



Concord Middle School Project

Project Manager Report

August 2021



Hill International

CONCORD MIDDLE SCHOOL PROJECT

**PROJECT MANAGER'S REPORT
AUGUST 2021**

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Hill International

Executive Summary

Town of Concord

Concord Middle School Project



Executive Summary

This Project Manager's Report for the Concord Middle School Project is submitted by **Hill International** (Hill), and covers activities through the month of **August 2021**.

Project Progress

The COVID-19 pandemic is ongoing. All project related meetings are continuing to be held via Zoom Video Conferencing.

The Design Team continued progression of the Schematic Design. Hill and SMMA attended a School Building Committee (SBC) meeting on August 5; Design Subcommittee (DSC) meetings on August 19 and 31; Sustainability Subcommittee (DSC) meetings on August 12 and 25; Executive Leadership planning meetings on August 4 and 18; a Finance Subcommittee meeting on August 20; and information gathering sessions including a Food Service & Equipment meeting on August 5; ASD Programming meeting on August 10; PV & Electrical coordination meeting on August 18; Safety & Security meeting on August 20; and Technology & Communications meeting on August 20. Hill and SMMA also met weekly to coordinate work tasks and deliverables to the SBC and subcommittees.

Milestones

The following milestones were achieved over the month of August 2021:

- At the August 5 SBC Meeting, a revised list of participants for each subcommittee were appointed and approved (see attached minutes). These subcommittees were tasked with deliberating in focused areas of the project to bring recommendations to future SBC meetings. SMMA presented the current floor plan and massing, building envelope, daylighting and classroom window study, and entry study. Hill reviewed the most current cash flow through July 31, 2021 and expenditures to date at \$833,040. An additional increase in the size of the gym by 552 GSF, driven by a CCYB request, was discussed by the committee. The CMS PE and Health programs do not require this additional space request and the gym size remained unchanged.
- At the August 19 and 31 DSC Meetings, SMMA presented on the auditorium layout and seating configurations, daylighting and classroom window study, building envelope including proposed glazing percentages, exterior brick options, and interior finishes for flooring and walls. The DSC examined these building design elements and arrived at the following recommendations: window option 1 for a two-window classroom approach; exterior brick option 3 grain preferred; auditorium option 2, single room with low sloped floor; burnished concrete ruled out for floor materials otherwise no exceptions to proposed floor and ceiling material options. Please see attached memo outlining decisions and related graphics.
- At the August 12 and 25 Sustainability Meetings, SMMA presented on natural and displacement ventilation, AC versus dehumidification, EV charging, and EUI updates. David Bearg provided his professional opinion on natural ventilation systems. Ultimately, the SSC ruled out the use of natural ventilation as value-added was not seen and risk of success in New England was questionable. The sub-committee further recommended investigation of displacement ventilation in targeted spaces. Mechanical systems will be placed on the roof, not on the ground level. The SSC ruled out the use of dehumidification in lieu of AC to maintain comfortable conditioned spaces in the building, especially during extreme weather events. Full capacity AC was recommended. The sub-committee reviewed the number of EV charging stations and agreed that 2% to meet LEED goals was acceptable in lieu of 10%

Town of Concord

Concord Middle School Project



per the EZ Code. A target of 10% was agreed upon for EV-ready charging infrastructure. A summary of recommendations are attached to the August 25, 2021 SSC meeting minutes.

Milestones projected for the coming months are:

- Complete amended Feasibility Study report
- Finalize project budget
- Complete Schematic Design package deliverables for estimating
- Agree on dates to authorize Design Development Phase

Issues

- Project cost remains at the upper limit of the budget.
- Hill and SMMA presented a request for an amendment to their contract for the extension of the feasibility and schematic phases.

Schedule

Major milestones are as follows:

- | | |
|---|--|
| ■ OPM Selection | Completed Aug. 28, 2019 |
| ■ Designer Selection | Completed Nov. 18, 2019 |
| ■ Feasibility Study (*amended report remains pending) | Completed April 29, 2021 |
| ■ Schematic Design | Tentative Completion date of Dec 8, 2021 |
| ■ Special Town Meeting | Tentative date of Dec. 10, 2021 |
| ■ Town Vote | To Be Determined |
| ■ Design Development | |
| ■ 60% Contract Documents | |
| ■ 90% Contract Documents | |
| ■ 100% Contract Documents | |
| ■ Bidding | |
| ■ Construction | |
| ■ Substantial Completion (New Building) | |
| ■ Demolition of Existing Building and Add New Fields | |
| ■ Closeout | |

NOTE: The Project Team is waiting on confirmation from the Town of Concord for the next Special Town Meeting date.

Budget

On April 8, 2019 Concord Town Meeting passed, by overwhelming majority, an appropriation not to exceed \$1,500,000 to study the feasibility of constructing a new Middle School, which may be located on the Sanborn School Site.

Town of Concord

Concord Middle School Project



Hill International contract for Feasibility/Schematic Design is \$299,800 and SMMA contract for Feasibility/Schematic Design is \$889,400.

Hill requested an additional \$5,500 to contract the cost estimator, PM&C, to provide cost estimate for Feasibility Study to compare and reconcile with SMMA's cost estimate. Hill got approval from the Leadership Team at the end of March 2020 and has completed the work. Amendment #1 was approved on September 1, 2020 for adding Feasibility cost estimate by PM&C for comparison and reconciliation with SMMA's cost estimate.

Based on the Feasibility Study completed by Finegold Alexander, the estimated Total Project Cost may range from \$80M to \$100M depending upon the solution that is agreed upon by the Owner. This Total Project Cost translates to a potential Total Construction Cost of \$60M to \$80M.

On December 5, 2019 Hill met with the Finance Subcommittee and presented the cost analysis for the Concord Middle School using the similar Middle School Project costs from the MSBA. The projected total project cost for the new Concord Middle School with 5% escalation is between \$80M - \$109M and the projected cost with 7% escalation is between \$83M - \$122M. The project budget is not yet finalized until the Design Team meets with the users and community to determine the programming, building size and enrollments.

In March 2021, Hill provided a preliminary cost analysis of the current program which forecasts the total project cost at \$99.9M.

In April 2021, the SBC brought forth additional scope requests with community support including a larger gym, larger auditorium, and additional parking. Hill and SMMA presented scope options ranging in cost from \$3.2M to \$9.75M above the current \$100M total project budget. The committee voted at the April 15 SBC meeting to increase the total project budget to not-to-exceed \$108M in order to further study these additional scope options.

In June 2021, the Project Team continued to monitor cost projections given the fluctuation of the building gross square footage from design iterations. Steps were taken to minimize the cost impact due to the increased gym and auditorium size. Total project cost projections currently range from \$100.8M to \$102.4M.

In July 2021, the total project cost fluctuated from \$101.5M to \$100.3M with continued changes to the building gross square footage. Market conditions and schedule can continue to impact cost and will be monitored and reported accordingly.

Cash Flow

Total project budget is \$100,000,000.

Total encumbered to date is \$1,194,700.

Total spent on construction to date is \$0.00.

Total spent to date is \$902,358. 75% of total encumbered.

Project Team Summary

Awarding Authority	Town of Concord (ToC)
Client	Town of Concord / Concord Public Schools
Owner's Project Manager	Hill International, Inc. (Hill)
Commissioning Agent	TBD

Town of Concord
Concord Middle School Project



Designer	SMMA
CM / GC	TBD



Hill International

Project Dashboard

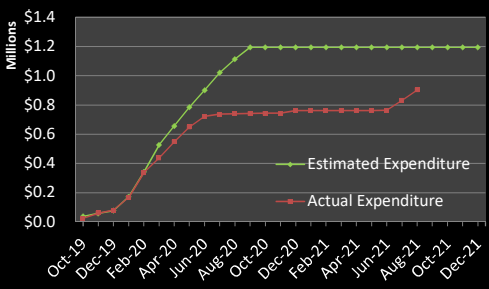


**Town of Concord
Concord Middle School**
Project Dashboard

August 31, 2021

EXECUTIVE SUMMARY



Project Accomplishments this Month					Current Issues & Areas of Focus			Current Progress Photos			
Reinstated subcommittees to assist with Schematic Design progression. Reviewed and selected interior and exterior finishes, window configurations, daylighting elements, ventilation and cooling preferences, and EV charging infrastructure for recommendation to the CMSBC.					COVID-19 Pandemic Schematic Design Package Deliverables						
Projected Major Tasks next Month											
Complete Project Budget Complete Preliminary Feasibility Study Report Complete Schematic Design package deliverables for estimating Agree on dates to authorize Design Development Phases											
Schedule Summary - Upcoming Milestones					Diversity Compliance			Project Cash Flow - Plan vs Actual			
	Scheduled Start	Scheduled Finish	Actual Start	Actual Finish	Metric	Target	Actual				
Designer Procurement	9/25/2019	11/18/2019	9/25/2019	12/9/2019	Designer's WBE/MBE	17.9%	TBD				
Feasibility/Schematic Design	11/19/19	7/1/2020	11/19/19		Contractor's WBE/MBE	10.4%	TBD				
Town Meeting (Proposed)	12/10/21	12/10/21									
Town Vote (Proposed)	12/17/21	12/17/21									
Secure Finance and Execute Contracts	12/10/21	12/30/21									
Design Development / Contract Documents	12/30/21	1/17/23									
Bidding	1/18/23	3/27/23									
Construction	3/28/23	8/29/24									
Move-in	8/30/24	1/5/25									
Demolition Existing Building	TBD										
Closeout	TBD										
PROJECT FINANCIAL OVERVIEW										Scope changes from the Original Scope	
Description	BUDGET				COST				CASH FLOW		N/A
	Baseline	Budget	Authorized Changes	Approved Budget	Committed Costs	Uncommitted Costs	Forecast Costs	Total Project Costs	Expenditures to Date	Balance To Spend	
Site Acquisition	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A
Construction	\$ 80,000,000	\$ -	\$ 80,000,000	\$ -	\$ 80,000,000	\$ -	\$ 80,000,000	\$ -	\$ 80,000,000	\$ 80,000,000	
Design Services	\$ 8,331,000	\$ -	\$ 8,331,000	\$ 889,400	\$ 7,441,600	\$ -	\$ 8,331,000	\$ 615,078	\$ 7,715,922		
Administrative	\$ 4,229,595	\$ 5,500	\$ 4,235,095	\$ 305,300	\$ 3,929,795	\$ -	\$ 4,235,095	\$ 287,280	\$ 3,947,815		
FF&E	\$ 2,677,500	\$ -	\$ 2,677,500	\$ -	\$ 2,677,500	\$ -	\$ 2,677,500	\$ -	\$ 2,677,500		
SUBTOTAL	\$ 95,238,095	\$ 5,500	\$ 95,243,595	\$ 1,194,700	\$ 94,048,895	\$ -	\$ 95,243,595	\$ 902,358	\$ 94,341,237		
Construction Contingency (Hard Cost)	\$ 4,000,000	\$ -	\$ 4,000,000	\$ -	\$ 4,000,000	\$ -	\$ 4,000,000	\$ -	\$ 4,000,000		
Owner's FFE Contingency	\$ -	\$ -	\$ -	\$ -	NA	NA	NA	\$ -	NA		
Owner's Contingency (Soft Cost)	\$ 761,905	\$ (5,500)	\$ 756,405	\$ -	\$ 756,405	\$ -	\$ 756,405	\$ -	\$ 756,405		
SUBTOTAL	\$ 4,761,905	\$ (5,500)	\$ 4,756,405	\$ -	\$ 4,756,405	\$ -	\$ 4,756,405	\$ -	\$ 4,756,405		
PROJECT TOTAL	\$ 100,000,000	\$ -	\$ 100,000,000	\$ 1,194,700	\$ 98,805,300	\$ -	\$ 100,000,000	\$ 902,358	\$ 99,097,642	Project Budget Transfers	
										N/A	



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Project Cash Flow

Concord Middle School
Estimated Project Cash Flow Thru SD Phase

	Month	OPM	Designer & Consultants	Commissioning Agent, FF&E & Misc.	Construction	Contingency	Estimated Expenditures	Actual Expenditures	Estimated Cumulative Expenditures	Actual Cumulative Expenditures
Feasibility Study	1 Oct-19	\$38,290					\$38,290	\$25,110	\$38,290	\$25,110
	2 Nov-19	\$20,550					\$20,550	\$34,595	\$58,840	\$59,705
	3 Dec-19	\$18,790					\$18,790	\$20,660	\$77,630	\$80,365
	4 Jan-20	\$18,790	\$75,645				\$94,435	\$88,210	\$172,065	\$168,575
	5 Feb-20	\$18,790	\$151,290				\$170,080	\$167,735	\$342,145	\$336,310
	6 Mar-20	\$24,070	\$161,376				\$185,446	\$101,535	\$527,591	\$437,845
	7 Apr-20	\$22,670	\$105,903				\$128,573	\$110,125	\$656,164	\$547,970
	8 May-20	\$21,590	\$106,361				\$127,951	\$100,465	\$784,115	\$648,435
Pause	9 Jun-20	\$21,590	\$96,275				\$117,865	\$73,474	\$901,980	\$721,909
	10 Jul-20	\$22,290	\$96,275				\$118,565	\$15,520	\$1,020,545	\$737,429
	11 Aug-20	\$24,430	\$69,318				\$93,748	\$3,785	\$1,114,293	\$741,214
	12 Sep-20	\$53,450	\$26,957				\$80,407	\$720	\$1,194,700	\$741,934
	13 Oct-20						\$0	\$2,590	\$1,194,700	\$744,524
	14 Nov-20						\$0	\$0	\$1,194,700	\$744,524
Restart Feasibility Study	15 Dec-20						\$0	\$16,798	\$1,194,700	\$761,322
	16 Jan-21						\$0	\$0	\$1,194,700	\$761,322
	17 Feb-21						\$0	\$0	\$1,194,700	\$761,322
	18 Mar-21						\$0	\$0	\$1,194,700	\$761,322
	19 Apr-21						\$0	\$0	\$1,194,700	\$761,322
	20 May-21						\$0	\$0	\$1,194,700	\$761,322
Schematic Design	21 Jun-21						\$0	\$2,400	\$1,194,700	\$763,722
	22 Jul-21						\$0	\$69,318	\$1,194,700	\$833,040
	23 Aug-21						\$0	\$69,318	\$1,194,700	\$902,358
	24 Sep-21						\$0	\$0	\$1,194,700	
	25 Oct-21						\$0	\$0	\$1,194,700	
	26 Nov-21						\$0	\$0	\$1,194,700	
	27 Dec-21						\$0	\$0	\$1,194,700	
	Subtotal for FS/ SD	\$305,300	\$889,400	\$0			\$1,194,700			

