Northeast Metro Tech

Building Committee

DRA

PMA Consultants

January 21, 2021

Agenda

Northeast Metropolitan Regional Vocational High School

- SBC Vote to Approve Prior Minutes
- Designer Update
  - MSBA Facilities Assessment Committee
  - Next Phase: Schematic Design
- OPM Update
  - Project Delivery Method
- Discussion

Key Project Milestones

Northeast Metropolitan Regional Vocational High School

MSBA Module #2 Forming the Project Team	MSBA Module #3 Feasibility Study	MSBA Module #4 Schematic Design	MSBA Module #5 Funding the Project
AUGUST 2019 *OPM Selection* ***JANUARY 2020*** *Designer Selection*	***JANUARY 2020*** *Begin Feasibility Study* ***AUGUST 2020*** *SBC approves PDP* *Submit PDP to MSBA* ***SEPTEMBER 2020*** *SC approves Education Plan* ***DECEMBER 2020*** *SBC approves PSR* *Submit PSR to MSBA* ***JANUARY 2021*** *MSBA FAS Meeting* ***FEBRUARY 2021*** *MSBA BOD approves PSR*	***JANUARY 2021*** *Begin Schematic Design* ***JUNE or JULY 2021*** *SBC approves SD/DESE design package* ***JULY 2021*** *Submit SD/DESE to MSBA* *MSBA FAS Meeting* ***AUGUST 2021*** *MSBA BOD approves project scope & budget*	***LATE DECEMBER 2021*** *Local funding approval deadline*

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Acronym glossary

BOD – Board of Directors (MSBA)
DESE – Massachusetts Department of Elementary & Secondary Education
Ed. Plan – Educational Plan
FAS – Facilities Assessment Subcommittee
ISS – Initial Space Summary
MSBA – Mass. School Building Authority
OPM – Owner's Project Manager
PDP – Preliminary Design Program
PSR – Preferred Schematic Report
SBC – School Building Committee
SC – School Committee
SD – Schematic Design

Updated 9.9.2020

Facilities Assessment Subcommittee Comments Include:

- Positive reaction to proposed **School Location**
  - *Will relieve traffic congestion on Hemlock Road*
  - *Will improve separation of Breakheart Reservation parking*
  - *Will minimize disruption of existing school during construction*
- Appreciation of Updated **Education Program**
  - *Inclusion of non-AP electives*
  - *Consideration of additional Professional Development*
- Positive reaction to proposed **Floor Plans**
  - *Appreciation of compact footprint*
  - *Improved flow, security, and access*
  - *Distribution of Special Education spaces*

Facilities Assessment Subcommittee follow-up:

- Parking locations and proximity to **Breakheart Reservation**
  - *Detail what steps the project team has taken to understand the parking and traffic flow on the site*
  - *What refinement is slated to take place in Schematic Design?*
- Use of the **Gymnasium**
  - *Detailing the district's plans for the physical education schedule*
- Site **Drainage**
  - *Detail what steps the project team has taken to understand any drainage concerns*
  - *What steps have been taken and/or will be taken to mitigate those concerns?*
- Location of the **PK playground**
  - *Describe the proximity of the PK playground to the auto shop storage yard*
  - *Address where the auto shop storage yard will be exhausting to*

Schematic Design Phase

Northeast Metropolitan Regional Vocational High School

Goal:

Define the major **Project parameters**:

- Scope 
- Budget 
- Schedule 

Schematic Design Phase

Northeast Metropolitan Regional Vocational High School

Architectural Design areas:

