

# New Willard Elementary School Construction

Concord, MA



## Community Meeting

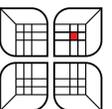
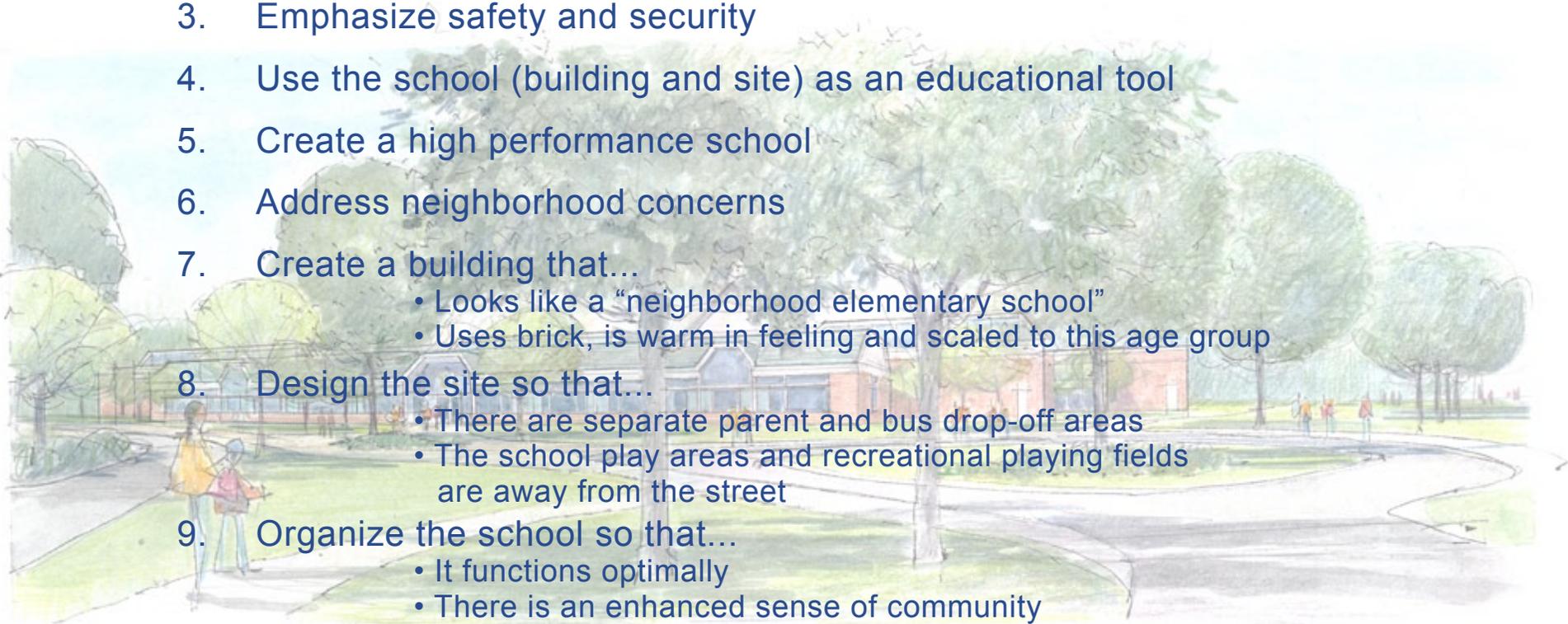
October 11, 2007



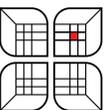
The Office of Michael Rosenfeld, Inc., *Architects*

# Goals & Values

1. Design to meet the students' educational needs in all respects
2. Establish basic educational parity with Alcott and Thoreau
3. Emphasize safety and security
4. Use the school (building and site) as an educational tool
5. Create a high performance school
6. Address neighborhood concerns
7. Create a building that...
  - Looks like a "neighborhood elementary school"
  - Uses brick, is warm in feeling and scaled to this age group
8. Design the site so that...
  - There are separate parent and bus drop-off areas
  - The school play areas and recreational playing fields are away from the street
9. Organize the school so that...
  - It functions optimally
  - There is an enhanced sense of community
10. Meet local, state, and MSBA requirements
11. Complete this project on time and budget
12. Consider future expansion



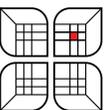
# A School in a Park



# The Site



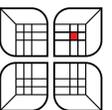
Maximize open space



# The Site



Protect and save existing trees

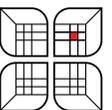


# The Site



Maximize contiguous  
Recreational areas and  
playing fields

Baseball  
T-Ball (2)  
Soccer (2)  
Mini-Soccer (4)

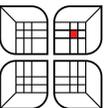


# The Site



Maximize contiguous  
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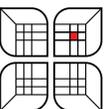
Baseball  
T-Ball (2)  
Soccer (2)  
Mini-Soccer (4)



# The Site



Locate new building so that the existing building functions during construction



# The Site

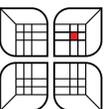


Locate new building so that the existing building functions during construction

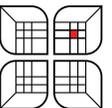
Smaller Footprint:

Existing Bldg: 54,000sf

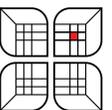
New Building: 48,600 sf



# The Site - Solar Orientation



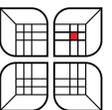
# The Site - Winds



# The Site - Low Impact Design



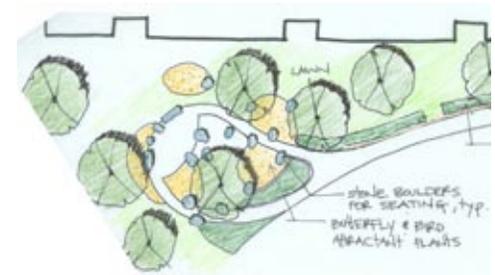
Bioretention Swales



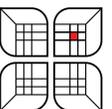
# The Site - Low Impact Design



Bioretention Swale



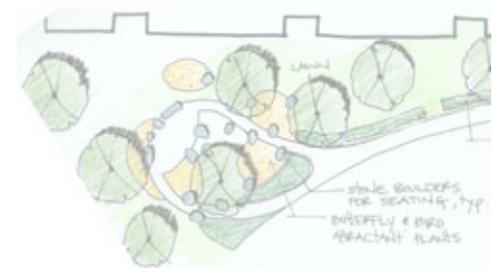
Outdoor Classroom



# The Site - Low Impact Design



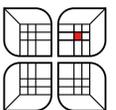
Bioretention Swale



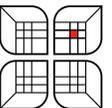
Outdoor Classroom



Rainwater Cistern



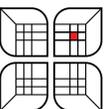
# The Site - Traffic Flow



# The Site - Traffic Flow



One-way Bus Loop  
with lane for passing  
and control gate

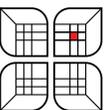


# The Site - Traffic Flow



One-way Bus Loop  
with lane for passing  
and control gate

One-way pick-up /  
drop-off with lane for  
passing



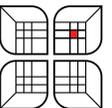
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One-way pick-up /  
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Parking for parents,  
staff and visitors



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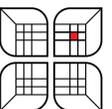


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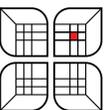
One-way pick-up /  
drop-off with lane for  
passing

Parking for parents,  
staff and visitors

Fire / Police Access



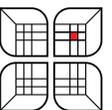
# The Site - Building Access



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Main Entry

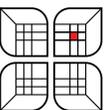


# The Site - Building Access



Main Entry

Service Entry



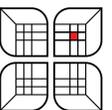
# The Site - Building Access



Main Entry

Service Entry

Bus Entry



# The Site - Building Access

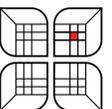


Main Entry

Service Entry

Bus Entry

Emergency Egress



# The Site - Building Access



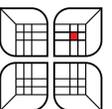
Main Entry

Service Entry

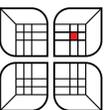
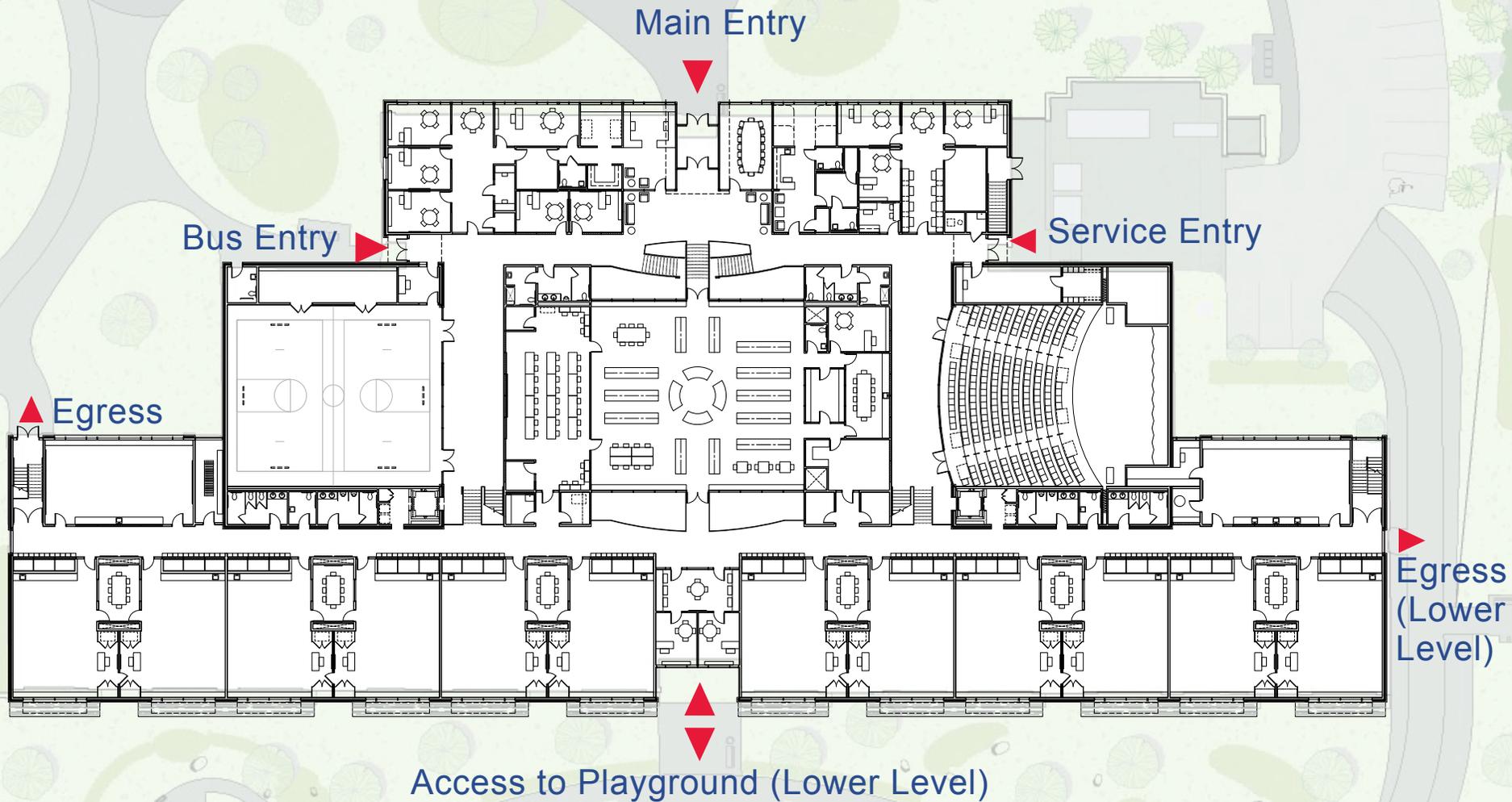
Bus Entry

Emergency Egress

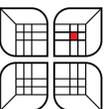
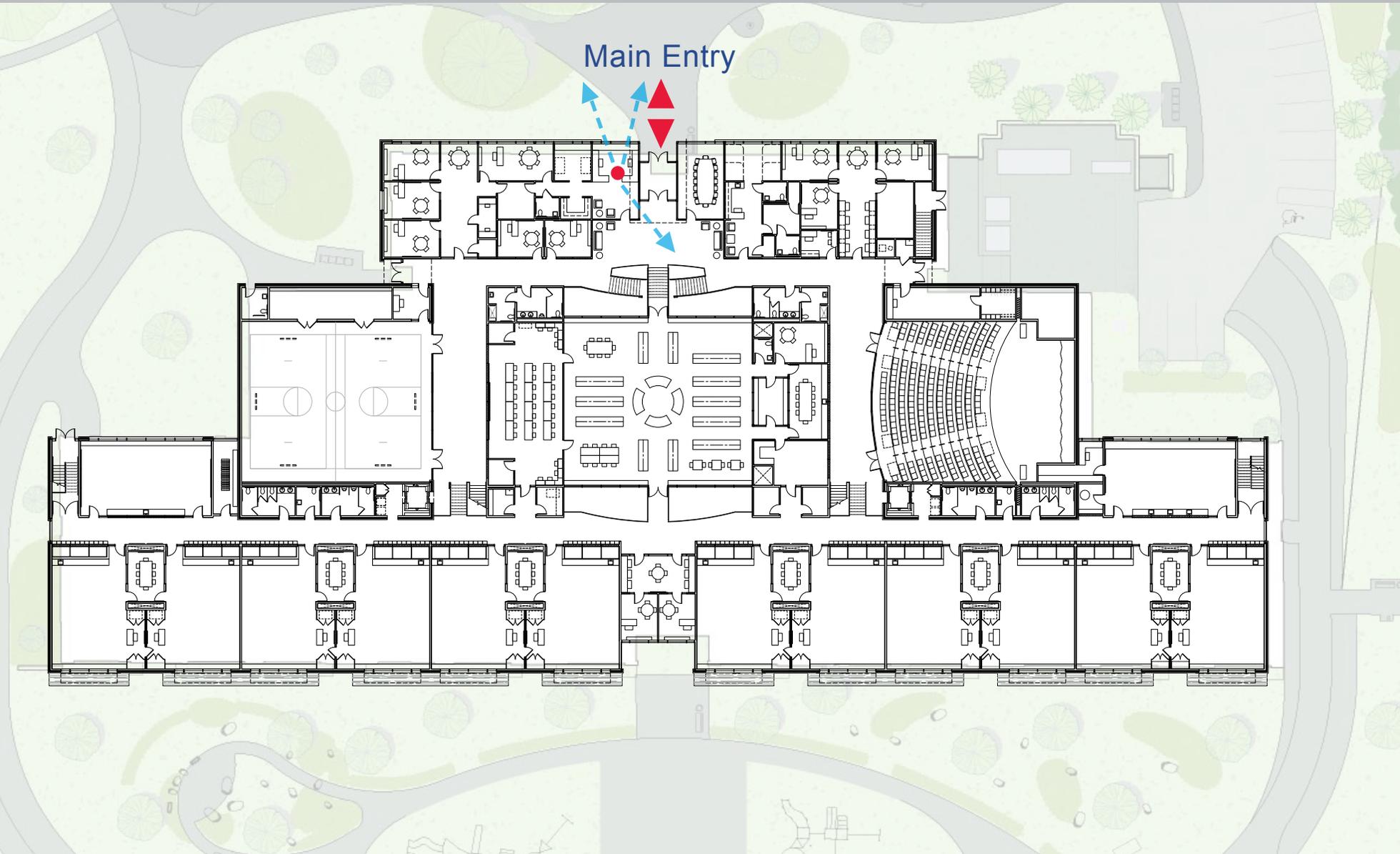
Access to Playground



