00
TOTAL DIRECT COST	----- 29,663,979	----- 100%	----- 231.75

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
<u>A. SUBSTRUCTURE</u>				
A10 - FOUNDATIONS				
A1010 STANDARD FOUNDATIONS				
<u>033000 CAST IN PLACE CONCRETE</u>				
Wall Footing 1' X 3' (1636 LF):				
4000 psi, NW, (incl. placement)	182	CY	146.00	26,572
Formwork	3,272	SFCA	6.50	21,268
Rebar	12,285	LBS	1.09	13,391
	<i>*unit cost \$336.43</i>			
Column Footing (122 ea):				
4000 psi, NW, (incl. placement)	352	CY	148.00	52,096
Formwork	5,184	SFCA	8.00	41,472
Rebar	16,340	LBS	1.09	17,811
	<i>*unit cost \$316.42</i>			
Foundation Frost Wall 1'-4" x 4'0" Deep (1636 LF):				
4000 psi, NW, (incl. placement)	322	CY	155.00	49,910
Formwork	13,088	SFCA	11.00	143,968
Brick shelf	1,636	LF	12.00	19,632
Reinforcing steel	43,470	LBS	1.09	47,382
	<i>*unit cost \$810.22</i>			
16" Elevator Mat	6	CY	575.00	3,450
Elevator Pit Wall	6	CY	775.00	4,650
Elev. sump pit	1	LS	1,500.00	1,500
Piers & pilasters	35	CY	775.00	27,125
Equipment pads	1	LS	4,000.00	4,000
Interior wall footing 1' x 2'	15	CY	345.00	5,175
Interior found. wall	32	CY	800.00	25,600
Stage stair (2 flts)	36	LFR	85.00	3,060
Stage ramp	200	SF	6.00	1,200
<u>072100 INSULATION</u>				
2" Rigid ext. found. insul w/prot.bd	6,544	SF	2.60	17,014
<u>071000 DAMPPROOF., WATERPROOF. & CAULKING*</u>				
Dampproof frost wall	6,544	SF	1.90	12,434
Elev. pit waterproofing	1	LS	4,100.00	4,100
<u>310000 EARTHWORK</u>				
Foundation Earthwork:				
Foundation excavation	2,600	CY	7.00	18,200

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Foundation backfill (on site mat'l)	1,500	CY	8.00	12,000
Perimeter foundation drain	1,636	LF	26.50	43,354
Ledge removal - allow	1	LS	25,000.00	25,000
Misc. Earthwork	1	LS	10,000.00	10,000

				651,364

A1030 SLAB ON GRADE

310000 EARTHWORK

12" Gravel base @SOG	2,349	CY	22.00	51,678
Excavate plumbing trenches	1	LS	5,000.00	5,000

033000 CAST IN PLACE CONCRETE

5" Slab on Grade:				
4000 psi, NW, (incl. placement)	987	CY	146.00	144,102
6x6 W1.4 X W1.4	63,414	SF	1.02	64,682
Control Joint	3,171	LF	3.10	9,829
Trowel Finish	63,414	SF	1.25	79,268
*unit cost \$4.70				

Thicken slab @ cols & CMU	50	CY	225.00	11,250
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072100 INSULATION

2" Rigid Slab Insul.	63,414	SF	2.92	185,169
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072616 BELOW GRADE VAPOR RETARDER

Stegro vapor barrier	63,414	SF	0.50	31,707

				582,685

TOTAL A10 FOUNDATIONS				1,234,048
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A20 - BASEMENT CONSTRUCTION

A2010 BASEMENT EXCAVATION		N/A		

				0

TOTAL A20 - BASEMENT CONSTRUCTION				0
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B. SHELL

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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B10 - SUPERSTRUCTURE

B1010 FLOOR CONSTRUCTION

051200 STRUCTURAL STEEL

T.S. brace frame (1 lbs/sf)	35	TONS	3,950.00	138,250
T.S. column (2 lbs/sf)	71	TONS	3,600.00	255,600
Wide flange beam (10 lbs/sf)	352	TONS	3,400.00	1,196,800
H.S.S. beam	10	TONS	3,600.00	36,000
Moment connection	50	EA	750.00	37,500
Shear stud (10/100)	7,036	EA	5.30	37,291

033000 CAST IN PLACE CONCRETE

3 1/2" NW Deck fill	70,362	SF	3.85	270,894
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053100 STEEL DECKING

2" x 20 Ga. comp deck	70,362	SF	2.70	189,977
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072100 INSULATION

Spray on fireproofing	70,362	SF	2.20	154,796
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2,317,108

B1020 ROOF CONSTRUCTION

051200 STRUCTURAL STEEL

T.S. brace frame (1 lbs/sf)	38	TONS	3,950.00	150,100
T.S. column (2 lbs/sf)	76	TONS	3,600.00	273,600
Wide flange beam (10 lbs/sf)	380	TONS	3,400.00	1,292,000
H.S.S. beam	22	TONS	3,600.00	79,200
Moment connection	30	EA	750.00	22,500
Galv. RTU dunnage - allow	10	TONS	3,150.00	31,500
Galv. TS roof screen support	25	TONS	3,300.00	82,500
Entry canopy frame	2,500	SF	20.00	50,000

033000 CAST IN PLACE CONCRETE

3 1/2" NW Conc. Deck fill -roof	1,500	SF	6.00	9,000
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053100 STEEL DECKING

1 1/2" x 20 Ga Typ. Flat roof deck	58,400	SF	2.55	148,920
2" x 20 Ga. Comp deck	1,500	SF	2.70	4,050
3" x 18 Ga acoustical roof deck - gym	7,600	SF	7.15	54,340

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1 1/2" x 20 Ga canopy roof deck	2,500	SF	2.25	5,625
<u>072100 INSULATION</u>				
Spray-on Fireproofing	59,500	SF	2.25	133,875
<u>090007 PAINTING*</u>				
Paint steel canopy structure	2,500	SF	4.00	10,000

				2,347,210
TOTAL B10 SUPERSTRUCTURE				4,664,318

B20 - EXTERIOR ENCLOSURE

B2010 EXTERIOR WALLS

040001 MASONRY*

12" CMU backup - gym	5,051	SF	22.00	111,122
Masonry Veneer:				
Brick veneer - 60% of exterior	38,625	SF	30.00	1,158,750
Precast window head	2,050	LF	65.00	133,250
Precast window sill - typ	1,950	LF	45.00	87,750
Precast trim allowance	1	LS	150,000.00	150,000
Misc. Masonry detailing	1	LS	50,000.00	50,000
Masonry flashing	2,400	LF	9.00	21,600
Building staging - 100%	65,000	SF	2.00	130,000

054000 COLD FORMED METAL FRAMING

3" Soffit framing	3,500	SF	5.25	18,375
1/2" Dens glass sheathing -soffit	3,500	SF	3.00	10,500
8" x 16 Ga stud @ typ	59,325	SF	9.80	581,385
1/2" Dens glass sheathing-ext. wall	59,352	SF	2.75	163,218

050001 MISCELLANEOUS & ORNAMENTAL IRON*

Downspout boot - canopy	4	EA	650.00	2,600
Galv, loose lintel	2,050	LF	32.00	65,600
*Relieving angle carried w/Structure				

071000 DAMPPROOF., WATERPROOF. & CAULKING*

Control joint - allow	500	LF	9.50	4,750
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071326 AIR & VAPOR BARRIERS