Building Massing

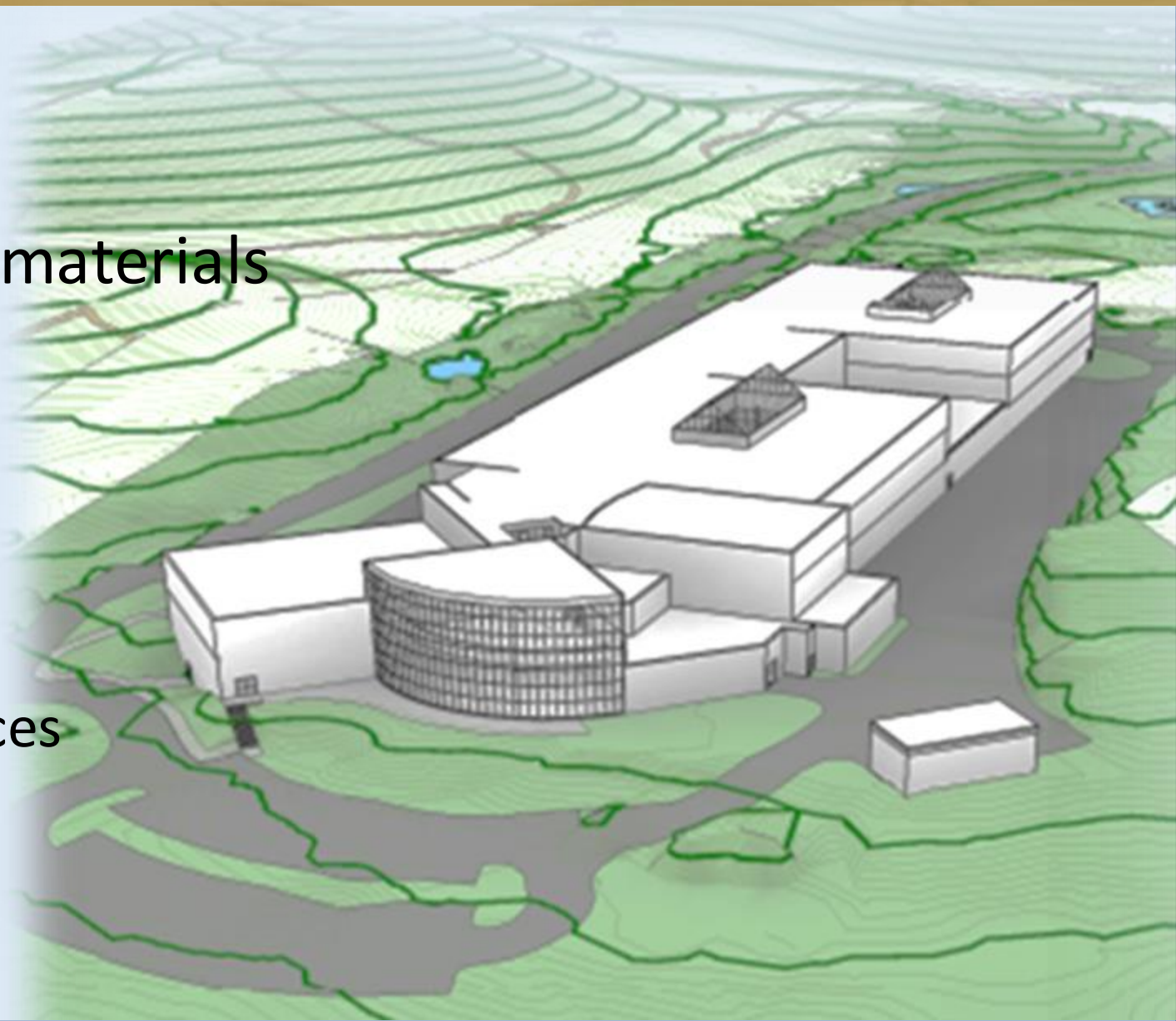
Building envelope, exterior materials

Major Interior spaces:

- Lobby
- Cafeteria
- Auditorium
- Library/ Media Center
- Corridors & Break-out spaces

Shops Layouts

Typical Classrooms



Schematic Design Phase

Northeast Metropolitan Regional Vocational High School

Site Design areas:

Confirm circulation, traffic flow & parking

Athletic field program

Exterior entrance areas, hardscape

Utility infrastructure

Wetlands impacts & Stormwater Drainage

Schematic Design Phase

Northeast Metropolitan Regional Vocational High School

Engineering Design areas:

- Structural system(s)
- Mechanical systems selection
- Mechanical & Electrical system narratives and system diagrams
- Security system strategies and equipment
- Network & Information Technology systems narratives & diagrams

Schematic Design Phase

Northeast Metropolitan Regional Vocational High School

Upcoming Meetings:

- Weekly Project Team
- Bi-Weekly Working Group
- Monthly Building Committee
- Faculty, Department Heads & Instructors
- Advisory Committees
- Community Meetings
- Conservation Commission
- Local Officials- Building, Fire, Traffic, DPW, DCR
- Security – Administration, First Responders

Project Delivery Methods

Northeast Metropolitan Regional Vocational High School

Design-Bid-Build Chapter 149

"Traditional approach" for Public Construction Project

- Project team takes design to 100% construction documents with little to no contractor / 3rd party involvement
- District can pre-qualify general contractors and subs
- Once plans are completed, bids are solicited from filed trade-contractors and general contractors
- Low "responsive and responsible" bidder is awarded the project
- Contract value is based on a "lump sum" amount

CMR Chapter 149a

(Chapter 193 of the Acts and Resolves of 2004)

- CM hired during the design process
- CM provides design phase, pre-construction and construction services
- CM becomes the builder of the project (the "contractor")
- CM & Owner participate in trade prequalification and sub contractor selection process
- Option for early release bid packages or "fast-track" schedules
- Contract value is based on "Guaranteed Maximum Price" (GMP)
- Open book accounting

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Construction Manager At Risk

Northeast Metropolitan Regional Vocational High School

Design-Bid-Build Advantages

- Familiar method & simple process to manage
- Fully defined project scope for construction
- Lowest price proposed and accepted, including contractor fee and overhead, secured competitively; “best price”
- Total project cost (w/o change orders) known on bid day
- Owner/Designer can completely control design
- Simple accounting
- **BEST SUITED FOR: Less complicated projects that are budget-sensitive, but are not schedule sensitive and not subject to change**

CM-at-Risk Advantages

- Selection based on qualifications, experience & proposed team rather than low cost (better project controls)
- Design phase assistance with budgeting, site logistics and constructability results in ability to address challenges early
- Early cost estimates & feedback to help in the design process results in a more accurate cost model
- Fast track schedule/early bids possible
- Team concept with Owner, OPM, Designer
- **BEST SUITED FOR: Projects that are time sensitive, challenging to define or subject to potential changes; projects requiring high construction oversight due to site logistics & phasing.**

Construction Manager At Risk

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Design-Bid Build Disadvantages

- May equate to a longer schedule duration
- Smaller pool of available bidders for NEMT.
- Hard price not known until bids are received; may require re-design and value engineering/re-bid if bids exceed budget
- Less GC project management
- No GC input in design, planning or budgets
- Typically less collaborative relationships
- Increases probability of disputes/claims (GC passes through changes)
- Changes and claims which may increase final project cost

CM-at-Risk Disadvantages

- Potential for higher up-front cost due to "filling holes" in scope and/or documents (with result of minimizing future change orders and avoiding delays)
- CM-at-Risk is a qualification based selection process – value can be selected over low bid
- CM-at-Risk usually reserved for more complex projects, resulting in higher upfront costs
- Most CMs signatory to union carpenters and laborers and preferred vendors
- CMs may work to "pad" their negotiated GMP contract to mitigate CM risk
- Open book accounting can encourage pass-thru costs
- Collaborative approach during pre-con may dissolve once GMP executed