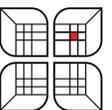
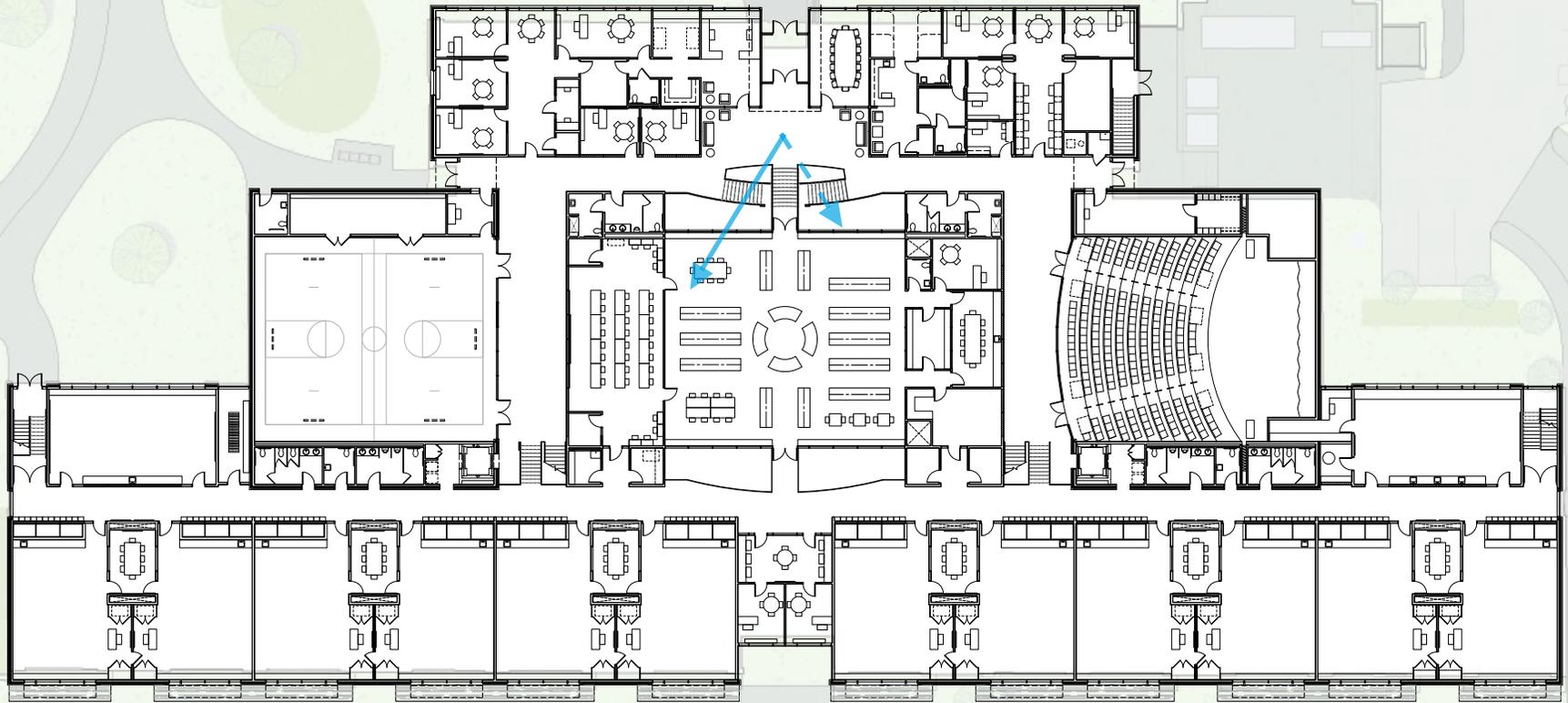
# School Organization- Building Access



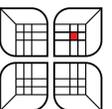
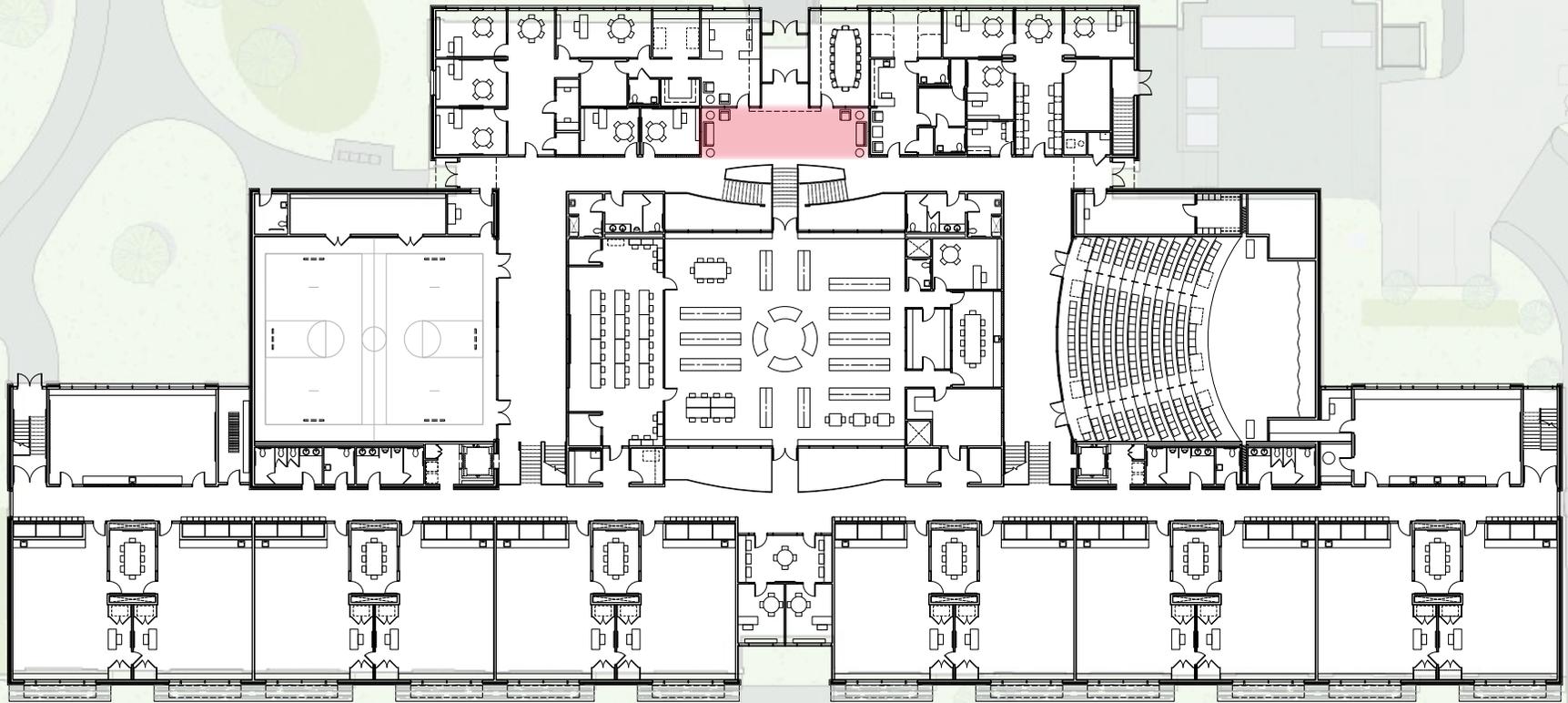
# School Organization - Control Points



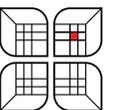
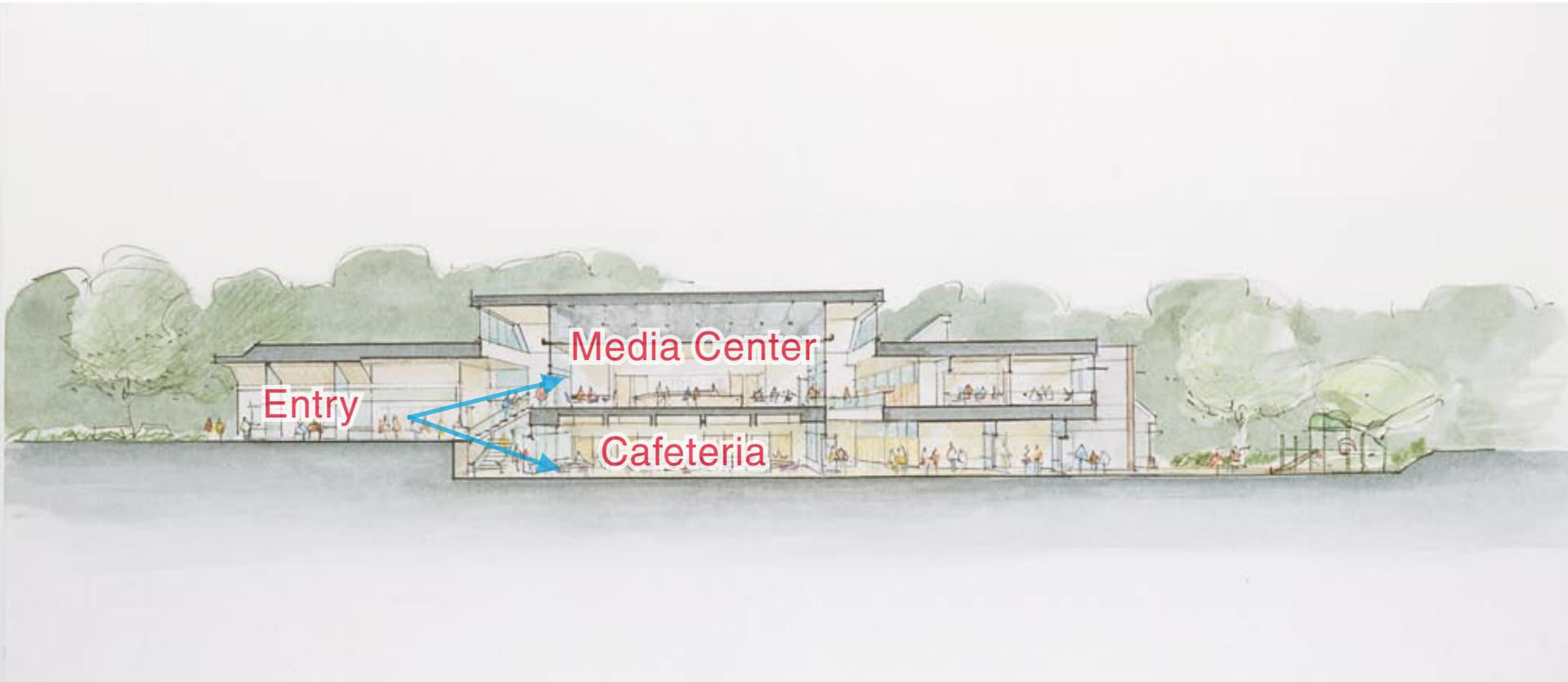
# School Organization - Main Entry



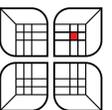
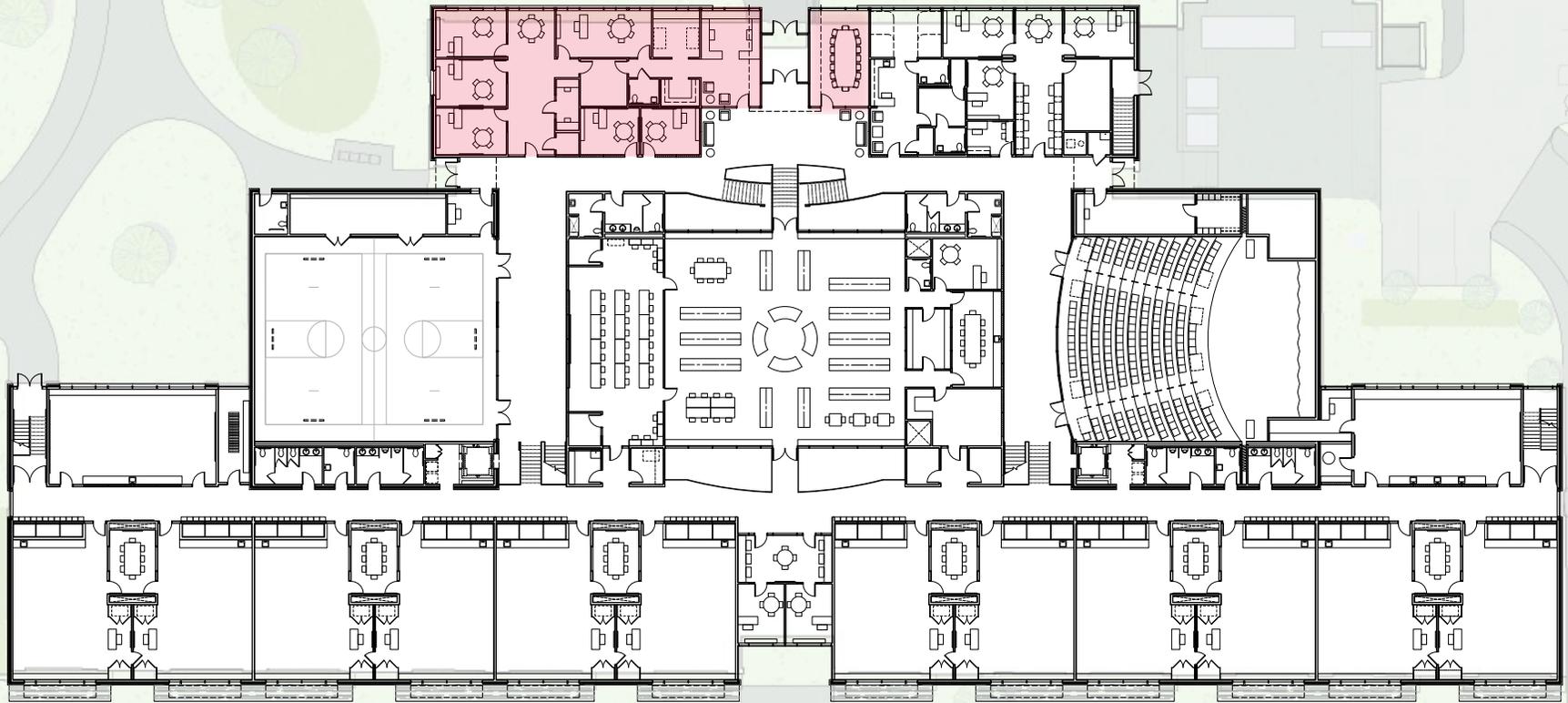
# School Organization - Gathering Area