Adhered air & vapor barrier - wall	59,352	SF	3.10	183,991
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DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Adhered air & vapor barrier - soffit	3,500	SF	3.10	10,850
<u>072100 INSULATION</u>				
3" Icyene - wall	59,352	SF	3.20	189,926
3" Rigid Insul - wall	59,352	SF	2.85	169,153
*Excludes soffit insulation				
<u>074213 PERFORMED CLADDING</u>				
Alum. Panel:				
Canopy ceiling	2,500	SF	25.00	62,500
Soffit panel - typical - 12"	3,500	SF	25.00	87,500
Wall panel - 40% ext.	24,350	SF	55.00	1,339,250
Equip roof screen	1,500	SF	32.00	48,000
<u>092116 GYPSUM WALLBOARD</u>				
1 Lyr 5/8" gyp @ ext. wall	50,000	SF	2.05	102,500
<u>101400 IDENTIFYING DEVICES (EXT. BLD MTD SIGNAGE)</u>				
24" Alum bldg mtd letter - allow	21	EA	340.00	7,140

				4,889,711
<u>B2020 EXTERIOR WINDOWS</u>				
<u>061000 ROUGH CARPENTRY</u>				
P.T. - perim blocking	10,500	LF	4.10	43,050
<u>071326 AIR & VAPOR BARRIERS</u>				
Flex flashing - perim	10,500	LF	7.50	78,750
<u>071000 DAMPPROOF., WATERPROOF. & CAULKING*</u>				
Exterior sealants - perim.	10,500	LF	6.25	65,625
<u>080001 METAL WINDOWS*</u>				
Curtain wall - 7"	3,500	SF	88.00	308,000
Typ. alum. window - 4 1/2"	10,958	SF	66.00	723,228
<u>109000 MISCELLANEOUS SPECIALTIES</u>				

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Alum louvers - allow	200	SF	65.00	13,000
Sun screen (3'6")	300	LF	195.00	58,500
Int. light shelf	150	LF	150.00	22,500

				1,312,653
 B2030 EXTERIOR DOORS				
<u>061000 ROUGH CARPENTRY</u>				
P.T. - perim blocking - HM open	160	LF	4.10	656
<u>071000 DAMPPROOF., WATERPROOF. & CAULKING*</u>				
Exterior sealants - perim. HM open	160	LF	6.25	1,000
<u>080001 METAL WINDOWS*</u>				
7' Alum. Doors (Incl. Hardware):				
Main entry - dbl	2	PR	7,150.00	14,300
Rear lobby - dbl	1	EA	7,150.00	7,150
Café - dbl	2	PR	7,150.00	14,300
Stair hall egress - dbl	2	PR	7,150.00	14,300
Auto opener - allow	1	PR	4,200.00	4,200
Classroom - sgl		N/A		
<u>081113 HOLLOW METALWORK</u>				
Insulated HM Doors and Frame (Incl. Hdw):				
Roof stair - sgl	2	EA	1,800.00	3,600
Receiving - dbl	1	EA	2,400.00	2,400
Elec/mech rm - sgl	1	EA	950.00	950
Elec/mech rm - dbl	1	EA	2,000.00	2,000
Storage- sgl	1	EA	950.00	950
Storage - dbl	1	EA	2,000.00	2,000
Gym - dbl	2	EA	5,500.00	11,000
<u>083323 SPECIAL DOORS</u>				
OH Doors		N/A		
<u>087100 DOOR HARDWARE</u>				
		With Doors		
<u>090007 PAINTING*</u>				
Paint HM Door & frame - sgl	4	EA	100.00	400
Paint HM Door & frame - dbl	5	EA	150.00	750

				79,956

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
TOTAL B20 - EXTERIOR ENCLOSURE				6,282,320

B30 - ROOFING

B3010 ROOF COVERINGS

061000 ROUGH CARPENTRY

Typ. Flat roof edge blocking (3 BF/LF)	7,200	BF	3.20	23,040
Base flashing blocking (3 BF/LF)	2,250	BF	3.20	7,200
Mechanical equip blocking	1	LS	10,000.00	10,000

070002 ROOFING AND FLASHING*

PVC roof - canopy	2,500	SF	10.00	25,000
PVC roof w/ 6" rigid insul	70,000	SF	11.85	829,500
Green roof sys.		n/a		
1/2" Gyp prot. bd w/glass mat facing	70,000	SF	1.55	108,500
Poly vapor barrier	70,000	SF	0.35	24,500
Tapered insul premium - allow	10,000	SF	4.00	40,000
Base flashing	750	LF	32.00	24,000
Membrane flashing	1	LS	25,000.00	25,000
Walkway paver (2'x2')	200	EA	24.00	4,800
Aluminum Trim & Flashing:				
Canopy roof fascia	300	LF	35.00	10,500
Typical roof fascia and projection	2,500	LF	50.00	125,000
Misc. flashing	1	LS	35,000.00	35,000

1,292,040

B3020 ROOF OPENINGS

077200 ROOF ACCESSORIES

Elevator vent	1	EA	500.00	500
Roof guardrail		NIC		

*Mechanical equip screen is included with B1020 & B2010

075423 ROOFING & FLASHING*

Skylights	1	LS	25,000.00	25,000
Roof hatch	1	EA	3,200.00	3,200
Stage vent		N/A		

28,700

TOTAL B30 ROOFING				1,320,740
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DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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C. INTERIORS

C10 - INTERIOR CONSTRUCTION

C1010 PARTITIONS

040001 MASONRY*

8" CMU elev. shaft wall	1,656	SF	22.00	36,432
8" CMU - 14' kitchen/mech	3,500	SF	18.00	63,000

050001 MISCELLANEOUS & ORNAMENTAL IRON*

CMU angle brace frame - 4' 0C	150	EA	75.00	11,250
Loose lintels	200	LF	22.00	4,400

061000 ROUGH CARPENTRY

Interior blocking	128,000	GSF	0.50	64,000
Misc. rough carpentry	128,000	GSF	0.50	64,000

072100 INSULATION

Firestopping	128,000	GSF	0.35	44,800
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081113 HOLLOW METALWORK

Interior H.M Windows, Sidelites and Transoms :

Classroom sidelight (50 ea)	700	SF	35.00	24,500
Admin sidelight (10 ea)	70	SF	35.00	2,450
7' sidelight -allow	200	SF	35.00	7,000
4' window -allow	300	SF	35.00	10,500
Misc. window/sidelight & transom	300	SF	35.00	10,500

083323 SPECIAL DOORS

Access panels	1	LS	15,000.00	15,000
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080002 GLASS AND GLAZING*

Glass & Glazing - HM Frame:

Classroom sidelight	700	SF	14.00	9,800
Admin sidelight	70	SF	14.00	980
7' sidelight -allow	200	SF	14.00	2,800
4' window -allow	300	SF	14.00	4,200
Misc. window/sidelight & transom	300	SF	14.00	4,200

*Excludes fire rated stair hall glazing

090007 PAINTING*

Paint window/sidelight & transom	1,570	SF	5.00	7,850
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092116 GYPSUM WALLBOARD

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1 Lyr 5/8" gyp @ ext. wall frame Drywall partitions and assemblies *Partitions include sound attenuation, tape & joint compound finish	128,000	w/B2010 GSF	11.00	1,408,000
				----- 1,795,662