General Project Risks with Both Project Delivery Methods

- Unforeseen Conditions (30, 39M) for both building and site conditions
- Incomplete architectural documents
- Poor or questionable qualifications of sub-contractors, poor performance. Pool of contractors available
- Sub-contractor or Trade contractor failures
- Working on and around occupied facilities
- Complex site logistics, phasing, occupied sites
- Less cooperative team environment
- Inadequate or over staffed GC/CM or general requirements
- Potential bid protests

Northeast Metropolitan Regional Vocational High School

CM-at-Risk Cost Consideration for NEMT

Potential cost consideration between DBB and CM-at-Risk

For budget comparison, utilizing an excerpt from the MSBA Joint OPM & Contractor Roundtable held on 10-20-2016:

> *Bid Result: When evaluating construction cost as established in the Project Funding Agreement Amendment based on bid price or executed Guaranteed Maximum Price, the linear trend line begins in January 2008 at an approximate $38 per square foot difference and ends in July 2015 at an approximate **$35 per square foot difference***

The floor plan of our preferred solution may be 383,000 GSF. Therefore, the estimated difference in price may be:

$35/sf x 383,000sf = $13,400,000 in additional Construction Costs

Note: Other sources report 5% to 10% cost differential. MSBA report utilized since they are finding partners

Note: Unused funds are returned to owner at the end of the project. This is likely not captured in this data.

CM-at-Risk Cost Consideration for NEMT

Potential cost consideration between DBB and CM-at-Risk

Working with our architects, DRA, it is estimated that utilization of the CM-at-Risk project delivery method will allow early site enabling starting in June of 2022 (lowering disruption to the existing school), and early concrete/steel to begin in June 2023. If the DBB method was used, it may take an **additional 6-9 months** to complete construction (depending on design deadlines, etc.).

Construction cost estimators currently forecast escalation at 4-6% per year.

The construction cost estimate is roughly $243,515,000. So the cost savings based on schedule may be estimated as: At 5% → [1/2 year * (5%)/year] * $243,515,000. = **$6,087,000** in schedule savings.

At 5% → [3/4 year * (5%)/year] * $243,515,000. = **$9,130,000** in schedule savings.

Construction Manager At Risk

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Ch. 149A Projects CMR

Saugus Middle High School
Boston Arts Academy
Somerville High School (CTE)
Shrewsbury Beal School
Danvers Smith Elementary School
Essex Tech High (CMAA & ENR Awards)
North Reading Middle High (ENR Award)
Shrewsbury Sherwood Middle
Rochester Memorial Elementary
East Somerville Community School (CMAA Award)
Belmont Wellington Elementary
Boston Public Library Central Library
Bruce C. Bolling Building (CMAA & ENR Award)
Shrewsbury Public Library
University of Massachusetts (CMAA Awards)

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University of Massachusetts (CMAA Awards)

Construction Manager At Risk

Northeast Metropolitan Regional Vocational High School

Office of the Inspector General (OIG) CM-at-Risk Application to Proceed Requirements

Construction management at-risk (CM-at-Risk) can be utilized for building projects estimated to cost $5 million or more and design-build for public works projects estimated to cost $5 million or more.

PMA will assist the District :

Under M.G.L. c. 149A, §4, the OIG will issue a Notice to Proceed when the public agency has demonstrated that:

- The public agency has authorization from its governing body to enter into a contract with a construction management at risk firm. **The authorization shall include the results of any public vote** if applicable.
- The public agency has the capacity, a plan and procedures in place and approved of by the governing body, where appropriate, to effectively procure and manage construction management at-risk services for the specific project and has **retained the services of a qualified owner's project manager.**
- The public agency has in place **procedures to ensure fairness in competition, evaluation and reporting of results** at every stage in the procurement process.
- The building project has an **estimated construction value of $5,000,000 or more.**
- The public agency has determined that the use of construction management at risk services is **appropriate for the building project and states in writing the reasons for the determination.**

Construction Manager At Risk

Northeast Metropolitan Regional Vocational High School

Office of the Inspector General (OIG) CM-at-Risk Application to Proceed Requirements

PMA / OPM Role:

- Help Awarding Authority decide whether to use DBB or CM-at-Risk
- Work closely with DRA to ensure design/project documents support chosen delivery method
- Cultivate CM interest in project
- Draft CM Request for Qualifications and Request for Proposals
- Manage/organize the CM selection process
- Assist in drafting and finalizing the CM contract
- Collaborate with District/DRA on Draft Trade Contractor Request for Qualifications and Request for Proposals
- Push for real value during pre-construction phase
- Assist in negotiation of GMP
- Manage “open book” accounting

Construction Manager At Risk

Northeast Metropolitan Regional Vocational High School

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OVERVIEW OF THE CM-AT-RISK PROJECT DELIVERY METHOD

General Advantages of CM-at-Risk over Design-Bid-Build

1. The CM-at-Risk Contractor's **professional approach to project delivery**, from design through occupancy, particularly with regard to estimating, scheduling, and managing the work, can result in less potential for budget overruns, late completion, and poor quality.
2. With the CM-at-Risk approach, **the contractor is selected based on qualifications and fee**; as compared to the Design-Bid-Build approach where **the low-bid General Contractor (GC) is accepted**. As part of the selection process, the Owner checks references, learns the firm's cost/schedule/quality performance on past similar projects, and checks the financial stability of firm.
3. At the time that the filed sub-bidders (trade contractors) prepare their bids they know who the GC is, thus there may be fewer allowances for uncertainty included in their bid prices.
4. General Conditions are negotiated rather than bid; this can result in **more experienced and a larger number of on-site staff**. (*Proponents of CM-at-Risk assert that this can result in better control of the work while advocates of traditional Design-Bid-Build assert that this extra experience and personnel contributes to the higher cost of building with CM-at-Risk cited in disadvantage # 1 on page 2.*)
5. Cost estimates by the CM-at-Risk firm may be more accurate since the estimate is made by a contractor who has been responsible for constructing similar work.
6. Cost transparency (open books during construction); Owner has the ability to audit costs to ensure that the Owner pays no more than the guaranteed maximum price (GMP). **Savings** resulting from unutilized allowances and contingencies that are explicitly built into GMP **are returned to Owner**.
7. CM-at-Risk firm is responsible for costs in excess of the GMP.