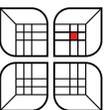
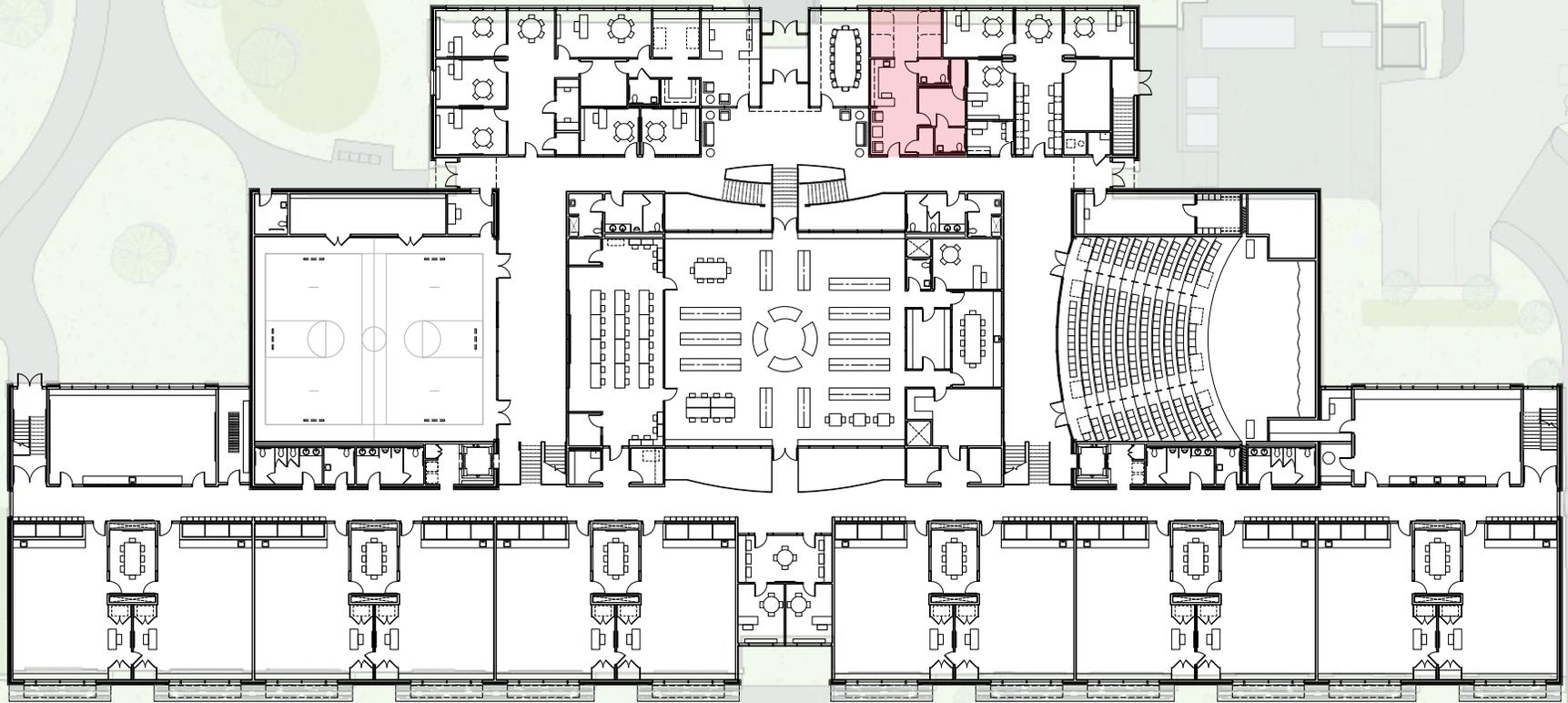
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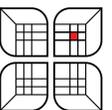
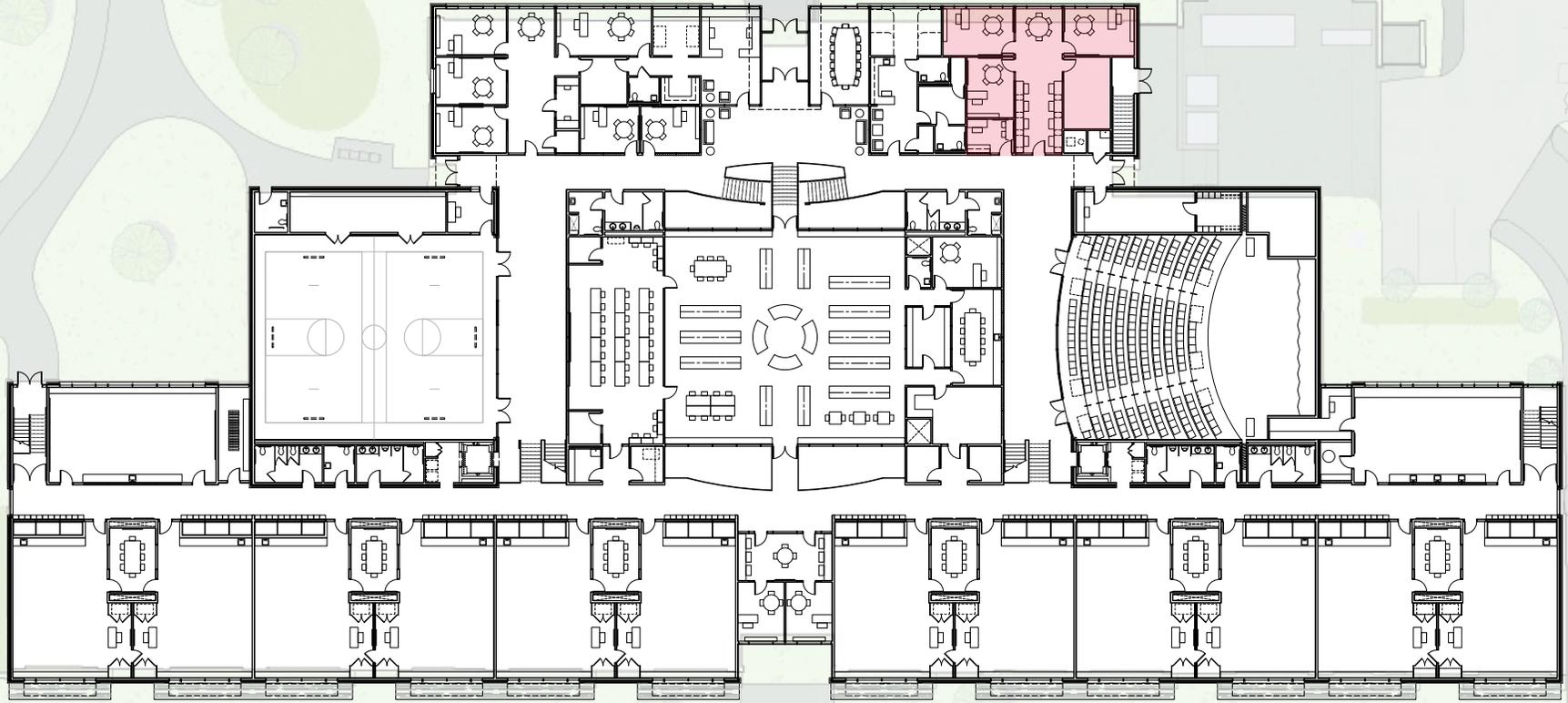
# School Organization- Admin. Suite & Conf.



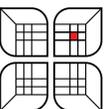
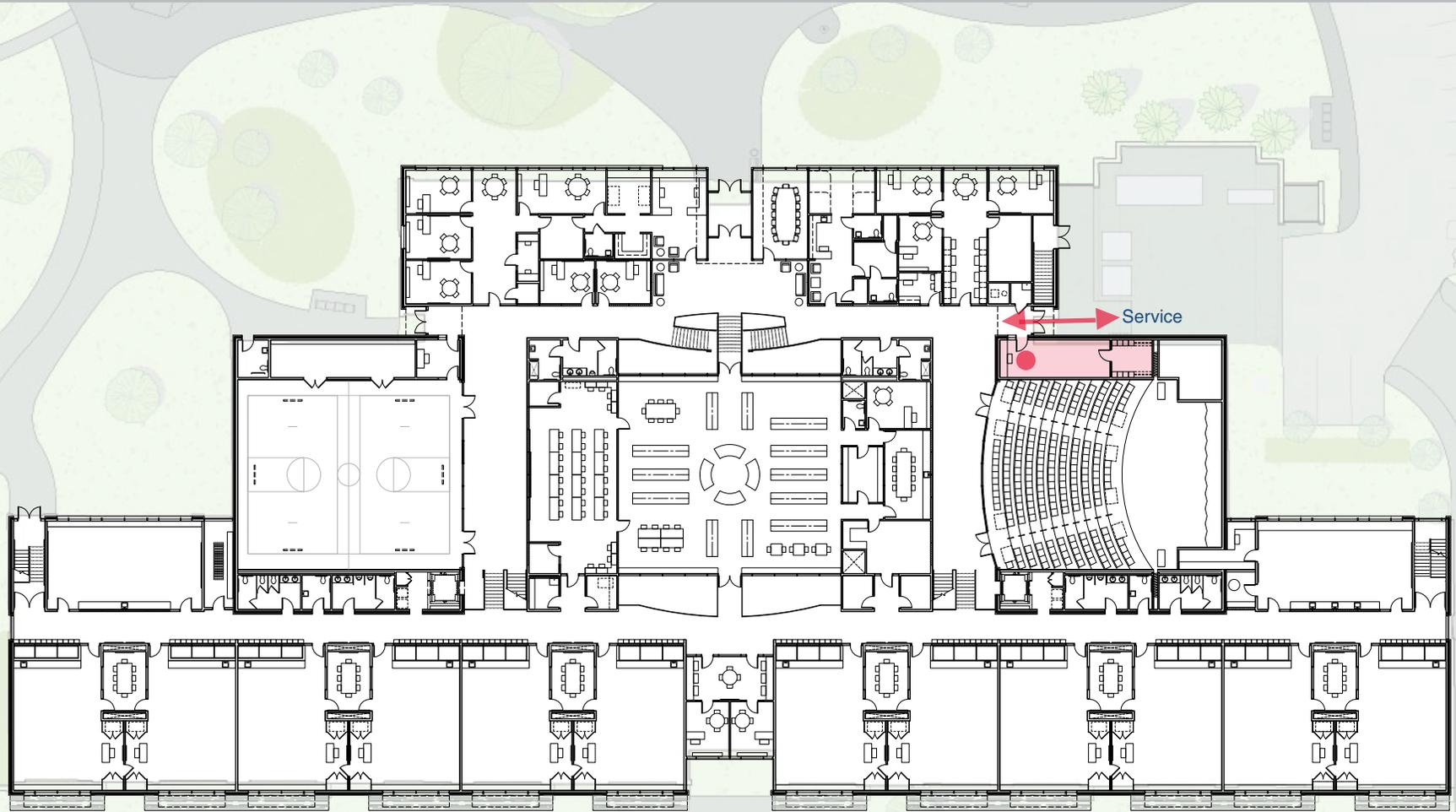
# School Organization- Health Suite



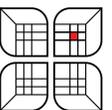
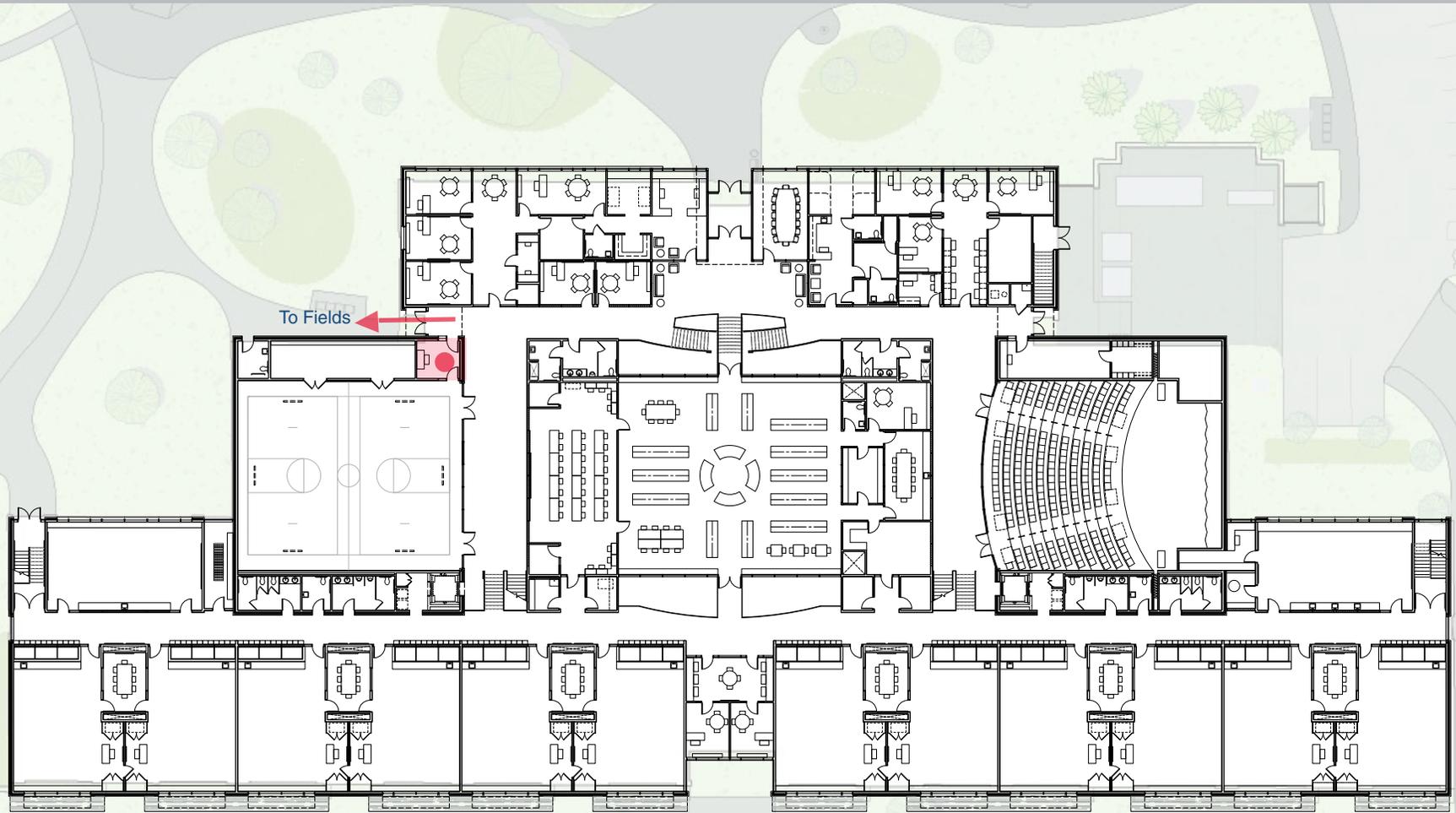
# School Organization- Reading Suite



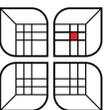
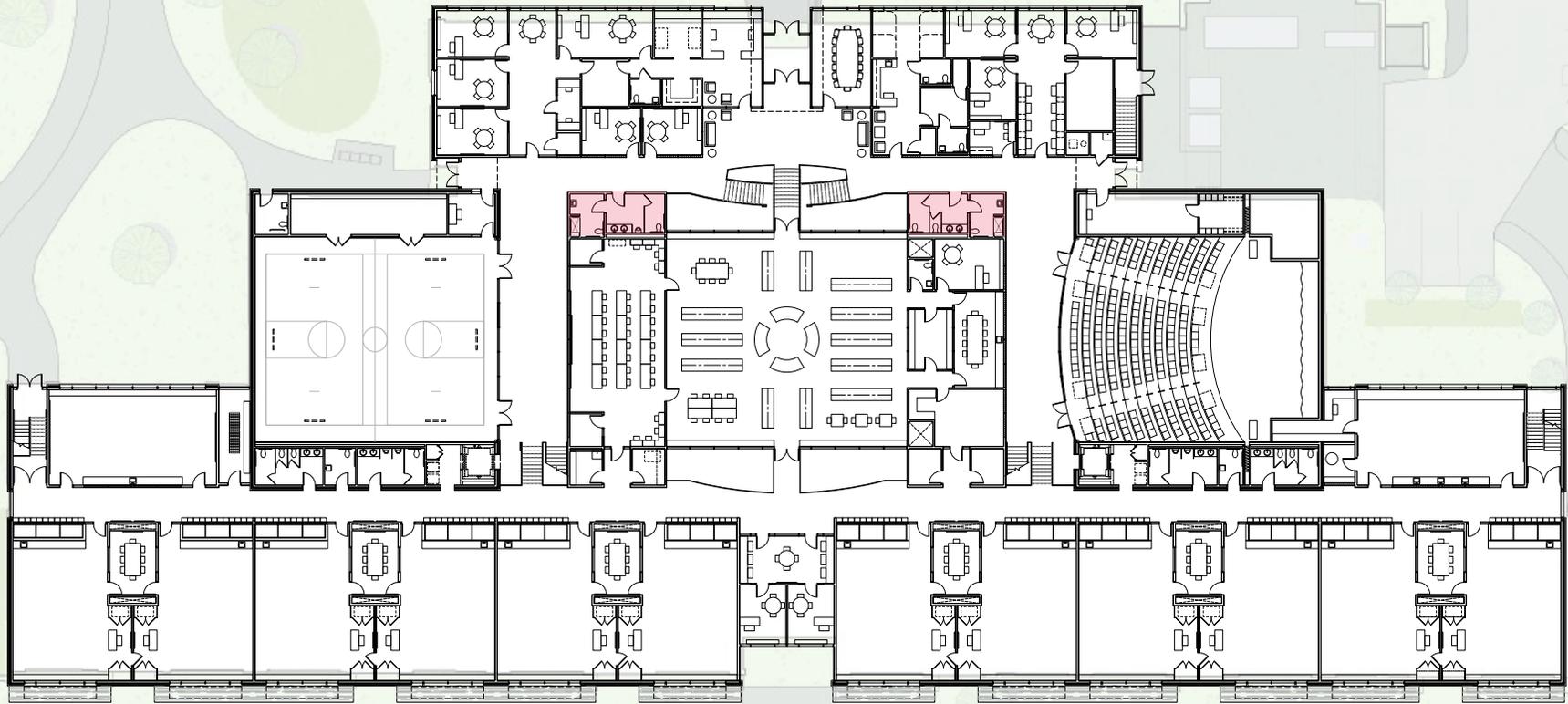
# School Organization- Custodian



