Massachusetts School Building Authority

Steven Grossman
Chairman, State Treasurer

John K. McCarthy
Executive Director

Science Lab Initiative – Designers & OPMs Meeting

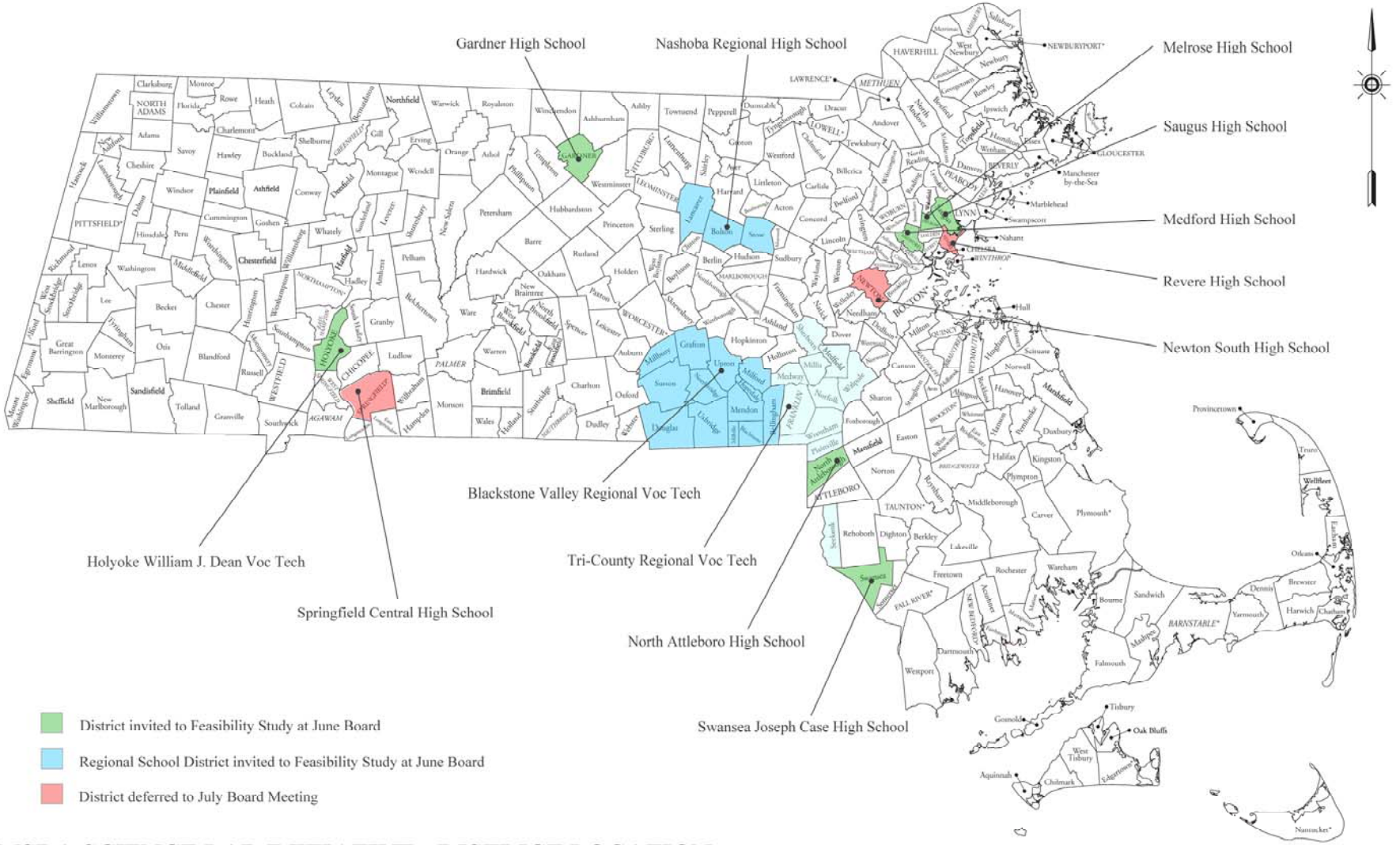
June 13, 2012

Introduction to Science Lab Initiative

- 13 schools submitted compliant Statements of Interest ("SOI") for the Initiative on January 11, 2012
- The MSBA Science Lab Advisory Committee ("SLAC") recommended approval for 10 districts shown below to receive an invitation to feasibility study which were authorized at the June 6 Board Meeting
  - Blackstone Valley Regional Voc Tech
  - Holyoke Wm J Dean Voc Tech
  - Melrose HS
  - North Attleborough HS
  - Swansea Joseph Case HS
  - Gardner HS
  - Medford HS
  - Nashoba Regional Voc Tech
  - Saugus HS
  - Tri-County Regional Voc Tech

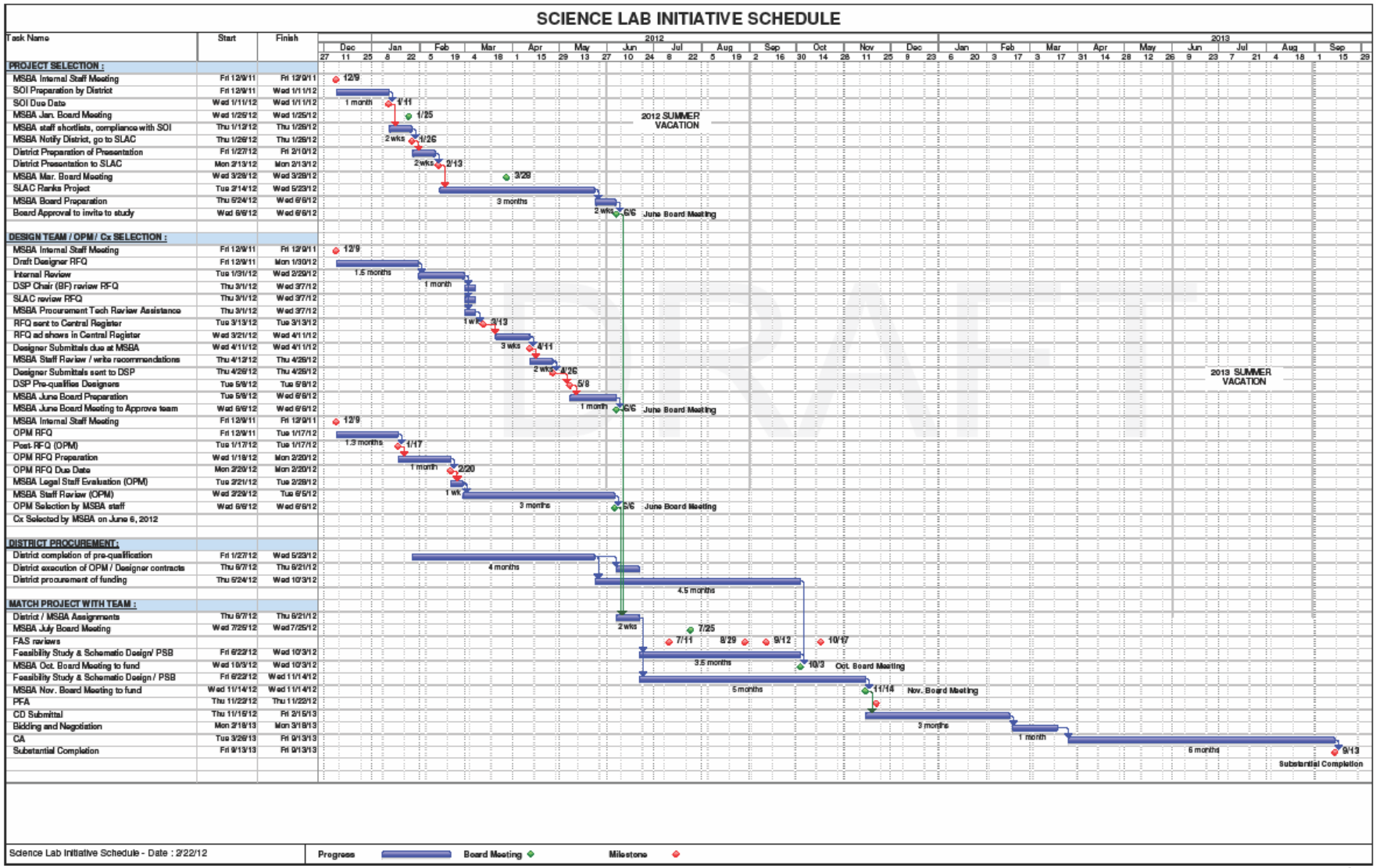
  *This invitation to collaborate on a Feasibility Study is **not** approval of a project, but is strictly an invitation to the District to work with the MSBA to explore potential solutions to the problems that have been identified in the SOI.*
- 3 schools are currently under further review for the July 25th Board Meeting
  - Newton South HS
  - Revere HS
  - Springfield Central HS

District Locations



MSBA SCIENCE LAB INITIATIVE - DISTRICT LOCATION

SLI Schedule

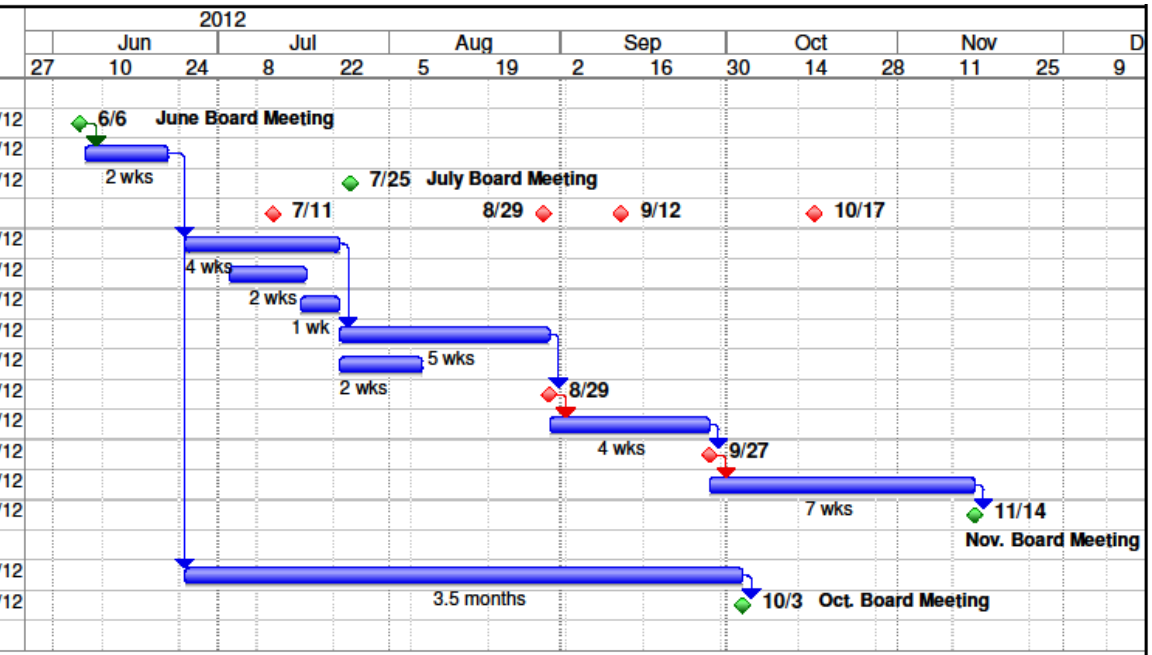


SLI Schedule

- The MSBA staff anticipates the following projects for SD/PSB recommendation for *October 3rd* Board Meeting:
  - Blackstone Valley Regional Voc Tech
  - Holyoke Wm J Dean Voc Tech
  - Melrose HS
  - Swansea Joseph Case HS
  - Tri County Regional Voc Tech
- The MSBA staff anticipates the following projects for SD/PSB recommendation for *November 14th* Board Meeting:
  - Gardner HS
  - Medford HS
  - Nashoba Regional Voc Tech
  - North Attleborough HS
  - Saugus HS

