

ARCHITECTURAL ASSESSMENT

Hanover High School

Originally constructed in 1958 with an addition in 1962. The building is approximately 116,375 sf in area with 700 students for grades 9 through 12. Aside from minor building upgrades such as the installation of an elevator in the early 1990's, upgrading a chemistry lab in 1995, renovating a portion of the locker rooms in 1999 and recent renovations of the computer and math lecture halls, the building has not experienced any major renovations. General facility comments are as follows:



Exterior Envelope (foundation, walls, windows, doors, roof)

Description

Foundation: Cast in place concrete foundation.

Exterior wall: Brick exterior veneer with precast concrete accents, concrete masonry unit back-up, steel framed construction.

Windows: Non-thermal window, single-pane, metal window system with painted metal panels. Some window frames were noted be constructed of wood. Glass block noted at locker rooms and Gym.

Doors: Combination of insulated hollow metal doors (recently installed at main entry), original hollow metal doors in fair condition, deteriorated wood doors in poor condition.

Roof: The roof is composed of a combination of ballasted EPDM rubber membrane (10 to 11 years old), while the band room was recently re-roofed with fully adhered EPDM rubber membrane.

1. A review of the building exterior found that overall the building was in good condition, with the exception of:

- a. The severely deteriorated single-pane non-thermal metal window system, which is a source of extreme heat loss. Window glazing sealants have failed. Some metal panels are pulling away from the framing system. Paint is peeling. Glass block is cracked in many places, does not provide much thermal value.

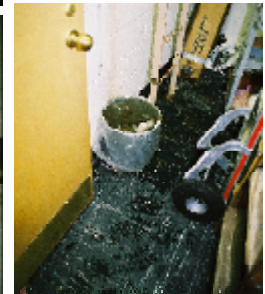
- b. Rotting wood exterior doors; some were inoperable, others are difficult to open/close. This is a life safety



concern particularly at the doors that lead out from a stairway into the courtyard.

c. Masonry:

- ✍ deteriorating and discolored brick throughout,
- ✍ vertical cracks in the brick in several locations (appears to be due to lack of control joints),
- ✍ horizontal shift of brick at joint (appears to be due to lack of control joint)
- ✍ evidence of water/moisture getting behind the brick areas mostly below window sills,
- ✍ mortar in need of repointing in certain areas,
- ✍ spalling noted in the precast concrete.
- ✍ No weep holes visible.



d. Paint chipping and bubbling at interior side of exterior walls. This may be due to failure of (or lack of) vapor barrier.

e. Cantilevered extension at the 2nd floor computer rooms show signs of water damage to the sto-type finish system

f. Portions of the roof and fascia (see below).

2. The roof was found to be in fair condition overall with particular areas and components in poor condition. General comments are as follows:

- a. Workmanship over most of the roof was noted to be very poor, particularly at the perimeter fascia. The membrane has not been fastened or sealed properly, gaps and cracks at seams and flashing areas noted. Edge seaming tape was not installed. Metal fascia and edge metal had blown off in areas all around the building perimeter/edge; one location had a 40 foot long piece missing. Deficient workmanship appears to be the primary concern on this roof. Leaks were reported at a number of locations.



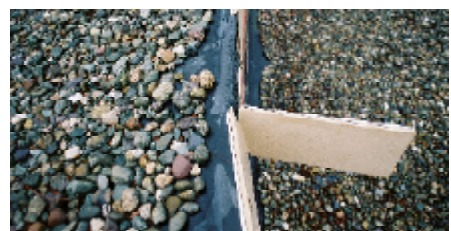
- b. The ballasted roofing system for the gym roof is inappropriate for the condition; the slope is too steep for a ballasted roof system. In addition, the workmanship is

very poor. Holes and gaps in the membrane were noted at several locations, some as large as 12" long (at rooftop unit). The membrane was sparsely ballasted with stone and what appeared to be old stone walkway pads (12" x 18"). Leaks are inevitable with the roof in this condition. Leaks were reported at the Gym.