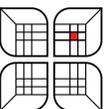
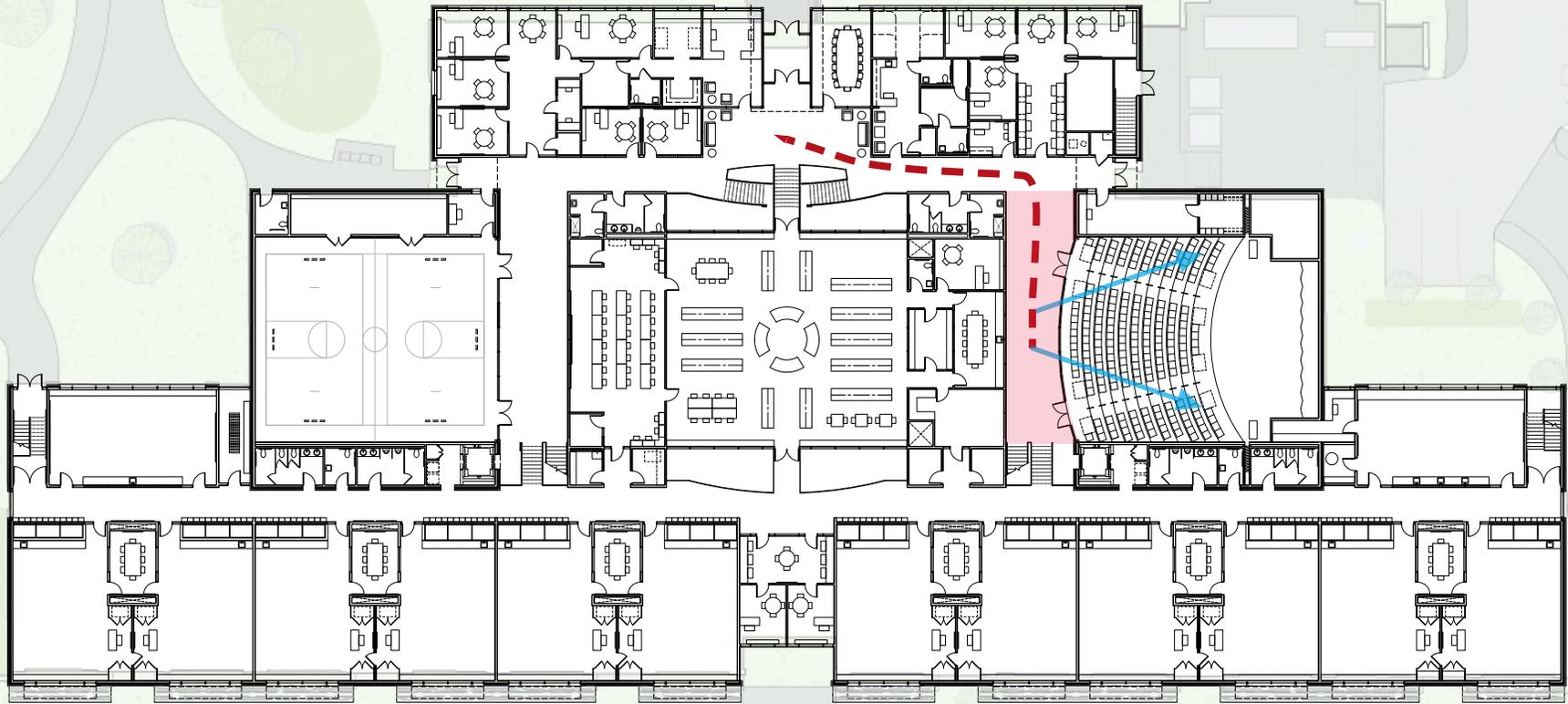
# School Organization- Gym Teacher



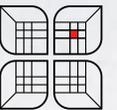
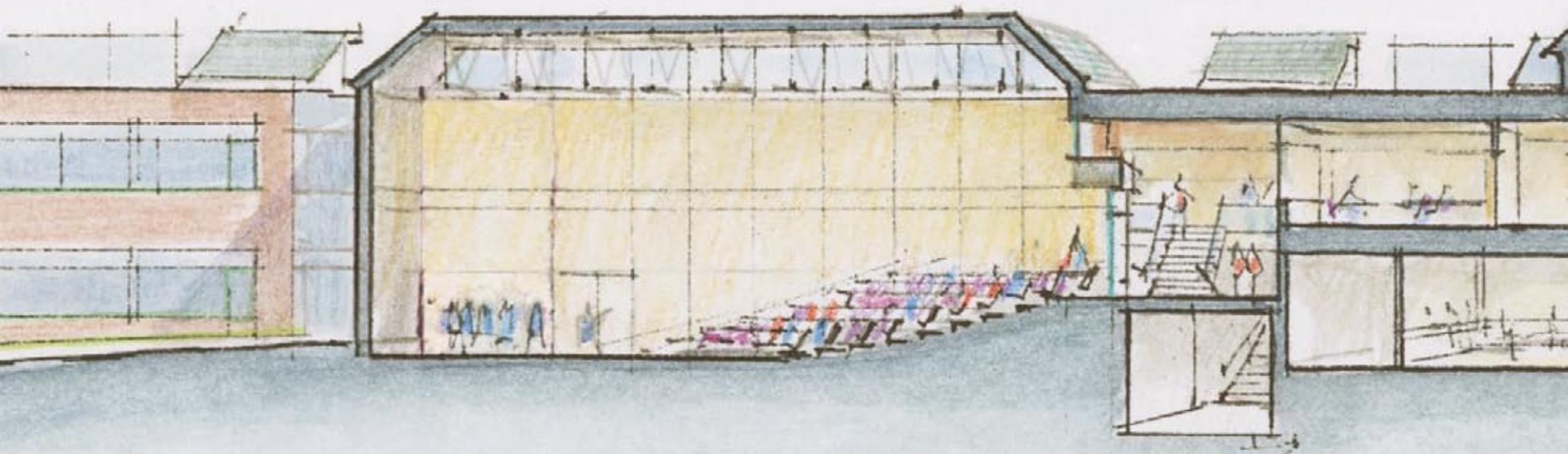
# School Organization- Public Bathrooms



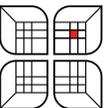
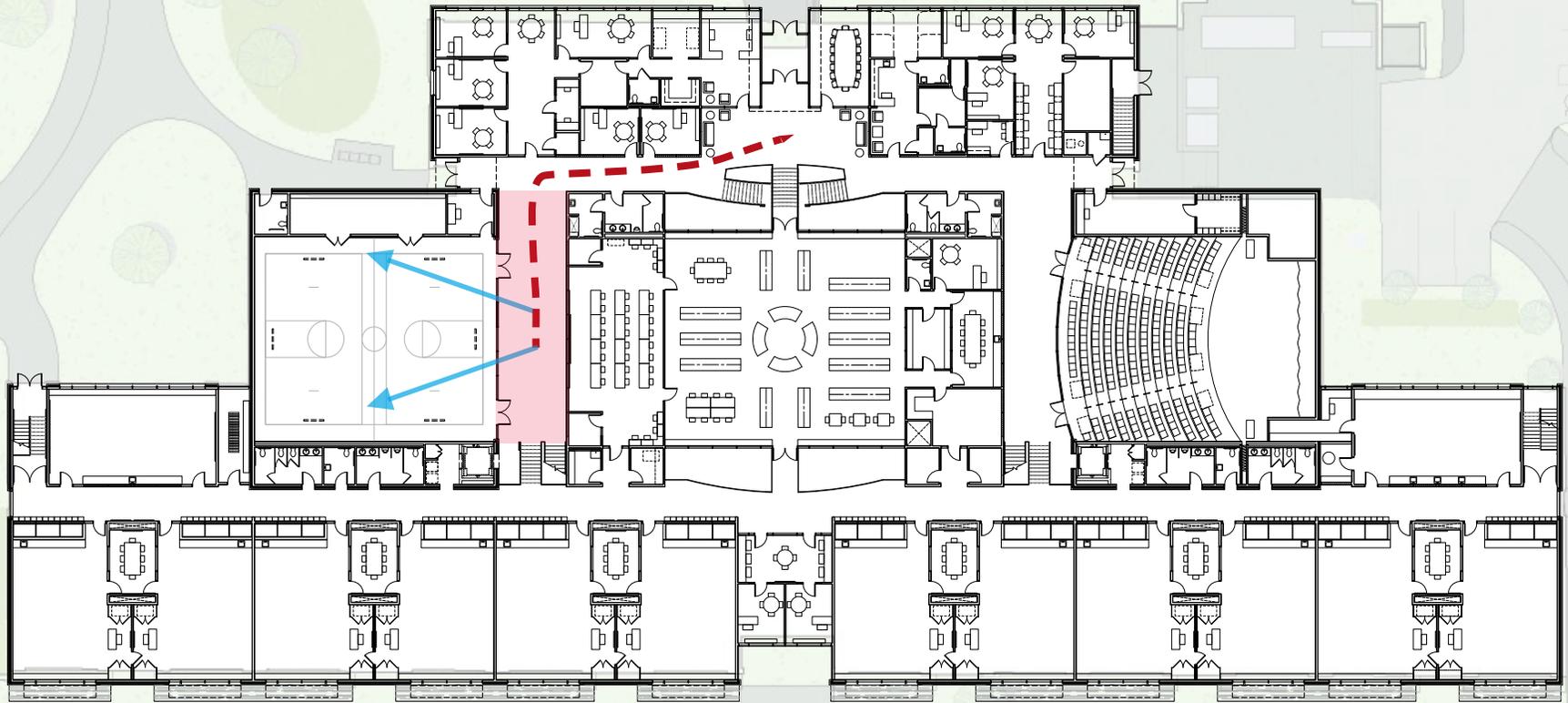
# School Organization- Art Display Gallery



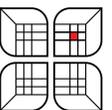
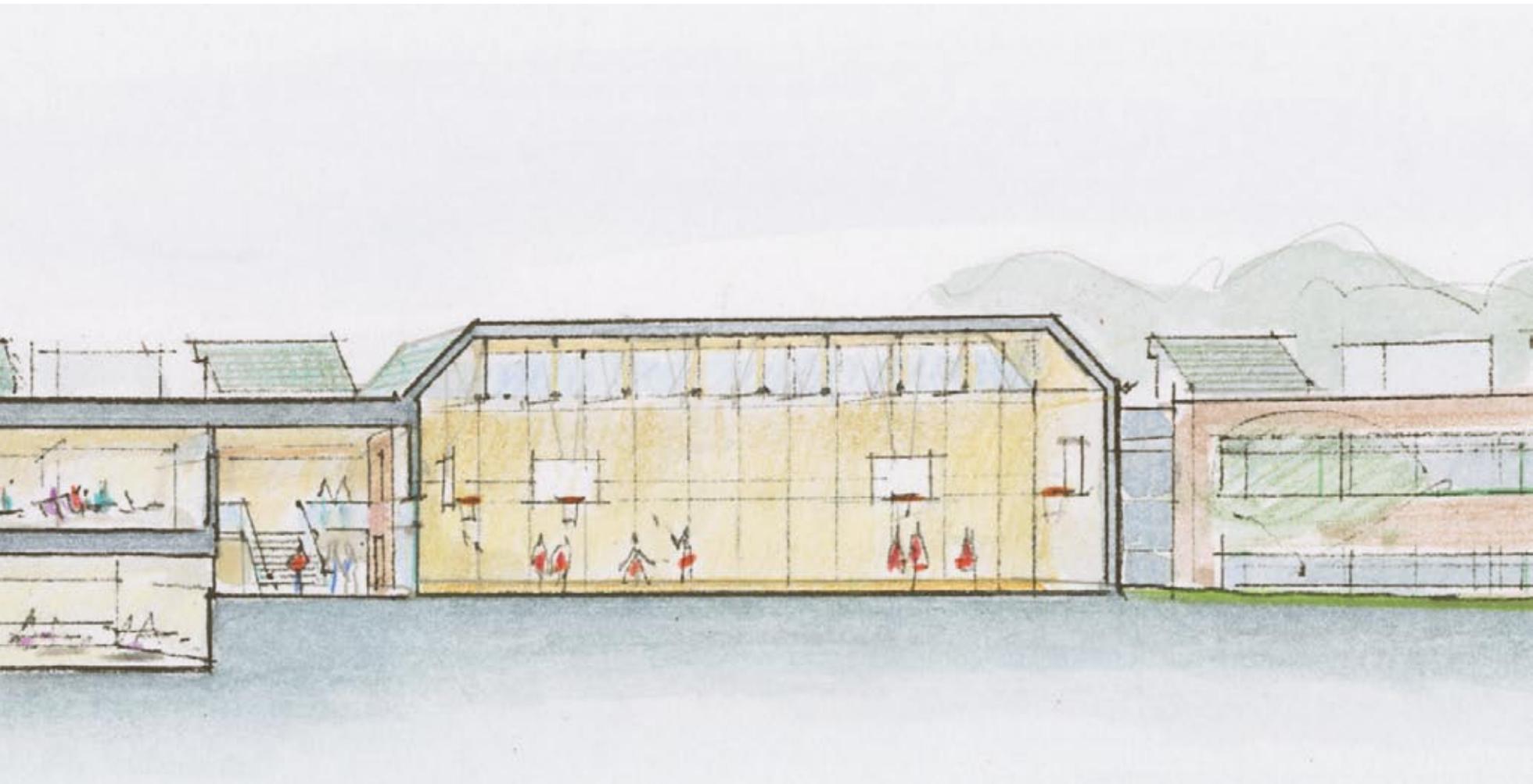
# School Organization- Auditorium