C1020 INTERIOR DOORS

081113 HOLLOW METALWORK081416 WOOD AND PLASTIC DOORS

Interior Door, Frame, Hds., Glass & Glazing:

Media ctr - dbl	2	EA	2,500.00	5,000
Typ. classroom - sgl	50	EA	1,100.00	55,000
Interconnecting classroom - sgl	31	EA	850.00	26,350
Storage - sgl	12	EA	700.00	8,400
Storage - dbl	6	EA	1,250.00	7,500
Toilet rm - sgl user	9	EA	950.00	8,550
Locker rm - sgl	4	EA	950.00	3,800
Stair/corridor - dbl	9	EA	3,500.00	31,500
Mech/elec. - sgl	8	EA	800.00	6,400
Mech/elec. - dbl	2	EA	1,600.00	3,200
Office - sgl	8	EA	1,100.00	8,800
Kitchen - sgl	2	EA	1,200.00	2,400
Kitchen - dbl	2	EA	2,250.00	4,500
Music class - sgl	2	EA	1,500.00	3,000
Stage - sgl	1	EA	1,800.00	1,800
Stage - dbl	1	EA	3,600.00	3,600
Gym - dbl	2	EA	3,600.00	7,200

087100 DOOR HARDWARE

With Doors

080001 METAL WINDOWS*

Aluminum (Frame, Door, Glass, Glazing and Hdw):

Vest - dbl	2	PR	6,500.00	13,000
Main office -sgl	2	EA	3,200.00	6,400

Aluminum Storefront:

Vestibule 10'	200	SF	70.00	14,000
Main office 7'	300	SF	70.00	21,000

083323 SPECIAL DOORS

Dish drop window		N/A		
Servery grille		N/A		
Main office security grate		N/A		

090007 PAINTING*

Paint door frame - sgl	105	EA	75.00	7,875
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DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Paint door frame - dbl	46	EA	135.00	6,210

				255,485

C1030 FITTINGS

050001 MISCELLANEOUS & ORNAMENTAL IRON*

Gym equip. support & frame	1	LS	5,000.00	5,000
OT/PT swing support	1	LS	1,500.00	1,500
Misc. metals	128,000	GSF	0.50	64,000

062000 FINISH CARPENTRY

Utility & closet shelving	1	LS	7,500.00	7,500
Typ. window sill/apron (nic cw-gym)	1,826	LF	30.00	54,780
Built - in corridor benches - allow	50	LF	300.00	15,000
Proscenium trim @ stage front panel	1	LS	10,000.00	10,000
Misc. wood trim	128,000	GSF	0.50	64,000

Custom Casework:

Admin desk	1	LS	7,500.00	7,500
Circulation desk	1	LS	10,000.00	10,000

102113 COMPARTMENTS & CUBICLES

Solid Plastic Toilet Rm. Partitions (8 Rms):

Std. partition	8	EA	1,150.00	9,200
HC partition	8	EA	1,350.00	10,800
Urinal screen	8	EA	275.00	2,200

Locker Rm Partitions (2 RMS):

Std. partition	2	EA	1,150.00	2,300
HC partition	2	EA	1,350.00	2,700
Urinal screen	2	EA	275.00	550

Changing stall w/bench

Changing stall w/bench	5	EA	1,500.00	7,500
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102813 TOILET & BATH ACCESSORIES

Toilet Accessories	1	LS	45,000.00	45,000
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Janitor shelf	3	EA	200.00	600
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*Excludes classroom accessories

101100 MARKERBOARDS & TACKBOARDS

5' Smart board		NIC		
Markerboards 4' h	3,600	SF	18.00	64,800
Tackboards 4' h	3,600	SF	13.00	46,800
Display cases - allow	1	LS	20,000.00	20,000
Class/mtg space flag pole - allow	50	EA	35.00	1,750

105113 METAL LOCKERS

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Locker rm bench	7	EA	800.00	5,600
Gym lockers	100	EA	270.00	27,000
Student Mtl corridor locker	450	EA	245.00	110,250
Kitchen staff locker - allow	6	EA	225.00	1,350
<u>109000 MISCELLANEOUS SPECIALTIES</u>				
Wall & corner guards - allow	1	LS	5,000.00	5,000
Fire extinguisher and cab - allow	8	EA	450.00	3,600
Cubicle curtain track w/ curtain - health off.	2	EA	1,200.00	2,400
<u>101400 IDENTIFYING DEVICES</u>				
Building directory - allow	1	EA	5,000.00	5,000
Dedication plaque	1	EA	3,500.00	3,500
Door signage plaque	128,000	GSF	0.15	19,200
<u>106000 OPERABLE PARTITION</u>				
		N/A		
				----- 636,380
TOTAL C10 - INTERIOR CONSTRUCTION				2,687,527

C20 - STAIRS

C2010 STAIR CONSTRUCTION

050001 MISCELLANEOUS & ORNAMENTAL IRON*

Metal Pan Stair w/Rails:

Roof access - allow	1	FLT	25,000.00	25,000
Monumental lobby	2	FLT	28,000.00	56,000
Stair hall switch back	4	FLT	25,000.00	100,000
Roof access stair gate	1	EA	1,500.00	1,500

Interior Rails:

Stage ramp wall rail	20	LF	95.00	1,900
Stage ramp guard rail	20	LF	225.00	4,500
Lobby guardrail		N/A		
Stage stairs wall rail	12	LF	115.00	1,380

033000 CAST IN PLACE CONCRETE

Conc stair pan fill	7	FLTS	1,250.00	8,750
				----- 199,030

C2020 STAIR FINISHES

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
<u>090005 RESILIENT FLOORING*</u>				
Rubber treads and risers - full flt.	7	FLT	1,100.00	7,700
Rubber stair landing tile	300	SF	6.00	1,800
<u>062000 FINISH CARPENTRY</u>				
<u>090007 PAINTING*</u>				
Paint stair & rails	7	FLTS	1,300.00	9,100

				18,600
TOTAL C20 - STAIRS				217,630

C30 - INTERIOR FINISHES

C3010 WALL FINISHES

071000 DAMPPROOF., WATERPROOF. & CAULKING*

Joint sealants - interior	128,000	GSF	0.55	70,400
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098400 ACOUSTICAL WALL TREATMENT

Tectum Wall Panel: 2" Gymnasium	1,400	SF	20.00	28,000
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Fabric Wrapped Acoustical Panels - Allow:

Stage	500	SF	27.00	13,500
Café	750	SF	27.00	20,250
Corridor	500	SF	27.00	13,500
Music class rm	500	SF	27.00	13,500
Music practice rm		N/A		
IMC	300	SF	27.00	8,100

090002 TILE*

Ceramic Wall Tile:				
8' toilet rm	4,360	SF	14.00	61,040
4' Wainscot janitor closet @ mop sink	300	SF	14.00	4,200
7'4" Wainscot corridor/stair hall - allow	12,000	SF	16.00	192,000

090007 PAINTING*

Vinyl wall covering		NIC		
Interior painting- walls	128,000	GSF	1.55	198,400

092116 GYPSUM WALLBOARD

FRP Panel: Kitchen - 10'	2,500	SF	8.25	20,625
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DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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*Includes Section 09770

643,515

C3020 FLOOR FINISHES

033000 CAST IN PLACE CONCRETE

Sealed Concrete	1,406	SF	0.95	1,336
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090002 TILE*