Schedule – June to Nov. 2012

Task Name	Start	Finish
MSBA June Board Meeting	Wed 6/6/12	Wed 6/6/12
District / MSBA Assignments	Thu 6/7/12	Thu 6/21/12
MSBA July Board Meeting	Wed 7/25/12	Wed 7/25/12
FAS reviews		
PDP	Mon 6/25/12	Sun 7/22/12
PDP telcons	Tue 7/3/12	Mon 7/16/12
PDP meetings	Mon 7/16/12	Sun 7/22/12
PSR	Mon 7/23/12	Wed 8/29/12
Districts present to TK / JF	Mon 7/23/12	Mon 8/6/12
FAS meeting	Wed 8/29/12	Wed 8/29/12
SD / PSB	Thu 8/30/12	Thu 9/27/12
Due date for SD / PSB	Thu 9/27/12	Thu 9/27/12
SD / PSB Review	Fri 9/28/12	Wed 11/14/12
MSBA Nov. Board Meeting to fund	Wed 11/14/12	Wed 11/14/12
Feasibility Study & Schematic Design/ PSB	Mon 6/25/12	Wed 10/3/12
MSBA Oct. Board Meeting to fund	Wed 10/3/12	Wed 10/3/12



Science Lab Initiative Schedule
June to November 2012 Board Meeting - 4/3/12

Progress | Board Meeting | Milestone

OPM / Design Team Tasks

The District must submit an Initial Compliance Certification and the preliminary overview of available or projected local funding to the MSBA no later than June 30th in order to keep within the program schedule parameters.*

OPM / Design Team can assist the District by:

- Proposed Project Schedule showing MSBA SD/PSB board approvals, MSBA submittals, PFA execution, CD completion, bid date, construction NTP, construction substantial completion, move-in, etc.
- Contract Execution by deadline (OPM- 6/20, Arch- 6/22)

District Conditions for project approval:*

- Professional staff development plan
- Review and assessment of stored items
- Storage and prep areas used for intended purposes
- Chemical Management Certification
- Stretch Energy Code compliance
- Public bidding and procurement compliance
- Conformance with MSBA SLI guidelines

**Refer to Board Action Letter*

Chemical and General Storage Management

With the assistance of the OPM and design team, the District will:

- Complete the implementation of the Chemical Management Certification in accordance with Attachment B of the MSBA Board Action letter dated 02/23/2012
- Work with EPA
- Dispose of unneeded materials
- Temporary relocation of chemicals during construction
- Relocate chemicals for final occupancy
- Each District must ensure that areas designated as chemical storage and prep areas are being used for their intended purpose and not for offices, lunch areas or other inappropriate uses (based on conditions of invitation).

Project Funding

- District is scheduled to have PFA in Oct / Nov 2012 (after SD/PSB approval)
- One funding agreement
- Incentive points - not applicable
- MSBA will contract with Cx if applicable

Guidance on Consultant Fees

- OPM must submit draft proposals of OPM and architect's fees to the MSBA prior to submittal of proposal to district.
- OPM
  - FS thru PS+B – Anticipate fees up to $20,000.
- Architect
  - FS thru PS+B - $50k - $200k depending on project scope.

Module 3 & 4 Guidelines

- Condensed as appropriate based on project scope
  - Space Summaries for Core Academic only plus any other affected areas.
  - Ed plan for Science Department only plus any other affected areas.
  - Mod 3 and 4 submittal (as a combined package) prior to the appropriate Board Meeting per MSBA schedule: **Oct = Aug 9, Nov = Sept 27**
- Mod 3 – Feasibility Study
  - Preliminary Design Program (*loose submittals at scheduled meetings)*
  - Preferred Schematic Report (*loose submittals at scheduled meetings)*
- Mod 4 – Schematic Design
  - Submittal package per Mod 3 & 4, reviewed by OPM and submitted to MSBA.
  - DESE submittal required specific to the science department and other affected areas.

Design Enrollment

District	School	Age of Existing Building	Grade	2011/2012 Enrollment	Adjusted Enrollment
Blackstone Valley Regional Vocational Technical School District	Blackstone Valley Regional Vocational Technical High School	1964	9-12	1,147	**574**
Gardner	Gardner High School	1976	9-12	636	636
Holyoke	William J. Dean Technical High School	1989	9-12	573 / 700	**404**
Medford	Medford High School	1971	9-12	1,227	**1,305**
Melrose	Melrose High School	1975	9-12	1,026	1,026
Nashoba Regional School District	Nashoba Regional High School	1961	9-12	1,016	1,016
North Attleborough	North Attleborough High School	1973	9-12	1,209	1,209
Saugus	Saugus High School	1953	9-12	709	709
Swansea	Joseph Case High School	1975	9-12	587	587
Tri-County Regional Vocational Technical School District	Tri-County Regional Vocational Technical High School	1977	9-12	1,006	**503**

Science Lab Guidelines

- **Requirements**
  - The MSBA allotment of 1,440 nsf for each science lab is based on 60 nsf per student (24 students). Smaller science classrooms may be considered if the class size is smaller, with a minimum of 60 nsf per student.
  - The district and design team should provide for a science lab layout that allows as much flexibility and universality as practical, given the district's science department educational plan.
  - Both lab and lecture configurations must be accommodated in every designated science lab room. Separate labs and lecture rooms are not permitted.
  - No raised lab utilities, that may restrict flexibility, are to be provided in the central floor area of the science labs. Utilities from a grid suspended from the ceiling may be needed for some disciplines, but only if the peripheral utilities cannot accommodate most needs.
  - No fixed casework is permitted in the central floor area.

Science Lab Guidelines - continued

- **Best Practices**
  - Sturdy, standing-height two-student tables should match the height of peripheral countertops so that students perform lab work standing (preferable) and "seat work" on stools. Two-student tables (not larger) are recommended so they can be moved into a variety of configurations. Adjustable-height tables are not recommended.
  - Stub utilities where needed for potential future configurations.
  - Sinks should be wide and deep enough to accommodate buckets and other large containers.
  - Optional fume hoods and bio-safety cabinets should be accessible from both the prep room and the classroom.
  - Provide full black-out window treatment in labs.
  - Provide moveable teacher demonstration tables (not fixed).
  - Each lab prep room should include one refrigerator and one dishwasher.
  - Provide visual access between labs and prep rooms / prep room doors.
  - Shared spaces can be reduced in area, with saved areas reallocated elsewhere as needed.
  - Prep rooms and chemical storage should be keyed in such a way to provide limited access, for required personnel only.

Science Lab Guidelines - continued

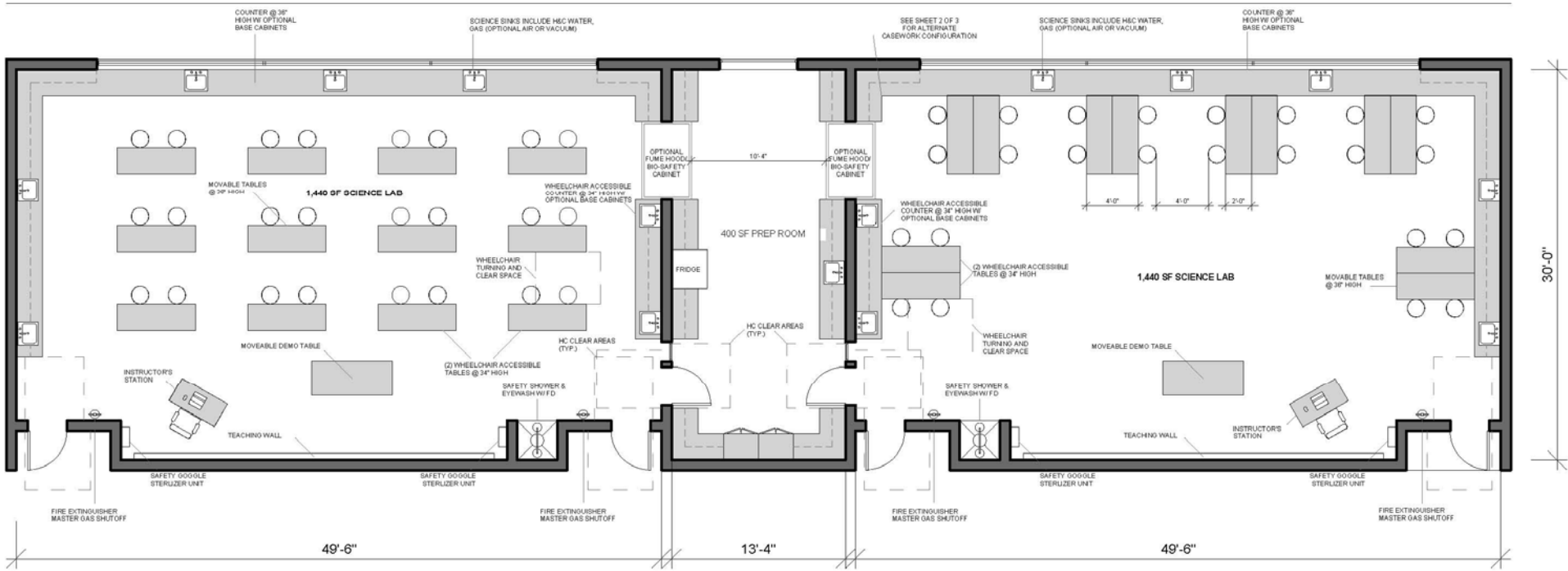
- **Best Practices** (continued)
  - At the districts discretion, chemical storage can be divided into satellite storage rooms, but chemical storage in prep rooms is discouraged.
  - Safety equipment and information such as fire blankets, sterile eye protection, and material safety data sheets (MSDS) should be located in highly-visible and easily-accessed places, preferably near exits and other required safety equipment.
  - Rather than green houses, consider designs that allow plants to be placed on shelves or moveable racks with access to light from classroom windows.
  - At least two means of egress from each lab should be provided (the building code may require this, depending on area).