- c. The expansion joint between the 1958 building and 1964 addition, constructed of wood, does not appear to be per industry standards and had a notable deflection. In addition, the rubber roofing at this location had a large gouge that exposed the wood. Leaks were reported at this location
- d. The roof was leaking at the time of our visit at the roof access hatch.
- e. Ponding water noted in several areas; additional roof drains are recommended.
- f. Roof appeared to be spongy in some areas. Further investigation is warranted.
- g. Smoke vents at stage are severely rusted.
- h. Areas of the roof membrane were not ballasted appropriately. It appeared that when repair work had been done recently, the stones were not placed back to their original location. This may result in wind uplift issues.

Exterior Envelope- Recommendations

- 1. Repair/replace/repoint masonry as needed and install control joints.
- 2. Address roof and window flashing to address cavity wall moisture infiltration.
- 3. The entire window system should be replaced with an energy efficient, thermally broken, double-glazed, insulated Low E, operable window system that takes into consideration the entire building design. Tinted or heat mirror windows may be an option to discuss to protect against excessive glare or heat-gain. Where the metal system covers a large portion of the exterior wall, additional structural steel may be required to maintain the sheer strength of the wall. Glass block should be replaced with insulated translucent panels (Kalwall-type).
- 4. Replace all exterior doors and hardware (except for doors most recently installed).



5. Replace entire roof system and fascia, except for recently installed fully adhered membrane system. Utilize tapered insulation. Install additional roof drains.
6. Replace stage smoke vents.



Interior (flooring, walls, doors, built-ins and equipment, ceiling)

Overall the building has been maintained very well. Comments and observations are as follows:

Flooring

1. The original Vinyl Asbestos Tile (VAT) flooring is currently in place throughout the school. Carpeting covers the majority of the VAT, due to a lack of funds to perform the abatement of the VAT.
2. Carpeting in some areas has been recently installed, while in other areas it is in poor condition with seams taped with duct tape. Any major renovation project should include the removal and replacement of carpeting and VAT.
3. Gym wood flooring has reached the end of its life after 40 years of use and should be replaced during a renovation project.
4. Stage wood floor is heavily gouged and should be replaced.
5. Kitchen VCT tile is damaged and lifting in some areas

If a renovation project entails any asbestos abatement, the removal of all remaining VAT should be included in that scope of work. Replace all VAT flooring with carpet, VCT, or natural linoleum. While the asbestos within the tiles may not be hazardous unless it is exposed to the air or is not maintained properly, total removal of this tile and adhesive is recommended.

Walls:

1. Cracks in the music room, near room 220 and at several other locations around the building were noted.
2. Corridor walls are mostly structural glazed facing tile (sgft) wainscot and concrete masonry units (cmu) above and are in very good condition.
3. Folding partitions between several classrooms are used in some classrooms while not at all in others. Nonetheless, the partitions carry a minimal acoustic value if any and should be replaced.
4. Corridor lockers have been re-faced with heavy gage locker doors with no moving latching mechanism. These appeared to be in very good condition.
5. Window stools in some areas were made of wood, which were warped and deteriorating. Recommend replacement

Doors

1. Interior doors are in very poor condition; heavily gouged and damaged. Hardware requires replacement due to handicap accessibility. Some doors do not meet minimum width for HC. Recommend that all doors be replaced.



Built-Ins/Equipment

1. One science lab had been recently upgraded with new equipment, while others are still utilizing original tables and casework. The original tables and casework are over 40 years old, have been gouged and damaged and should be replaced.
2. Woodshop equipment is mostly original. These require maintenance on a regular basis and parts are difficult to find. Recommend replacement.
3. Bleachers are original, wood construction and are in fair to good condition. Parts are difficult to find, maintenance and upkeep is frequent. In addition, they are not handicap accessible. Recommend replacement.
4. Most library furnishings have been recently upgraded.
5. Auditorium seating is original, of metal and wood construction, most are in good to fair condition, while some are damaged and unusable. Recommend that all seating be replaced.
6. Numerous pieces of kitchen equipment are in need of replacement; all are original and require frequent maintenance and upkeep. Cooler and Freezer compressors are noisy, located in the kitchen, and should be on the roof instead.