Particular Advantages Resulting from the CM-at-Risk Firm's Involvement During the Design Phase

1. CM-at-Risk involvement in the design-phase may result in bid packages that are more complete; thereby resulting in fewer omissions, gaps, and confusion over staging. With better contract documents, there is less potential for claims and disputes in the construction phase. The CM-at-Risk firm has a vested interest in making sure that the bid packages are as complete as possible because the CM firm is going to be responsible for building the work
2. Constructability reviews during design can eliminate complex and/or costly details. Any inconsistencies within the contract documents can be eliminated as they are developed – fixing problems on paper is much less costly than fixing problems while construction is underway on-site.
3. CM-at-Risk may bring **higher quality non-filed sub-bidders** to submit proposals to perform work; and the CM-at-Risk may have successfully employed many of these subs on previous projects. (*This may be offset by less competition & higher pricing cited in disadvantage # 6 on page 2.*)
4. Estimates by the builder throughout the design enable in-process adjustments to be made to the design scope/finishes/complexity in order to keep the estimated cost under the established budget. **Value Engineering is done by the builder during design.**
5. The CM-at-Risk, who will be responsible for constructing the work, reviews the scheduling and complexities of the construction together with the architect while the design is in process; thereby giving the CM-at-Risk firm a more in-depth knowledge of work than the Design-Bid-Build contractor who receives the plans 5 to 6 weeks prior to bid.

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Other Advantages of CM-at-Risk over Design-Bid-Build

1. Potential for fewer change orders during construction.
2. Approach is well-suited to complex and schedule-critical projects. **Some elements of the work can be "fast-tracked."** For example, excavation and foundation work can be released for bid while the design of superstructure and interior building elements are being finalized. Also, long-lead items can be ordered before the trade contracts are bid.
3. The firms that provide CM-at-Risk services **conduct business differently** from many of the firms that provide low bids in the Design-Bid-Build method. The CM-at-Risk firm may be more likely to have **collaborative, rather than adversarial, relationships** with the owner, architect, and OPM. The CM-at-Risk firm can function as an owner's advocate during the design and as a collaborative contractor after the establishment of the GMP.
4. The Commonwealth of Massachusetts Division of Capital Asset Management and Maintenance (DCAMM), a state agency responsible for public building construction, constructs a lot of its work with the CM-at-Risk project delivery method. Realistic schedules, construction input provided during design, motivation to establish and maintain good relationships, and the desire to seek success on its current work are all benefits cited by DCAMM. (CM firms are interested in being recommended and selected for future work.)
5. Advocates of CM-at-Risk assert that the use of the use of the CM-at-Risk project delivery method in public construction has attracted higher quality firms to the public construction market, prior to the construction reform legislation of 2004 many CM firms did not bid on public construction work and focused their efforts on the non-public construction market.

Disadvantages to CM-at-Risk as Compared to Design-Bid-Build

1. **Higher construction cost.** Estimators and analysts report that **CM-at-Risk projects cost 5% to 10% more than work constructed under Design-Bid-Build.** (*CM-at-Risk firms assert that higher initial costs are offset by the benefits of projects that are designed to budget with fewer post-bid change orders. **Note:** Sherwood Middle School and Shrewsbury Public Library projects, delivered with the CM-at-Risk method, had fewer change orders than industry average and expended less than the budgeted amount for CM contingency and Owner's contingency.*)
2. **Advantages** of CM-at-Risk **may diminish with less complex projects**, less schedule-critical projects, and projects with a well-developed design.
3. **If early work packages are released, more effort is required from the architect** to develop both the early and the later work packages; thereby increasing the cost of the architectural contract.
4. CM-at-Risk involvement and suggestions during the design could be perceived as interference (*however, this can be mitigated through the selection of a CM firm who has a track record of teamwork and professionalism*).
5. CM-at-Risk may be a less familiar process than Design-Bid-Build, particularly with public projects (*however, CM-at-Risk has been used in public projects in Massachusetts since 2005, and has been used in private construction for decades*).
6. With CM-at-Risk, **the CM firms may limit their solicitations to preferred non-filed-sub-bid subcontractors** that they have had satisfactory experiences with on past projects **thereby resulting in less competition and higher pricing.** (*Advocates of CM-at-Risk may assert that restricting the list of bidders enhances the quality of work.*)

Northeast Metro Tech

Building Committee

Thank You!