Kitchen:

Quarry floor tile - mud set	4,642	SF	17.00	78,914
Quarry tile base	275	LF	8.00	2,200

Toilet Room (sgl user):

Ceramic floor tile - thin set	750	SF	15.00	11,250
Ceramic base	379	LF	6.00	2,274
Waterproof - upper floor	500	SF	7.00	3,500
Marble threshold	12	EA	50.00	600

Toilet Room (multi user):

Ceramic floor tile - thin set	1,766	SF	15.00	26,490
Ceramic base	545	LF	6.00	3,270
Waterproof - upper floor	754	SF	7.00	5,278
Marble threshold /saddle	55	LF	30.00	1,650

Locker/Toilet Room:

Ceramic floor tile - thin set	1,463	SF	15.00	21,945
Ceramic base	228	LF	6.00	1,368
Marble threshold /saddle	2	EA	65.00	130

Janitor Closet (3 EA):

Ceramic floor tile - thin set	93	SF	15.00	1,395
Ceramic base	55	LF	6.00	330
Waterproof - upper floor	93	SF	7.00	651
Marble threshold	3	EA	50.00	150

Porcelain Tile:

Entry / lobby tile	5,214	SF	18.00	93,852
Porcelain base	482	LF	7.00	3,374

090005 RESILIENT FLOORING*

Gym base	352	LF	2.50	880
Resilient sports floor at gym	7,569	SF	19.00	143,811
Café linoleum sheet-hvy duty	728	SY	82.00	59,696
Linoleum sheet - corridor	2,224	SY	82.00	182,368
Linoleum tile - classroom	7,180	SF	5.75	41,285
Rubber base	15,500	LF	2.20	34,100
Concrete moisture barrier	128,000	SF	1.00	128,000

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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095000 WOOD FLOOR

Stage wood flooring - maple *Includes 6 mil poly, resilient pads, sealant & finish	1,700	SF	15.00	25,500
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096800 CARPET

Admin carpet	399	SY	42.00	16,758
Media ctr carpet	941	SY	42.00	39,522

124813 MATS

Main Entry: Recessed alum entrance mat	200	SF	45.00	9,000
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940,877

C3030 CEILING FINISHES

092116 GYPSUM WALLBOARD

Gyp ceiling - toilet rm	2,516	SF	8.00	20,128
2 Hr. gyp ceiling	1,500	SF	13.00	19,500
Typ. gyp ceiling	5,000	SF	8.00	40,000
Stage acoustical reflector	750	SF	25.00	18,750
Gyp soffits & light coves	1	LS	50,000.00	50,000

090003 ACOUSTICAL TILE*

Ceiling System:				
Music classroom	2,000	SF	5.50	11,000
2x2 ACT typical	104,863	SF	4.75	498,099
MR Kitchen	4,642	SF	5.00	23,210
Cafeteria ceiling system	6,552	SF	10.00	65,520

090007 PAINTING*

Paint gyp ceiling	9,016	SF	0.85	7,664
Paint gyp soffits & light coves	1	LS	25,000.00	25,000
Paint exposed structure - gym	7,569	SF	1.50	11,354
Paint exposed structure - mech/elec.	1,500	SF	1.00	1,500

791,724

TOTAL C30 - INTERIOR FINISHES				2,376,116
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D. SERVICES

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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D10 - CONVEYING

D1010 ELEVATORS & LIFTS

140001 ELEVATORS*

Stage lift		N/A		
Passenger elevator	3	STOP	37,000.00	111,000

050001 MISCELLANEOUS & ORNAMENTAL IRON*

Elev. framing	1	EA	3,000.00	3,000
Elev. pit ladder	1	EA	1,500.00	1,500

115,500

TOTAL D10 - CONVEYING				115,500
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D20 - PLUMBING

D2010 PLUMBING

220001 PLUMBING*

Plumbing	128,000	GSF	10.50	1,344,000
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1,344,000

TOTAL D20 - PLUMBING		/SF		1,344,000
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D30 - HVAC

D3010 HVAC

230001 HVAC*

HVAC	128,000	GSF	29.00	3,712,000
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3,712,000

TOTAL D30 - HVAC		\$29.00 /sf		3,712,000
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D40 - FIRE PROTECTION

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
D4010 SPRINKLERS				
<u>210001 FIRE SUPPRESSION*</u>				
Fire pump	1	LS	75,000.00	75,000
8" Check valve assembly	1	LS	8,600.00	8,600
6" Wet valve alarm assembly	1	EA	4,500.00	4,500
4" Check valve	1	EA	2,200.00	2,200
Siamese connection	1	EA	1,200.00	1,200
Sprinkler sys - wet	128,000	GSF	4.00	512,000
Test , drawings, misc gc	1	LS	7,500.00	7,500

				611,000

TOTAL D40 - FIRE PROTECTION			\$4.77 /sf	611,000
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D50 - ELECTRICAL

D5010 ELECTRICAL SERVICE & DISTRIBUTION

260001 ELECTRICAL*

Electrical	128,000	GSF	26.00	3,328,000

				3,328,000

TOTAL D50 - ELECTRICAL			\$26.00 /sf	3,328,000
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E. EQUIPMENT & FURNISHINGS

E10 - EQUIPMENT

E1010 COMMERCIAL EQUIPMENT

114000 FOOD SERVICE EQUIPMENT

Kitchen equipment & casework	1	LS	450,000.00	450,000

				450,000

E1090 OTHER EQUIPMENT

113100 APPLIANCES

Gym laundry appliances	1	RM	2,500.00	2,500
Teacher work rm appliances	2	RM	2,500.00	5,000
Health office appliances	1	LS	2,500.00	2,500

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Teachers dining appliances	1	LS	2,500.00	2,500
Life Skill Rm/Care Classroom - Allow:				
Dishwasher		NIC		
Refrigerator		NIC		
Range		NIC		
Range hood		NIC		
<u>116600 ATHLETIC & SPORTS EQUIPMENT</u>				
Basketball backstops - electric	6	EA	9,500.00	57,000
Wall padding - 6'	1,250	SF	15.00	18,750
Motorized gym divider curtain	1,900	SF	18.00	34,200
Volley ball court equip.	1	EA	700.00	700
Scoreboard		w/Electrical		
Folding bleachers	1	LS	40,000.00	40,000
PT floor mats		NIC		
<u>116143 STAGE DRAPERY</u>				
Stage curtains	1	LS	30,000.00	30,000
<u>115213 PROJECTION SCREENS</u>				
Projection screen - stage	1	EA	10,000.00	10,000
<u>119000 MISC. EQUIPMENT</u>				
Metal storage shelving		NIC		
Book security equipment		NIC		
Kiln	1	LS	3,500.00	3,500
<u>116100 THEATRE EQUIPMENT</u>				
Audio & video	1	LS	30,000.00	30,000
Dimming, stage, rigging	1	LS	40,000.00	40,000
<u>115300 LABORATORY EQUIPMENT</u>				
Science Lab equipment	5	EA	7,500.00	37,500
Science Prep rm appliance	3	EA	5,000.00	15,000
Science fume hood	4	EA	6,500.00	26,000