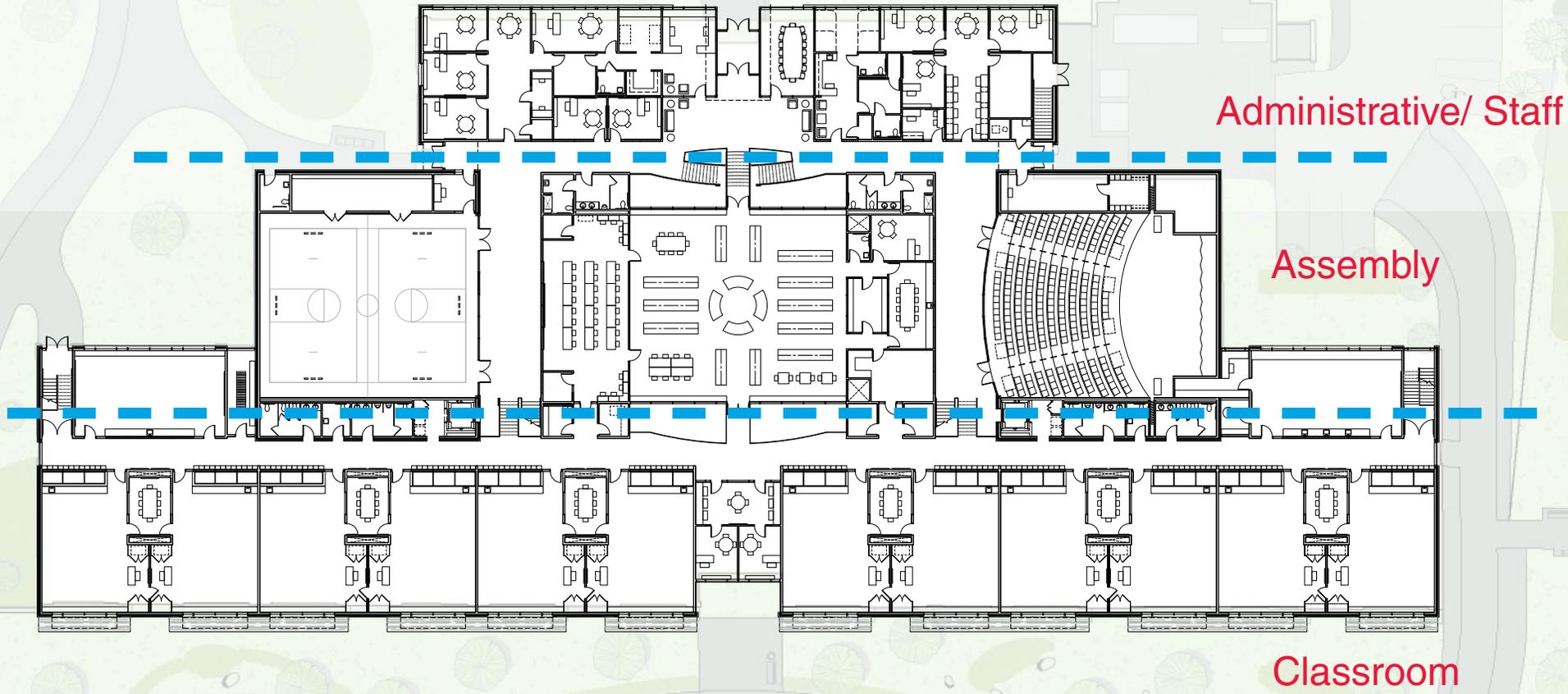
# School Organization- Viewing Gallery



# School Organization- Gymnasium



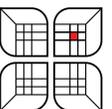
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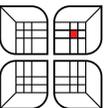
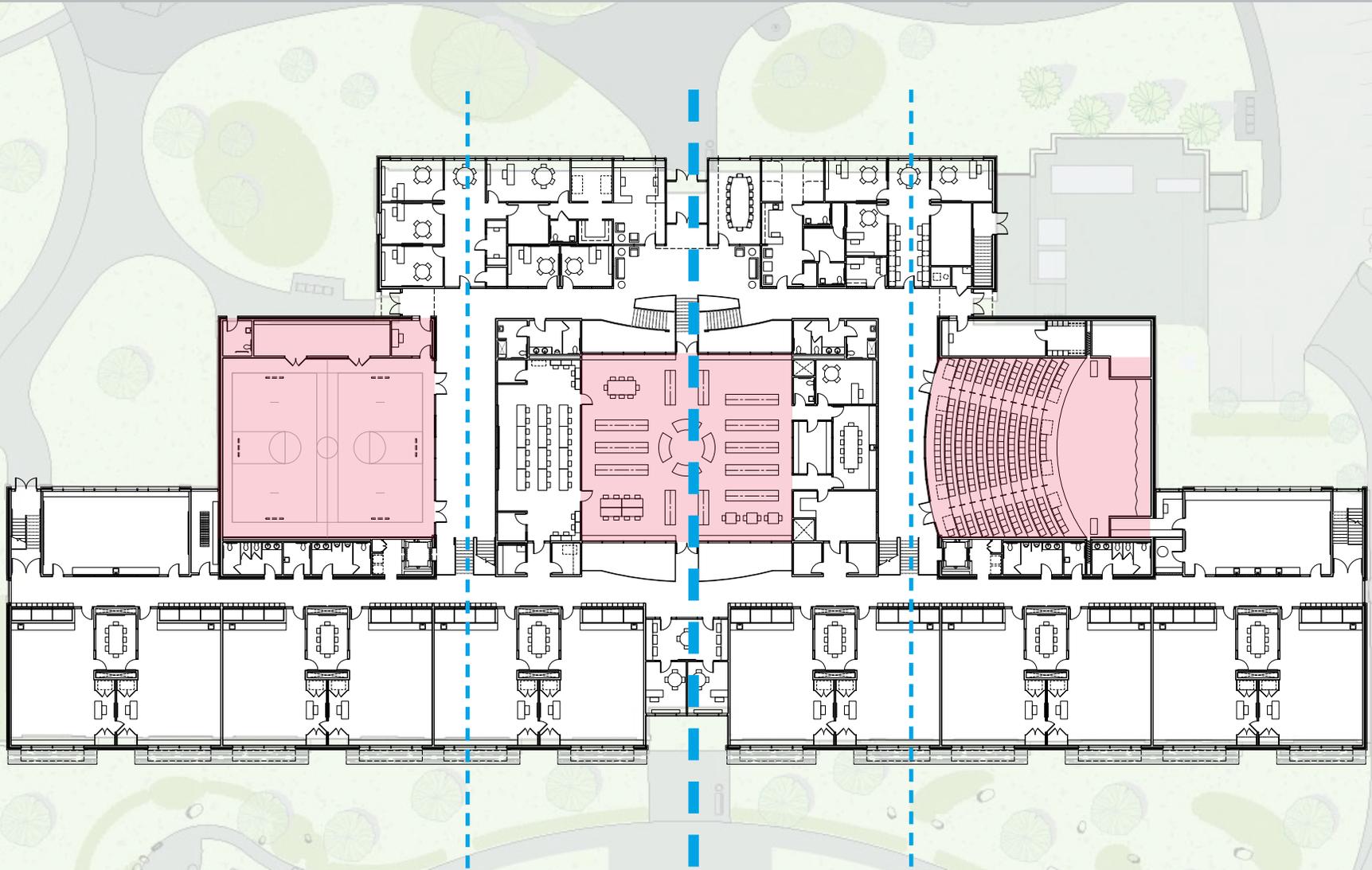
Administrative/ Staff

Assembly

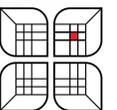
Classroom



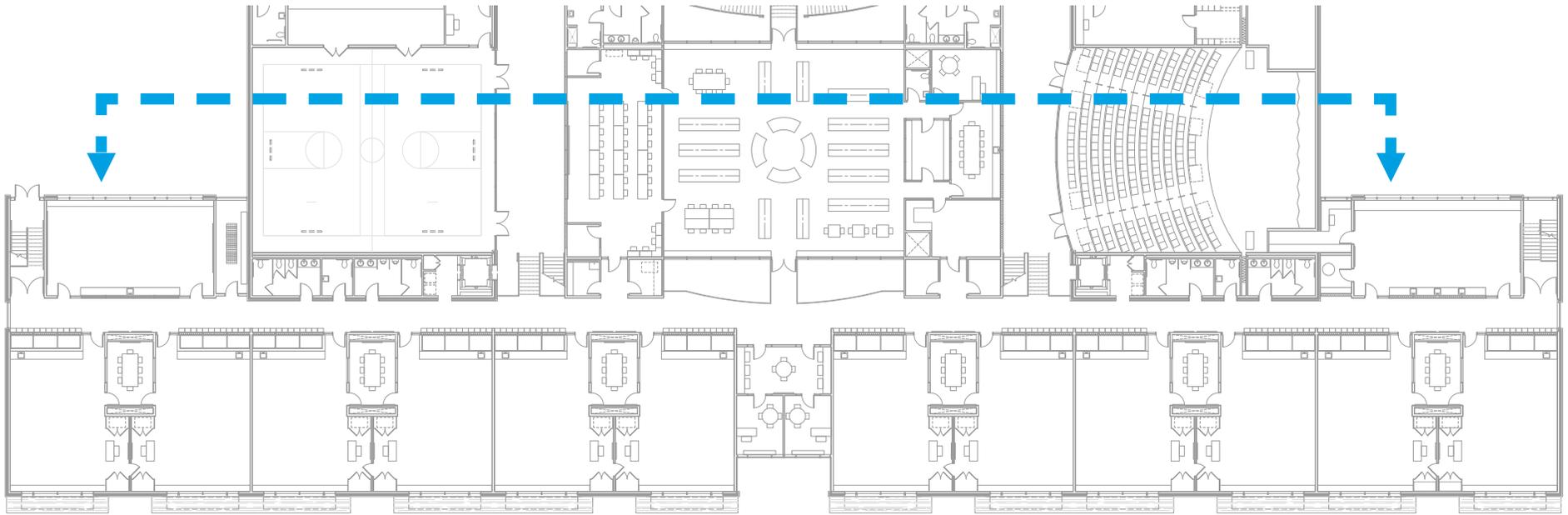
# School Organization



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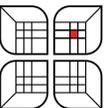
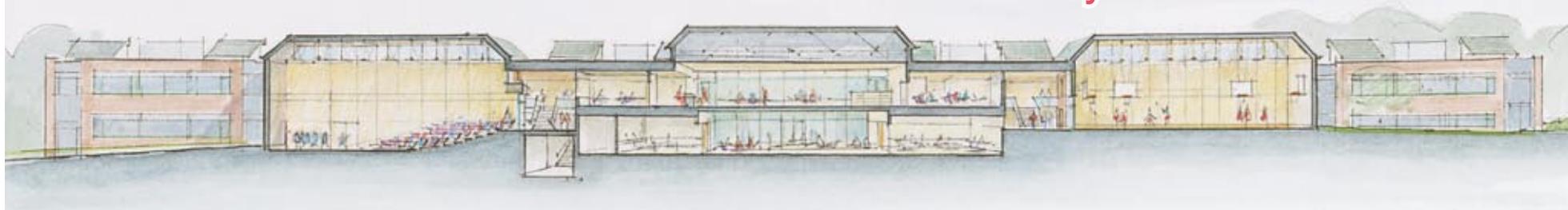
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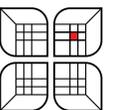
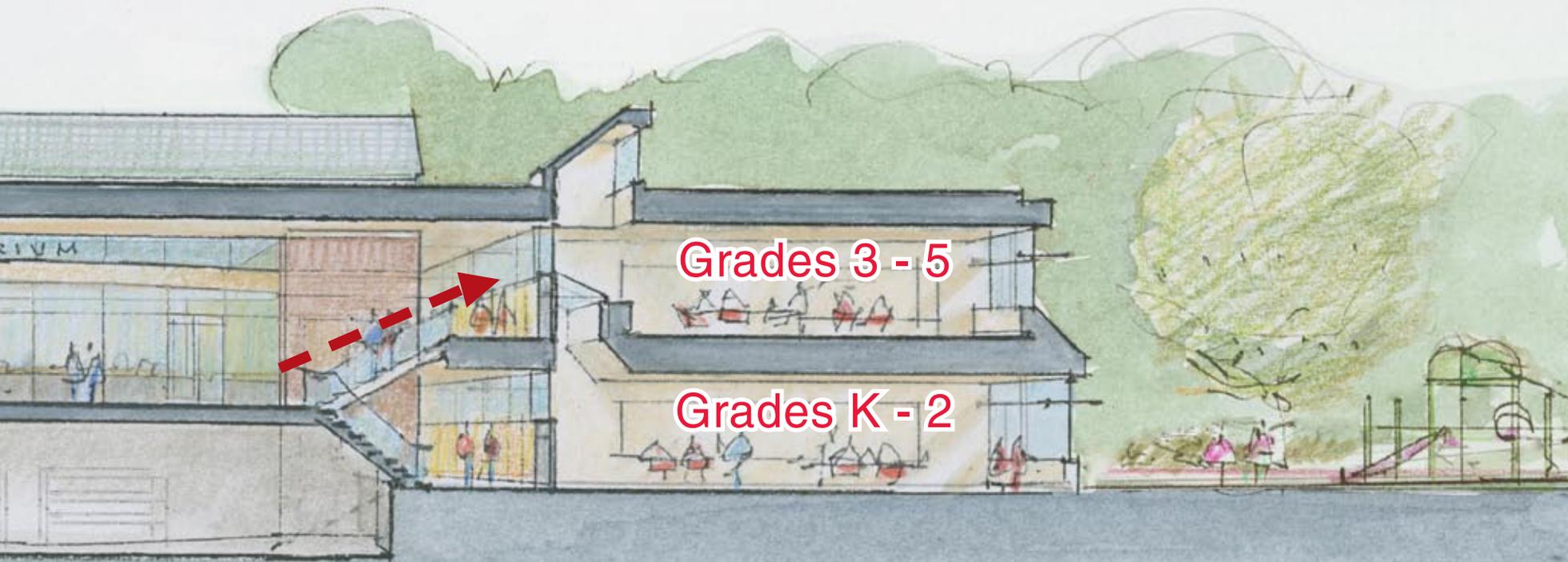
Auditorium

Media Center

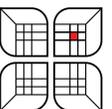
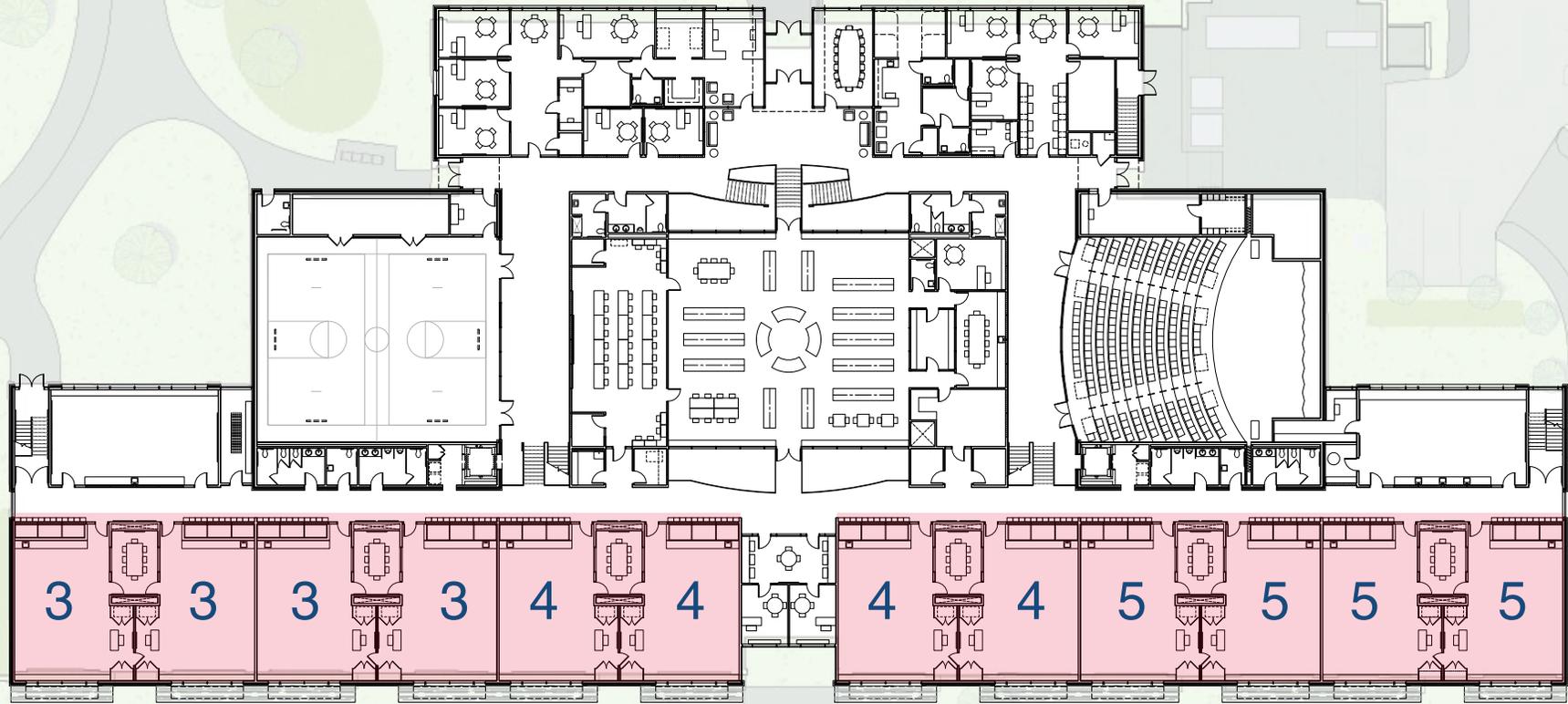
Gymnasium