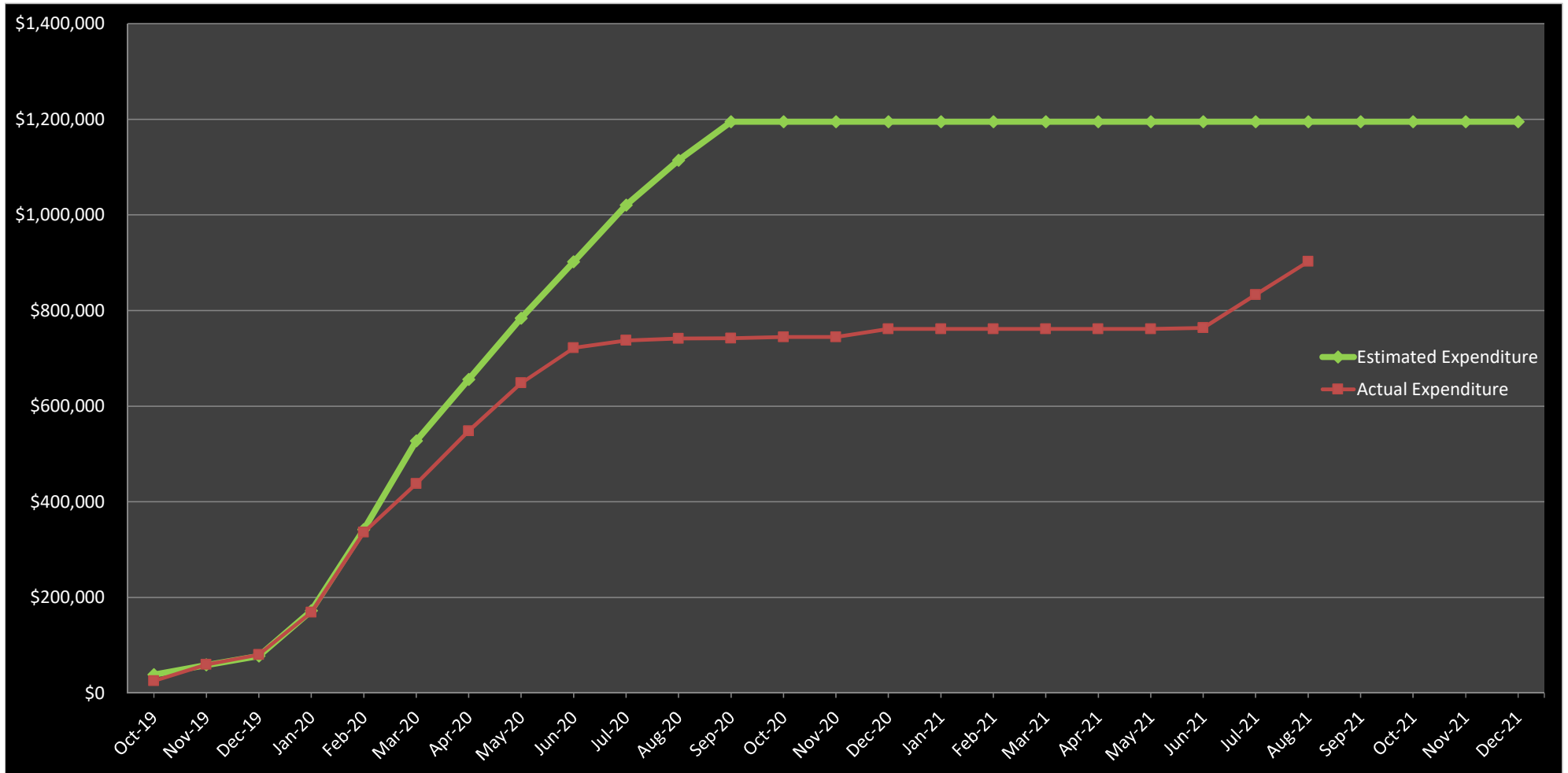


August 31, 2021

Town of Concord
Concord Middle School
Estimated Project Cash Flow Graph



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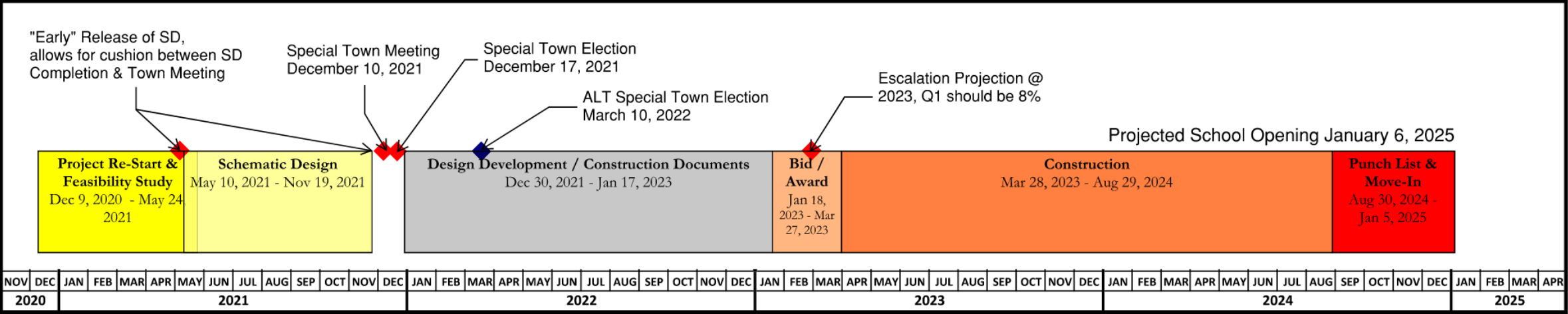


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Schedule Update

Project Schedule

Schedule Scenario Option B - "Early" Release of Schematic Design & Design Development



Concord Middle School Schedule Review 8/31/21

2019					2020												2021												2022											
Schedule Name	Activity	Start	End	Duration	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June
BASELINE SCHEDULE (Contract)																																								
2019 09-11 Master Schedule Draft	Feasibility Study	11/19/19	04/03/20	136																																				
2019 09-11 Master Schedule Draft	Schematic Design	04/06/20	09/24/20	171																																				
2019 09-11 Master Schedule Draft	Design FS/SD			310																																				
2019 09-11 Master Schedule Draft	Town Meeting	11/10/20	11/10/20	0																																				
2019 09-11 Master Schedule Draft	Town Vote	12/28/20	12/28/20	0																																				
Accelerated Schedule (updated contract)																																								
2020 02-06 CMS Schedule Draft R5	Feasibility Study	11/19/19	03/26/20	128																																				
2020 02-06 CMS Schedule Draft R5	Schematic Design	03/27/20	08/18/20	144																																				
2020 02-06 CMS Schedule Draft R5	Design FS/SD			273																																				
2020 02-06 CMS Schedule Draft R5	Town Meeting	09/16/20	09/16/20	0																																				
2020 02-06 CMS Schedule Draft R5	Town Vote	09/30/20	09/30/20	0																																				
Initial COVID Pause (before pause)																																								
2020 05-12 CMS Schedule	Feasibility Study	11/19/19	06/12/20	206																																				
2020 05-12 CMS Schedule	Covid Pause	06/16/20	08/28/20	73																																				
2020 05-12 CMS Schedule	Schematic Design	08/31/20	03/23/21	204																																				
2020 05-12 CMS Schedule	Design FS/SD	11/19/19	03/23/21	490																																				
2020 05-12 CMS Schedule	Town Meeting	04/15/21	04/15/21	0																																				
2020 05-12 CMS Schedule	Town Vote	06/01/21	06/01/21	0																																				
Updated COVID Pause (after pause)																																								
2020 12-07 CMS Schedule Draft	Feasibility Study	11/19/19	03/15/21	482																																				
2020 12-07 CMS Schedule Draft	Covid Pause	06/16/20	12/01/20	168																																				
2020 12-07 CMS Schedule Draft	Schematic Design	03/16/21	10/21/21	219																																				
2020 12-07 CMS Schedule Draft	Design FS/SD			702																																				
2020 12-07 CMS Schedule Draft	Town Meeting	10/05/21	10/05/21	0																																				
2020 12-07 CMS Schedule Draft	Town Vote	11/23/21	11/23/21	0																																				
Current Proposed Schedule																																								
2021 01-26 CMS Schedule Draft	Feasibility Study	11/19/19	04/29/21	527																																				
2021 01-26 CMS Schedule Draft	Covid Pause	06/16/20	12/01/20	168																																				
2021 01-26 CMS Schedule Draft	Schematic Design	05/06/21	12/17/21	225																																				
2021 01-26 CMS Schedule Draft	Design FS/SD			759																																				
2021 01-26 CMS Schedule Draft	Town Meeting	12/10/21	12/10/21	0																																				
2021 01-26 CMS Schedule Draft	Town Vote	12/17/21	12/17/21	0																																				



Hill International

Cost Analysis



Concord Middle School Project

Side-by-Side Cost Analysis

7/20/2021

24-Jun-21

20-Jul-21

District	Concord	Concord	Concord	Holyoke	Braintree	Dennis-Yarmouth
School Name	Concord MS	Concord MS	Concord MS	Peck MS	South MS	Mattacheese MS
Construction Type	New	New	New	New	New	New
Enrollment	700	700	700	550	800	940
GSF	142,995	145,647	143,660	105,840	145,846	186,500
Assumed Start of Construction	March 2023	March 2023	March 2023	July 2021	Dec 2020	Feb 2020
OPM	Hill International	Hill International	Hill International	Pinck & Co	Hill International	PMA
Designer	SMMA	SMMA	SMMA	Jones Whitsett Architects	Miller Dyer Spears	Perkins Eastman
Cost Estimator	Based on AM Fogerty	Based on AM Fogerty	Based on AM Fogerty	PM&C	AM Fogerty	AM Fogerty
Gross SF	142,995	145,647	143,660	105,840	145,846	186,500
Cost / SF	\$ 348.00	\$ 348.00	\$ 348.00	\$ 358.07	\$ 342.01	\$ 355.02
Construction	\$ 49,762,260.00	\$ 50,685,156.00	\$ 49,993,680.00	\$ 37,897,838.00	\$ 49,880,245.00	\$ 66,210,891.00
Demolition / Hazmat	\$ 1,500,000.00	\$ 1,500,000.00	\$ 1,500,000.00	\$ 2,924,000.00	\$ 100,000.00	\$ -
Site Cost	\$ 7,500,000.00	\$ 7,500,000.00	\$ 7,500,000.00	\$ 4,933,611.00	\$ 6,653,556.00	\$ 9,485,544.00
TOTAL DIRECT	\$ 58,762,260.00	\$ 59,685,156.00	\$ 58,993,680.00	\$ 45,755,449.00	\$ 56,633,801.00	\$ 75,696,435.00
Total Mark-ups	\$ 21,217,016	\$ 21,550,242	\$ 21,300,574	\$ 9,922,209	\$ 12,547,615	\$ 18,048,057
Design Contingency	12.00% \$ 7,051,471.20	\$ 7,162,218.72	\$ 7,079,241.60	Included Above	Included Above	Included Above
Escalation	8.00% \$ 5,265,098.50	\$ 5,347,789.98	\$ 5,285,833.73	Included Above	Included Above	Included Above
GC	5.00% \$ 3,553,941.48	\$ 3,609,758.23	\$ 3,567,937.77	Included Above	Included Above	Included Above
GR	2.50% \$ 1,865,819.28	\$ 1,895,123.07	\$ 1,873,167.33	Included Above	Included Above	Included Above
Permits (waived)	0.00%			Included Above	Included Above	Included Above
P&P Bond	2.00% \$ 1,529,971.81	\$ 1,554,000.92	\$ 1,535,997.21	Included Above	Included Above	Included Above
Profit	2.50% \$ 1,950,714.06	\$ 1,981,351.17	\$ 1,958,396.44	Included Above	Included Above	Included Above
TOTAL CONSTRUCTION	\$ 79,979,276.33	\$ 81,235,398.10	\$ 80,294,254.07	\$ 55,677,658.00	\$ 69,181,416.00	\$ 93,744,492.00
CONSTRUCTION COST PER STUDENT	\$114,256.11	\$116,050.57	\$114,706.08	\$101,232.11	\$86,476.77	\$99,728.18
CONSTRUCTION COST PER SF	\$559.32	\$557.76	\$558.92	\$526.05	\$474.35	\$502.65
PROJECT COST	\$99,974,095.41	\$101,544,247.62	\$100,367,817.59			

AVERAGE COST/SF (Bldg Only)	\$335.11
AVERAGE COST/SF (Construction)	\$502.99
MEDIAN COST/SF (Bldg Only)	\$348.98
MEDIAN COST/SF (Construction)	\$508.01

Braintree	Orange	Millbury Shaw ES	Weymouth	Framingham	Somerset
East MS	Dexter Park ES	R.E. Shaw ES	Maria Weston Chapman MS	Fuller MS	Somerset MS
Add/Reno	Add/Reno	New	Add/Reno	New	New
1180	520	550	1470	630	590
184,425	97,115	90,266	252,170	136,970	124,200
Feb 2018	July 2021	Feb 2021	July 2020	June 2019	March 2022
Hill International	Hill International	Hill International	Hill International	SMMA	CGA Management
Miller Dyer Spears Arch.	Raymond Design Assoc. Inc.	Turowski2 Architecture	HMFH	Jonathan Levi Architects	Ai3 Architects
VJ Associates	PM&C	PM&C	PM&C	Miyakoda Consulting	Info not available
184,625	97,115	90,266	252,170	136,970	124,200
\$ 252.16	\$ 303.88	\$ 356.58	\$ 342.94	\$ 370	Info not available
\$ 46,554,736.00	\$ 29,511,155.00	\$ 32,186,918.00	\$ 86,479,720.00	\$ 50,707,570	Info not available
\$ 1,892,087.00	\$ 1,012,727.00	\$ 1,422,466.00	\$ 5,690,445.00	\$ 3,063,200	Info not available
\$ 3,307,612.00	\$ 5,438,731.00	\$ 6,712,058.00	\$ 9,965,351.00	\$ 6,719,690	Info not available
\$ 51,754,435.00	\$ 35,962,613.00	\$ 40,321,442.00	\$ 102,135,516.00	\$ 60,490,460	\$ -
\$ 15,982,264	\$ 9,768,115	\$ 8,948,349	\$ 25,970,125	\$ 17,444,969	Info not available
Included Above	Included Above	Included Above	Included Above	Included Above	Info not available
Included Above	Included Above	Included Above	Included Above	Included Above	Info not available
Included Above	Included Above	Included Above	Included Above	Included Above	Info not available
Included Above	Included Above	Included Above	Included Above	Included Above	Info not available
Included Above	Included Above	Included Above	Included Above	Included Above	Info not available
Included Above	Included Above	Included Above	Included Above	Included Above	Info not available
Included Above	Included Above	Included Above	Included Above	Included Above	Info not available
\$ 67,736,699.00	\$ 45,730,728.00	\$ 49,269,791.00	\$ 128,105,641.00	\$ 77,935,429.00	\$ 69,956,365.00
\$57,403.98	\$87,943.71	\$89,581.44	\$87,146.69	\$123,707.03	\$118,570.11
\$366.89	\$470.89	\$545.83	\$508.01	\$569.00	\$563.26



Hill International

Schematic Design Progression

Memorandum

To: Court Booth, Chair CMS Design Subcommittee
 From: Kristen Olsen, SMMA
 Project: Concord Middle School Project
 Re: Design Subcommittee Decisions
 Distribution: (MF)

Date: 8/27/2021
 Project No.: 19153.00

Design "Givens"

- Floor plan will continue to develop and be refined and optimized to meet the program requirements and CMSBC cost efficiency goals.
- Building is organized two major areas: large space wing (west) and academic wing (east), separated by and straddling the natural topography
- Security will be developed with Concord Public Schools, Police Dept and Fire Dept.