				355,150
TOTAL E10 - EQUIPMENT				805,150

E20 - FURNISHINGS

E 2010 FIXED FURNISHINGS

129000 MISC. FURNISHINGS

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Meco shade - manual	10,958	SF	5.25	57,530
Int. office/class window shades	1	LS	7,500.00	7,500
<u>123553 CLASSROOM CASEWORK</u>				
Architectural casework	128,000	SF	2.50	320,000
Casework (Epoxy Counter w/Wood Cabinets):				
Art room	2	EA	20,000.00	40,000
Science room	6	EA	60,000.00	360,000
Prep room	3	EA	15,000.00	45,000
Tech room	5	EA	15,000.00	75,000

				905,030
E2020 MOVABLE FURNISHINGS		NIC		

				0
TOTAL E20 - FURNISHINGS				905,030

PROJECT: Mountview Middle School
 LOCATION: Holden, MA
 CLIENT: Lamoureux - Pagano Associates, Architects
 DATE: 31-Aug-12

No.: 11100

**NEW BUILDING
 EXISTING SITE -SITWORK**

SUMMARY

	<u>TOTAL</u>	<u>PERCENT OF PROJECT</u>	<u>COST PER SF</u>
G. BUILDING SITWORK			
G10 - SITE PREPARATION			
G1010 SITE CLEARING	76,825	2%	0.00
G1020 SITE DEMOLITION & RELOCATIONS	186,250	5%	0.00
G1030 SITE EARTHWORK	412,305	11%	0.00
G1040 HAZARDOUS WASTE REMEDIATION	0	0%	0.00
G20 - SITE IMPROVEMENTS			
G2010 ROADWAYS	745,294	21%	0.00
G2020 PARKING LOTS	0	0%	0.00
G2030 PEDESTRIAN PAVING	121,503	3%	0.00
G2040 SITE DEVELOPMENT	439,225	12%	0.00
G2050 LANDSCAPING	402,500	11%	0.00
G30 - SITE MECHANICAL UTILITIES			
G3010 WATER SUPPLY	170,895	5%	0.00
G3020 SANITARY SEWER	104,404	3%	0.00
G3030 STORM SEWER	643,500	18%	0.00
G3040 HEATING DISTRIBUTION	0	0%	0.00
G3050 COOLING DISTRIBUTION	0	0%	0.00
G3060 FUEL DISTRIBUTION	43,750	1%	0.00
G3090 OTHER SITE MECHANICAL UTILITIES	0	0%	0.00
G40 - SITE ELECTRICAL UTILITIES			
G4010 ELECTRICAL DISTRIBUTION	154,560	4%	0.00
G4020 SITE LIGHTING	94,100	3%	0.00
G4030 SITE COMMUNICATIONS & SECURITY	35,000	1%	0.00
G4090 OTHER SITE ELECTRICAL UTILITIES	0	0%	0.00
G90 - OTHER SITE CONSTRUCTION			
G9010 SERVICE AND PEDESTRIAN TUNNELS	0	0%	0.00
G9090 OTHER SITE SYSTEMS	0	0%	0.00
TOTAL	3,630,110	100%	0.00

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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G. BUILDING SITEWORK**G10 - SITE PREPARATION**

G1010 SITE CLEARING

311000 SITE PREPARATION & CLEARING

Erosion control	4,500	LF	3.65	16,425
Drain inlet protection - allow	8	EA	50.00	400
Construction entrance and staging	1	LS	10,000.00	10,000
Misc. site preparation	1	LS	50,000.00	50,000

				76,825

G1020 SITE DEMOLITION & RELOCATIONS

311000 SITE PREPARATION & CLEARING

Site Preparation	745,000	SF	0.25	186,250

				186,250

G1030 SITE EARTHWORK

310000 EARTHWORK

Cut and Fill	25,500	CY	7.00	178,500
Site Rough Grading	82,777	SY	0.65	53,805
Backfill demolished building	5,000	CY	18.00	90,000
Ledge Removal - allowance	2,000	CY	45.00	90,000

*Site utilities include excavation & backfill

412,305

G1040 HAZARDOUS WASTE REMEDIATION

N/A

0**TOTAL G10 - SITE PREPARATION****675,380****G20 - SITE IMPROVEMENTS**

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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G2010 ROADWAYS

320000 PAVEMENT, CURBING & EDGING

4 1/2" Vehicular Bituminous Pavement:

New Parking and drive	14,500	SY	26.00	377,000
12" Gravel base @ drive	4,833	CY	19.50	94,244
Granite curb - straight	7,040	LF	29.50	207,680
Granite curb - radial	1,760	LF	29.50	51,920
Tactile warning paver at HC Cut	6	EA	325.00	1,950
Traffic signage	1	LS	5,000.00	5,000
Misc. pavement markings	1	LS	7,500.00	7,500

				745,294

G2020 PARKING LOTS

*Included with G2010

0

G2030 PEDESTRIAN PAVING

320000 PAVEMENT, CURBING & EDGING

4" Concrete pavement	12,000	SF	4.25	51,000
8" Gravel base @ walk	300	CY	21.00	6,300
3" Bituminous walk	1,500	SY	23.00	34,500
8" Gravel base @ walk	333	CY	21.00	6,993
Specially Entry Pavement	3,500	SF	6.00	21,000
8" Gravel base @ walk	90	CY	19.00	1,710

				121,503

G2040 SITE DEVELOPMENT

323100 SITE IMPROVEMENTS

6" Concrete dumpster pad	500	SF	10.00	5,000
Dumpster enclosure	85	LF	65.00	5,525
Dumpster gate	1	EA	2,500.00	2,500
Baseball Field	1	EA	65,000.00	65,000
Softball Field	1	EA	65,000.00	65,000
Tennis court	2	EA	55,000.00	110,000
Basketball court	1	EA	40,000.00	40,000
Fencing	1	LS	60,000.00	60,000
Bollards @ transformer/generator	6	EA	550.00	3,300

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Vehicular access gate	2	EA	2,200.00	4,400
Bike rack - allow	5	EA	450.00	2,250
Bench - allow	10	EA	1,800.00	18,000
Trash receptacle - allow	3	EA	1,250.00	3,750
Flag pole	1	EA	4,500.00	4,500
Misc. site improvements	1	LS	50,000.00	50,000

				439,225

G2050 LANDSCAPING

329000 LANDSCAPING

Landscaping - allow	1	LS	100,000.00	100,000
Loam and Seed disturbed area	55,000	SY	5.50	302,500
Irrigation system		NIC		

				402,500

TOTAL G20 - SITE IMPROVEMENTS				1,708,522
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G30 - SITE MECHANICAL UTILITIES

G3010 WATER SUPPLY

330000 UTILITIES

Site connection	1	LS	7,500.00	7,500
4" Domestic	25	LF	51.00	1,275
6" Fire service line	200	LF	58.00	11,600
10" Main	1,200	LF	89.00	106,800
Hydrant	5	EA	1,850.00	9,250
10" Gate valve	4	EA	1,150.00	4,600
6" Gate valve	2	EA	850.00	1,700
4" Gate valve	1	EA	670.00	670
Ledge removal	500	CY	55.00	27,500

				170,895

G3020 SANITARY SEWER

330000 UTILITIES

Grease trap (5,000 gal)	1	EA	7,000.00	7,000
8" PVC Sanitary main	1,200	LF	48.00	57,600
6" Cast Iron	42	LF	62.00	2,604
Sanitary manhole	3	EA	2,500.00	7,500
Clean out	4	EA	550.00	2,200
Ledge removal	500	CY	55.00	27,500