Additional "post visit" Best Practices:

- *Plumbing fixtures should have both cold and hot water*
- *Eye wash units should be multiple & distributed faucet mounted units (rather than a single station, and not the bottle type).*
- *Student tables should not include under-counter storage.*

Science Lab Guidelines - Prototype Design

- Scheme A



Front Facing / Large Group Instruction / Teams of 2 Configuration

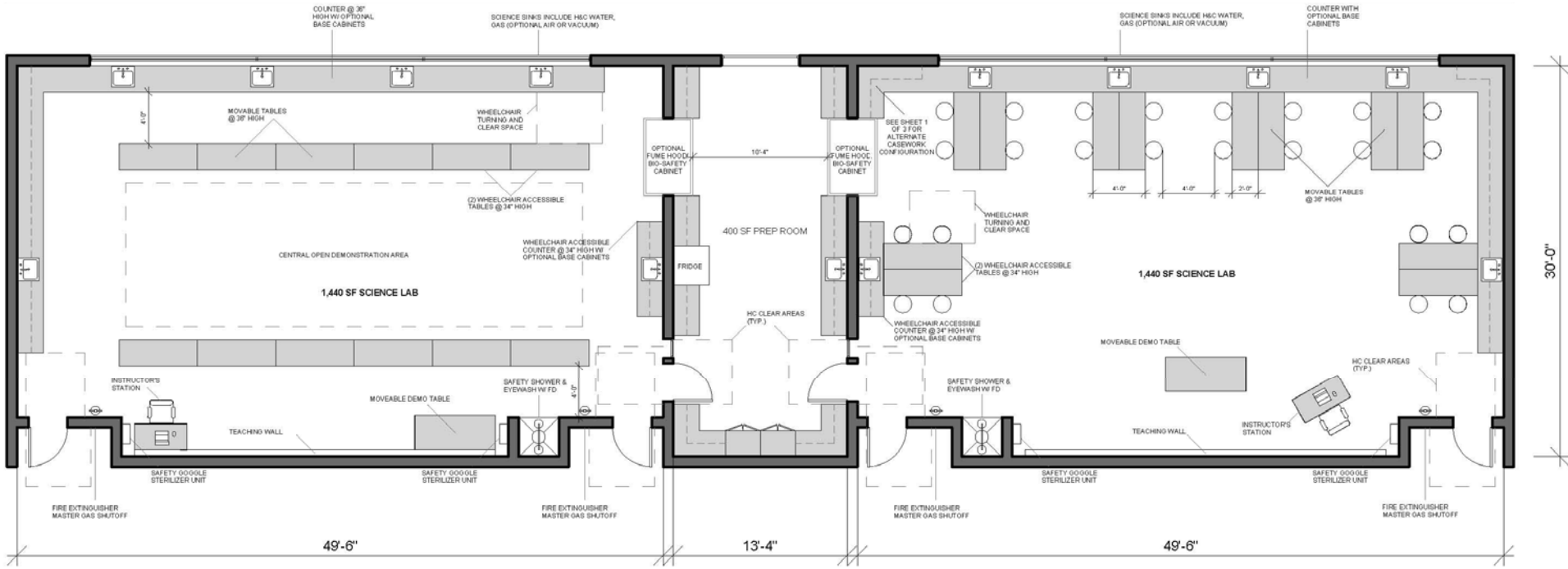
Lab Configuration 1

Room Size: 1,440 SF
24 Students / 1 Instructor
60 SF /student in Lab Area

Room Size: 1,440 SF
24 Students / 1 Instructor
60 SF /student in Lab Area

Science Lab Guidelines - Prototype Design

- Scheme B



Ramp / Motion Studies Configuration

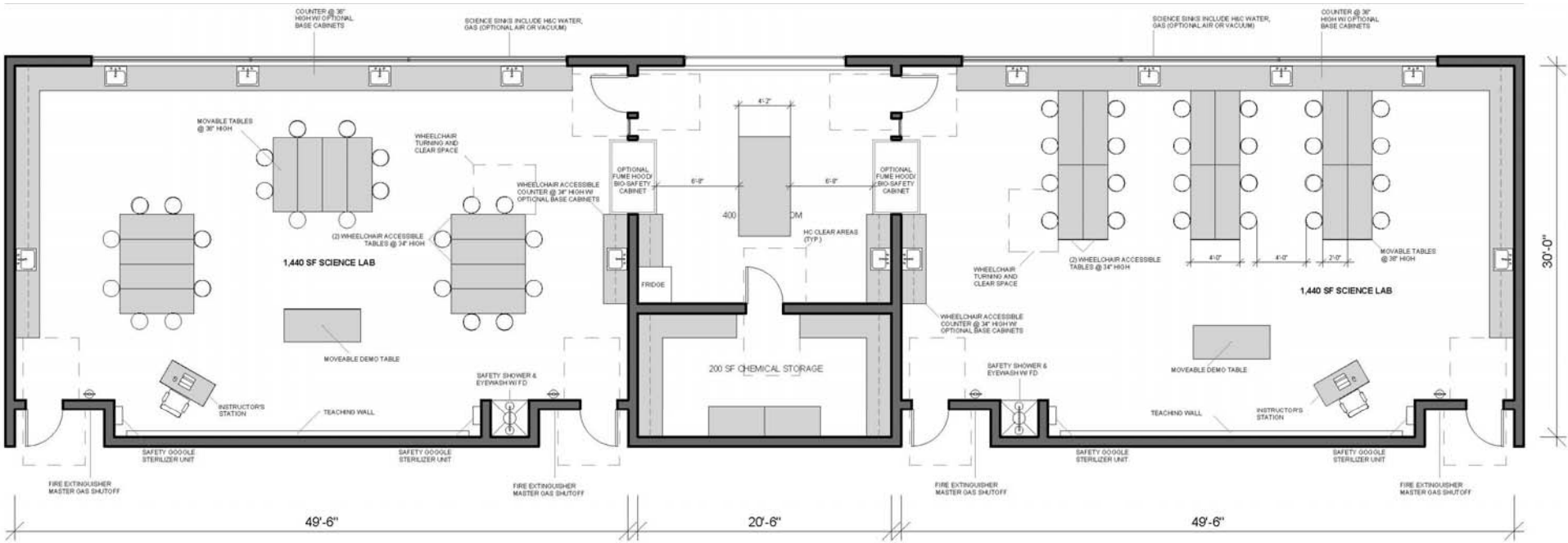
Room Size: 1,440 SF
24 Students / 1 Instructor
60 SF /student in Lab Area

Lab Configuration 2

Room Size: 1,440 SF
24 Students / 1 Instructor
60 SF /student in Lab Area

Science Lab Guidelines - Prototype Design

- Scheme C *(showing chemical storage room)*



Mid-size group / Robotics Configuration 1

Room Size: 1,440 SF
24 Students / 1 Instructor
60 SF /student in Lab Area

Mid-size group / Robotics Configuration 2

Room Size: 1,440 SF
24 Students / 1 Instructor
60 SF /student in Lab Area

FF&E Funding

- Develop and submit FF&E budget based on room data sheets and a listing of all items required.

Blackstone Valley Regional HS

- District: Blackstone Valley Regional
- Reimbursement Rate: 53.5%
- Built in 1964, exterior repairs, a new HVAC system and roof in 2005.
- Current Enrollment: 1,147 (adjusted enrollment 574)
- GSF: 282,290 sq. ft.

Blackstone Valley Regional HS

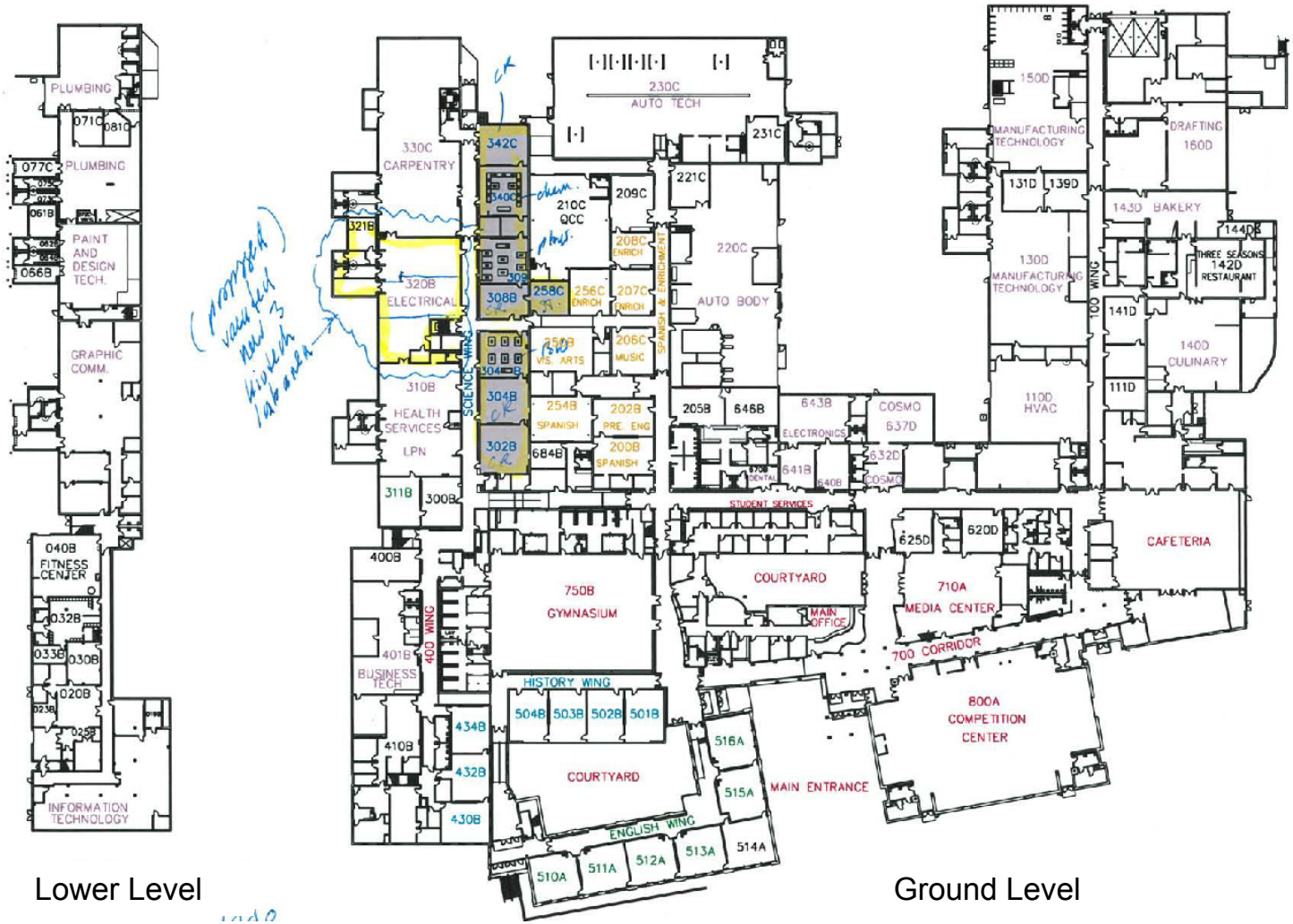
- Labs are in the original portion of the building, with full interior upgrades dating to the renovation, although very limited access to exterior walls.