Schematic Decision phase recommendations sought by the DSC to the CMSBC:

Building Envelope

1. Brick Pattern	Option 1: Mist Dissipating / Gradient	Option 2: Solid	Option 3: Grain	Option 4: Texture
2. Window Shape/Size	Option 1	Option 3	-	-

Design Approach

3. Auditorium	Option 1: Hybrid Fixed and Collapsible, Dividable	Option 2: Traditional Sloped	Option 3: Traditional Sloped and Stepped
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Interior Design

4. Ceilings	Will consider exposed to structure and infra-structure	Will not consider exposed to structure and infrastructure
5. Floor	Will consider polished concrete	Will not consider polished concrete

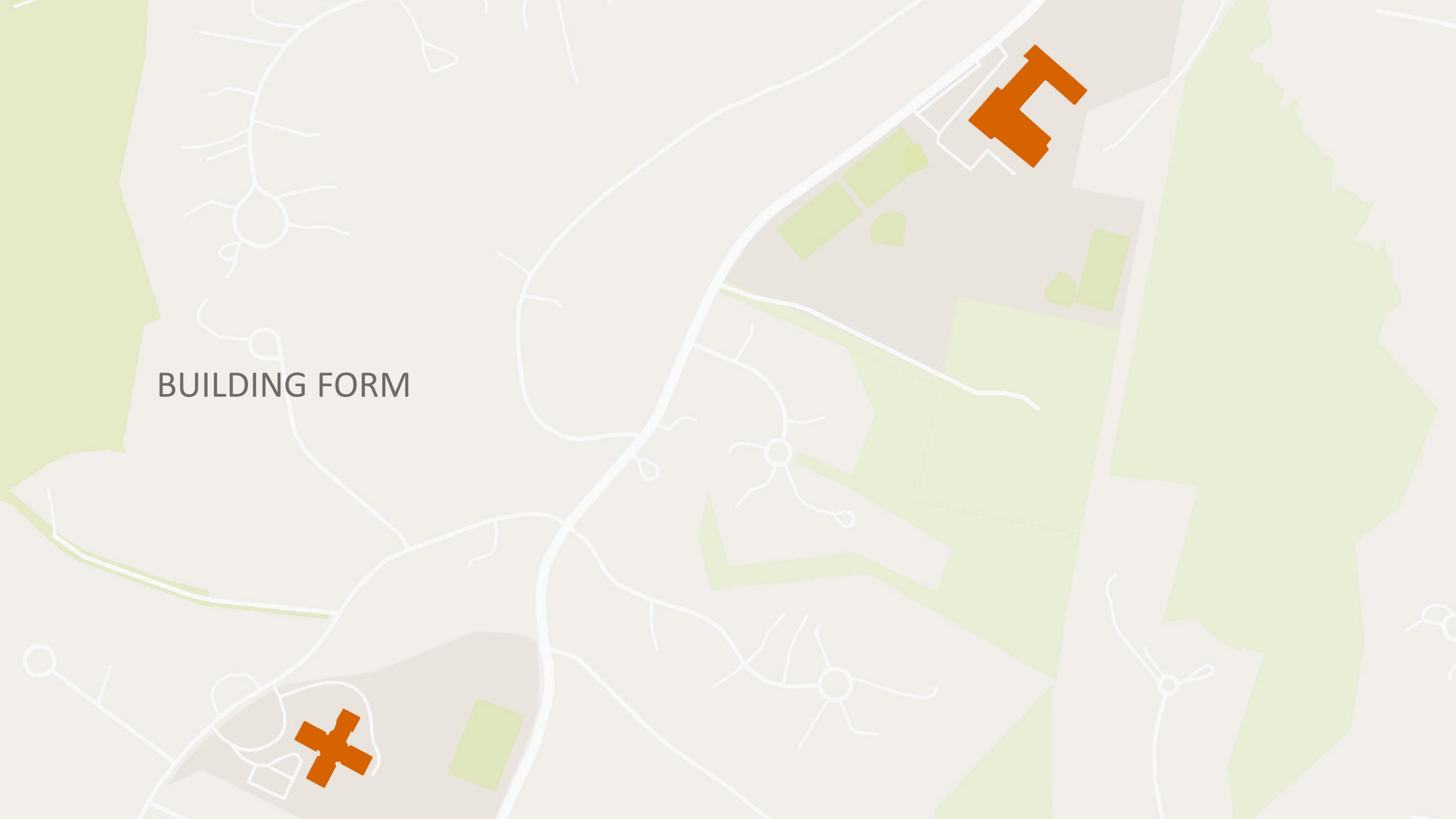
Notes:

- Window Option 1: Slightly more glare than Option 2; better views to the outdoors.
 Window Option 2: Slightly less glare than Option 1; less access to views to the outdoors
 Design team recommends Option 1 based on our understanding of the DSC and CMSBC goals for daylighting, views and glare.
- Hybrid model was put forward as a result of information gathered from the Music Dept during the Schematic Design educational programming interviews.

1000 Massachusetts Avenue
 Cambridge, MA 02138
 617.547.5400

www.smma.com

BUILDING FORM

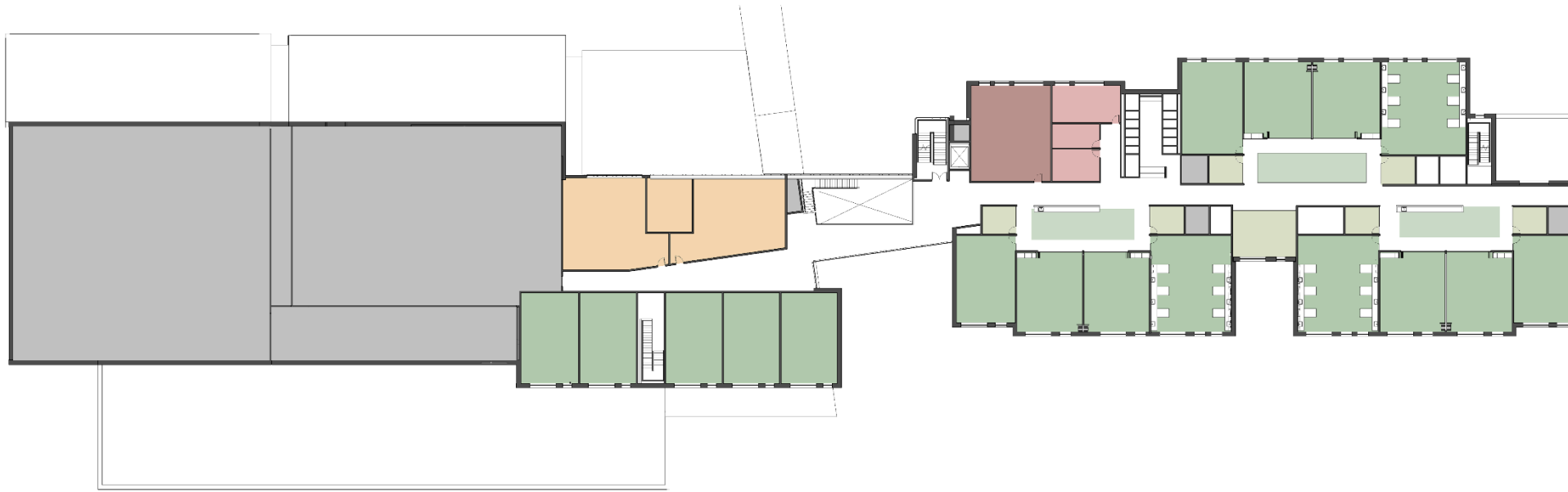


- Classroom
- Team Commons
- Special Education
- Vocation/Tech Classroom
- Administration
- Guidance
- Nurse
- Media Center
- Auditorium
- Music
- Art
- Physical Education
- Cafeteria



GROUND FLOOR PLAN





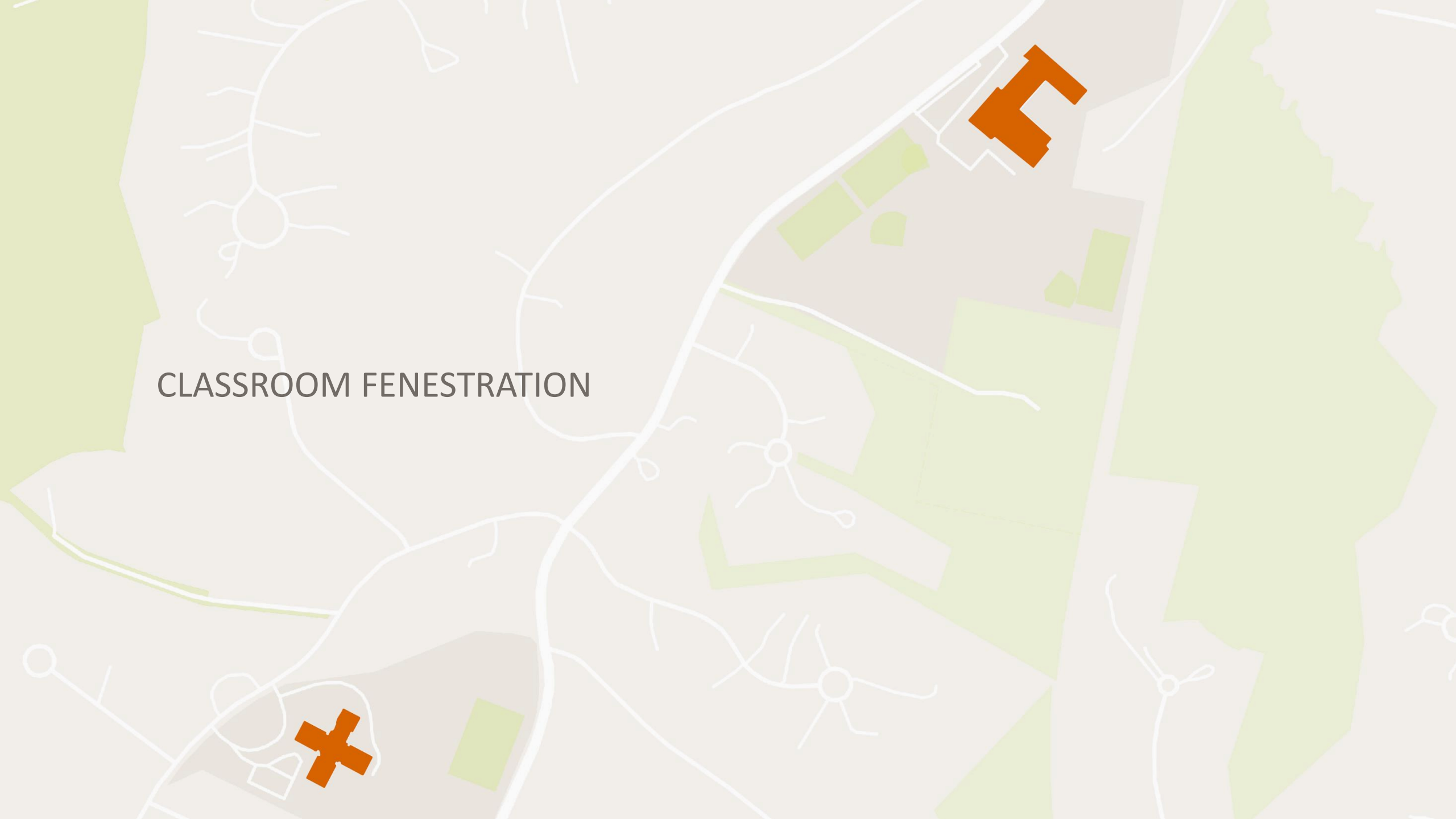
UPPER-LEVEL PLAN

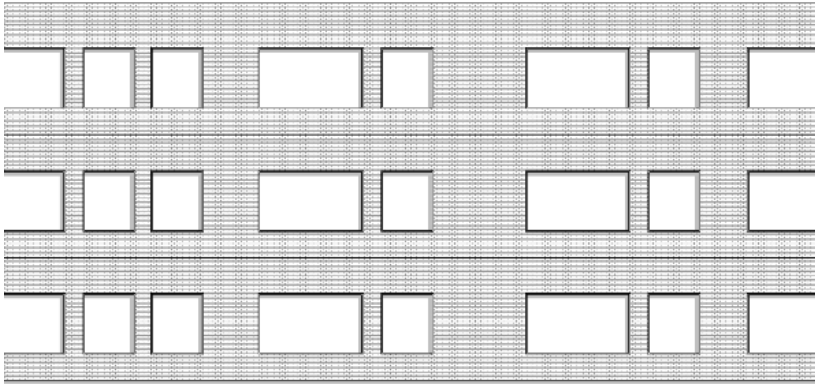


LOWER-LEVEL PLAN

- Classroom
- Team Commons
- Special Education
- Vocation/Tech Classroom
- Administration
- Guidance
- Nurse
- Media Center
- Auditorium
- Music
- Art
- Physical Education
- Cafeteria