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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104,404

G3030 STORM SEWER

330000 UTILITIES

Storm Sewer:

Site Drainage :

Area drain	7	EA	1,250.00	8,750
Drainage manhole	18	EA	2,250.00	40,500
Catch basin	25	EA	2,250.00	56,250
24" RCP	1,500	LF	56.00	84,000
12" RCP	2,500	LF	38.00	95,000
18" RCP	2,000	LF	46.00	92,000
15" RCP	500	LF	42.00	21,000
Water quality structure	3	EA	12,000.00	36,000

Detention Systems	5,000	SF	20.00	100,000
Ledge removal - allow	2,000	CY	55.00	110,000

643,500

G3060 FUEL DISTRIBUTION

330000 UTILITIES

Fuel Distribution:

Gas main trenching and backfill	1,200	LF	25.00	30,000
Ledge removal	250	CY	55.00	13,750

43,750

G3090 OTHER SITE MECHANICAL UTILITIES

N/A

0**TOTAL G30 - SITE MECHANICAL UTILITIES****962,549****G40 - SITE ELECTRICAL UTILITIES**

G4010 ELECTRICAL DISTRIBUTION

260000 ELECTRICAL*

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
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SPARE OR EMPTY RACEWAYS

PVC Underground:

4"	5,000	LF	14.20	71,000
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GROUNDING:

Ground rod 3/4" x 10'

	1	EA	77.00	77
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Bare copper wire #1/0	25	LF	3.30	83
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330000 UTILITIES

Transformer pad	1	EA	2,000.00	2,000
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Emergency generator pad (15'x30')	1	EA	2,500.00	2,500
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Conc. ductbank	1,200	LF	42.00	50,400
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Tele/data duct bank	750	LF	38.00	28,500
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*Primary cabling - By Others

154,560

G4020 SITE LIGHTING

260000 ELECTRICAL*

Parking light pole	20	EA	3,500.00	70,000
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Pedestrian lighting	12	EA	1,800.00	21,600
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Flag pole lighting	1	LS	2,500.00	2,500
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94,100

G4030 SITE COMMUNICATIONS & SECURITY

330000 UTILITIES

Security Cameras	10	EA	3,500.00	35,000
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35,000

G4090 OTHER SITE ELECTRICAL UTILITIES

N/A

0

0**TOTAL G40 - SITE ELECTRICAL UTILITIES****283,660****G90 - OTHER SITE CONSTRUCTION**

N/A

TOTAL G90 - OTHER SITE CONSTRUCTION**0**

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

- D. Preliminary Design:
New Construction at
Alternate “Malden Street”
Site Option
 - 1. Narrative Description of
Option
 - 2. Preliminary Site Plan
 - 3. Preliminary Floor Plans: 1st,
2nd, and 3rd
 - 4. Final Evaluation of Site –
Brassard Design &
Engineering
 - 5. Traffic Study – Nitsch
Engineering
 - 6. Structural Study – Bolton &
DiMartino
 - 7. Fire Protection Report –
Sensible Solutions
 - 8. Plumbing and HVAC Study –
Seaman Engineering
 - 9. Recommendations – Electrical
Systems – ART Engineering
 - 10. MA-CHPS Scorecard
 - 11. Revised Estimate of the Cost
of Construction

Mountview Middle School

270 Shrewsbury Street, Holden, MA 01520

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

D. Preliminary Design Options: New Construction at Alternate "Malden Street" Site Option Narrative

FEASIBILITY STUDY

NEW CONSTRUCTION AT ALTERNATIVE "MALDEN STREET" SITE OPTION – NARRATIVE

1. General:

A new 3 story school and athletic fields located on a town owned 70 acre site which abuts the existing Leroy E. Mayo Elementary School and associated athletic fields.

2. Educational Program:

The District's Educational plan is fully supported by the preliminary floor plan layout. The Academic wings are three stories, each floor level divided into two distinct and matching clusters of general classrooms, SPED classrooms, Science Lab and common teaching areas. Each classroom is adjacent to Art and Technology classrooms dedicated to each grade on each of the three floors. Faculty work spaces are located on each floor central to the two clusters. Administration, Cafeteria, Gymnasium and Music Suite are located away from the Academic clusters allowing for independent access for after school functions as well as segregating the noisier activities of the Music Suite, Gymnasium, etc. away from the quieter academic functions.

3. Site:

Refer to attached site work narrative.

4. Vehicular Circulation:

The pattern for buses and parents pick up and drop off separates each with district routes for their respective functions. Buses will use a dedicated bus loop delivering and retrieving students at the lobby's Main Entrance. Parents will use the Ring Road behind the building for drop off and pick up at the rear entrance to the Main Lobby. Both parents and buses will access the site on the same entrance driveway and exit on the same separate exit drive. This circulation pattern will enable the fourteen buses to readily access and vacate the site while providing ample queuing and separate drop off area for the 250 parent drop off automobiles. The 45 minute staggered dismissal times for the middle and elementary schools will allow exit access via the existing Mayo School driveway. (Refer to attached Traffic Study).



Mountview Middle School

270 Shrewsbury Street, Holden, MA 01520

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

D. Preliminary Design Options:

New Construction at Alternate "Malden Street" Site Option Narrative

FEASIBILITY STUDY

5. Parking:

The design provides for the required 125 parking spaces conveniently located for both the school and athletic fields.

6. Service Access:

Service to the mechanical room and cafeteria kitchen is located within a screen service yard containing a tailgate height loading dock, dumpster location, transformer and other service or building related mechanical items.

7. Athletic Fields:

The athletic fields will be constructed within the site somewhat remote from the school. The sloping topography at the building site is not conducive for the array of fields required. A Phys Ed field will be constructed directly adjacent to the school. The balance of required fields will be constructed within walking distance from the school on a more level portion of the site. This location is in close proximity with the existing Mayo School facilities.

8. Phasing:

The new building construction required no special phasing. Construction can proceed uninterrupted.

9. Existing School and Site:

The abandonment of the existing school with the completion of the new school at Malden Street poses a problem for the town; of what to do with the existing school and site? 1.) Demolish the school and sell the site, which will leave the town without the playing fields, 2.) Demolish the school and build new fields total cost borne by the town or mothball the building and continue to accrue costs of maintenance and heating.

It is not within the purpose of this study to answer the "what to do" question, only to address it.



Mountview Middle School

270 Shrewsbury Street, Holden, MA 01520

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

D. Preliminary Design Options:

New Construction at Alternate "Malden Street" Site Option Narrative

FEASIBILITY STUDY

10. Code and Zoning:

The project will require a variance for the 30 foot zoning regulations on maximum building height.

11. Structural/Plumbing/ Fire Protection/HVAC/Electrical and Data Communications (refer to attached narratives).



Mountview Middle School

270 Shrewsbury Street, Holden, MA 01520

3.3.2.3 FINAL EVALUATION OF ALTERNATIVES

D. Preliminary Design Options:

New Construction at Alternate "Malden Street" Site Option Narrative

FEASIBILITY STUDY

Merits	Limitation
<ul style="list-style-type: none">▪ No land acquisition required.▪ Will provide for team teaching.▪ Will not impact existing middle school and fields.▪ Provided opportunity to develop campus. type arrangement with Mayo Elementary School.▪ Lower annual operating costs.▪ Relieves traffic on Shrewsbury Street.▪ Shortest construction time.▪ No impact on students or school operations.	<ul style="list-style-type: none">▪ Steep Site.▪ Size bisected by wetlands requiring a crossing.▪ Involved permitting track.▪ Provides potential cut through for vehicles from Malden to Bullard Street.▪ Lack of all utilities to the site.▪ What to do with existing school and site after abandonment.▪ Need to construct all new athletic fields.▪ Increases traffic on Malden Street.▪ No state reimbursement for Hazmat remediation.