- School currently has 9 small labs, although some of these are limited to lecture classroom in equipment and size.

- District wants to enlarge the science dept into the existing vacated electrical / voc-tech area by converting it into 3 biotech labs.

- There is no project budget set yet until FS options are presented.

Blackstone Valley Regional HS



Lower Level

Ground Level

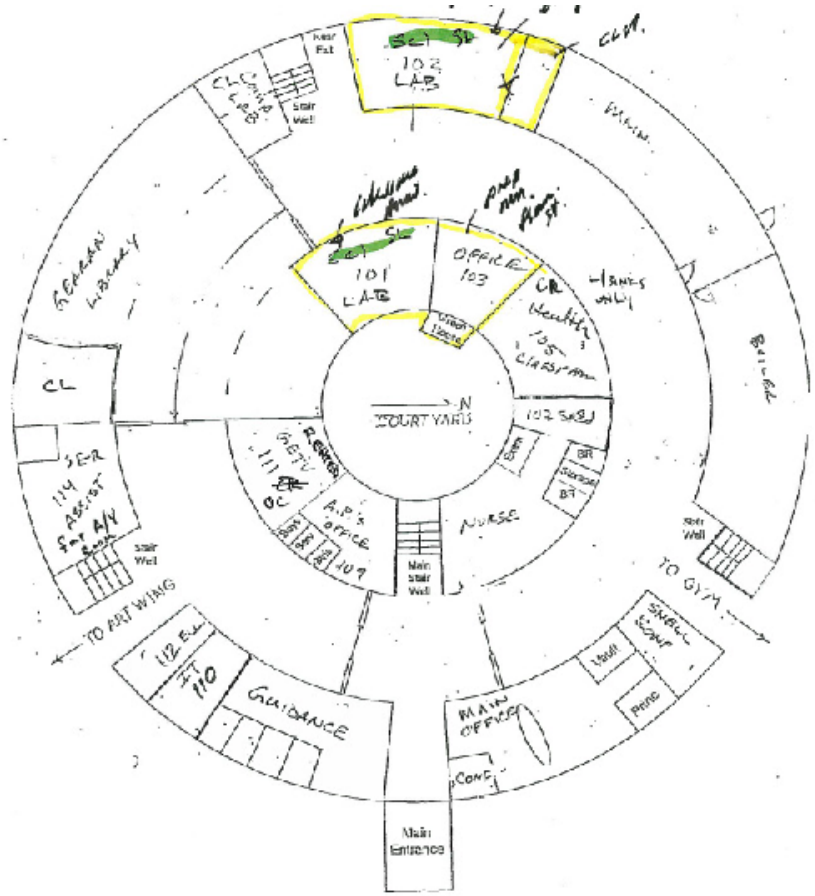
Gardner High School

- District: Gardner
- Reimbursement Rate: 79%
- Built in 1976, band room addition in 2002 and new roof in 2011.
- Current Enrollment: 636
- GSF: 214,000 sq. ft.

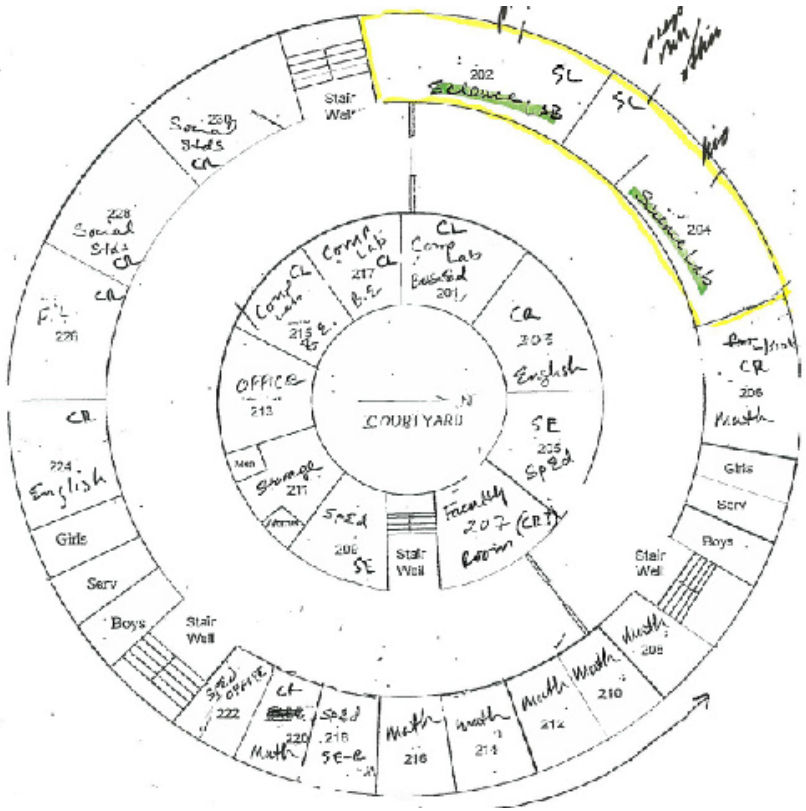
Gardner High School

- 18-20 students per science lab, approximately 1400 SF each.
- Science department SF area is potentially adequate but outdated. Original enrollment for 1200, current is 636.
- Existing building has no sprinkler system and is approximately 75% HC compliant.
- SOI states a need for replacement of all exterior windows, doors and 3 boilers.
- The District has no set budget, deferring to the study.

Gardner High School

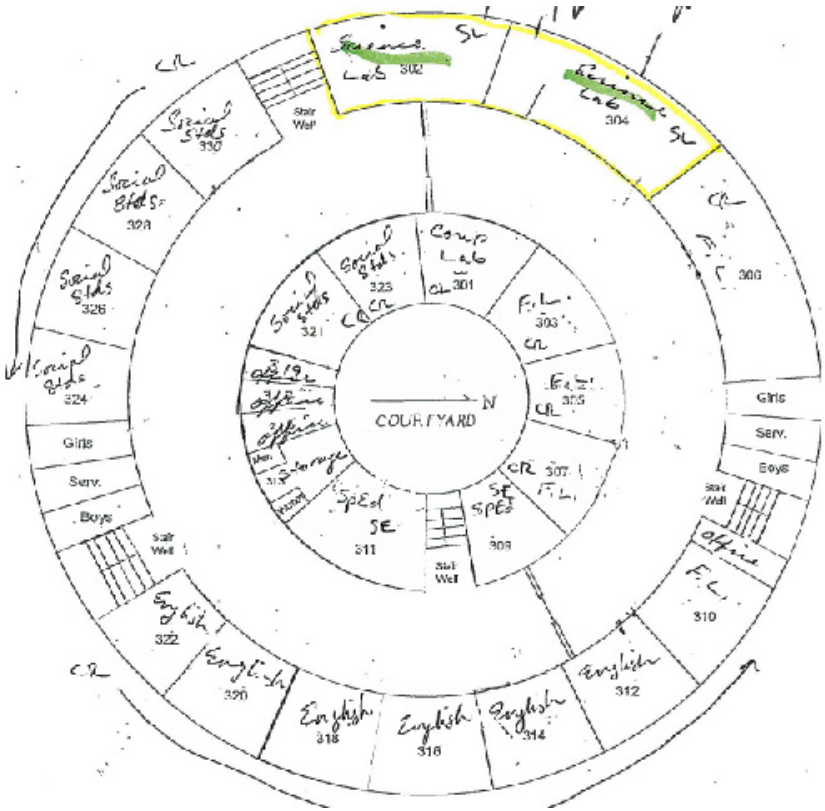


First Floor

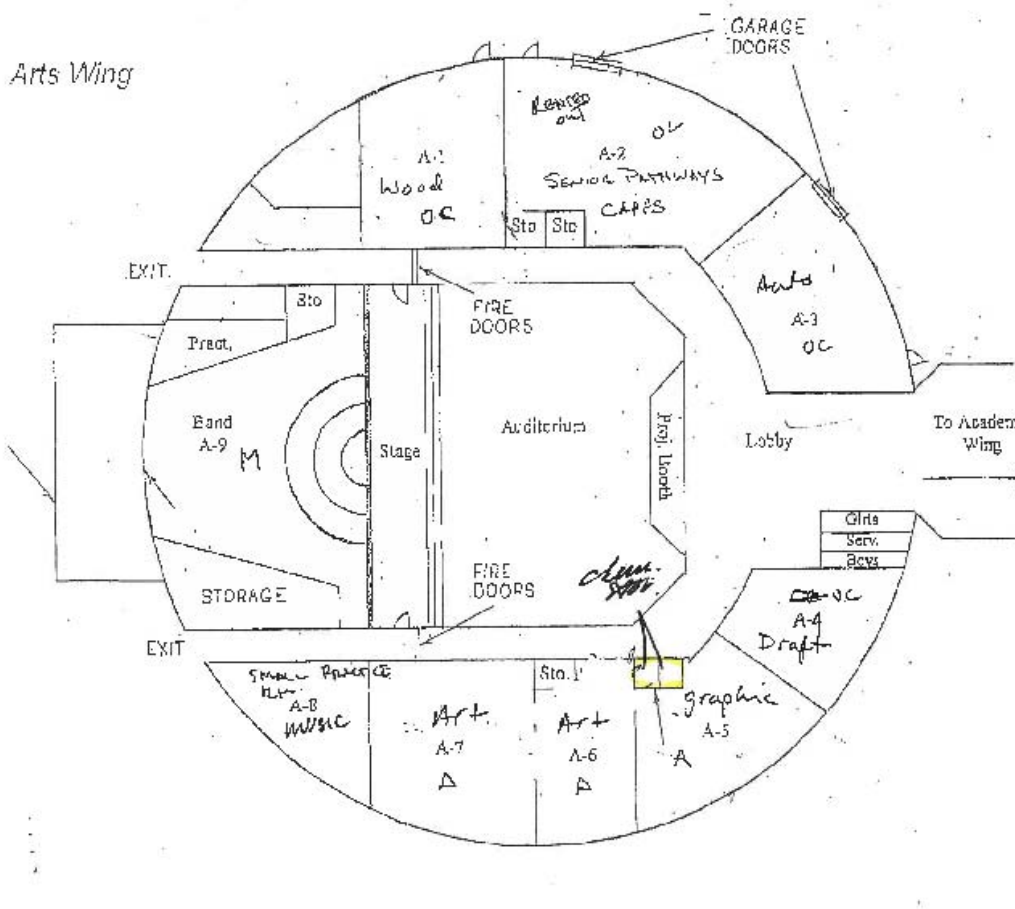


Second Floor

Gardner High School



Third Floor



Arts Wing

William J Dean Vocational Technical HS

- District: Holyoke
- Reimbursement Rate: 80%
- Built in 1989, new roof in 2011.
- Current Enrollment: 700 (adjusted enroll: 404)
- GSF: 212,000 sq. ft.

William J Dean Vocational Technical HS

- Existing Science Lab Dept. SF is slightly under MSBA standards for net SF, spread over 3 floors (due to availability of classrooms, not by choice).