DRA

January 21, 2021

Northeast Metropolitan Regional Vocational High School

Northeast Metropolitan Regional Vocational School Project

CONSTRUCTION MANAGER AT RISK PRESENTATION

January 21, 2021

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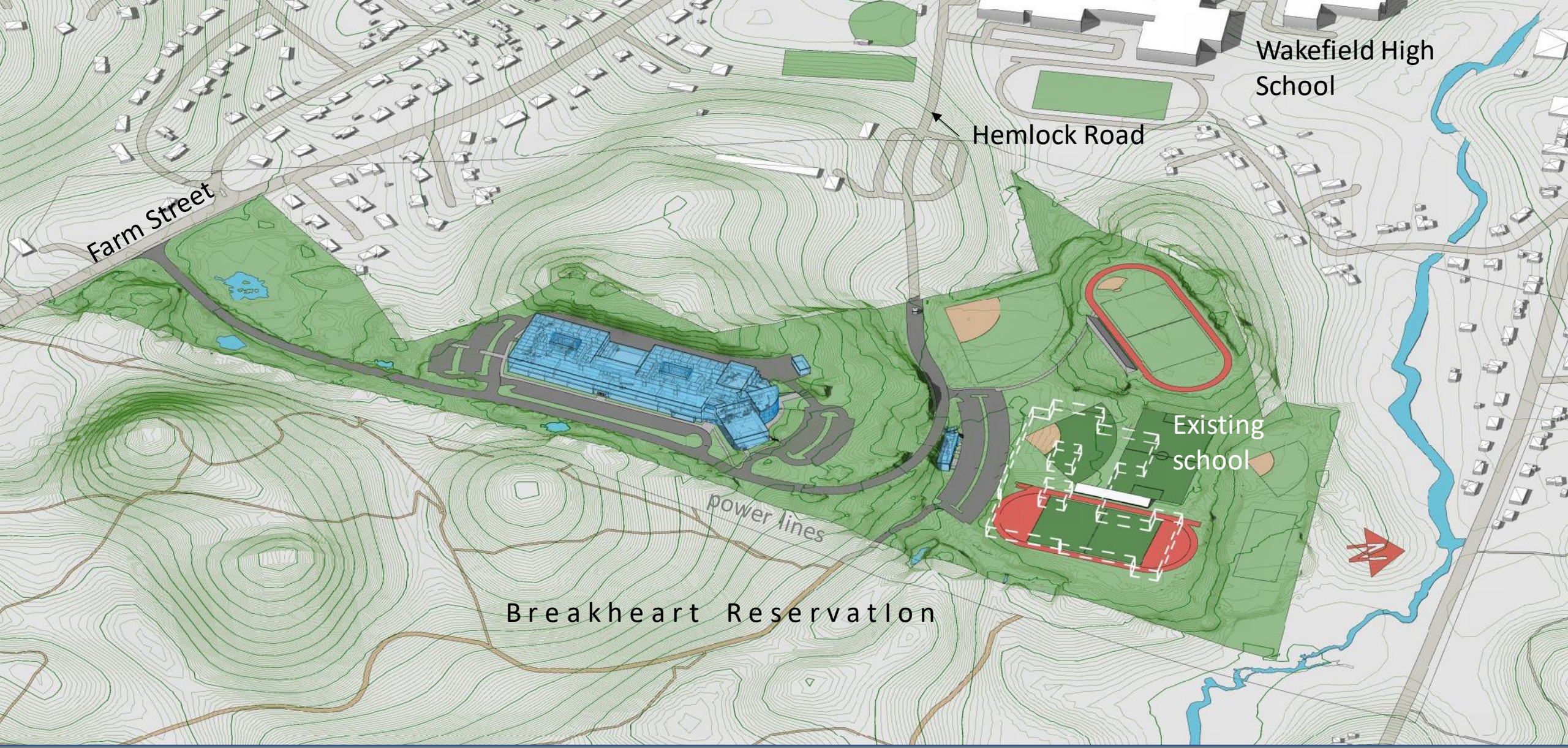
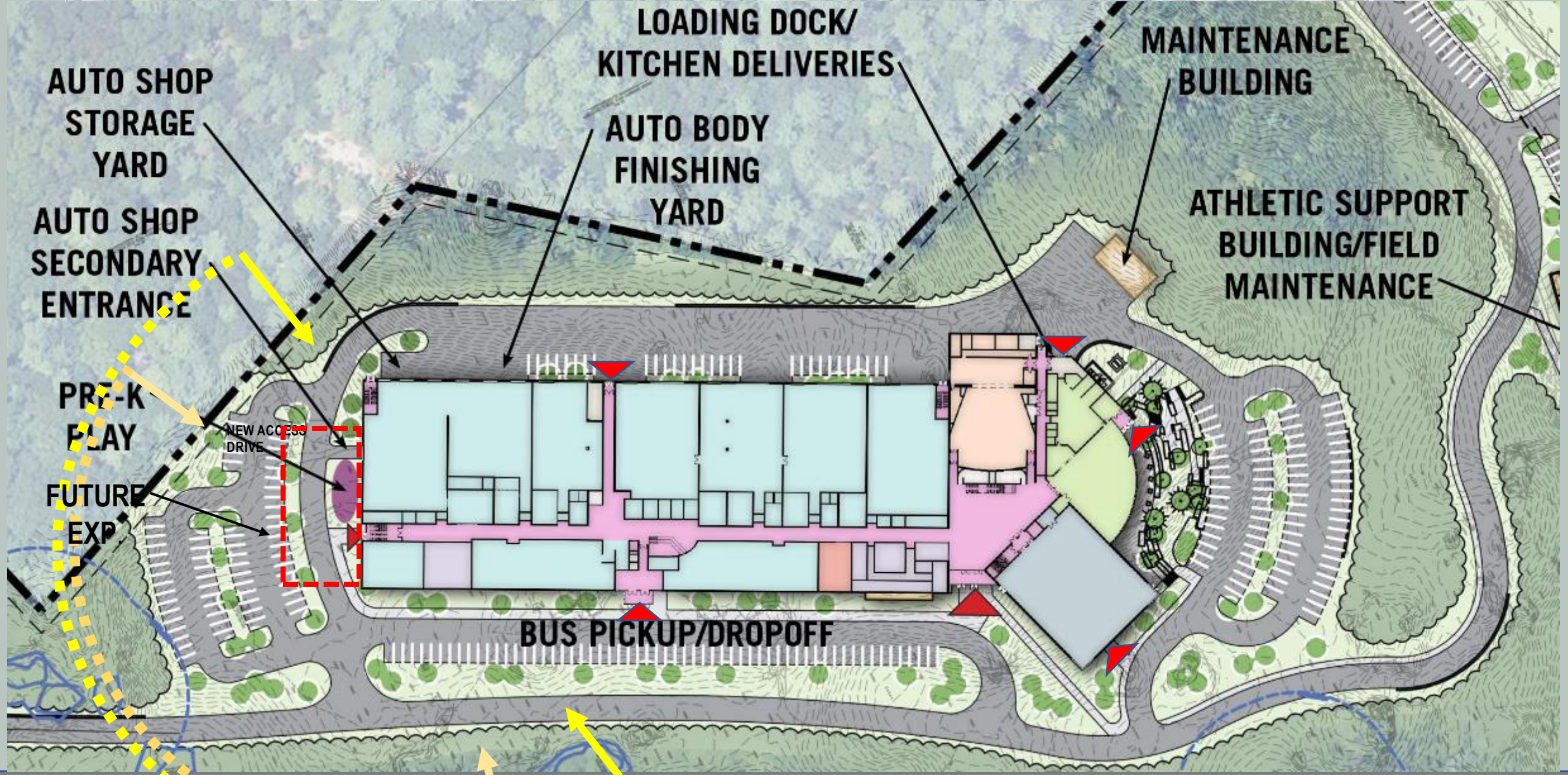
Massachusetts School Building Authority