CLASSROOM FENESTRATION



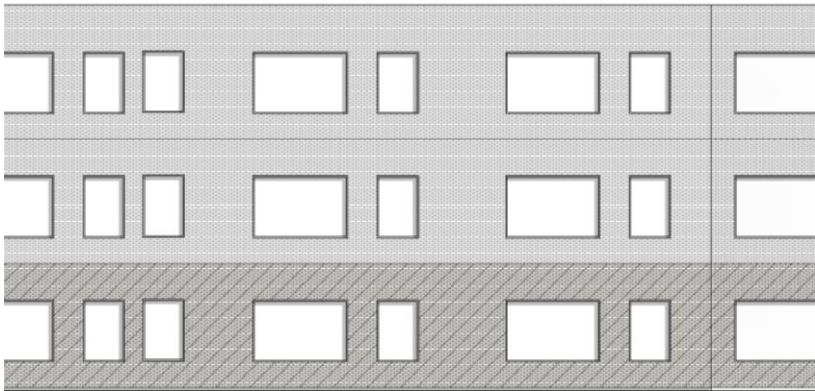


NORTH ELEVATION

Glazing Area/Classroom: 128 SF

Wall Area/Classroom: 350

WWR: 36.6 %



SOUTH ELEVATION

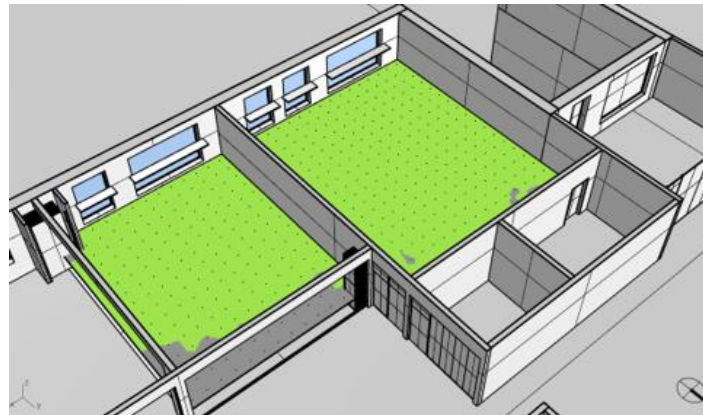
Glazing Area/Classroom: 108 SF

Wall Area/Classroom: 350

WWR: 30.8 %

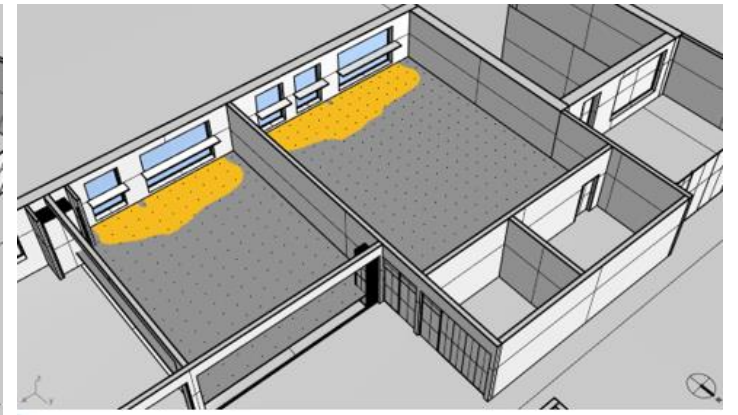
OVERALL WWR: 25%

CLASSROOM OPTION 1

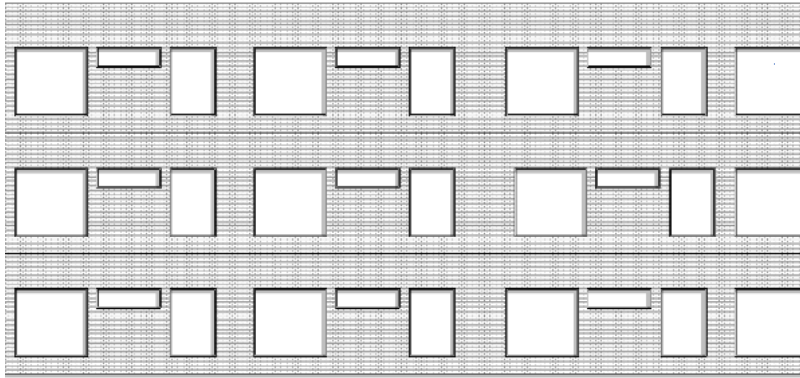


Design Option 1 - South Classrooms: 88.1% SDA

Scenario 3 – Ext. Sunshades 24" deep and interior light shelf 18" deep

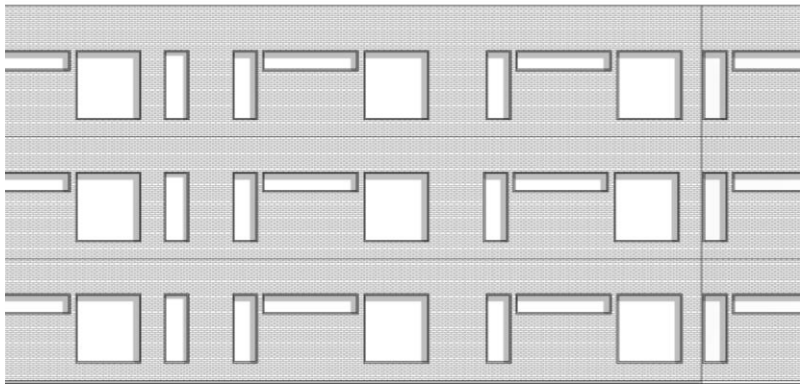


Design Option 1 - South Classrooms: 13.9% ASE



NORTH ELEVATION

Glazing Area/Classroom: 128 SF
 Wall Area/Classroom: 350
 WWR: 36.6 %

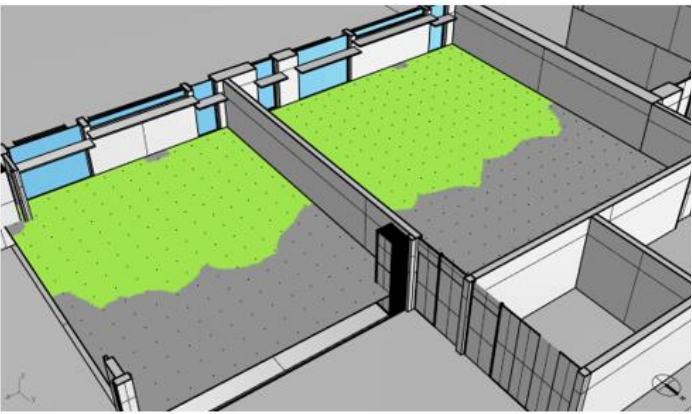


SOUTH ELEVATION

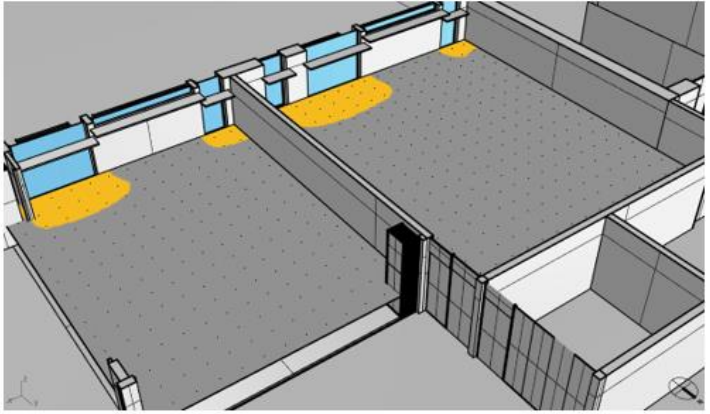
Glazing Area/Classroom: 108 SF
 Wall Area/Classroom: 350
 WWR: 30.8 %

OVERALL WWR: 25%

CLASSROOM OPTION 3



Design Option 2 - South Classrooms: 58.1% SDA
 Scenario 3 – Ext. Sunshades 24" deep and interior light shelf 18" deep

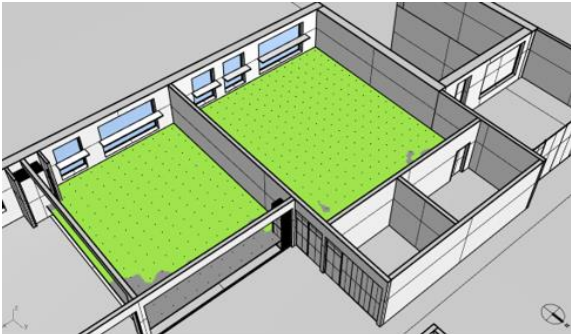


Design Option 2 - South Classrooms: 7.5% ASE

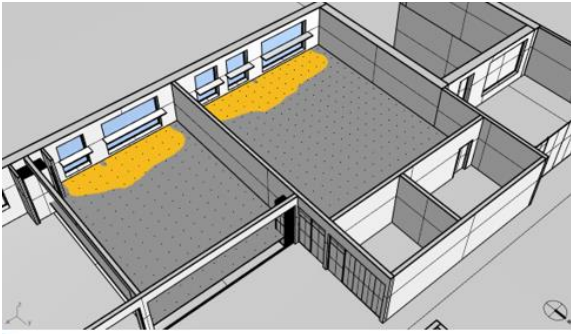
Metric	LEEDv4	
ASE <small>(1000,250)</small>	<= 10%	required
sDA <small>(300/50)</small>	40%	1 pt
	55%	2 pt
	75%	Exemplary

	Design Option 1				Design Option 3				Comments
	sDA (40%, 55% Threshold)		ASE (≤ 10%)		sDA (40%, 55% Threshold)		ASE (≤ 10%)		
	North	South	North	South	North	South	North	South	
Scenario 1 no sunshade/no light shelf	50.0	95.3	0	13.7	33.8	67.9	0	5.7	
Scenario 2 24” Sunshade (S)/18” light shelf (N)	49.0	93.8	0	10.6	40.0	66.1	0	5.3	
Scenario 3 24” Sunshade (S)/18” light shelf (N/S)	49.0 (same as Scen 2)	91.9	0	9.9	40.0 (same as Scen 2)	36.7	0	4.2	

OPTION 1

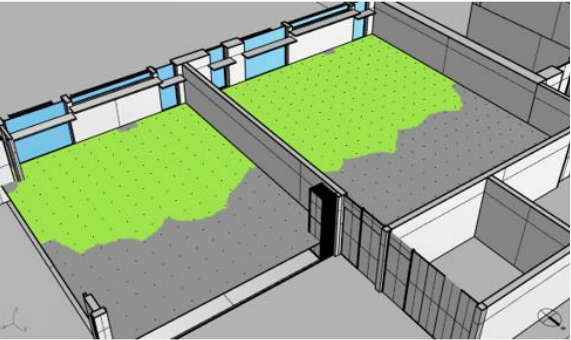


Design Option 1 - South Classrooms: 88.1% SDA

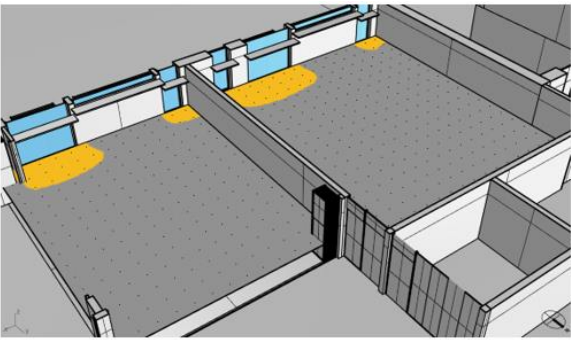


Design Option 1 - South Classrooms: 13.9% ASE

OPTION 3



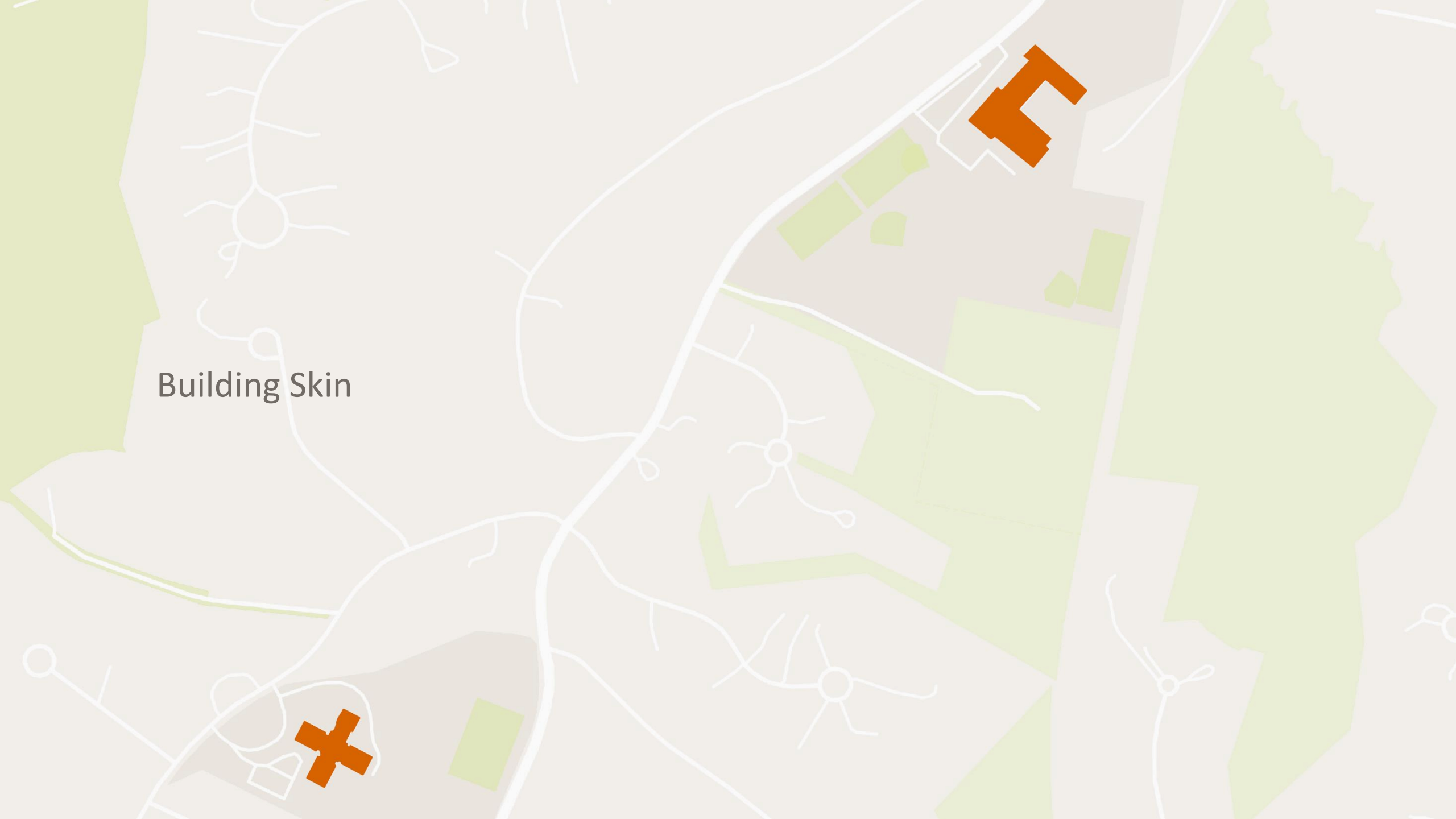
Design Option 2 - South Classrooms: 58.1% SDA