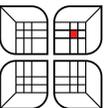
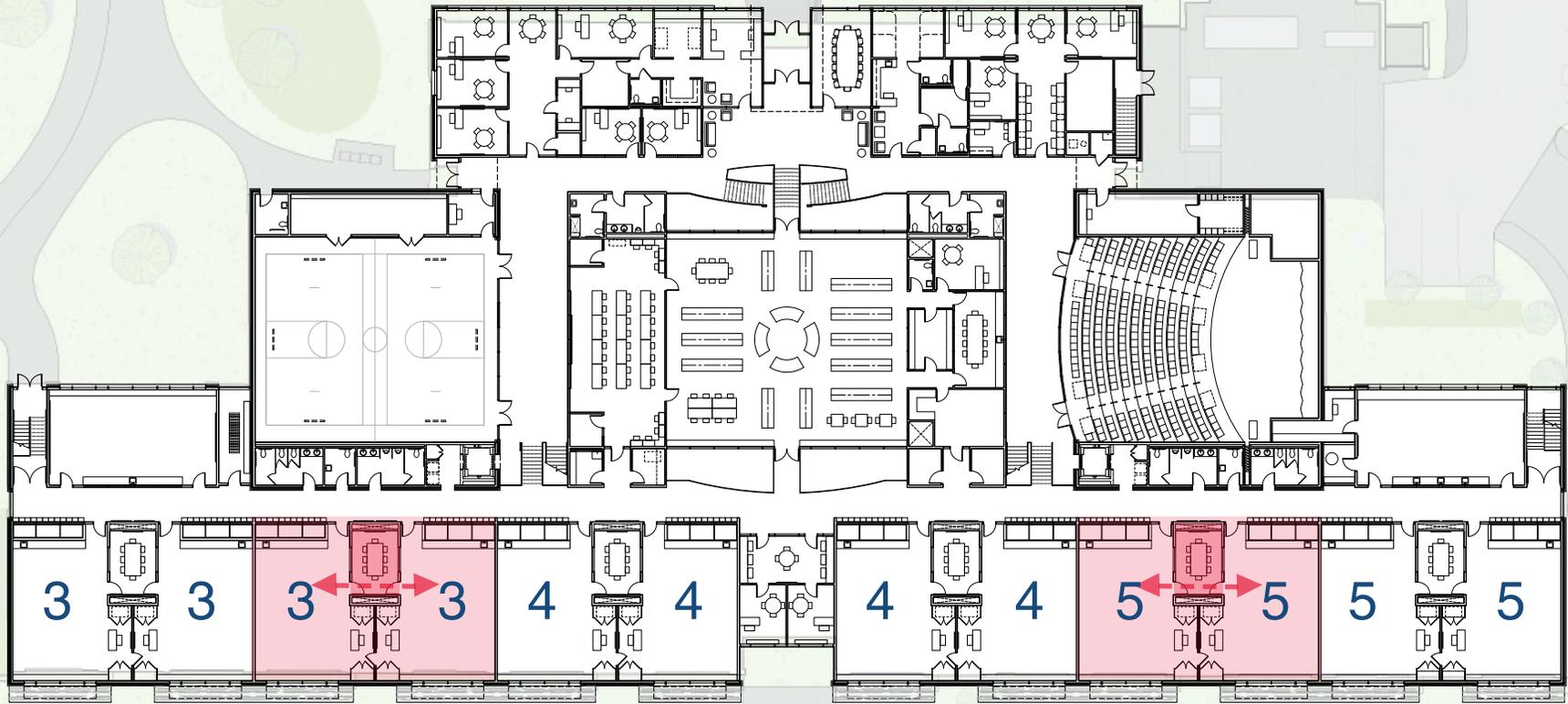
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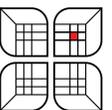
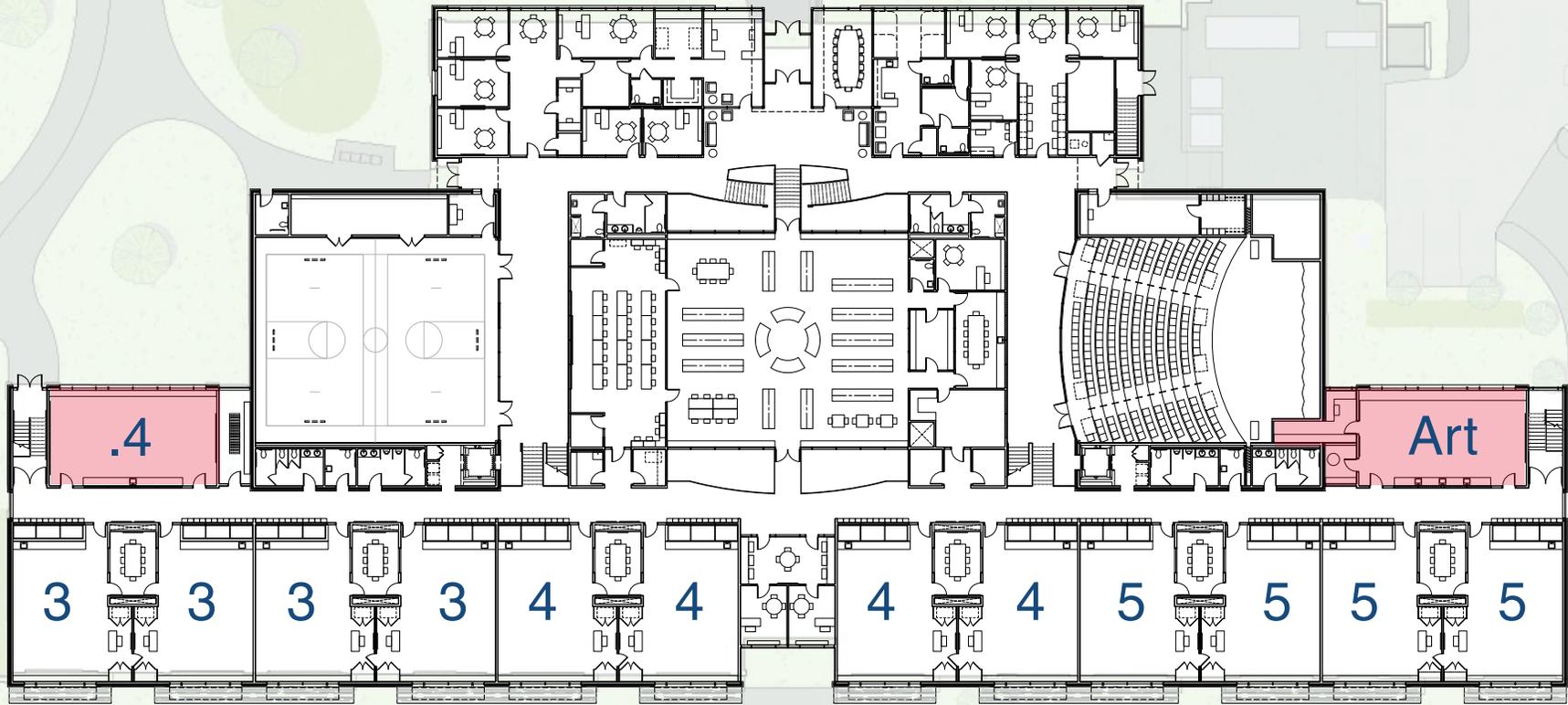
# School Organization- Clustering



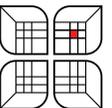
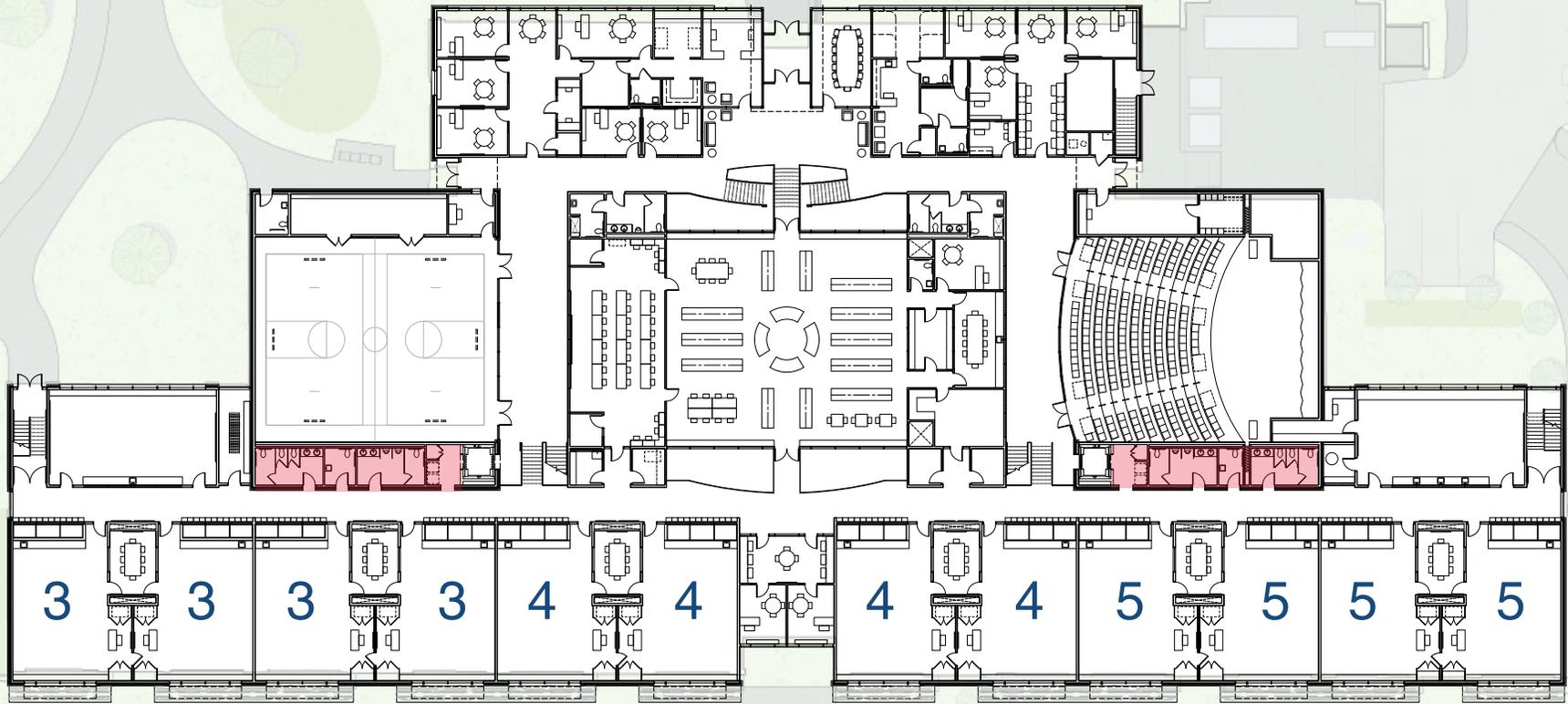
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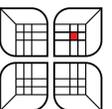
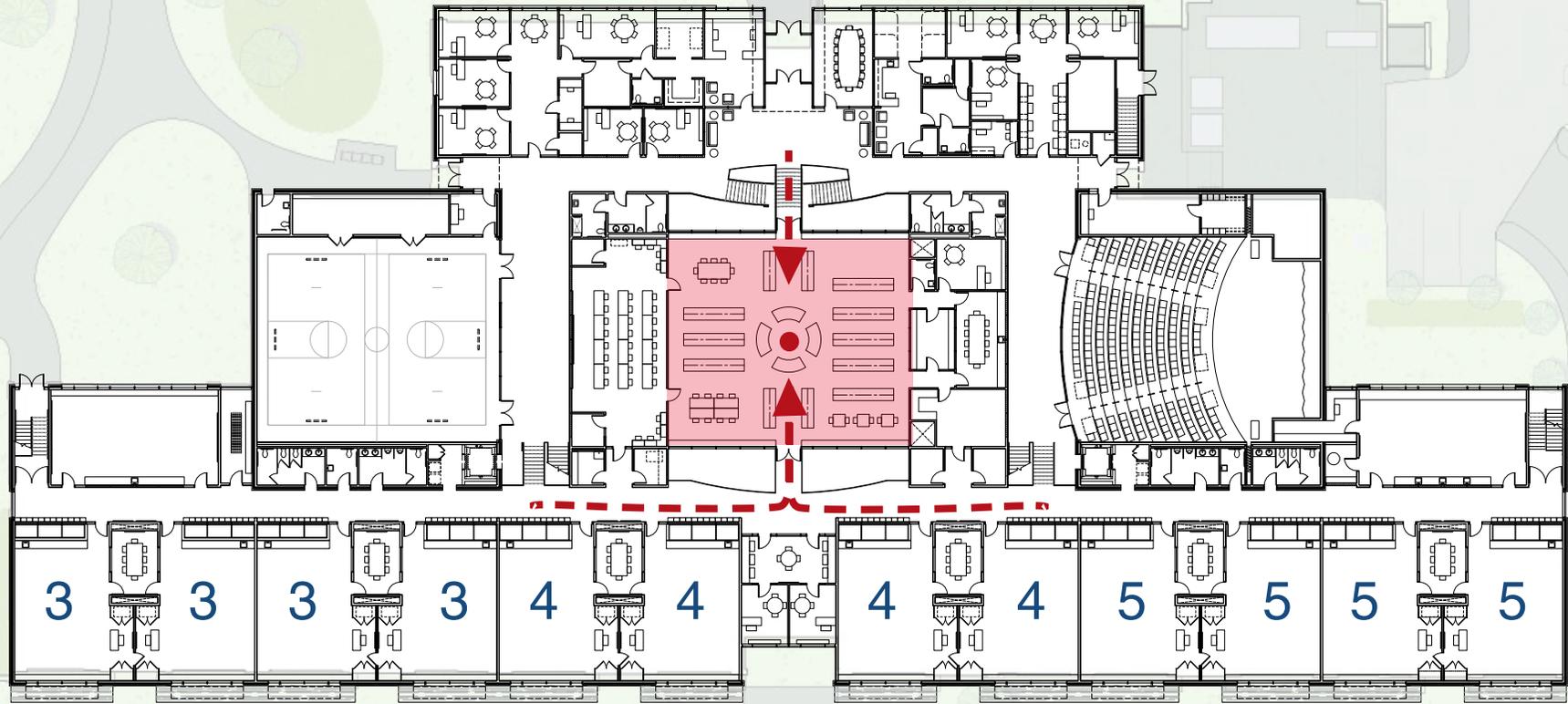
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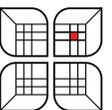
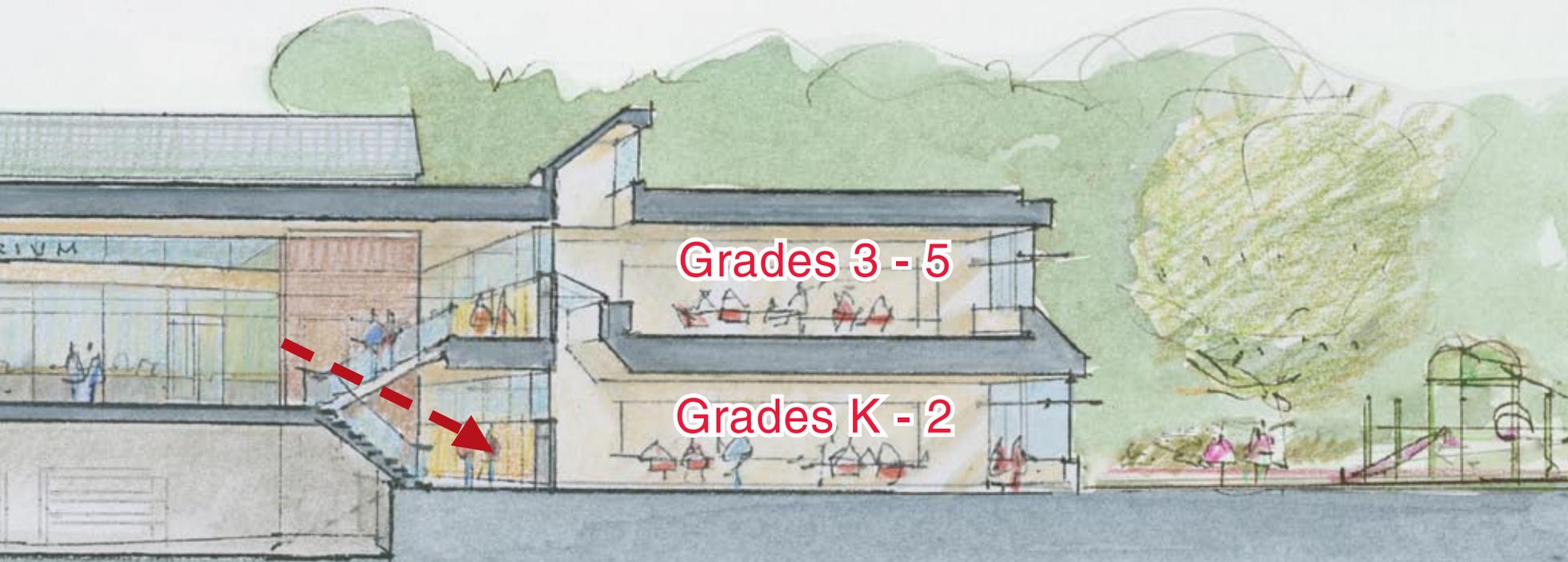
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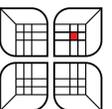
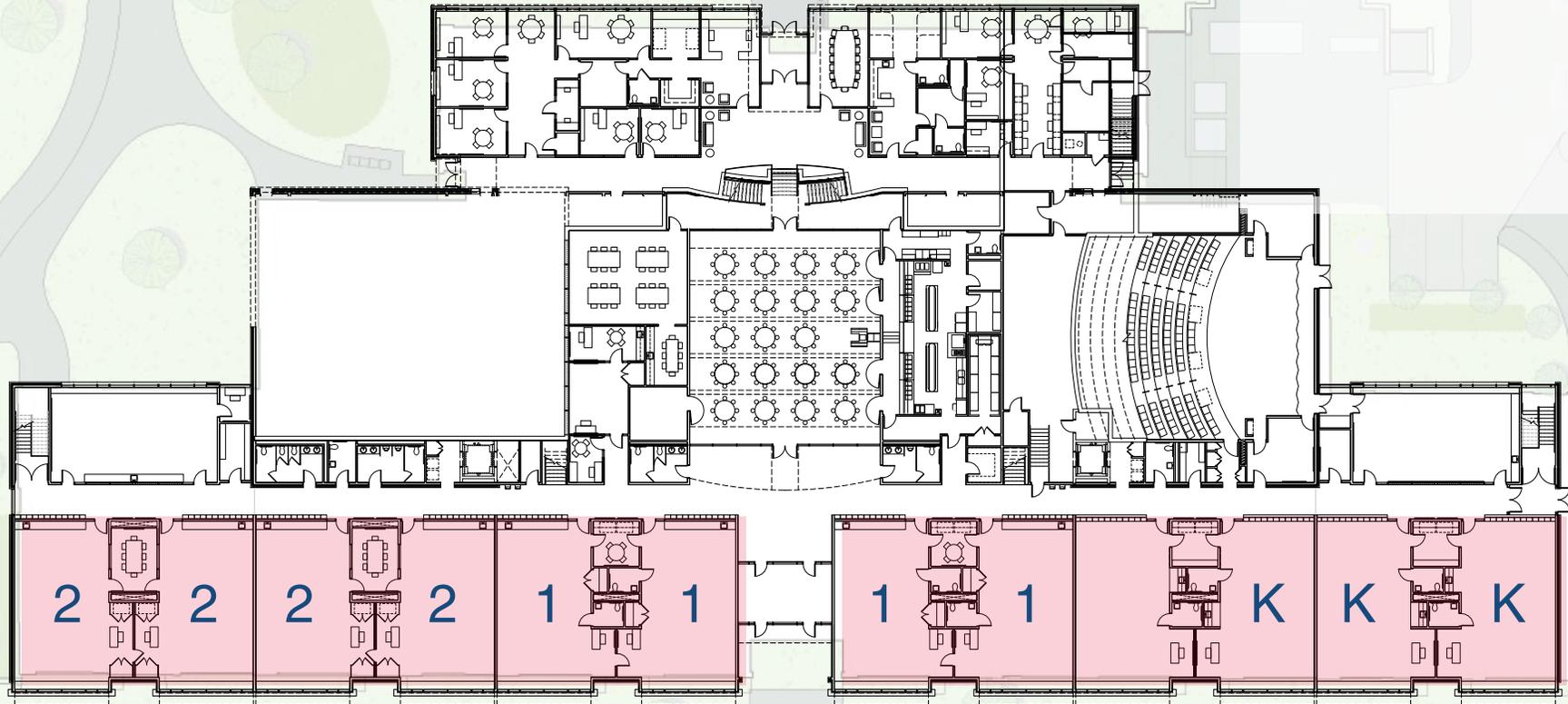
# School Organization- Media Center