- District would prefer to relocate all SD to 3rd floor except for the shop / fab-lab spaces which would be on the second floor adjacent to the shop classroom.

- Voc-tech split is as follows - 9th is 80% academic, 10th - 12th is 50% resulting in a modified DE of 140 for grade 9, and 88 each for grades 10 - 12 (total modified DE = 404, total current DE = 700).

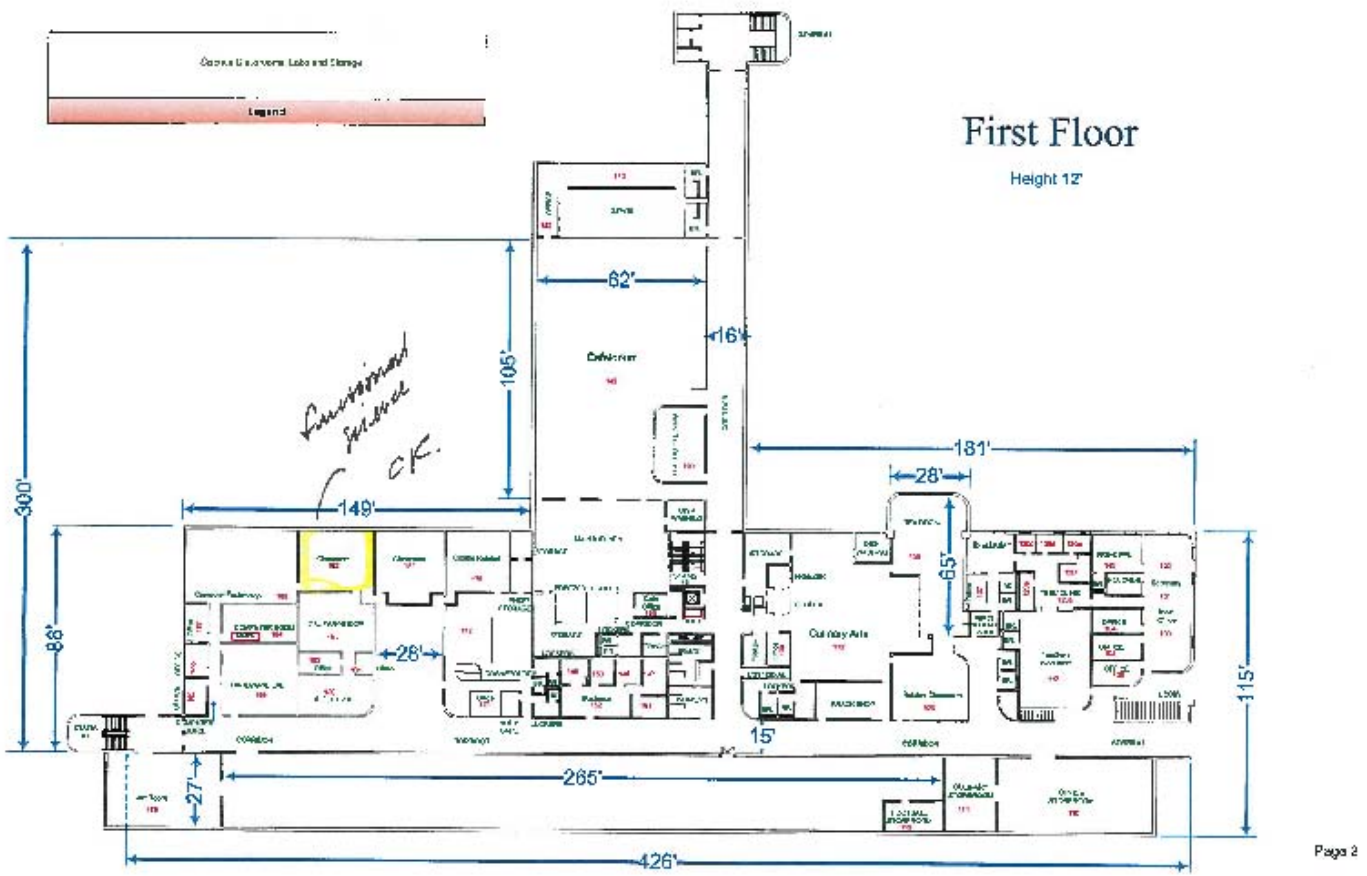
- The District prefers to renovate in place so the existing net area is more than sufficient per modified DE.

- The District has no set budget, deferring to the study.

- The District notes a future potential DE of 700 which, using the split already noted, would result in a modified DE of 404.

- Interior renovation is very viable since many partitions are moveable and the 3 existing labs have perimeter utilities.

William J Dean Vocational Technical HS



William J Dean Vocational Technical HS

Second Floor

Third Floor

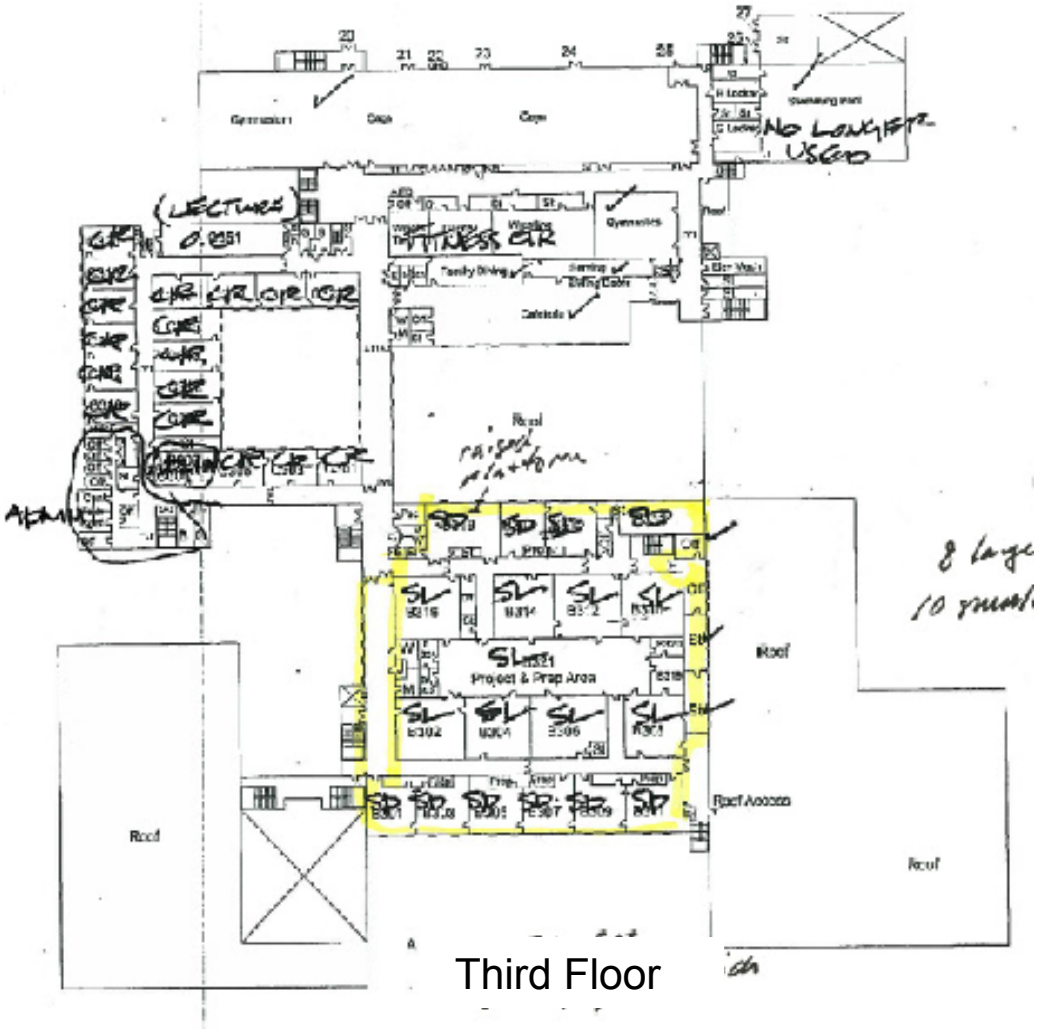
Medford High School

- District: Medford
- Reimbursement Rate: 59.2%
- Built in 1971, new exterior doors in 1999, new roof in 2000, and a new boiler in 2005
- Current Enrollment: 1,227 (adjusted enroll: 1,305)
- GSF: 532,000 sq. ft.

Medford High School

- HS students go to one of 3 schools within the facility (Curtis Tufts for sped students, MVTHS or MHS).
- Little HC compliance, no sprinkler system.
- The SD is appropriately sized, all seem adequate although 8 are small.
- Generally, current layout could work with some modifications.
- Central Project / prep area should be reconfigured. Room 319 has a poured concrete stepped lecture floor.
- District anticipates construction budget of $5M.

Medford High School



Third Floor

Melrose High School

- District: Melrose
- Reimbursement Rate: 50.8%
- Built in 1975, upgraded mech in early 1980's, electric in 2008, and roof between 1994-2012, new vestibule and doors in 2008.
- Current Enrollment: 1,026
- GSF: 241,000 sq. ft.

Melrose High School

- District wants to renovate 11 SL, MSBA guidelines show that they should have fewer bigger labs.

- District wants to keep SD same size. Could encroach into adjoining spaces if guideline class sizes and enrollment show that the SD should be bigger.

- Facility is bigger than DE warrants. District says HVAC reno will be separate project.