Design Option 2 - South Classrooms: 7.5% ASE

WINDOW OPTION COMPARISON

Building Skin





OPTION 1 MIST



OPTION 2 SOLID



OPTION 3 GRAIN



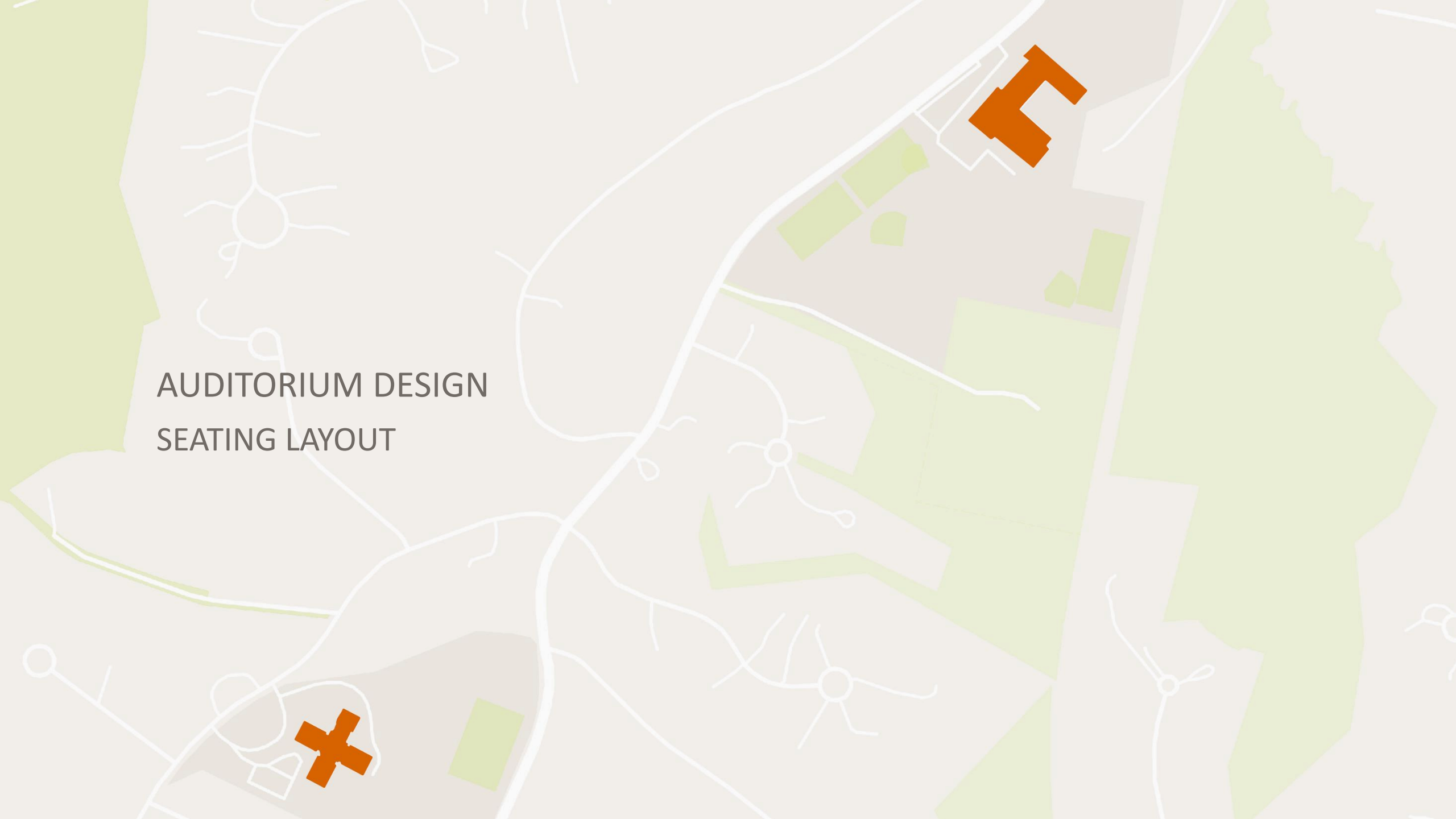
OPTION 4 TEXTURE

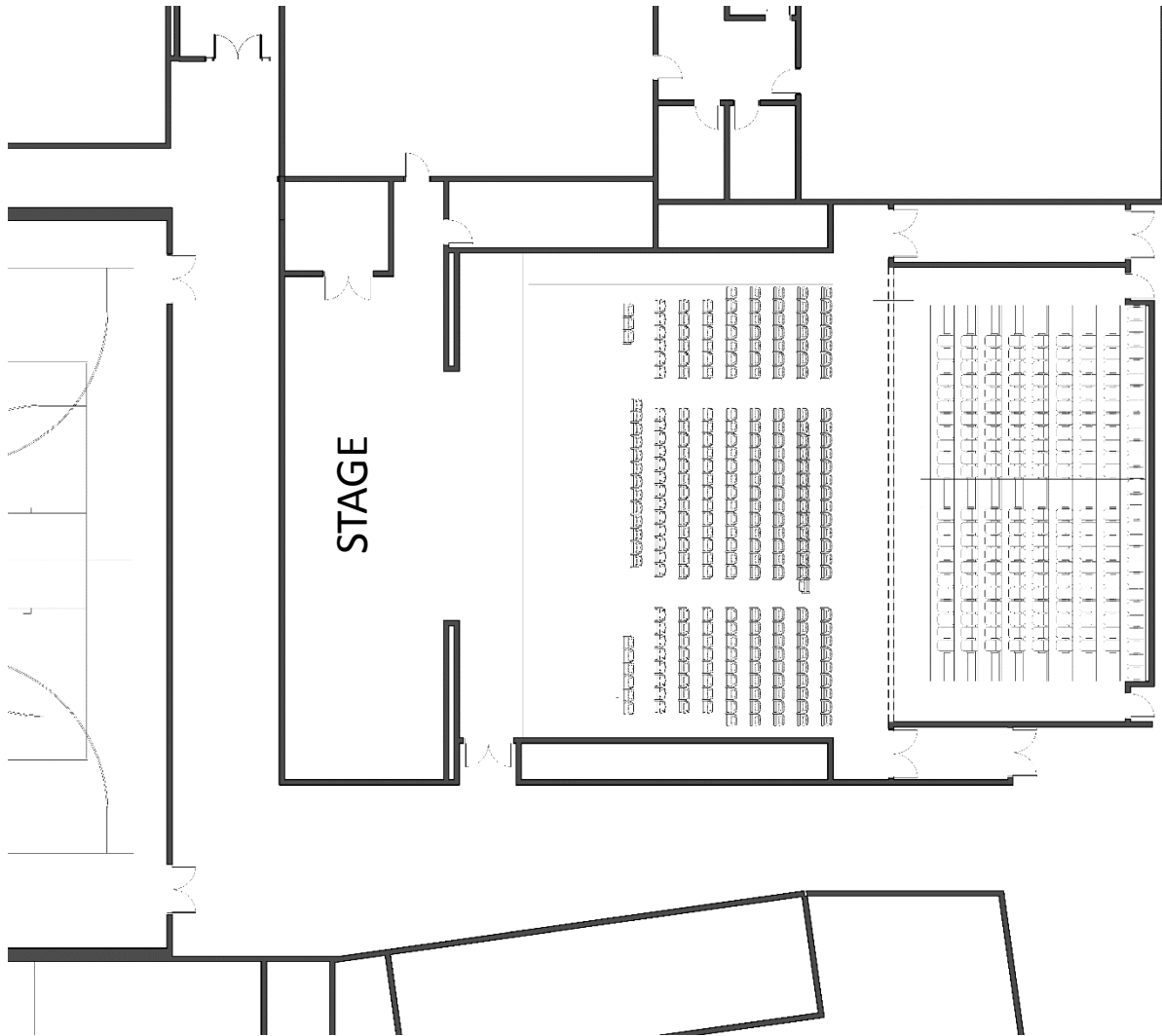


OPTION 3 – GRAIN LAYERED BRICK COLORS

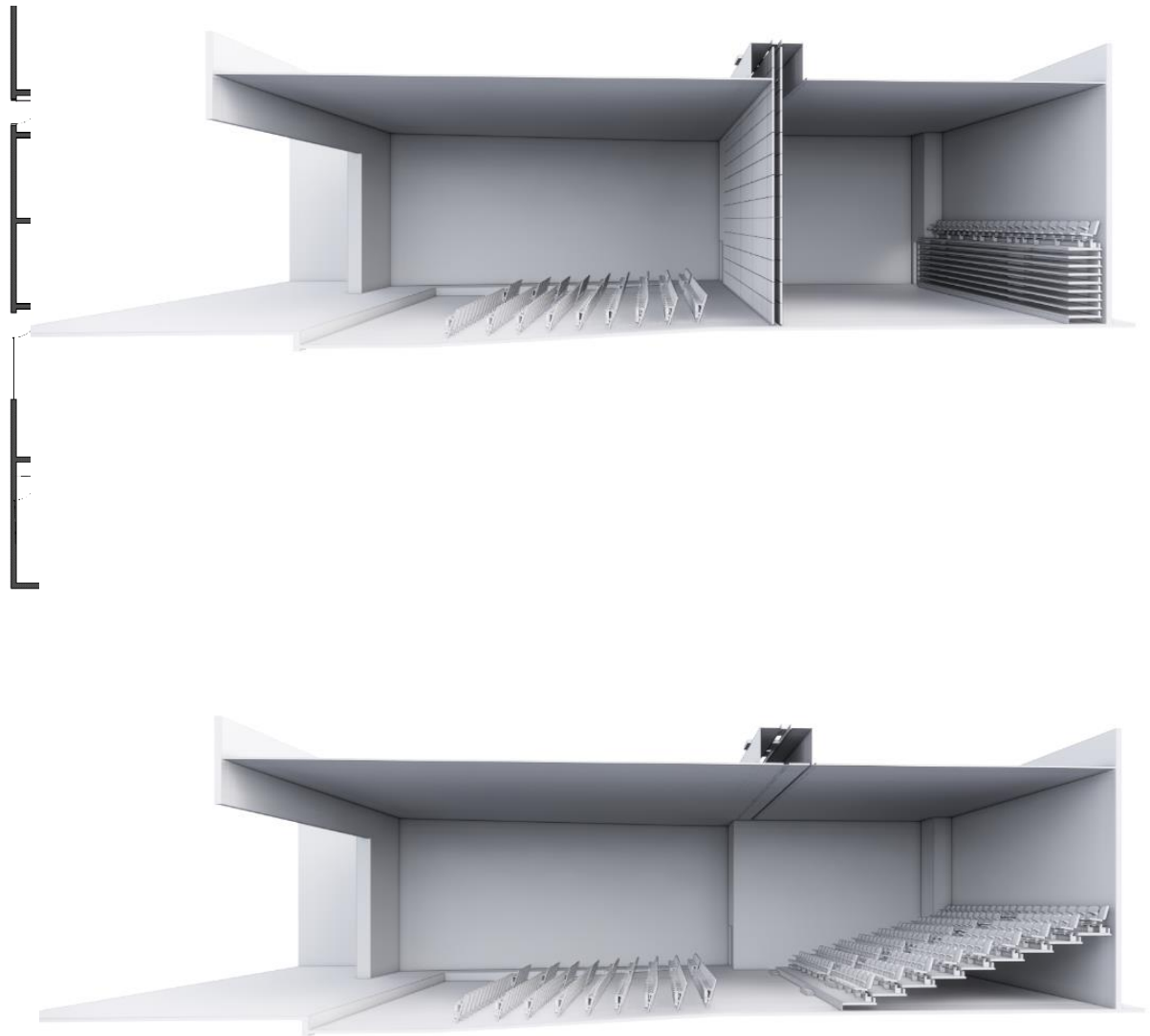


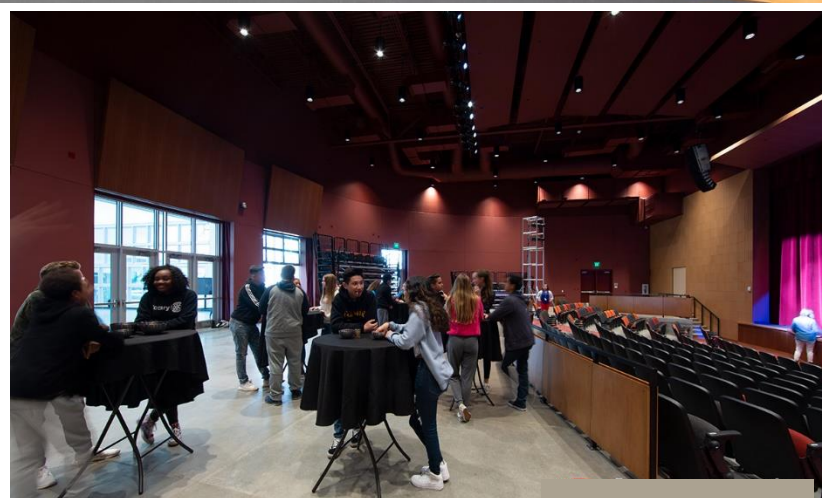
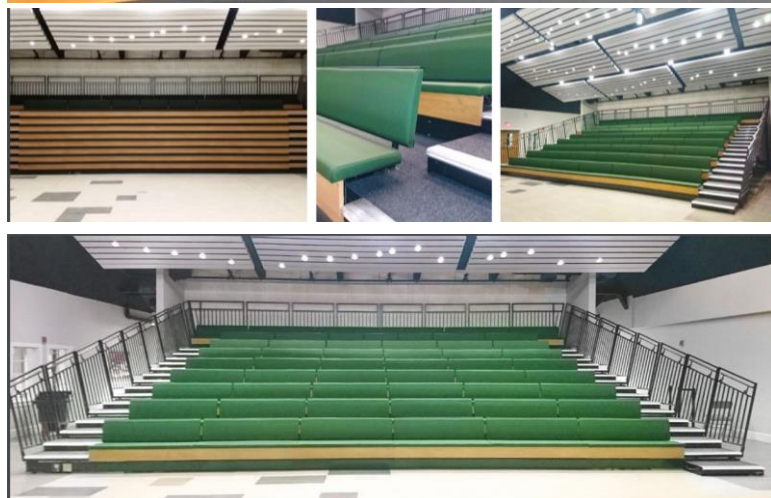
AUDITORIUM DESIGN
SEATING LAYOUT