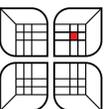
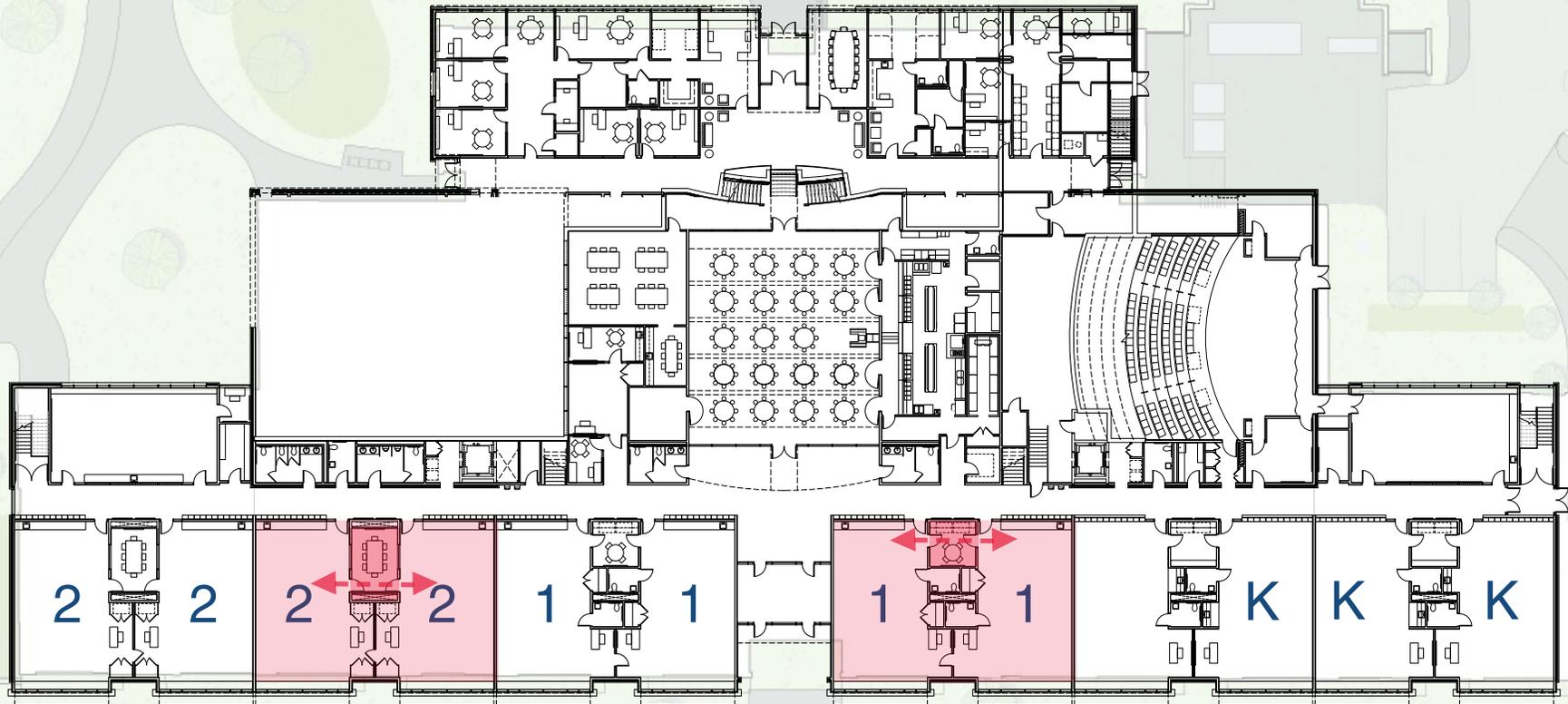
# School Organization



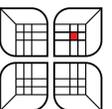
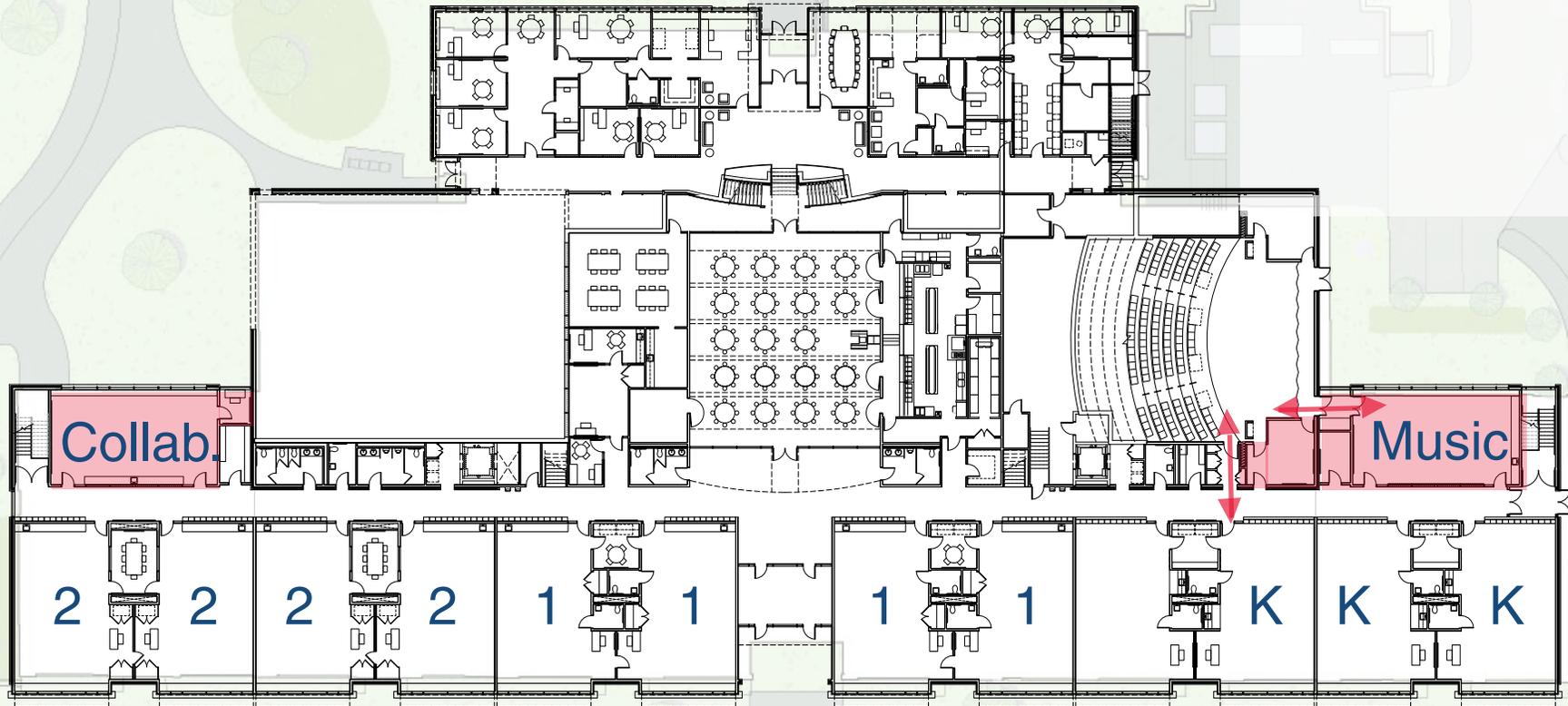
# School Organization- Clustering



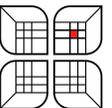
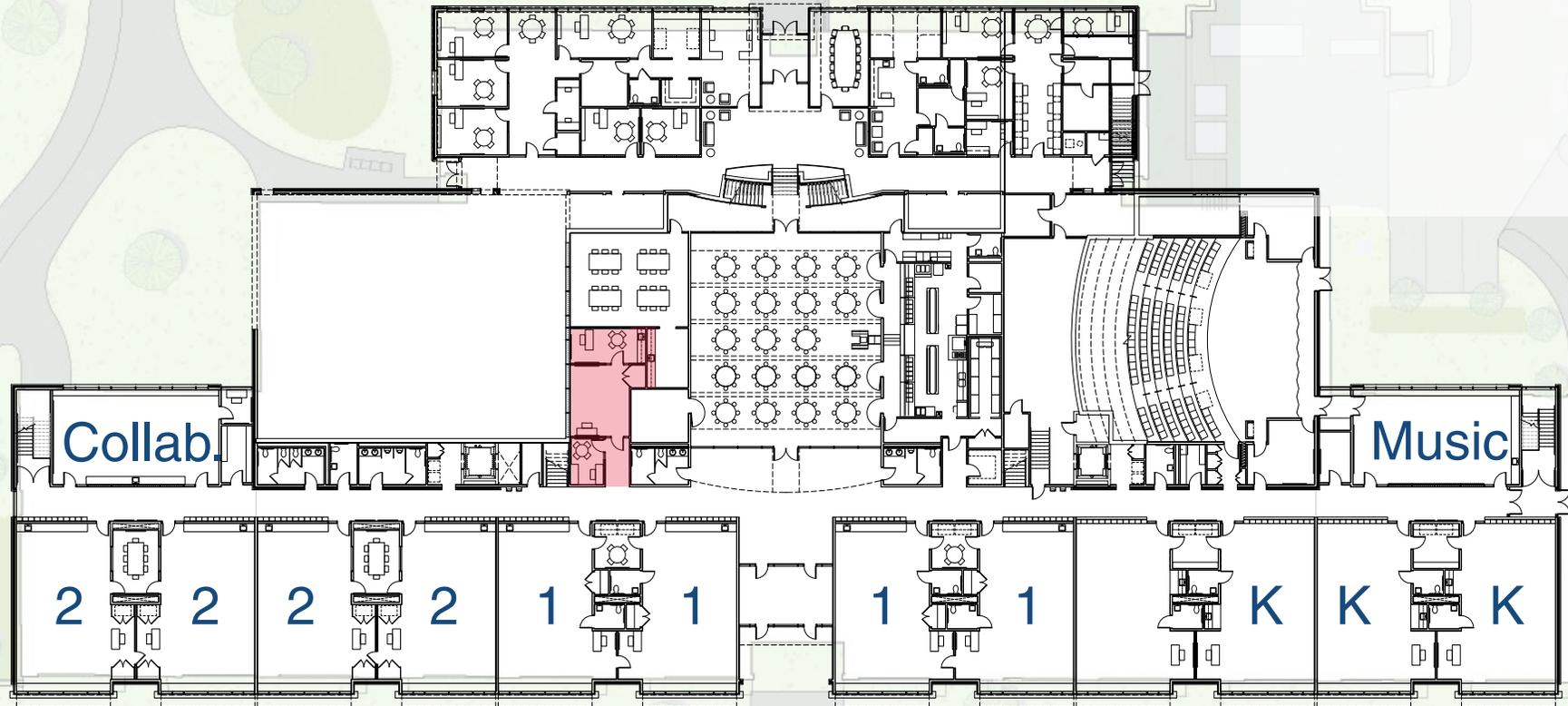
# School Organization- Clustering



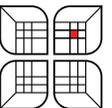
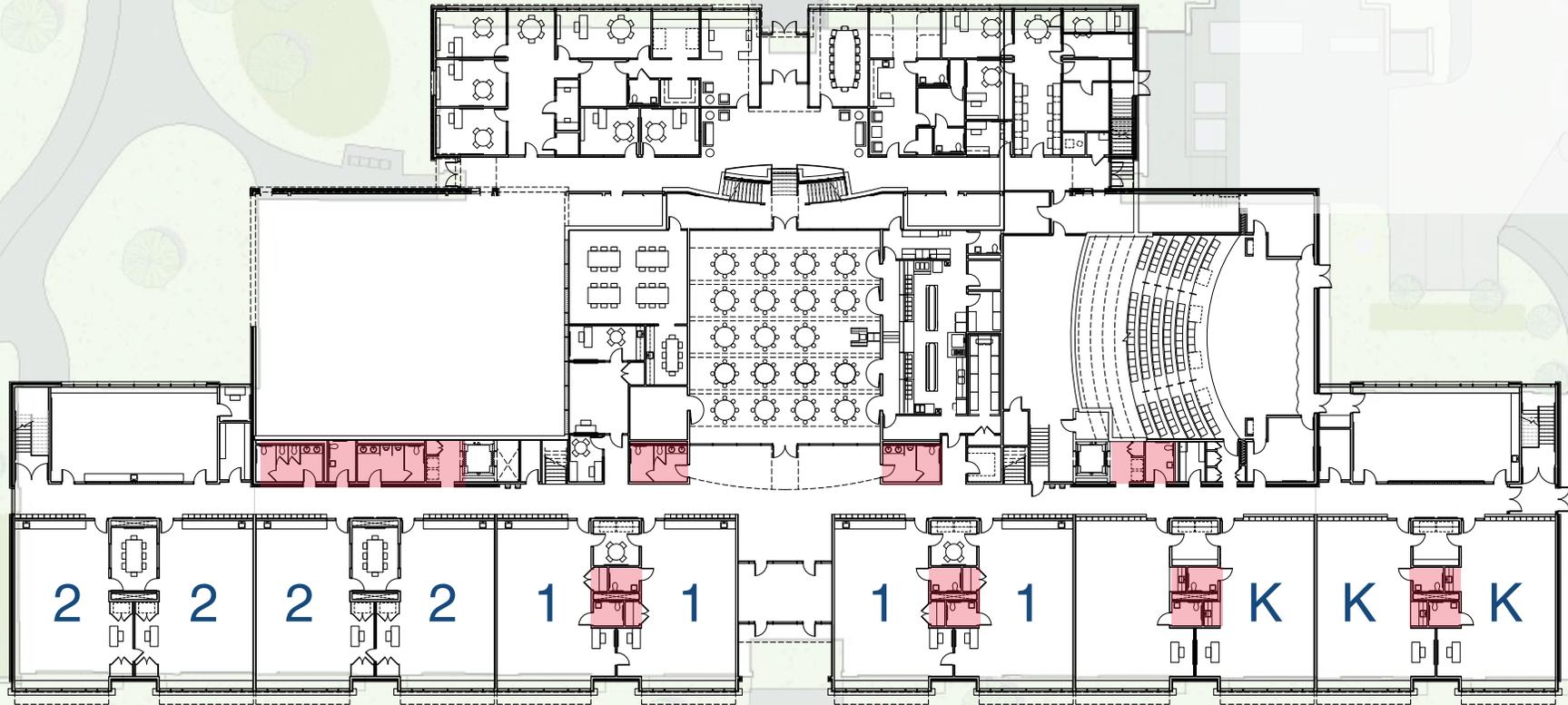
# School Organization- Clustering