September 4, 2012

Mr. William Senecal
Lamoureux Pagano Architects
108 Grove Street
Worcester, MA 01605

RE: Mountview Middle School Feasibility Study – Site Work
New Construction / New Site Alternative

Dear Bill:

Per your request, Brassard Design & Engineering, Inc. has conducted an evaluation of a potential school construction site (Malden Street Site), previously submitted under separate cover. Based on the results of the evaluation, and on the general development program that you provided for the construction of a new school on the Malden Street site (New Construction / New Site), we have estimated the associated scope of site work required to advance the project.

The New Construction / New Site alternative would include the construction of a new school building, access roads, utility services/facilities, parking areas, and athletic fields. The site's primary access would be derived from Malden Street, with a connecting road extending to the east onto the existing Mayo Elementary School site. The connecting road would merge with the existing Mayo School access road, providing secondary access onto Bullard Street.

The school and primary parking areas and a looped access drive would be constructed on a forested knoll located on the central northerly section of the site. This primary development site would require a significant, but achievable, earth moving effort to achieve a plateau of sufficient scale to site the school building. The extent to which ledge removal would be required would be a focus of a pre-design geotechnical investigation.

A baseball field, softball field, soccer field, and tennis courts would be constructed on forested upland on the northeasterly section of the site. A significant earth moving effort would also be needed in this area to achieve properly graded athletic fields constructed as broad terraces.

Water and fire protection services would be derived from a water service main extending from Malden Street through the site and connecting to the existing service main at the Mayo School. Because of topographic constraints and due to the configuration of the existing sanitary sewer collection system, a sanitary sewage pump station would be required to connect the site to the municipal system. A sanitary force main would be installed that would direct discharge to the existing sewer collection main located in Bullard Street.

The stormwater management system for the project would likely include varied methods for treating flows and providing groundwater recharge with multiple discharge locations. The type and extent of each system section will be dependent on soil conditions, terrain, and spatial constraints for each section of the site. Because the project will involve discharges to wetland resource areas tributary to a water supply (Wachusett Reservoir) the management of stormwater flows will be a focal point of municipal and state review of the project.

Connecting the two development areas, and establishing the connection to the Mayo School site would require a wetland crossing and potentially substantial permitting effort as described below.

The site work for the project would likely involve the following specific work items:

Pavements and Access

- Establish a curb cut on Malden Street for new site access road extending through the site to the existing Mayo Elementary School access drive (2,300LF+/-);
- Construct looped access drive for new school building (2,000LF+/-);
- Construct new parking for school building and additional parking for the athletic facilities;
- Construct pedestrian access ways throughout the site;
- Install site access signage and other informational signage;
- Repair/replace pavement at the existing Mayo School access drive where disturbed for new utility connections (1,000LF+/-);

Site Utilities

- Install new water/fire protection service main and service loop for hydrant locations at building (4,800LF+/-)
- Construct grease trap, and sanitary sewer pump station with force main connection to Bullard Street (3,000LF+/-);
- Construct stormwater management systems including provisions for water quality treatment and groundwater recharge per the MA DEP Stormwater Standards. The system will likely consist of 3-4 discrete sections, each including collection structures and piping, a treatment component (chamber or open conveyance treatment system), a recharge component, and stabilized outfall location;

Landscape / Earthwork

- Clear approximately 25-30 acres+/- of forested area to accommodate the development program;
- Conduct major earthwork operations to create a 7+ acre development zone for the school building, and a 10+ acre development zone for athletic fields (in 4 broad terraces);
- Construct a new baseball, softball, and soccer fields and tennis court on easterly section of the site;
- Implementation of site-wide landscaping installation of new trees, shrubs, and groundcover.

The above is not intended to be an exhaustive list, but provides a general frame of reference for the scale of site construction necessary for the implementation of the Addition/Renovation design alternative.

Permitting

In order to complete the site work, municipal permitting would be required including:

- Site Plan Review / Special Permit application to the Holden Planning Board per section XI of the Holden Zoning Bylaw, for verifying compliance with municipal design standards and zoning requirements.
- An ENF filing will be required and may be triggered by the amount of total site disturbance that results from the project (> 25 acres) but will also be triggered by the anticipated wetland impact referenced below;
- Due to the necessity of establishing a wetland crossing between the western and eastern sections of the site, and because buffer zone disturbance may be required for the main site entry road and the connection to the Mayo School, multiple environmental permits will be required including:
 - Notice of Intent under the Wetlands Protection Act (Holden/DEP)
 - 401 Water Quality Certification (DEP)
 - Bureau of Resource Protection WM-09 (DCR)
 - Watershed Protection Act Variance (DCR)
 - NHESP (Endangered Species filing).

(see the attached memo from EcoTec, Inc., dated July 10, 2012 detailing the initial wetland and associated permitting evaluation.)

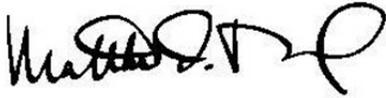
- Because size of the construction site will exceed 1 acre, a Notice of Intent application to EPA will be required per the National Pollutant Discharge Elimination System (NPDES). The application is related to control of stormwater discharges from the

construction site and must be filed at least 14 days prior to initiation of construction activities.

Other construction-related permit applications and processes that will be the responsibility of the general contractor are not listed.

If you have any questions or require additional information please contact me at your convenience.

Sincerely,
BRASSARD DESIGN & ENGINEERING, INC.

A handwritten signature in black ink, appearing to read "Matthew T. Brassard". The signature is stylized and cursive.

Matthew T. Brassard, PE

EcoTec, Inc.

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To: Matthew Brassard, PE

Date: July 10, 2012

From: Scott Morrison, RPSS
Sr. Environmental Scientist

Re: Holden, Bullard & Malden Streets
(proposed school site)

Paul McManus, PWS
President

Introduction:

EcoTec has prepared the following assessment for a possible school construction project in Holden, Massachusetts. This information has been prepared to provide a general understanding of the environmental permitting required. This assessment assumes that a proposed school will be constructed in the western portion of the site, athletic fields will be constructed in the northeastern portion of the site and an access road is proposed to connect from Malden Street through to the existing Mayo School.

Environmental Permitting:

Several environmental permits are required under local, state, and federal environmental regulatory programs in order to implement a proposed school construction project on the site. This assessment provides a general summary of required permits below. This assessment is based on a conceptual site layout and a preliminary site inspection only. Detailed site evaluation, survey, and engineering would be required to obtain a thorough understanding of permitting requirements.

Site Inspection:

On July 6, 2012, a preliminary site inspection was conducted by Scott Morrison, RPSS of EcoTec to evaluate the site for the presence of wetland resource areas and to evaluate a possible wetland crossing to connect the existing Mayo School off Bullard Street to Malden Street. The site inspected consists of Assessors Map 150 Parcel 43. In addition, an inspection was conducted on Assessor's Map 150, Parcel 40 as a possible alternative access route off Malden Street. The site contains Bordering vegetated wetlands throughout the central, southern, and western portions of the site that are associated with a northwesterly flowing mapped intermittent and perennial stream. The Town of Holden GIS mapping was utilized as a base layer to conduct the evaluation with the following comments based upon the field inspection.