OPTION 1 – HYBRID BLACKBOX FLIPPED



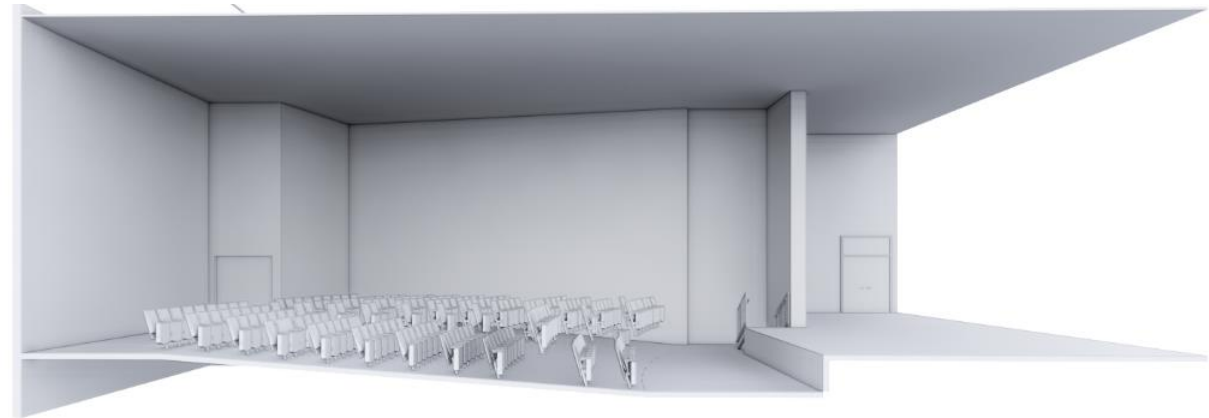
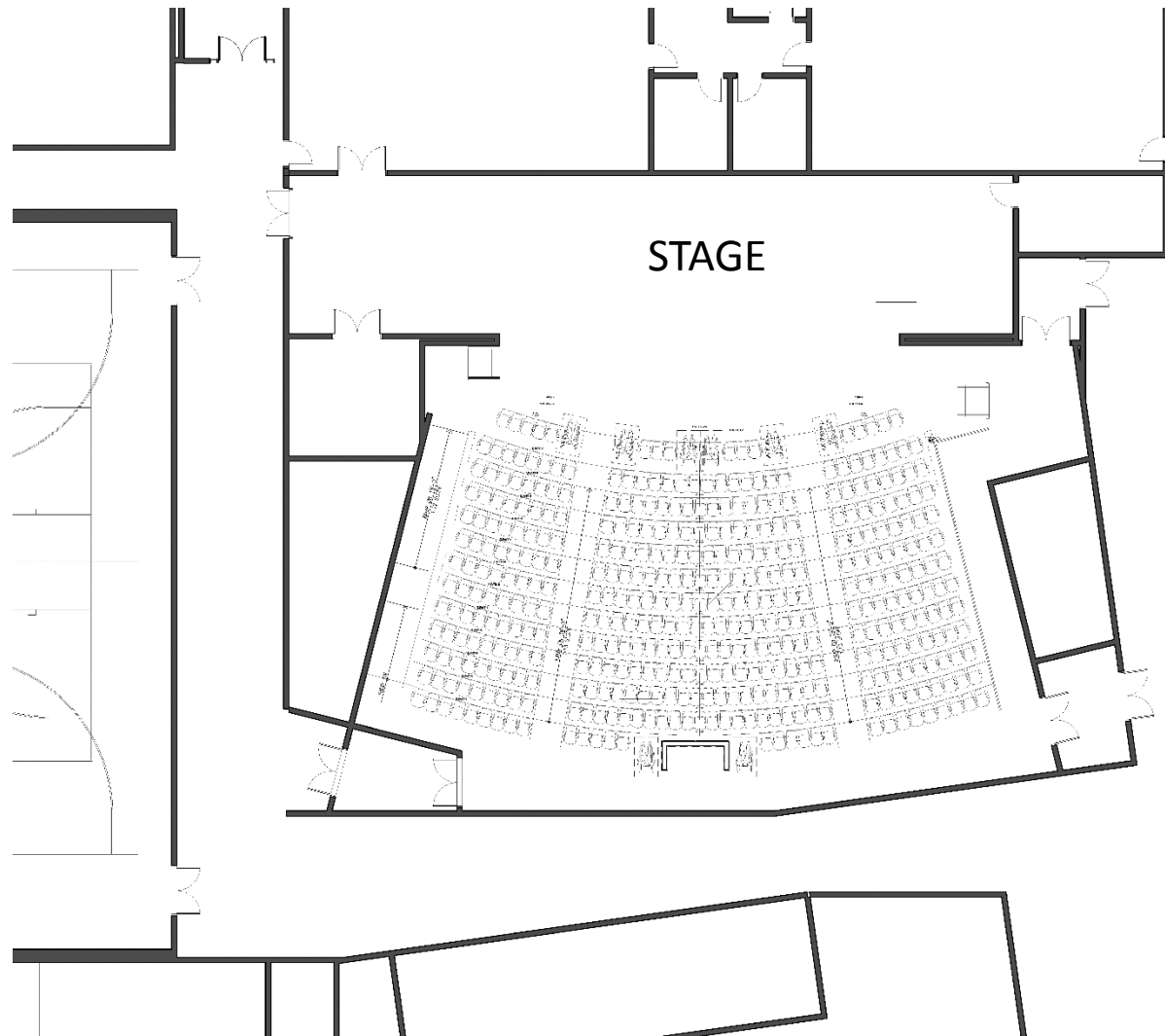


Pro's

- Acoustics, finishes, and mechanical system to match conventional auditorium
- Multiple activities can operate simultaneously – with potential for separate mechanical control
- Front (fixed seating) can accommodate one full grade

Con's

- Increased distance from furthest seat to stage
- Operable partition and seats will require maintenance
- Perception of unconventional



OPTION 2 – SLOPED FLOOR WIDE FAN



Pro's

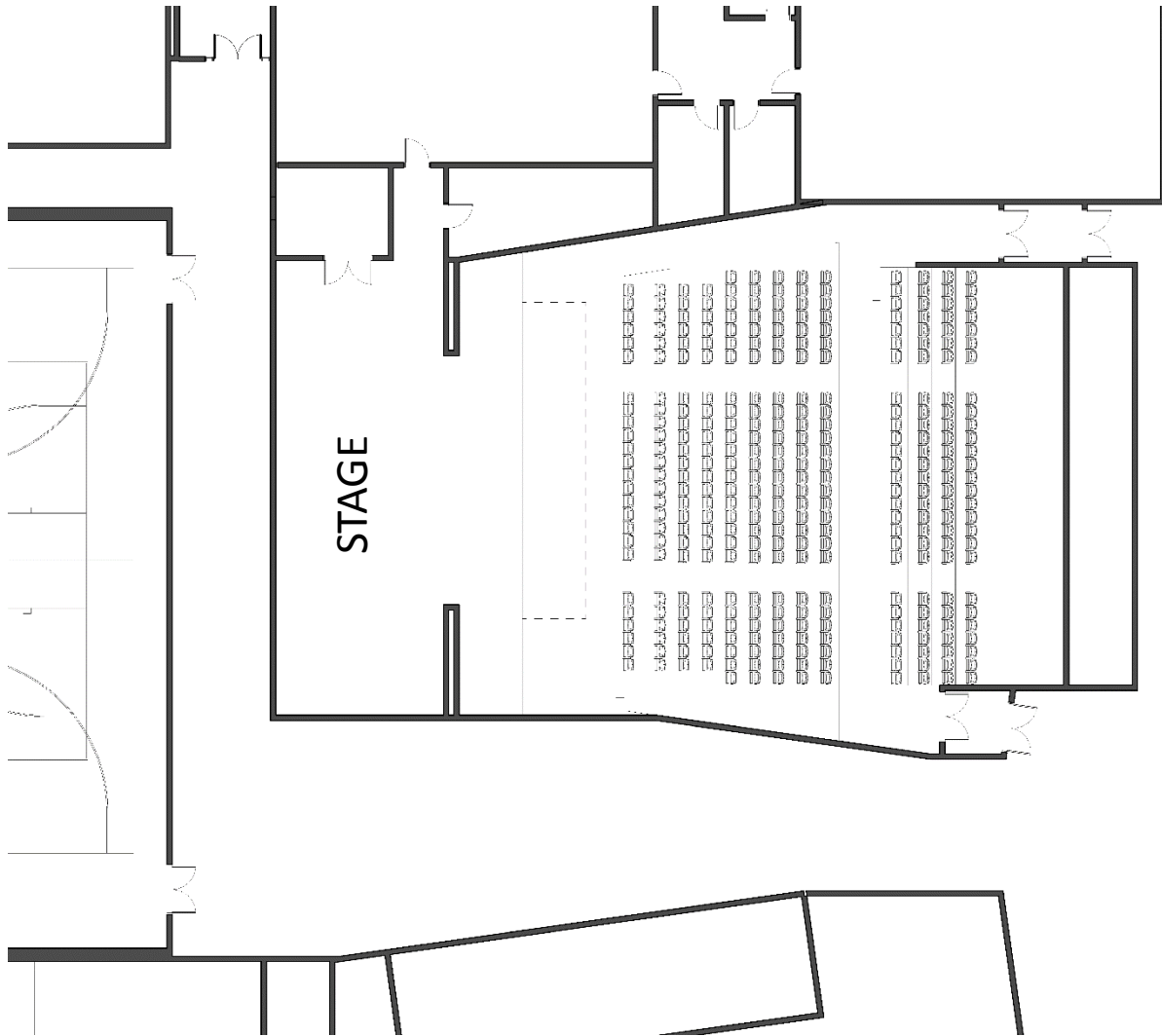
- Floor Plan rotation allows for wider seating house
- Shorter sightlines from back row
- Shorter distance walking from back row to stage
- Uniform treatment of space



Con's

- Limits use of space only as a conventional auditorium

OPTION 2 – SLOPED FLOOR WIDE FAN



OPTION 3 – TIERED SIDE ENTRANCE FLIPPED



Pro's

- Common layout found in many schools
- Uniform treatment of space
- Potential to use space below stepped seating
- Stepped seating in rear shortens sightlines to stage from back row

Con's

- Limits use of space only as a conventional auditorium
- Increased distance from furthest seat to stage
- Will require further study of distribution of wheelchair accessible seats



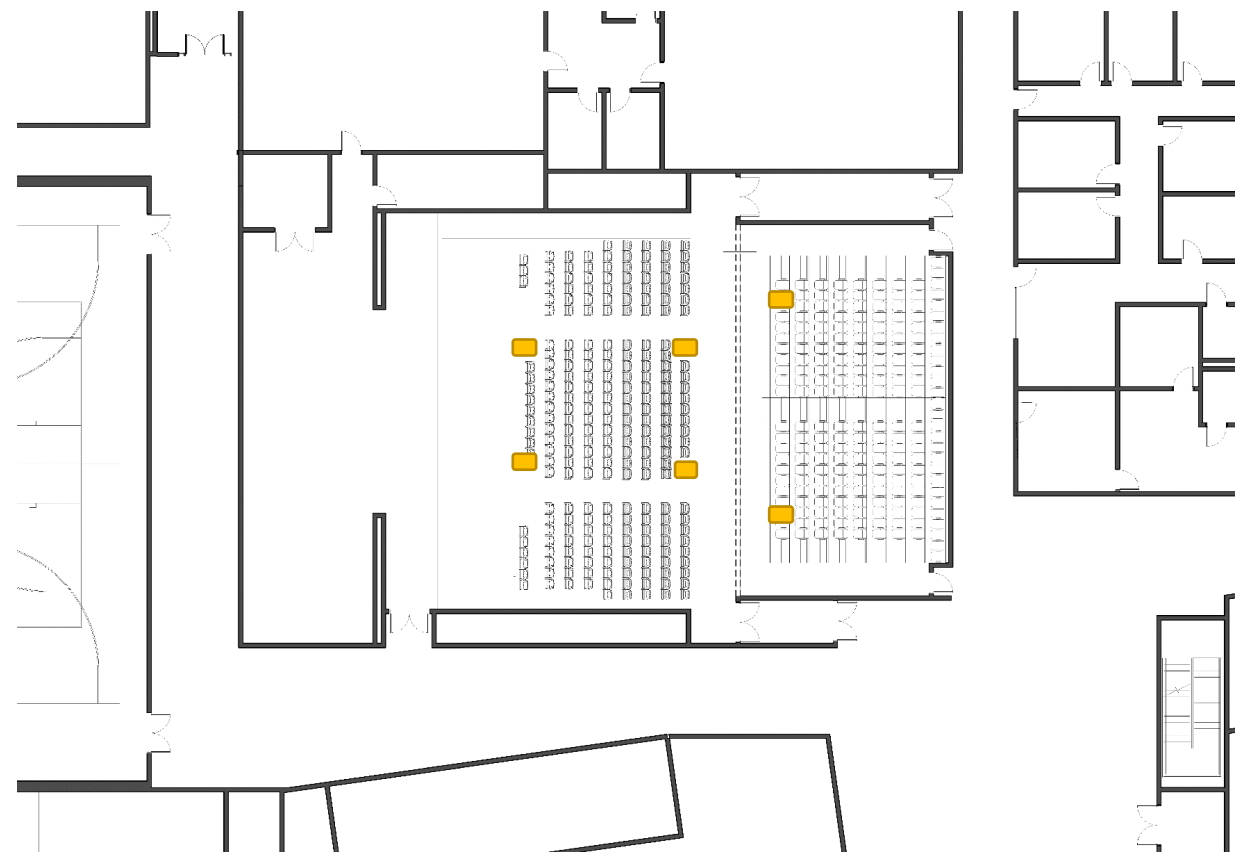
OPTION 3 – TIERED SIDE ENTRANCE FLIPPED

Places of Assembly 521 CMR 14

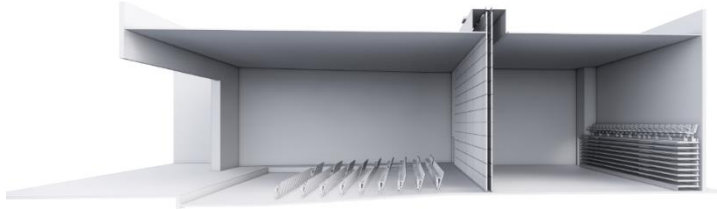
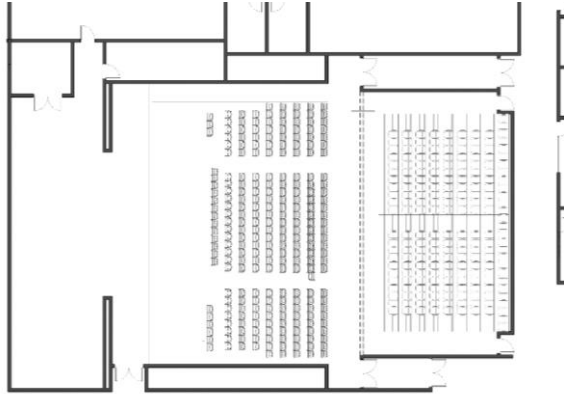
Required Wheelchair Spaces	6 (for total seating up to 500)
----------------------------	---------------------------------

Wheelchair seating locations shall be dispersed throughout all seating areas so as to provide a choice of admission prices and views comparable to those for the general public

Exception: Accessible viewing positions may be clustered for bleachers, balconies, and other areas having sight lines that require slopes of greater than 5%

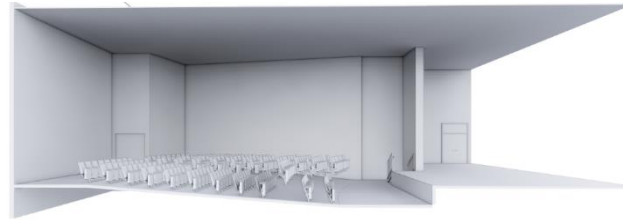
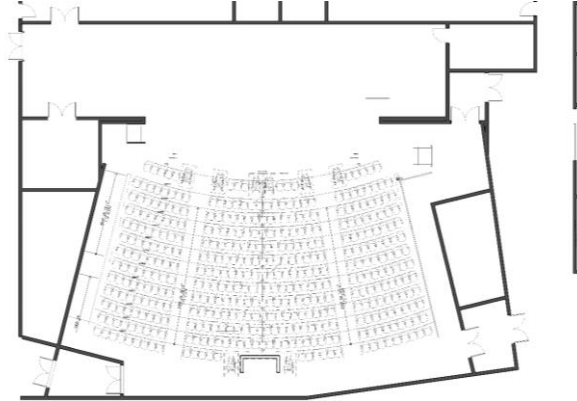


OPTION 1: HYBRID



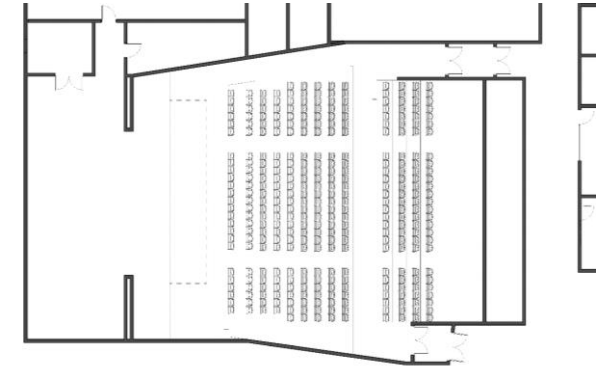
Furthest Seat: 82' Feet from Proscenium
 Seating House: 74'x84'
 Stage Width: 38'