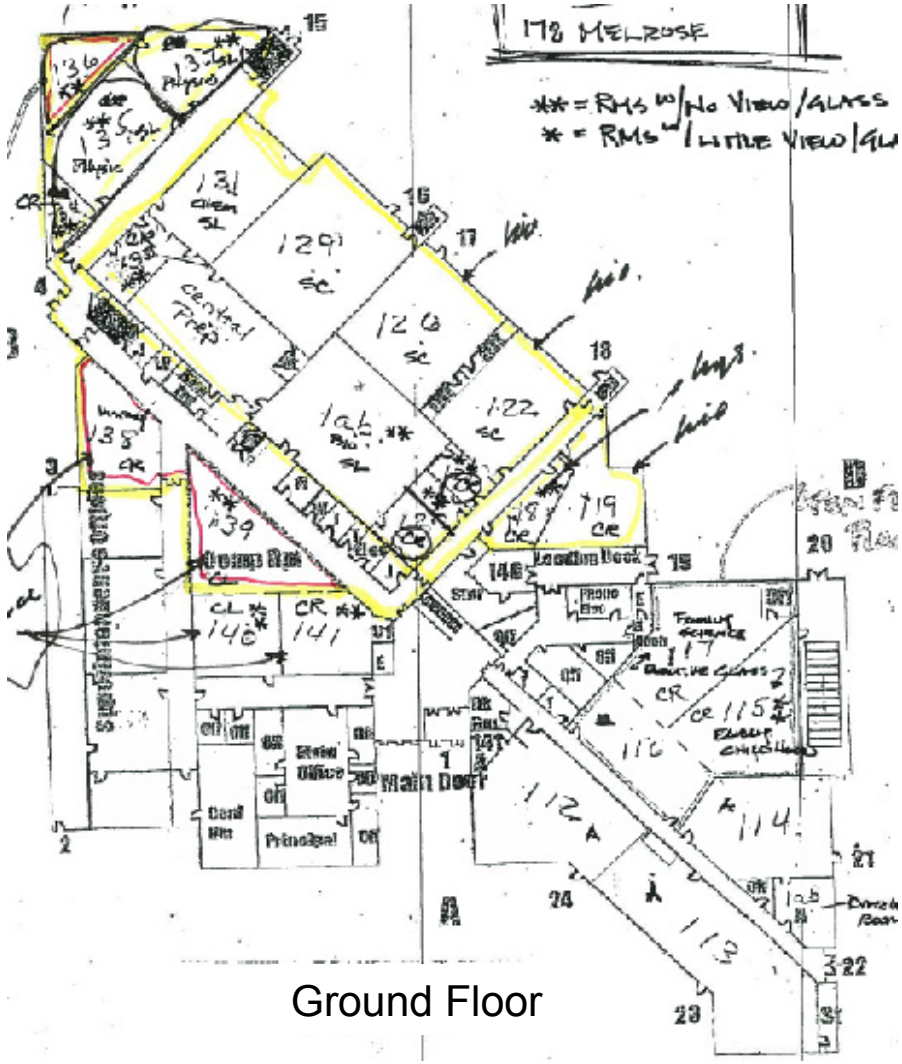
- DRA did original HS. HC reno up to date. All but the first floor was renovated so SD has no fire sprinkler system.

- SOI states a need to modernize eleven 1970's era SL to current MSBA standards.

- SOI also states Replace components if building HVAC (replace existing RTO's with a new chiller)

- District anticipates a construction budget of $1.5M.

Melrose High School



Nashoba Regional High School

- District: Nashoba
- Reimbursement Rate: 46%
- Built in 1961, CR wing, gym and media center addition in 1970, auditorium and admin added in 2002. HVAC, electric upgrades, new roof and CR windows in 2002.
- Current Enrollment: 1,016
- GSF: 194,500 sq. ft.

Nashoba Regional High School

- Original 1961 building with 1970's & 2000's addition.

- Lower level (existing 1960s original and end of 70's addition) is SD of 10 labs although an additional SD office could be used as a lab to make 11.

- The six 70's labs have sitting-height fixed tables in a row with plumbing etc, the original 4 labs are well configured and adequately sized with large prep rooms.

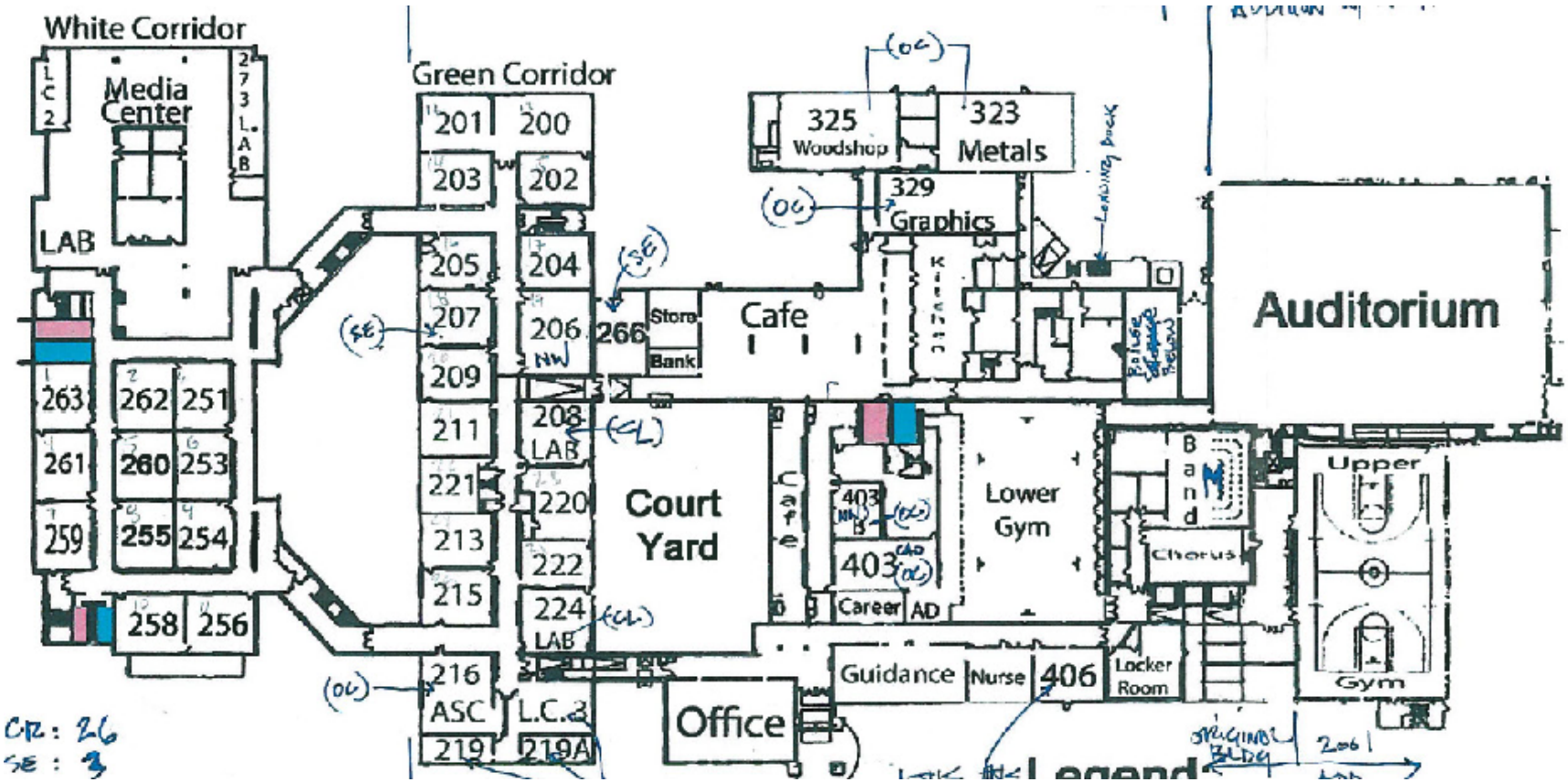
- LPA conducted a FS in 2008.

- SOI states a need for an additional SL and upgrades to 2 existing SL and the addition of 3 SL (eng design, biotech, and advanced chem)

- SOI also states a need for the replacement or repair of the existing roof and windows.

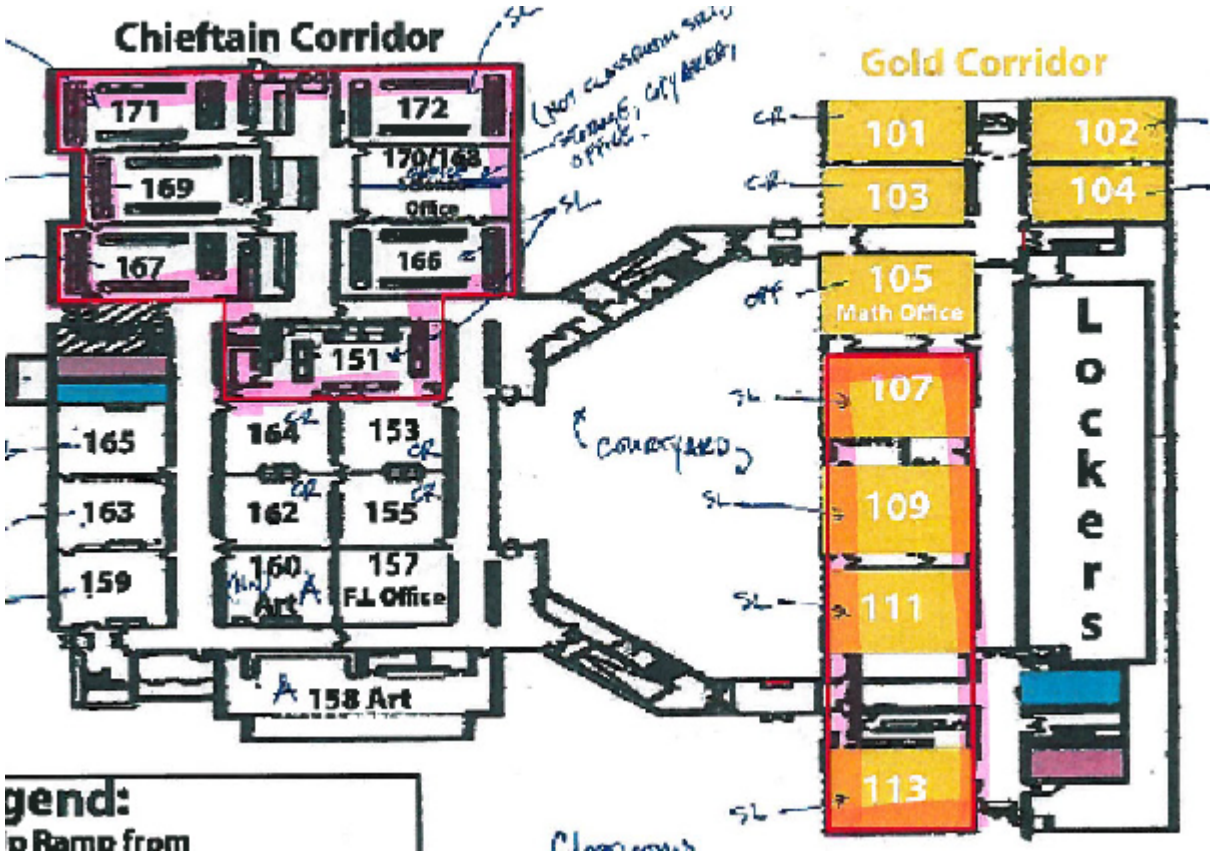
- The District has no set budget, deferring to the study.

Nashoba Regional High School



Ground Level

Nashoba Regional High School



Lower Level

North Attleborough High School

- District: North Attleborough
- Reimbursement Rate: 52.1%
- Built in 1973, ADA improvements made in 1998, New roof in 2001, six module CRs added 2002, new chiller and cooling tower in 2004.
- Current Enrollment: 1,209
- GSF: 175,000 sq. ft.

North Attleborough High School

- 12 existing labs, all but 1 (physics) is on 2nd floor as dept based plan.

- Existing bldg is open plan from 70's with new partitions that went up immediately after opening, wasteful areas in wide corridors and large open stairwells.

- Poorly configured renovations and new walls close off HVAC, plumbing, and access to light and systems.

- The District wants to expand the existing labs into the adjoining Math dept, and plans to use first floor spaces previously occupied by collaborative area.

- District anticipates budget of $2-3 million.

North Attleborough High School

First Floor

Second Floor

Saugus High School

- District: Saugus
- Reimbursement Rate: 52.7%
- Built in 1953, CR / MP room addition in 1960, Library and café addition in 1972, new roof 1991, converted to gas in 2011.
- Current Enrollment: 709
- GSF: 193,200 sq. ft.