Generally speaking, once furnishings reach a certain deteriorated state, they are no longer treated well by the students and rapidly become unserviceable. We recommend that an inventory of existing equipment be conducted to evaluate which furnishings could be repaired and re-used and which should be replaced. The bleachers should be checked for safety by a qualified inspector for the short term and replace with new for the long term.



Ceilings

1. Ceilings are mostly suspended acoustical ceiling panels that are in good condition. Some classrooms and areas around the school have glue-on acoustical tile and textured ceilings. The textured ceilings are listed in the latest AHERA reports as asbestos containing materials. Recommend abatement in any renovation project, if not sooner.
2. Original skylights have been covered and not in use. It is unclear if all components of the skylights were removed.

Space Use

There are a number of changes that have occurred to the building and to education since the original construction in 1958 and the addition in 1962. Many current programs and services were not offered or planned for in the original building design. Over the years, new programs developed, other programs were removed and new requirements were mandated by the state. The use of space slowly evolved into one of the challenges facing the school today. There are numerous space utilization deficiencies within the building. The factors affecting the Space Utilization review include:

- A. In 1993 Massachusetts enacted the Massachusetts Education Reform Act that set uniform standards for space requirements in schools across the State. This piece of legislation was developed for a number of reasons including;
 - ? Uniform standards for space requirements while allowing for flexibility: 135 sf/student for Junior High and 155 sf/student for Senior High; between 750 and 850 sf for typical classrooms.
 - ? Certain space requirements for core areas such as: the library/media, kitchen/cafeteria, auditorium, gym, etc.
 - ? Improve and set standards for student/teacher ratios
 - ? Aggressive approach toward building schools for the future with space for computer stations, hands-on projects, and community space.
- B. State mandated Special Needs regulations have been adopted requiring space in the school for special needs programs.
- C. 1958 and 1962 designed capacity vs. 2001/2002 actual enrollments combined with recommended State guidelines.

Taking these issues into consideration, we have compiled the following assessment of the current utilization of space:

- 1. Although the Library has increased in size by engulfing classroom space, some original library space has been lost to other school use. The resulting long, narrow configuration is not ideally suited for the function and use of a high school library and media center. The size of the library appears to be below state minimum guidelines.
- 2. Library has inadequate space for audio/visual storage. The original a/v room is now a computer/math room.
- 3. Home Arts is now a teachers room.
- 4. Guidance is housed in what previously was a classroom.



5. The student council storage room was previously a toilet room.
6. The shop program has been gaining more popularity in the area of technical drawing, industrial and visual arts, requiring more space.
7. There is a lack of storage space for general use and classroom use.
8. One classroom has been converted to be a learning resource/tutorial room for small group instruction and one-on-one assistance.
9. Nurse's room is very small and offers almost no privacy for exams and personal discussion with the nurse.
10. No space for Choral students. The stage is used as a classroom space.
11. Auditorium stage wings are small; inadequate space for storage or sets.



12. No music practice rooms as they are now used for storage.
13. The kitchen dishwashing area is located directly in the middle of the kitchen; this results in an inefficient/less than ideal work area for food preparation and food serving.
14. Kitchen dry storage space and freezer storage space is limited.



15. Locker rooms, basketball backboards, pads are all in good condition; recently upgraded.
16. Lacking gym storage space, phys. Ed office space, instructor showers.
17. Weight room is undersized.
18. Lack of trash/refuse area; carted off-site each day.
19. Security Alarm panel is located in the boiler room, with poor access.
20. Lack of space for wrestling and gymnastic programs, requires that the high school students use space at the Middle School, thus restricting the time available for other users of those facilities.

Space Utilization -Recommendation

Over the past forty-two years, requirements and needs have changed in education. The facility must be flexible and be adaptable to adequately provide for today's and tomorrow's educational program. Some existing spaces should be relocated to match the current desired educational program configuration (Educational Specifications). Where existing spaces do not "fit" the stated program, the school should consider modifications. Flexibility in educational spaces should be incorporated into any renovation/expansion plan for the future so that as requirements change, the school program may adjust more easily than in years past.