Preliminary Findings:

- The wooded swamp located in the central portion of the site is connected to the wooded swamp in the western portion of the site via an intermittent stream and additional wooded swamp in the southern portion of the site.
- A mapped intermittent and perennial stream is depicted on the USGS map and starts to the west of the existing athletic fields to the west of the Mayo School and flows in a northwesterly direction through a culvert beneath Malden Street. It should be noted that the stream was not flowing at the time of inspection. Therefore, it is likely that the perennial designation could be overcome and the stream determined to be an intermittent stream.
- The stream and wooded swamp connection between the central wetland and the stream flowing under Malden Street is not depicted by the GIS wetland mapping. A sketch of the approximate locations of the additional wetland connections is appended to this memo.
- Based upon visual estimates it appears that the wetlands in the northeastern corner of the site are understated by the GIS mapping and appear to connect to the off-site wooded swamp.
- An historic cart path/road crossing exists in the northern portion of the site in what appears to be a local drainage divide, with the wetland to the north flowing off site to the north and wetlands to the south of the crossing appearing to flow across the site to the south. This existing crossing is located approximately 50 feet south of the northern property corner, where the central wooded swamp intersects the property line. A visual estimate of the upland connection suggests the crossing is 10-15 feet in width and 120-150 feet in length. This assessment assumes that any proposed crossing could be limited to less than 5,000 square feet of Bordering Vegetated Wetland (BVW) fill.
- A potential vernal pool is located off site to the north of the site.
- The vacant lot off Malden Street appears to allow access without impacting the adjacent wetland resources, but appears to fall within the Watershed protection Act secondary protection Zone as detailed below. It should be noted that wetland delineation and survey location of those flags will be required to determine the exact extent of Bordering Vegetated Wetland, Riverfront Area, and the locations of the Primary and Secondary Protection Zones.

Based upon the site inspection conducted on July 6, 2012 the following is a summary of the regulations which apply to the proposed project, based upon the preliminary findings and assumptions provided above, and the requirements under the noted regulations.

Massachusetts Wetlands Protection Act:

A Notice of Intent (NOI) filing (permit application) is required and an Order of Conditions (permit) must be issued for work in the Buffer Zone and for any wetland fill associated with an access connection between the existing Mayo School and Malden Street or any other project component. The NOI is filed with the Holden Conservation Commission, with potential appeal to the Massachusetts Department of Environmental Protection (MADEP) by the applicant or other parties.

The project will be required to comply with Stormwater Management Standards including the prohibition of discharges to Zone A. The Wetlands Protection Act at 310 CMR 10.05(k)6 states that stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such area as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area, if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1. or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. It should be noted that Stormwater discharges to a Zone A are prohibited, unless essential to the operation of the public water supply. The Zone A on the site includes the land area within a 200 foot lateral distance from the upper boundary of the bank of a tributary or associated surface water body.

See the Massachusetts Endangered Species Act, below, for state-listed species considerations, which are also part of state wetland regulations.

Town of Holden Wetlands Protection Bylaw:

A Notice of Intent filing is also required under the Town of Holden Wetlands Protection Bylaw. This filing is generally filed simultaneously under the Act and Bylaw to allow for concurrent review.

Watershed Protection Act:

The Watershed Protection Act (WsPA) asserts jurisdiction over areas within 400 feet of mapped Tributaries to the Wachusett Reservoir and wetlands that border these Tributaries. Areas from 0-200 feet from the mapped Tributaries are considered the Primary Protection Zone, which is generally considered to be a no touch zone. Areas extending outward from the Primary Protection Zone 200-400 feet are regulated by limiting the amount of impervious, waste storage, generation and/or disposal and other restrictions not presented here. Finally the wetlands bordering the Tributary stream are regulated and filling of such wetlands is prohibited, except by variance. . Therefore, it appears that a variance from the provisions of the Watershed Protection Act would be required to allow expansion and wetland fill at the existing historic cart path crossing to allow for an emergency access from the existing Mayo School to a proposed new school through to Malden Street. A variance may also be required depending upon the amount of impervious surfaces for access to the site. A formal Request for Watershed Determination of Applicability can be filed with the Department of Conservation and Recreation (DCR) to request a jurisdictional determination under the Watershed Protection Act. EcoTec recommends such a filing.

Water Quality Certificate (Section 401):

This proposed project will require a 401 Water Quality Certificate (WQC) if filling of any Bordering Vegetated Wetlands (BVW) that is considered to be an Outstanding Resource Water (ORW). BVW on the site is considered to be ORW because it ultimately drains to a surface water supply (Wachusett Reservoir). It should be noted that there are additional triggers requiring a 401 WQC filing, but they do not appear to apply to this project.

Massachusetts Endangered Species Act (MESA):

The MESA Regulations require that no project may be permitted that will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures set forth at 310 CMR 10.59. As of the date of this Permitting Assessment, a review of the *Massachusetts Natural Heritage Atlas*, 13th edition, Priority Habitats and Estimated Habitats, Worcester North Quadrangle, valid from October 1, 2008, indicates there are no Certified Vernal Pools on or in the immediate vicinity of the site. However, the site is located within an Estimated Habitat and a Priority Habitat. A copy of this map is attached. The Wetland Regulations at 310 CMR 10.59 state that projects proposed within an Estimated Habitat as indicated on the most recent map published by the Natural Heritage and Endangered Species Program (NHESP) require a fully completed copy of any required Notice of Intent filed under the Act and Regulations (including all plans, reports, and other required materials) to be submitted to the Natural Heritage and Endangered Species Program no later than the date of filing with the Conservation Commission. In addition, in July 2005, the Massachusetts Endangered Species Act (M.G.L. Ch. 131A; "MESA") regulations (321 CMR 10.00 *et seq.*; the "MESA Regulations") were revised to provide formal review procedures for projects and activities proposed within a Priority Habitat. For nonexempt projects or activities proposed within a Priority Habitat, an additional filing beyond that required under the Wetlands Regulations for a project proposed within an Estimated Habitat, or a consolidated filing that meets the requirements under 321 CMR 10.20 and 310 CMR 10.59, must be made with the NHESP to allow the project or activity to be reviewed under MESA or under MESA and the Wetland Act, respectively.

Based upon recent permitting experience in the area, EcoTec believes that the rare species mapping on the site is due to the presence of the Blanding's Turtle. The proposed emergency access road appears to bisect the northern tip of the mapped habitat. As such, a filing will be required to be made with the NHESP. EcoTec recommends that the proponent make a request with the NHESP to determine/confirm the species of concern and meet with the NHESP to preliminarily discuss the project to determine the likelihood of permitting success and any specific restrictions or mitigation that might be required to permit the proposed project.

Massachusetts Environmental Policy Act (MEPA):

The Massachusetts Environmental Policy Act is an administrative review process to provide meaningful opportunities for public review of the potential environmental impacts of projects for which a state agency action (i.e. 401 Water Quality Certificate, DCR Variance, etc.) is required, and to assist each agency in using all feasible means to avoid damage to the environment or, to