Saugus High School

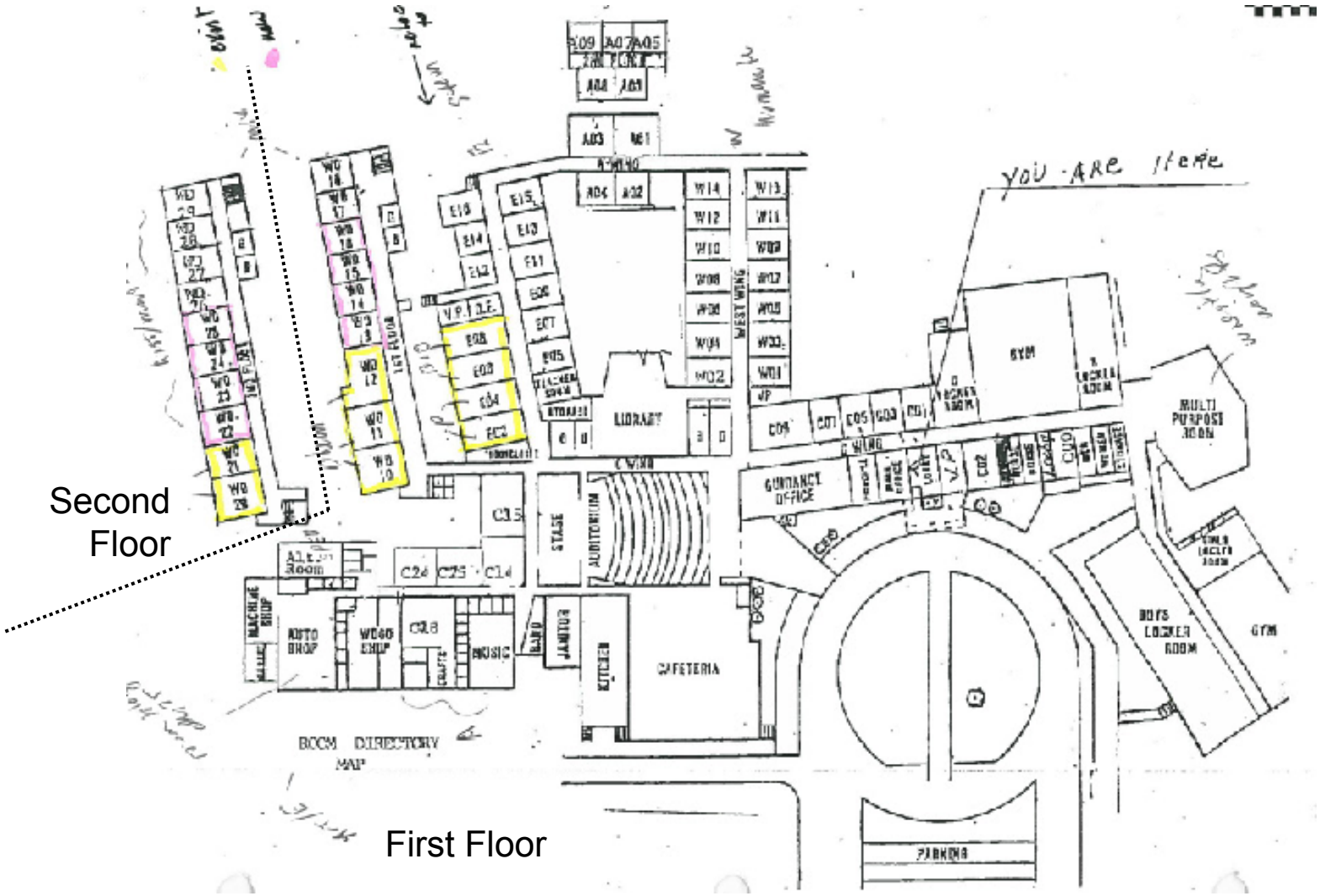
- Most of the existing 1950's facility is 1 story, with a 2 story 1972 "WD" addition which includes most of the Science Dept with 9 existing SL. District wants to convert this wing into a STEM dept.

- Town building dept is located in facility.

- EO wing has 2 physics & 2 bio labs, WD wing has 3 chem. on 1st & 2 Bio on 2nd. District wants to consolidate STEM to WD wing. "STEM" fab-lab is an old school industrial arts shop.

- The District has no set budget, deferring to the study.

Saugus High School



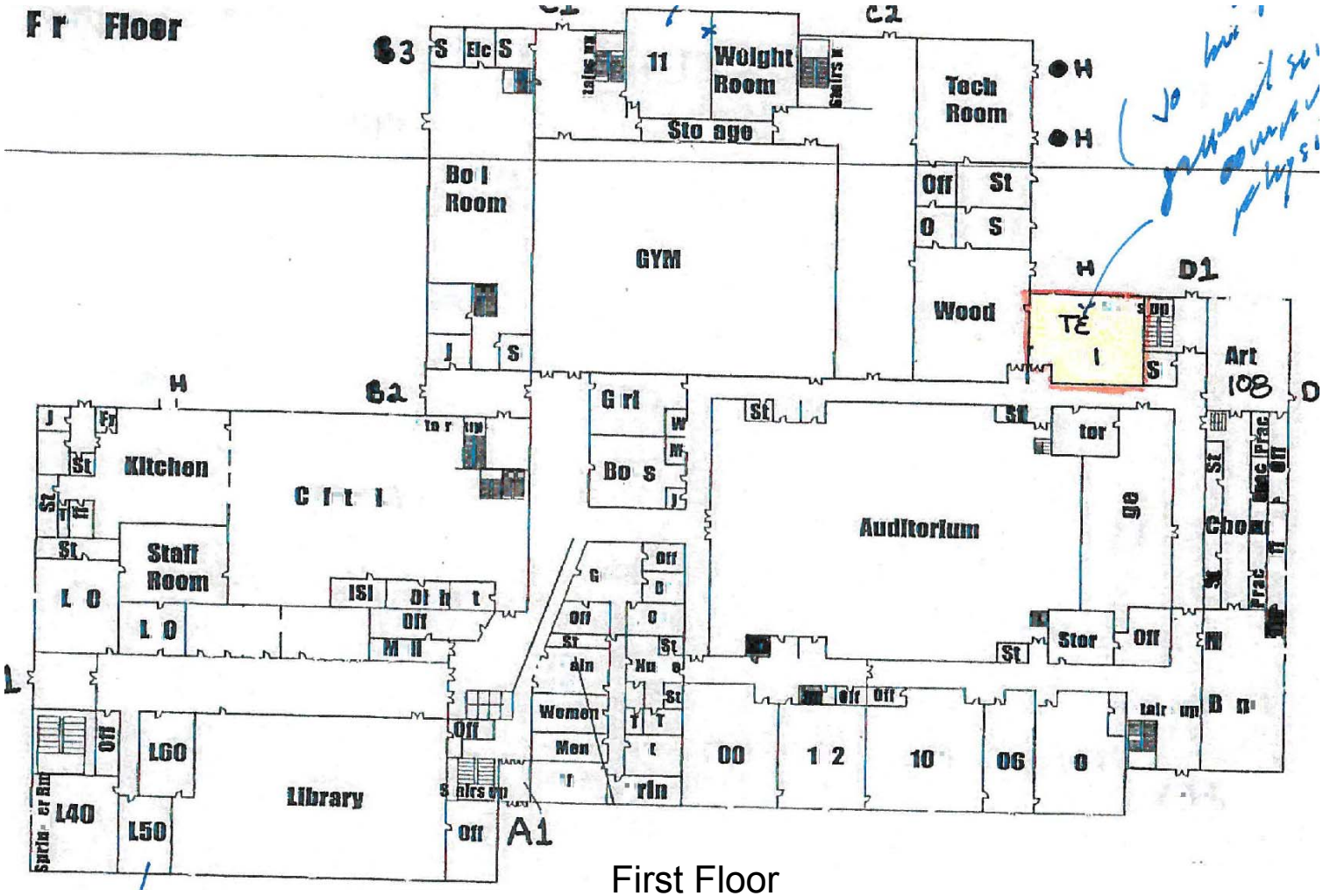
Joseph Case High School

- District: Swansea
- Reimbursement Rate: 54.2%
- Built in 1975, enclosing walls added 1977, new roof added 1996, gym renovation in 2011.
- Current Enrollment: 587
- GSF: 130,200 sq. ft.

Joseph Case High School

- Existing building has no fire sprinkler system or wireless network.
- HC is current.
- No existing chemical management plan is in place.
- The District has no set budget, deferring to the study.

Joseph Case High School



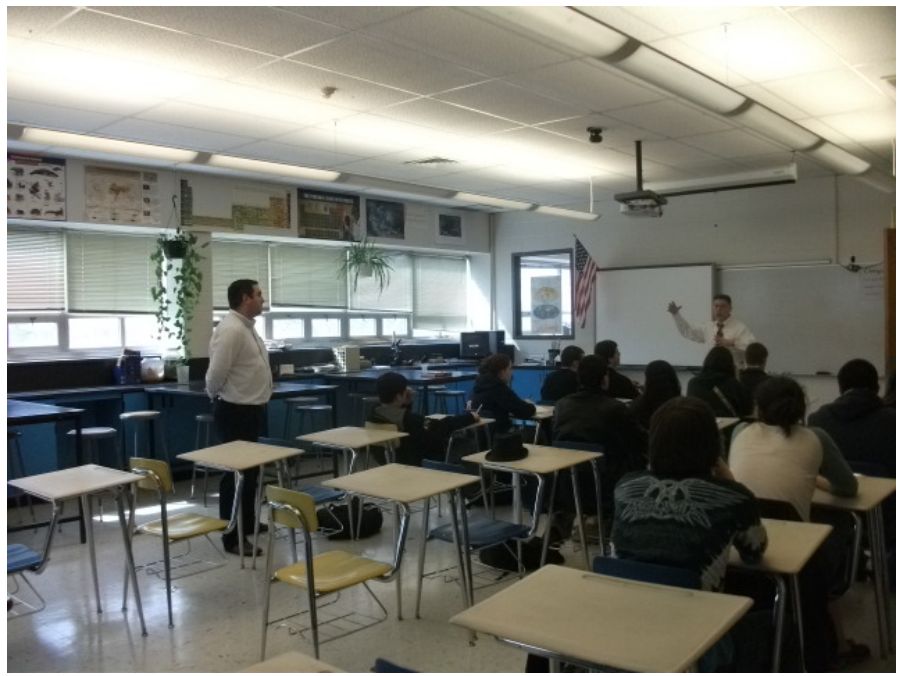
First Floor

Joseph Case High School

Second Floor

Tri-County Regional Vocational HS

- District: Tri-County
- Reimbursement Rate: 50.8%
- Built in 1977, new boilers in 1992, electric repair and roof replacement in 2009, new HVAC in 2001
- Current Enrollment: 1,006 (adjusted enroll : 503)
- GSF: 289,500 sq. ft.