Funding Affordable, Sustainable, and Efficient Schools in Partnership with Local Communities

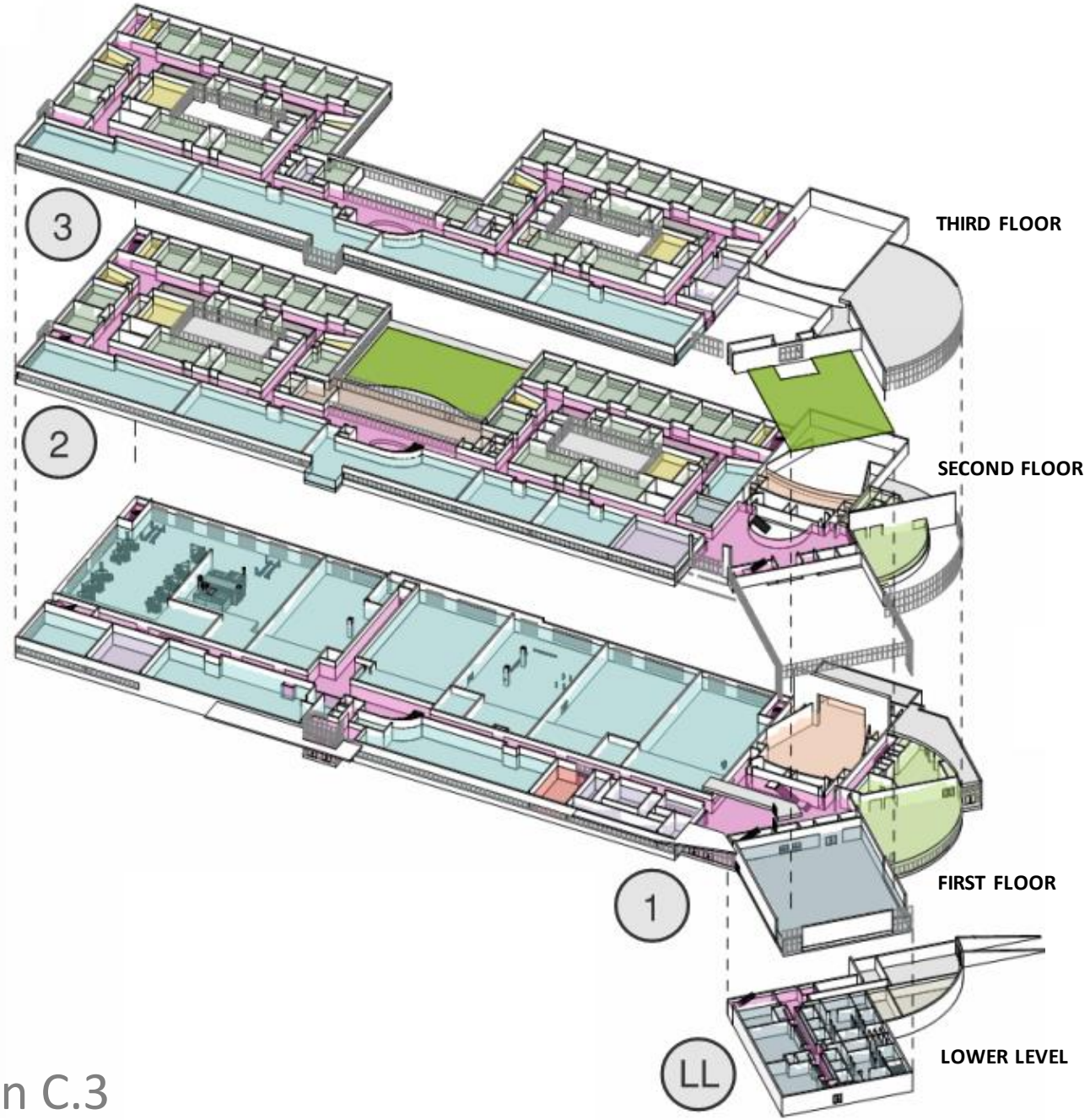

Wakefield High School
Hemlock Road
Farm Street
Existing school
power lines
Breakheart Reservation