OPTION 2: LOW SLOPED FLOOR



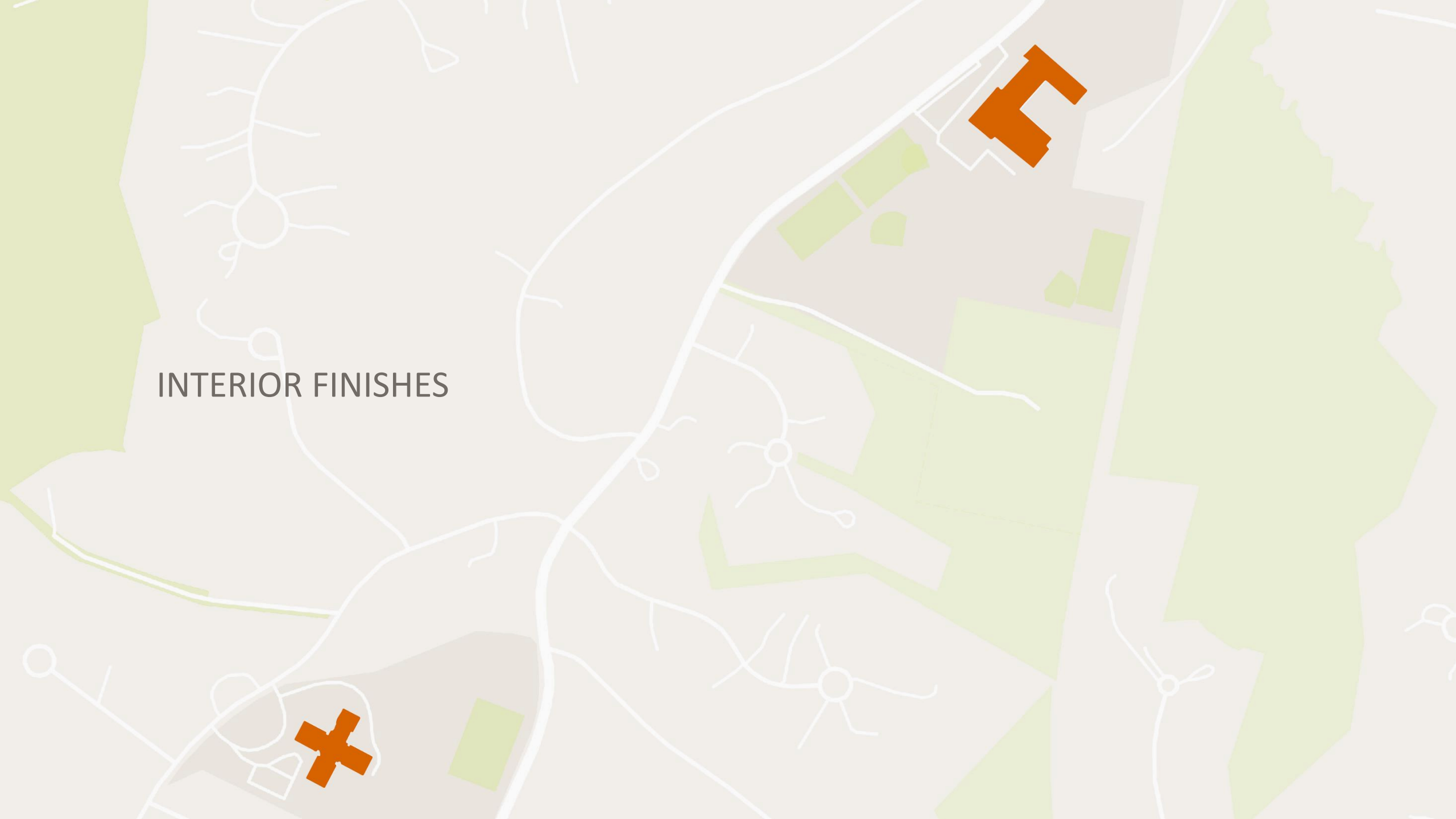
Furthest Seat: 55' Feet from Proscenium
 Seating House: 65'x94'
 Stage Width: 45'

OPTION 3: SLOPED & STEPPED SEATING



Furthest Seat: 82' Feet from Proscenium
 Seating House: 74'x84'
 Stage Width: 38'

INTERIOR FINISHES



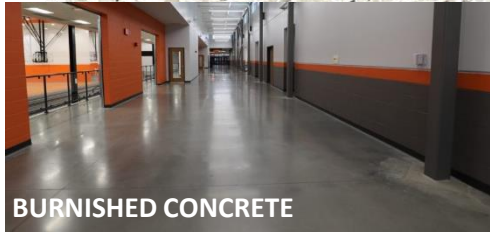
FLOORING

FLOORING

WALLS

CEILING

ACT/WOOD DECK
EXPOSED

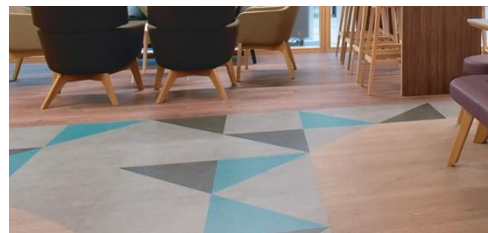


BURNISHED CONCRETE

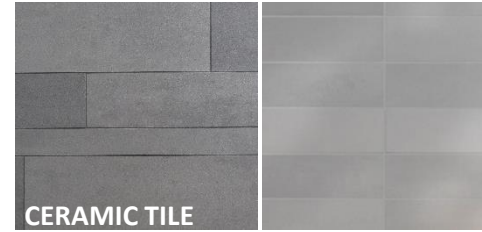
RUBBER FLOORING/ LINOLEUM



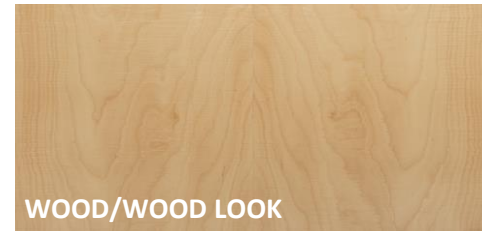
PORCELAIN TILE



CARPET TILE



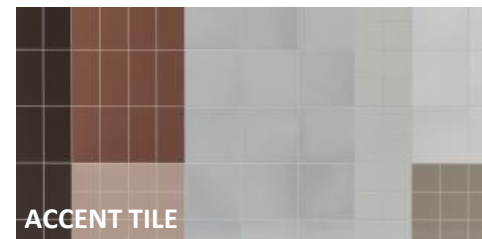
CERAMIC TILE



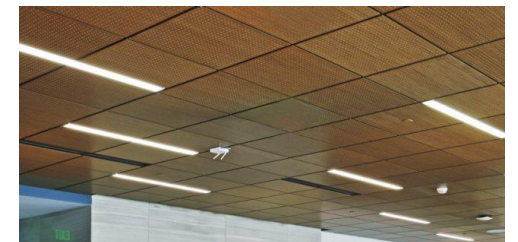
WOOD/WOOD LOOK



ACOUSTIC PANEL



ACCENT TILE



	Burnished Concrete	Ceramic Tile	Carpet Tile	VCT	LVT	Rubber	Linoleum
Sizes / Format	Slab	Tile	Tile	Sheet or tile	Plank	Sheet or tile	Sheet or tile
Description	Structural slab with finish coating;	Ceramic tile, mortar;	carpet tile;	Vinyl composite tile; site applied top coat;	Luxury vinyl tile; factory-applied UV cured finish;	Natural rubber, no additional coating;	Linoleum tile; wax polish;
Reference Manufacturer				Armstrong, Shaw	Armstrong, Shaw	Nora Sentico	Forbo, Armstrong
Cost/sf							
FACTOR 1: PROGRAM CAPABILITY	Circulation	Toilet Rooms, Lockers	Media Center, Admin Office, Sensitive Sound	Corridor, Classrooms, Labs, Team Commons	Corridor, Classrooms, Labs, Team Commons	Corridor, Classrooms, Labs, Team Commons	Corridor, Classrooms, Labs, Team Commons
FACTOR 2: ENVIRONMENTAL IMPACT <i>Based on results of Life Cycle Assessment (LCA), draws from multiple impact categories</i>	Very good Makes use of structural material, relies on finishing technique	Poor High carbon footprint due to energy intensive manufacturing	Poor High environmental impacts due to frequent replacement and energy intensive manufacturing	Very poor Much of impacts connected to coatings, stripper and polish	Poor High levels of vinyl and urethane	Good Made from recycled materials, No Red List Chemicals	Very good Bio-based material, low environmental impact in all categories
FACTOR 3: RED LIST CHEMICALS / TOXICITY <i>Includes chemicals of concern & known carcinogens prohibited by project guidelines</i>	Good No Red List Chemicals, VOC free coatings available	Good No Red List Chemicals, VOC free	Good No Red List Chemicals, VOC free, Some concern for air quality/allergens from dust accumulation	Poor Contains phthalates, a Red List Chemical; coatings may pose VOC concerns	Poor Contains high levels of phthalates, a Red List Chemical; coatings may pose VOC concerns	Good No Red List Chemicals, VOC free	Good No Red List Chemicals, VOC free
FACTOR 4: DURABILITY <i>Approximate life span based on manufacturer warrantee and Environmental Product Declaration (EPD)</i>	Very good Full life of building, structural element	Very good 30 year life span; Difficult to replace broken tile	Poor 10 year life span; Damaged tiles can be easily replaced	Poor 15-20 year life span; Damaged tiles can be easily replaced	Good 20 year life span; More durable than VCT, resistant to divots; Damaged planks can be easily replaced	Very good 30 year life span; Damaged tiles can be easily replaced; Indentations occur, but rebound	Very good 30 year life span; Damaged tiles can be easily replaced; Indentations occur, but rebound
FACTOR 5: MAINTENANCE <i>Required and recommended maintenance practices</i>	Low None	Low No refinished required; potential discoloration of grout over time.	Medium Requires vacuuming and Regular deep cleaning in high traffic areas.	High Regular stripping, buffing and recoating (urethane) 1-2 x/year; Required for durability.	Medium Does not require stripping and recoating, buffing and polish; Recommended for aesthetics.	Low No recoating required	Medium Periodic recoating (wet mop/wax, no stripping); Recommended for aesthetics/shine.
FACTOR 6: LIFE CYCLE COST <i>Tracked across 60 years cost/sq ft* material replacement (approx. maintenance cost, if relevant)</i>	\$ tbd	\$ tbd	\$ tbd	\$ tbd (\$tbd/SqFt /yr maintenance)	\$ tbd (\$tbd/SqFt /yr maintenance)	\$ tbd	\$ tbd (\$tbd/SqFt /yr maintenance)



Hill International

Meeting Minutes

Concord Middle School Building Committee
Meeting Minutes
August 05, 2021

PRESENT: Dawn Guarriello, Laurie Hunter, Pat Nelson, Matt Root, Charles Parker, Frank Cannon, Jared Stanton, Chris Popov, Jon Harris, Matt Johnson, Russ Hughes, Justin Cameron, Heather Bout, Court Booth, Peter Fischelis

PRESENT FROM HILL INTERNATIONAL: Ian Parks, Duclinh Hoang

PRESENT FROM SMMA/EWING COLE: Kristen Olsen, Michael Dowhan, Matt Rice, William Smarzewski, Keith Fallon, Saul Jabbawy

MEETING ORGANIZER: Dawn Guarriello

Call to Order

Dawn Guarriello called the meeting to order at 7:30 A.M. via Zoom Virtual Conference call. A recording of the meeting will be made available at the Concord Public School's project page and Town of Concord's website.

Approval of Minutes

Frank Cannon made a motion to approve the July 29, 2021 meeting minutes as written. Seconded by Matt Johnson. No further discussion. Motion carried unanimously with Court Booth and Peter Fischelis abstaining.

Correspondence

Heather Bout reported to the committee that there was one correspondence from Marc Caruso regarding gym size and run off.

Business

Co-chair Dawn Guarriello discussed with the committee on the membership of the subcommittees. The following Concord Building Committee Subcommittee list as follows:

Management – Laurie Hunter, Dawn Guarriello, Pat Nelson, OPM Project Manager, Design Firm Project Manager

Design – Court Booth (Chair), Dawn Guarriello, Laurie Hunter, Charlie Parker, Chris Popov, Russ Hughes, Peter Fischelis

Sustainability – Matt Root (Chair), Frank Cannon, Charlie Parker, Russ Hughes, (Future Town Sustainability Director)

Finance – Jared Stanton, Jon Harris, Court Booth, Peter Fischelis, Matt Johnson, (Chair TBD)

Communications/ Community Relations – Heather Bout (Chair)

Matt Johnson made a motion to appoint members of the subcommittees as listed. Frank Cannon Seconded. No discussion. Motion carried unanimously.

Court Booth noted the subcommittees do not make any decisions but will bring recommendations to the full committee where any and all decision making occurs.

Ms. Guarriello reported to the committee about reaching out to the subcommittee chairs about topics from the current subcommittee members. Court Booth, Chair of the Design Subcommittee, reported that the subcommittee would be looking to meet August 19, 2021 and will issue a draft agenda to dive deeper into design considerations and reaffirming space summary including clarity on gymnasium, auditorium and cafeteria. The subcommittee will review the process for examining the decision making about the form of the building such as footprint details, indents, corners and rooftop. Matt Root, Chair of the Sustainability Subcommittee, reported no date is set yet but that he has received some input. The six (6) items received to date are two (2) on ventilation (natural and displacement ventilation), reviewing electric vehicle (EV) charging stations requirements based on EZ code, energy use intensity (EUI) target based on initial SMMA energy model, ECO design charrette, and Photovoltaic (PV) system. Dr. Hunter would like to add for the Sustainability subcommittee to review the difference between air conditioning versus dehumidification in order to meet the goals. Jared Stanton, member of the Finance Subcommittee, reported using the MSBA financials format and using the same codes and structures to handle the finances in a manner that is transparent and easy to convey.

Schematic Design (SD)

Kristen Olsen, with SMMA, reported to the committee noting the cost due diligence slides have not changed from last week but there may be more items added at a later date.

William Smarzewski, with EwingCole, presented the site plan noting no change had been made since last week. For the interior design, Mr. Smarzewski noted the design time is continuing to advance and integrate systems for mechanical, electrical and plumbing as well as structural coordination. The largest change on the plan is the development of the server and seating as the design team continues to meet with the kitchen consultant and Concord Public Schools. On the Second Floor, the arrangement of the World Language classrooms are now oriented East-West for optimal solar orientation which reduces the building envelope and improves the energy modeling.