Tri-County Regional Vocational HS

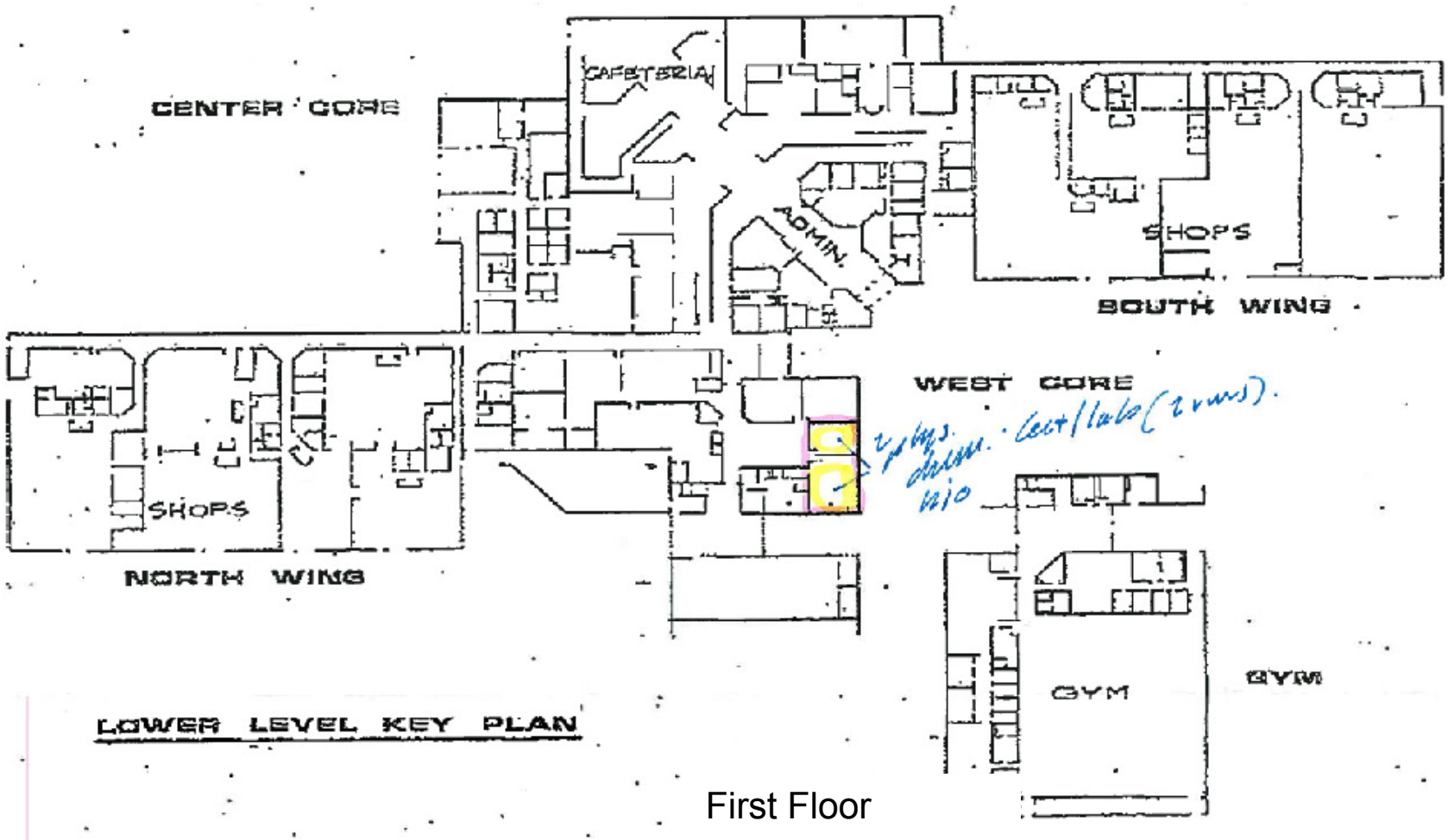
- Split students by week, so use 1/2 enrollment for calculating academic areas.

- 70's internal spaces allow limited access to exterior envelope.

- Existing SL are oversized (1620 - 2000 SF each). Upper level includes all but two labs - 5 labs plus 1 science lecture room.

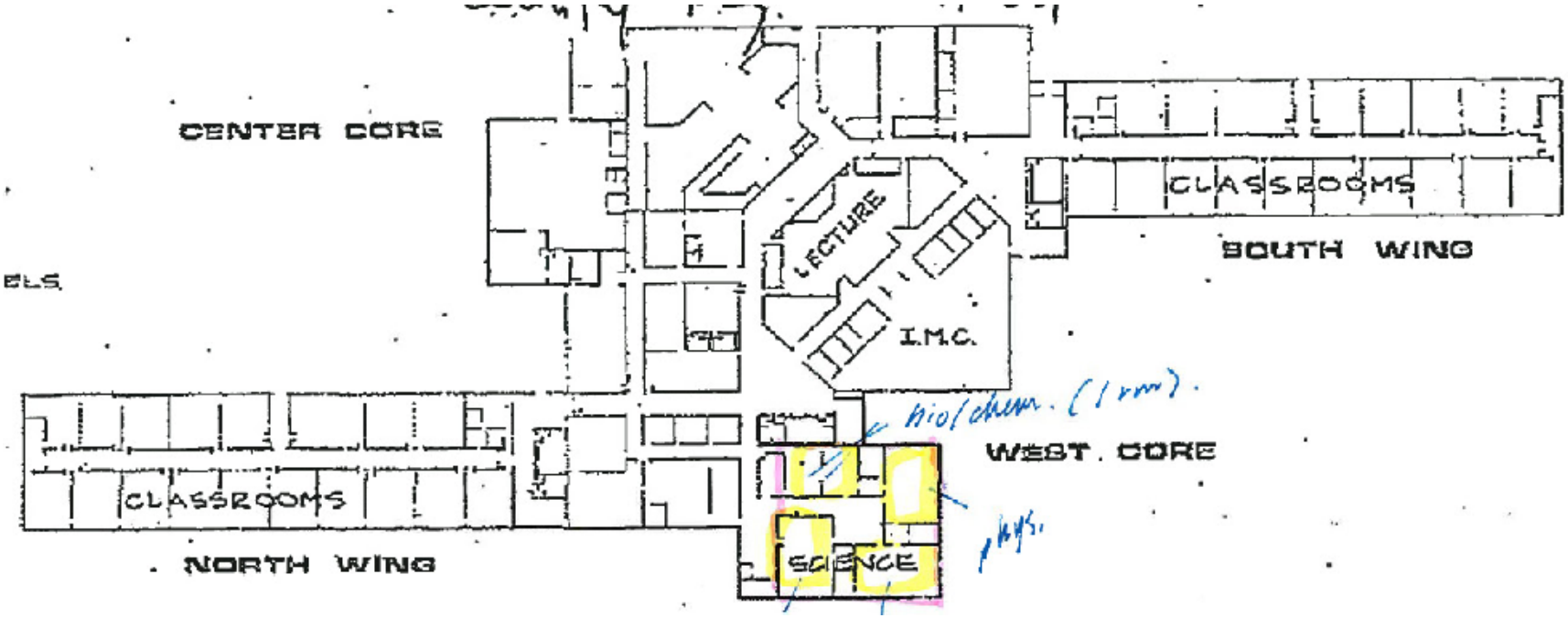
- District anticipates a construction budget of less than $1 million.

Tri-County Regional Vocational HS



First Floor

Tri-County Regional Vocational HS



Second Floor

Steven Grossman
Chairman, State Treasurer

John K. McCarthy
Executive Director

Please refer to the MSBA website "Our Programs and Initiatives" for additional information.

Questions?

Contact: Karl Brown
617-720-4466
Karl.Brown@massschoolbuildings.org

Katie Loeffler
617-720-3027
Katie.Loeffler@massschoolbuildings.org

Conclusion:

Prototype Design

- Egress Calculation

1,258 NSF
Movable Tables

1,097 NSF
Fixed Demo Table and Peninsula

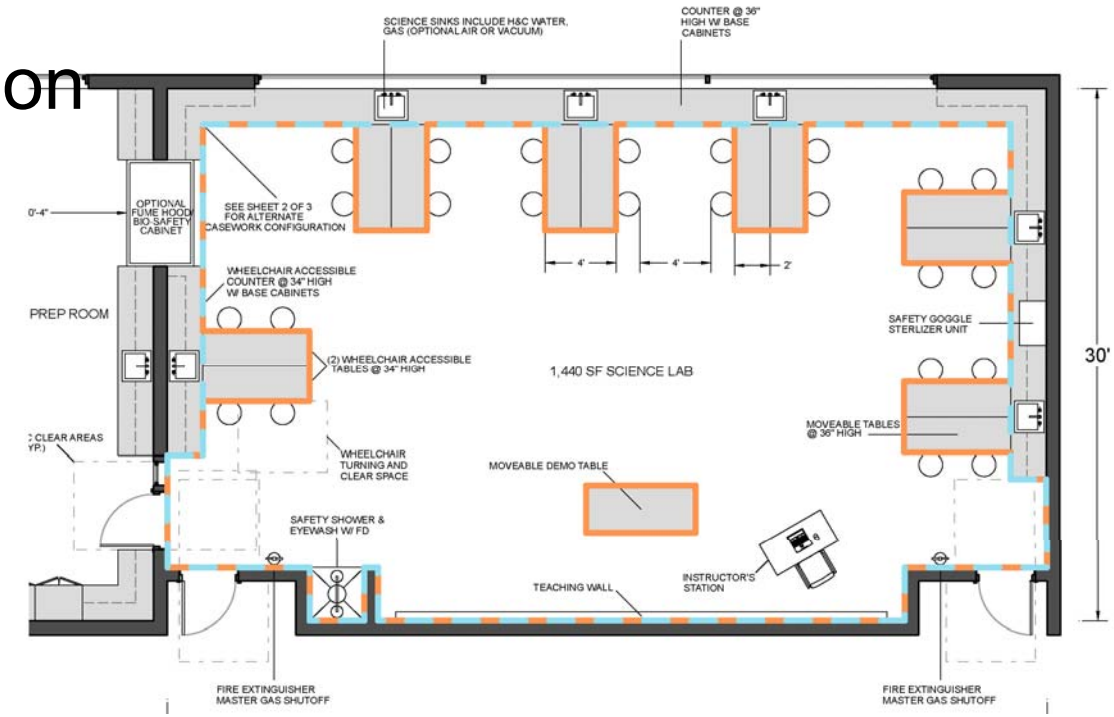


Table 1004.1.1 educational occupancy (classrooms) assumes 20 SF of net floor area per occupant (that goes up to 50 SF per occupant for shops and other voc tech rooms).*

Table 1015.1 educational occupancy max load of 49 occupants for rooms with one means of egress.*

Therefore 2 means of egress is required for any classroom with greater than 980 SF of net area (exclusive of built-in casework, fixed equipment, etc).

* 8th Edition Massachusetts State Building Code