Handicap Accessibility

Requirements for handicap accessibility were non-existent in 1956 when this school was built. In 1990, the Americans with Disabilities Act (ADA) was enacted into law by the Federal Government to provide civil rights protections and nondiscrimination on the basis of disability. Since 1990, the original regulations have been updated and new requirements and clarifications have been added. In addition, the Commonwealth of Massachusetts has developed their own regulations (521 CMR Architectural Access Board) that are in many instances more stringent than the ADA. Regulations are updated and added almost every year. Based on these regulations, we have found the following items to be in noncompliance or not accessible to the disabled:

1. The math classroom has tiered level seating with no seating designated for the disabled.
2. Virtually all the doors throughout the entire school are not handicap accessible as they have knob-type hardware, some do not meet required width.
3. Clear space adjacent to many classroom doors does not meet code.
4. Library bookshelf aisle spacing is too narrow.
5. High and low water fountains were noted but were missing proper hardware
6. Administration counter requires lower counter
7. Lack of interior signage.
8. English classroom has three steps to a raised platform: not accessible.
9. With the exception of one designated handicap accessible toilet, toilet rooms throughout the building are not accessible, including the nurse's room. The following items are not in compliance:
 - ✍ Lavatories
 - ✍ Toilets and urinals
 - ✍ Grab bars
 - ✍ Door width and clear space adjacent to doors
 - ✍ Clear turning space at single fixture toilet rooms



10. Bleachers

11. Lockers

12. Parking spaces

13. Auditorium:

- ⌘ Do not have accessible seating, nor are they dispersed around the room.
- ⌘ Ramp is too long (42') without a landing (30' is max permitted)
- ⌘ Slope of floor steep and changes as one proceeds to the front.
- ⌘ Do not have 5' landing space at top of ramp, adjacent to doors



Handicap Accessibility -Recommendation

Although it appears as though some building features are accessible to the disabled, many unfortunately are not. Each of the inaccessible features listed above has an impact on the ability of disabled students or members of the community to access various spaces throughout the school independently. Disabled people may include students with a permanent handicap condition, students that are temporarily disabled from athletic activity, parents or other visitors that could have any form of disability. Any form of renovation plan should incorporate as many items as possible to accommodate disabled people to the fullest extent possible.

Security

Several entries including the main entry into the building are not visible or easily accessible by administrative staff. Visibility to the main entrances (exterior and interior) is recommended. Discussion should take place as to different types of security systems available and to what extent the school is interested in integrating a control system into the school.

Health and Life Safety

There are a number of issues affecting the health, welfare, and safety of students and staff. From a building environment standpoint we have observed the following:

1. Stairway exits were blocked with stored items and with a hardware lock-down bar. This presents a serious life-safety concern, as these exits are required emergency exits for occupants from the 2nd floor. All doors into the courtyard were locked.



2. Guardrails and handrails at all stairs do not comply with current code.
3. Exit signs were not lit in a number of locations including the exit signs in the courtyard.
4. Corridor and stair doors are not smoke or fire rated: are not labeled, do not have latch, no panic devices, are held open with wood wedges.
5. The emergency systems (emergency lighting and exit signs) are in violation of current codes for a number of reasons. No emergency generator. See Electrical section for more information. The small basement area near the main entrance houses the main electrical panels for the building and also houses roughly 20 “car-size” batteries, linked together, being used to power the emergency lights during a power outage. Just prior to our site visit, a broken pipe flooded this room and the results could have been very serious. In addition the batteries were full of corrosion. This is a health and safety concern and should be addressed immediately.
6. Concerns with the electrical wiring have been reported due to a number of problems in the past.
7. Inadequate ventilation and air quality in a number of spaces, including the kitchen, industrial arts areas, and other rooms throughout the building. See HVAC section for more information.
8. Traffic flow and circulation between cars, busses and pedestrians at the end of the day and during events presents a hazardous condition as there is no bus-loop.
9. Asbestos-containing spray-on fireproofing was noted to be still in place on steel beams in the 1962 addition. This material, as noted in the hazardous materials section of the report is “friable”, meaning that portions of this material may fall on top of the acoustical ceiling tiles easily. Access above the ceiling in the addition should be limited to qualified asbestos personnel until an abatement of the material is performed.
10. Paint is chipping and peeling and has a high probability that it is lead-containing.
11. Wood working equipment lack safety switches and need upgrading to meet current OSHA standards.