Option C.3

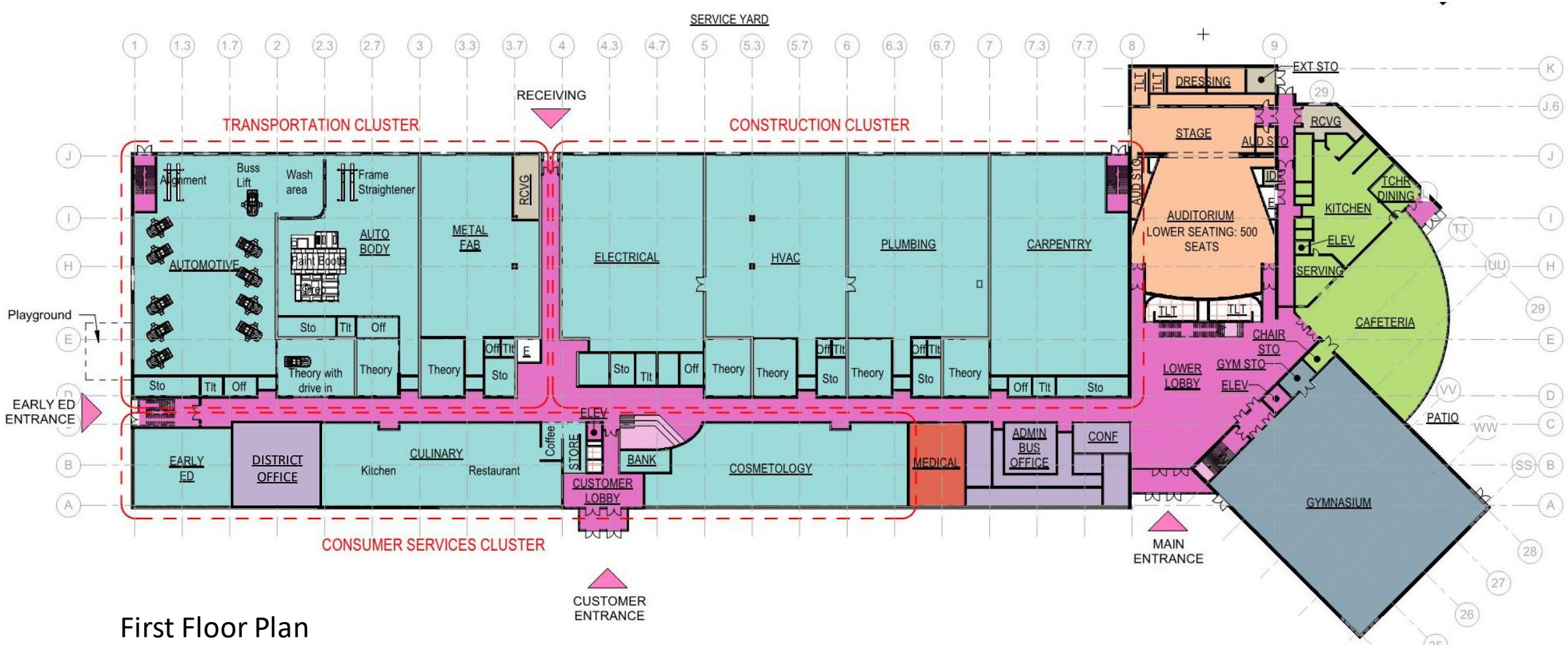
Option C.3


LOADING DOCK/
KITCHEN DELIVERIES
MAINTENANCE
BUILDING
AUTO SHOP
STORAGE
YARD
AUTO BODY
FINISHING
YARD
ATHLETIC SUPPORT
BUILDING/FIELD
MAINTENANCE
AUTO SHOP
SECONDARY
ENTRANCE
PRE-K
PLAY
NEW ACCESS
DRIVE
FUTURE
EXP
BUS PICKUP/DROPOFF
North