Saul Jabbawy, EwingCole, discussed the building envelope parameters noting alignment with the underlying budget requirements by targeting 75% masonry and 25% glass, meeting the energy performance goals and lighting distribution criteria, and paying attention to the student and teacher experience. Mr. Jabbawy presented the preliminary glazing wall ratios of the building as a whole as well as specific areas. Ms. Guarriello asked about glazing on the west side of the gym instead of the north and expressed concern with direct sunlight interfering with student activities. Mr. Johnson asked if the glazing at the center stairwell also was over the elevator shaft. Mr. Jabbawy noted the stairwell is the primary vertical circulation path for the school and should therefore be more welcoming. Mr. Jabbawy clarified that the elevator wall will be all masonry; the line on the slides was merely drawn too long, expressing it as glazing. Mr. Johnson expressed concern with the classroom spaces feeling enclosed as the common spaces have a lot of glazing which seems to take away opportunities for the learning spaces.

Mr. Jabbawy discussed the distribution of light in the classrooms and presented (4) different window schemes with a spatial daylight autonomy (sDA) study of each layout to the committee.

Discussion ensued:

- Matt Johnson noted having a preference to have the middle row of windows aligned instead of mirroring between floors 1 and 3. He furthermore noted the color choice of grey does not reflect local materials and therefore, does not have a naturalistic look and feel.
- Charlie Parker would like to clarify the goals for sDA and why they are the goals. Mr. Jabbawy noted the goal for the design team is to distribute light to learning spaces as much as possible within the budget of the building.
- Dawn Guarriello suggested to the design team to look at interior light shelves that could bounce the light farther into the room.
- Heather Bout noted the classrooms could have more daylight and expressed concern with the whiteboard being on the same wall as the windows. For the exterior, having the façade blend with the surrounding environment is preferred.
- Peter Fischelis noted a simpler design is preferred.
- Pat Nelson is curious about studies or input for kids who may have cognitive disorder and is concerned with the complexity of the windows.

Cash flow Update

Ian Parks, with Hill, presented to the committee on the cash flow noting no change in cash flow since last week. Mr. Parks presented the projected payments through the end of year for SMMA for Schematic Design and noted Hill had billed almost 100% of the contract and have not submitted and invoices this year. Dr. Hunter noted the Town Manager will be working with Hill and SMMA to discuss invoicing which would be brought to the committee at a later date.

Next Steps

Next meeting will be Thursday, September 2, 2021

New Business

Peter Fischelis put forth the motion to reopen the discussion of the gymnasium based on Marc Caruso's request for safety reasons to increase/add 552 sqft to allow for increased cross court widths with larger distance from the sidelines to the walls to enable two games to take place simultaneously. Heather Bout seconded.

Discussion ensued.

- Matt Johnson noted this may override the previous motions.
- Pat Nelson asked about the additional cost for the 552 sqft. Mr. Parks noted the cost would be about \$385,000.00
- Peter Fischelis notes the additional cost would be well spent for the community as the town currently does not have adequate space.
- Justin Cameron noted for the PE and health program, the current design is adequate for school operations.

Peter Fischelis withdrew his motion and noted that he did not feel the size of the gym was the right decision.

Public Comment

No public comments.

Adjournment

Co-Chair Dawn Guarriello requested the meeting be adjourned at 9:30 AM. Matt Johnson made the motion to adjourn, Court Booth seconded the motion. The motion carried unanimously.

Details of this meeting can be found on the YouTube link below:

<https://www.youtube.com/watch?v=7wSoxXKLlz4>

APPROVED

As revised and voted at 8.5.2021 meeting

Management

Laurie Hunter, Dawn Guarriello, Pat Nelson, OPM Project Manager, Design Firm Project Manager

Design

Court Booth (chair), Dawn Guarriello, Laurie Hunter, Charlie Parker, Chris Popov, Russ Hughes, Peter Fischelis

Sustainability

Matt Root (chair), Frank Cannon, Charlie Parker, Russ Hughes, (future town sustainability director)

Finance

(chair TBD) Jared Stanton, Jon Harris, Court Booth, Peter Fischelis, Matt Johnson

Communication/Community Relations

Heather Bout (chair)

Design Subcommittee (DSC)
Concord Middle School (CMS) Building Committee (SBC)
Meeting Minutes - August 19, 2021
Virtual Meeting conducted via Zoom
Approved: September 10, 2021

PRESENT: Court Booth, Peter Fischelis, Dawn Guarriello, Russ Hughes, Laurie Hunter, Charlie Parker, Chris Popov.

PRESENT FROM HILL INTERNATIONAL: Ian Parks, Duclinh Hoang.

PRESENT FROM SMMA and EwingCole: Kristen Olsen, Saul Jabbawy, Bill Smarzewski.

Court Booth called the online meeting to order at 7:31 AM. He noted that the meeting was recorded.

Attendance by roll call.

Court opened the meeting with a recommendation that the subcommittee seek to assist in the goal of ensuring that critical design-related decisions are well understood, especially due to the way in which multiple decisions may be incorporated in a single space summary deliberation and vote.

Different classroom window configurations were examined, with daylight and glare data for north and south sides. The function and effect of exterior light shades and interior light shelves were discussed. 75% masonry, 25% glass is the design objective.

Discussion was informed by information in slide format presented by SMMA (attached).

A split-auditorium concept was introduced, recalling the fact that music programming often calls for a flat floor or black box. It would call for a partition to provide for fixed seating for one grade and pull-out seating in the rear; it would provide for another separate music location while narrowing and extending the auditorium configuration. Potential cost adds were not available. The Windsor School in Boston may be a good example of this hybrid approach.

Different exterior brick patterns were introduced.

At 9:00 AM the meeting was interrupted and suspended by another meeting logging in. A quorum re-gathered at another link in order to adjourn the meeting without further discussion.

Meeting video available at:

https://concordps.zoom.us/rec/share/gRCwKMVXWtVSJPRt3kMQro207ZFhqV-f08qzqr0XjQCm9Zl1dGyu0yEQOessl_99.DGtlmUqQxE1wlhY6

Attachments:

Slide deck presented 8.19.21 by SMMA, pdf format
Space Summary current

The next meeting is on August 31 at 7:30 AM.

Design Subcommittee (DSC)
Concord Middle School (CMS) Building Committee (SBC)
Meeting Minutes - August 31, 2021
Virtual Meeting conducted via Zoom
Approved: September 10, 2021

PRESENT: Court Booth, Peter Fischelis, Dawn Guarriello, Russ Hughes, Laurie Hunter, Charlie Parker, Chris Popov.

PRESENT FROM HILL INTERNATIONAL: Peter Martini, Ian Parks, Duclinh Hoang.

PRESENT FROM SMMA and EwingCole: Kristen Olsen, Saul Jabbawy, Bill Smarzewski, Martine Dion, Phil Poinelli.

Court Booth called the online meeting to order at 7:31 AM. He noted that the meeting was recorded.

Attendance by roll call.

Public comments:

Alexa Anderson voiced support for the current 420-seat auditorium.

The Subcommittee and the design team examined window configurations, daylight and glare analysis, and wall-to-window ratio. "Option 1," a two-window classroom approach, was deemed better than Option 3 (3-window and whiteboard on exterior wall). Spatial daylight autonomy (sDA) and annual sunlight exposure (ASE) calculations for a school year were shared (slide 12), with both 24" deep exterior sunshades and 18" interior light shelves on the south side providing the best results.

The Subcommittee and the design team examined building skin alternatives (slide 15) and weighed the merits of those presented. #2, a traditional brick color and pattern, was eliminated. #3, "grain," was the first choice of two members, second choice for 3 members, placing it in the preferred category. More color choices in the grain pattern will be examined at a future meeting. #4, "texture," was the second most preferred, with debate about the ½" sections of brick protruding (the texture appearance).

The Subcommittee and the design team examined the new ideas for a hybrid or split auditorium. #1, hybrid, calls for a design with a partition and pull-out seating in the rear room. #2 is the idea most recently adopted by the CMSBC, single room with no partition split, "low sloped floor." #3, sloped and stepped seating, calls for no partition and an elevated rear section. See slide 52. Dr. Hunter conferred with music educators earlier this week and concluded that the hybrid ideas were not strongly favored. The Subcommittee reached consensus that option 2 was still preferred.

The Subcommittee and the design team started to examine interior finish alternatives, and specifically flooring (slide 66). This discussion will continue at the next meeting, and will examine ceilings, walls, and more cafeteria detail at that time.

Public comments:

Dean Banfield, Fincom observer speaking on his own behalf, noted that the CMSBC had not provided recent opportunity for the public to examine the public-facing aspects of the new building; also, that world language rooms could be included in the main academic wing; that the gym and auditorium locations could be swapped for improved access to the gym and the fields. He noted that the bridge connecting the two wings and the entrance, as recommended, calls for closer consideration.

Karen Reed voiced appreciation for the work she observed at the meeting.

Meeting video available at:

https://concordps.zoom.us/rec/play/kJumwrWwsywwv6zTylvY_kbogyaeIPuZnrnewlGwI62UeyN6dpHi5b6BGpjoj7eDev588-GrAx5l_vYb_iI8plHhBagG94bp?startTime=1630409469000&xzm_rtaid=TxAaValHS46rZ9doNRUoFw.1636418499813.5c5df5c7cafa9d63fd16f8537331208&xzm_rhtaid=962

Attachments:

Slide deck presented 8.31.21 by SMMA, pdf format

The next meeting is TBA.

Minutes – Sustainability Subcommittee Meeting – August 12, 2021
Prepared by Charlie Parker

Natural Ventilation

David Bearg presented his perspective on natural ventilation. Challenge is to provide generous supply of fresh air at low cost through a hybrid model. Need to move air without restrictions where possible. Simpler and more direct approach. And, easier to maintain. Need only Merv 8. Don't restrict with Merv 13.

Matt Root indicated a concern with non-standard design and the risk associated with it. Does the risk outweigh the benefit? Ventilation is small portion of energy and we should really focus on operational cost because it will be relatively low.

Russ indicated that we have Energy Recovery Wheels (ERU's) in each of the schools and they perform well.

Ian Parks from Hill expressed concerns on both cost and performance. System like this has not been used here in New England and how it would perform here.

Andy Oldeman presented an example of natural ventilation showing cross flow and vertical pathway with vent at the roof, which is a wonderful option. Question is with the temperature and humidity extremes. Need mechanical conditioning and that creates a parallel system.

Andy moved to a discussion of displacement ventilation showing difference to standard ventilation techniques, showing the layering of air in a room. Air enters low and rises. One drawback is that the displacement system cannot heat the air and this means there must be a separate system to provide heating at the perimeter. The auditorium is good candidate for this type of ventilation.

Charlie Parker requested analysis of more efficient energy recovery as part of the design process.

Air Conditioning vs Dehumidification

Dehumidification-based system create dryer air but no control over temperature. Advantage of dehumidification is that it saves on first cost over a full cooling system. Heating requires VRF capacity, but the requirement is lower in heating than cooling, leaving a middle ground option with dehumidification at the cooling peak. With VRF system there will be some cooling, it is a question of if full cooling is provided.

Laurie indicated that she had some experience with dehumidification-only and reported mixed results and stressed the importance of AC to existing staff in the middle schools.

Final Comments Displacement Ventilation

Matt asked a follow-up question about the need for heating at the perimeter given the high performance enclosure. Andy responded with a conservative view as to the perimeter heating requirement. Matt and David both indicated the importance of displacement ventilation to healthier environments.

Minutes of August 25th Sustainability Meeting – Prepared by Charles Parker

List of questions for up or down votes was sent by Matt Root for framing the meeting

Do we need to have SMMA further investigate a hybrid natural/mechanical ventilation strategy?

Matt recommended that we stick with the traditional model as the natural method deviates from the standard approach. Charlie Parker recommended against investigating this approach further. Russ indicated that we already have mechanical ventilation and not sure what value is added through the natural ventilation approach.

Subcommittee was unanimous in recommending that we not further investigate this option.

Do we want SMMA to present options for the use of displacement ventilation in specific spaces in the new Middle School.

Charlie Parker recommended that this option not be pursued for the classrooms but that the Auditorium would be a good fit, at a minimum. Russ agreed with limitation to non-classroom spaces, such as the Auditorium.

Subcommittee was unanimous in recommending not to investigate use of displacement ventilation throughout all school spaces. Additionally, the Subcommittee was unanimous in recommending that we further investigate the use of displacement ventilation in few targeted areas of the building (Auditorium, Gym, and Cafeteria).

Do we want SMMA to further investigate dehumidification only with no air conditioning, a partial air conditioning system, or full air conditioning.

The Subcommittee was in agreement that full a/c made sense because of the chance that we will confront extreme events and because most of the first cost is already going to be invested in a VRF system. The subcommittee believes the system should be sized to meet the full a/c load. Additionally, the Subcommittee was specifically not interested in pursuing a 'partial a/c system' as 'partial' simply indicates an undersized system that will not meet the full needs of the project.

Subcommittee was unanimous in recommending that the a/c be the full capacity.

Do we want SMMA to further investigate the number of EV charging stations to the level specified in the EZ code?

Subcommittee was in agreement that the number of charging stations should be limited to the number of EV vehicles assigned to school employees' vehicles which are to be hosted at the school. This is a very small number of employees.

Subcommittee agreed to defer this decision to a later date with the understanding that we will have pricing and a better understanding at that time. Consensus seemed to be 2% installed charging stations.

Subcommittee unanimously supported a reduction to 2% of spaces as EV charging stations.

Do we want SMMA to investigate 10% as EV ready?

Subcommittee was unanimously supported this with the proviso that this number may change as we learn more about costs.

Do we want SMMA to use the rooftop for the installation of the mechanicals?

The subcommittee was unanimous in allowing mechanical equipment on the roof because installing the VRF outside units closer to the inside units is far less costly and more efficient.

Community feedback:

1. Brad Hubbard-Nelson raised a question on roof-top aesthetics given the discussion on mechanicals being located on the roof. SMMA indicated that they are sensitive to the issue of rooftop design but noted that screens often fall prey to value engineering.
2. David Bearg thanked the group for allowing him to present the natural ventilation option and for the response.
3. Jake Swenson noted that GSHP systems would not be located on the roof and that would improve aesthetics. SMMA responded that GSHP was an option that with still under life cycle cost analysis (LCA).
4. Janet Rothrock indicated an interest in LCA for GSHP vs ASHP. SMMA indicated that this analysis is in process.

CMS Sustainability Subcommittee - 8/25 SD recommendations

Option #	Request to the Design Team	Subcommittee Recommendation
1	Further investigate a hybrid natural ventilation strategy (beyond opening windows).	Not Recommended
2	Further investigate a complete displacement ventilation system.	Not Recommended
3	Present options for a partial displacement ventilation system.	Recommended
4	Present options for a dehumidification only system (no air conditioning).	Not Recommended
	Further investigate a partial air conditioning system - heat pump sizing based on heating demand, which is lower than the air condition peak, so there would be no air conditioning at the extreme.	Not Recommended
5	Reduce the number of EV charging stations from the requirements listed in the EZ-Code to 2% installed spaces connected to building (meet LEED goal).	Recommended
6	Allow mechanicals systems to be placed on the roof.	Recommended
7	Target EV charging infrastructure for 10% of parking as EV ready.	Recommended
8		