Option C.3

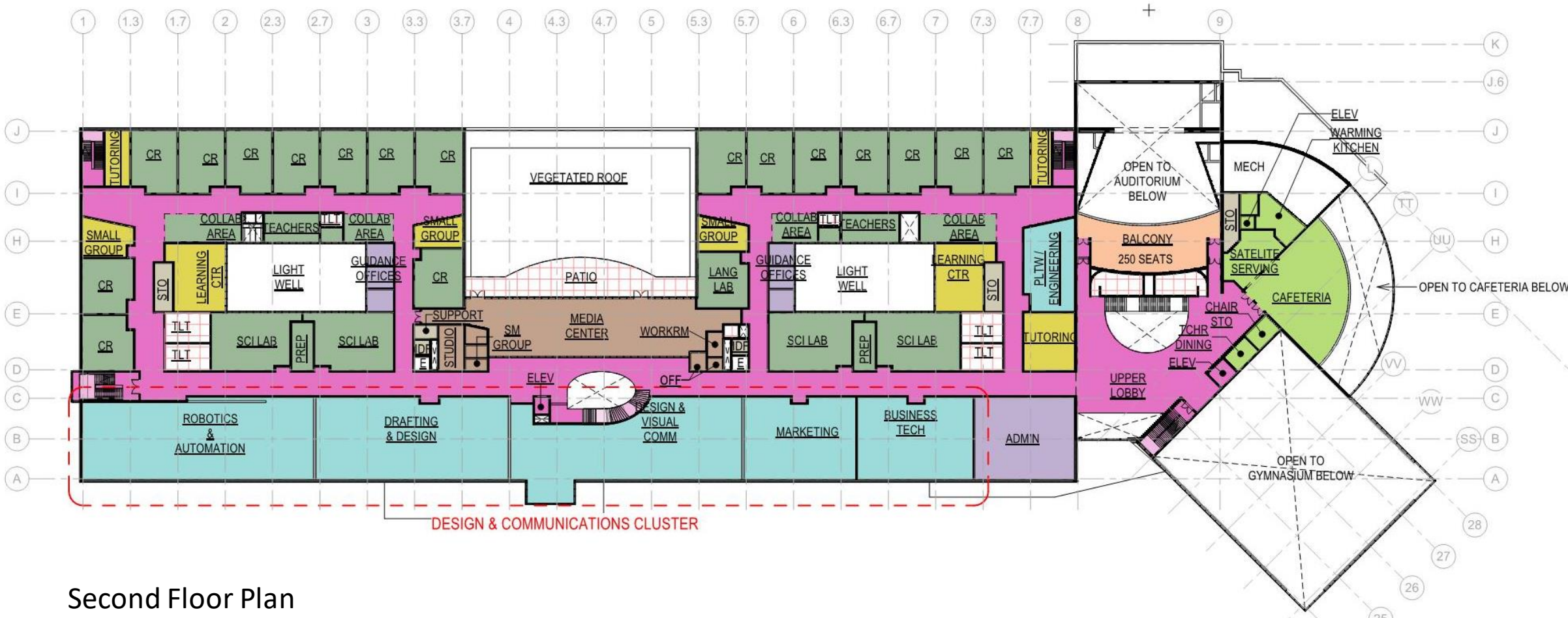


Option C.3



First Floor Plan

Option C.3



Second Floor Plan

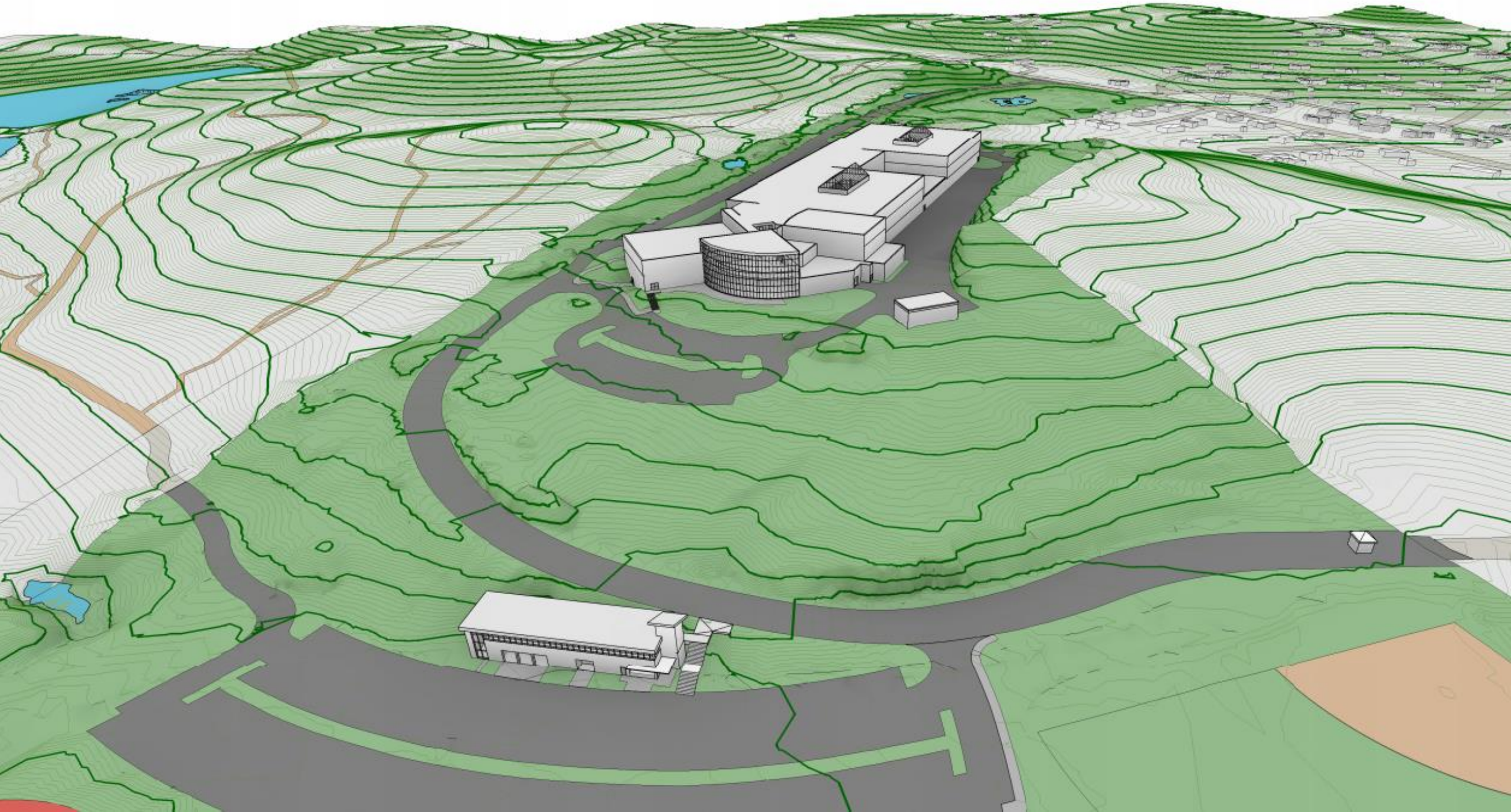
Option C.3

Third Floor Plan

Option C.3

Lower Level Plan

Option C.3




Team Lockers and Concessions Building
Outline of existing school

Option C.3

Lower level Locker Rooms

Option C.3