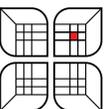
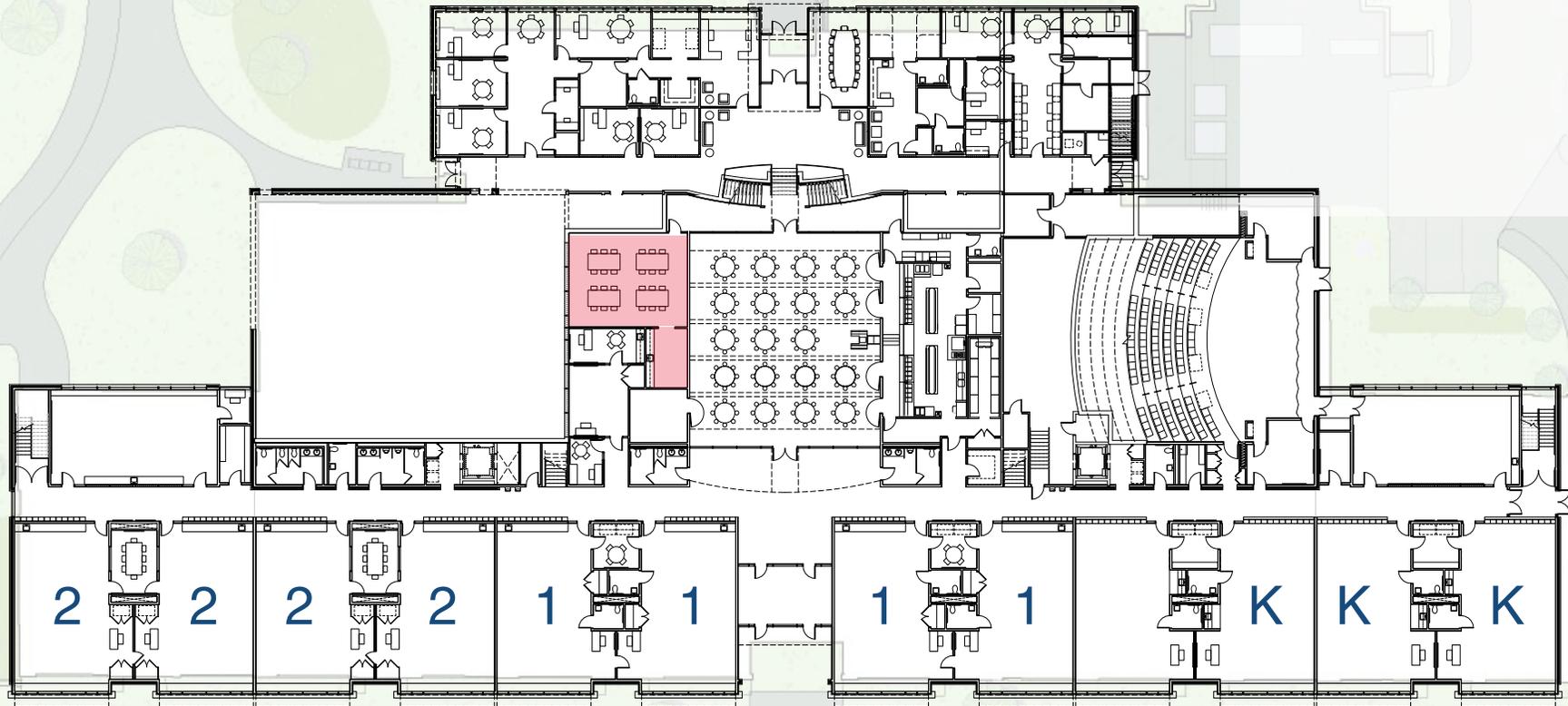
# School Organization- Clustering



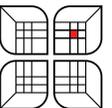
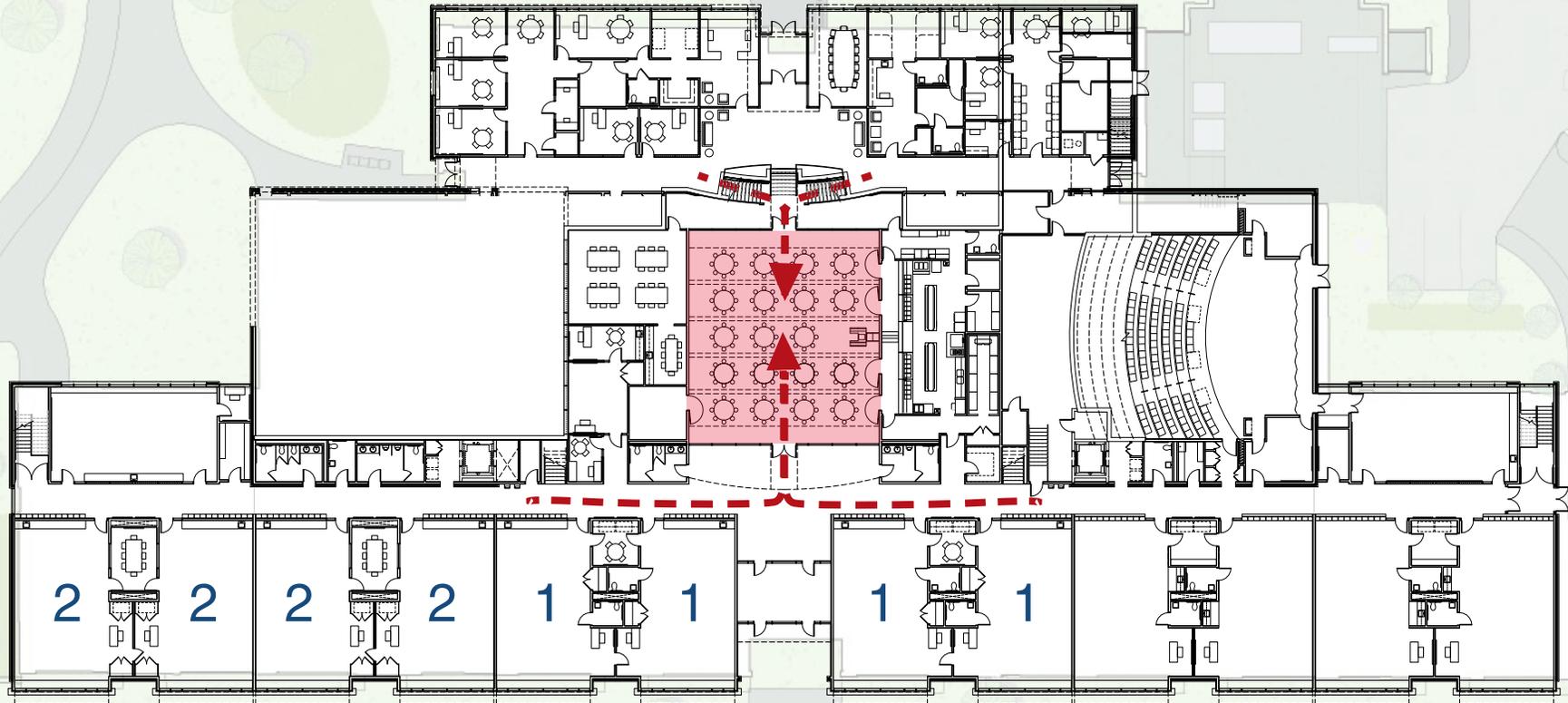
# School Organization- Clustering



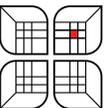
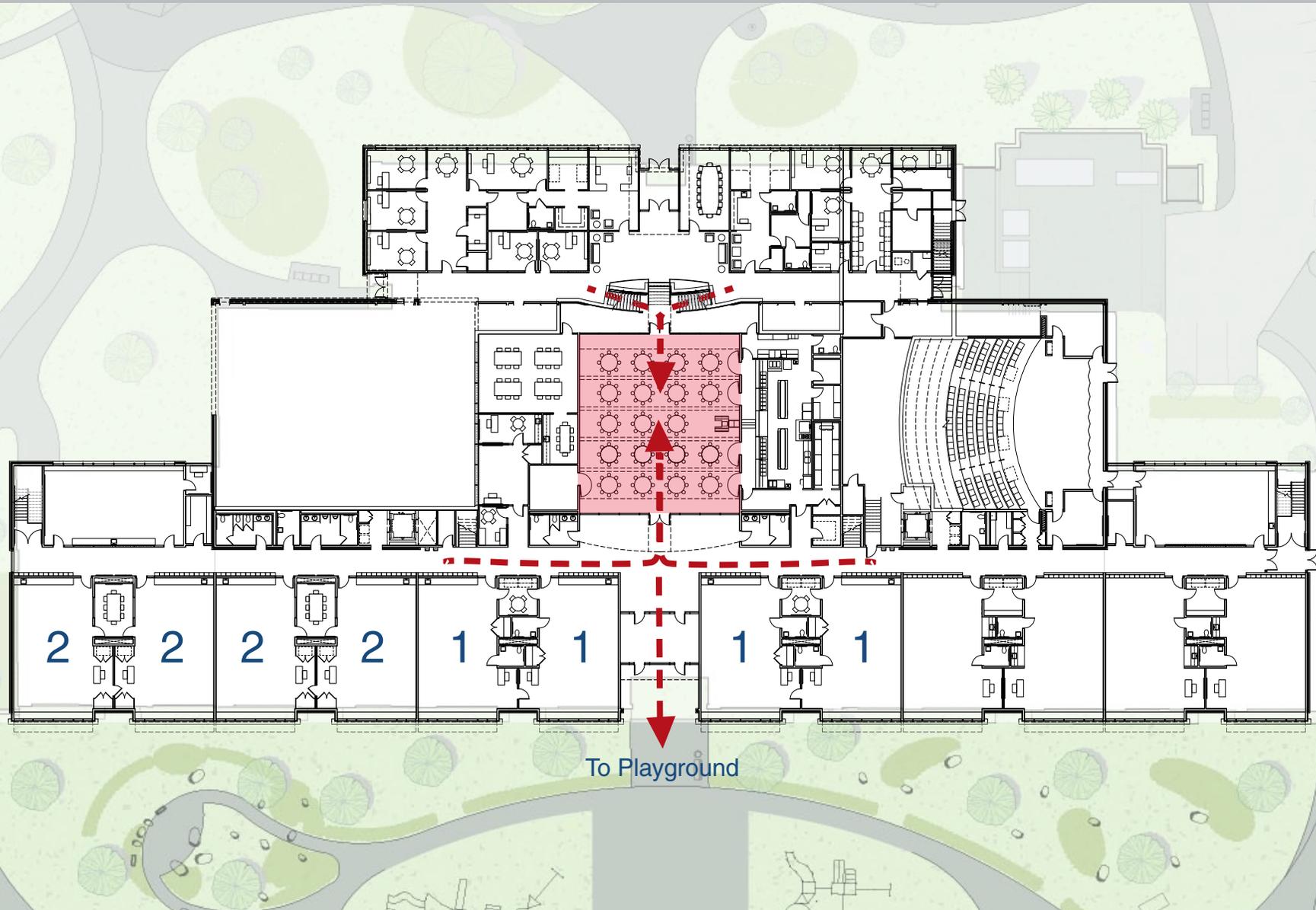
# School Organization- Staff / Dining



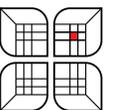
# School Organization-Cafeteria



# School Organization-Cafeteria

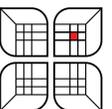
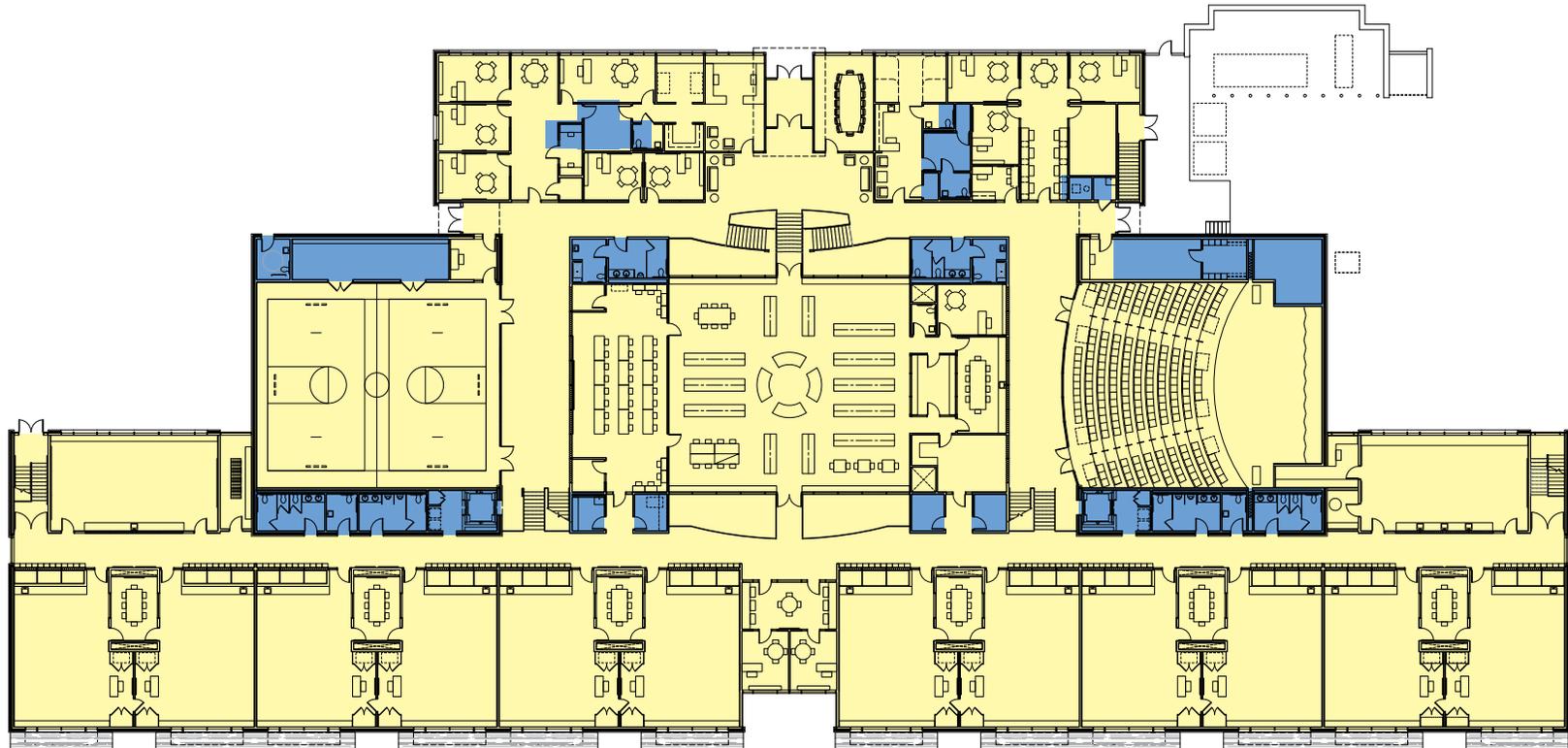


# View from the South



# High Performance Design Elements

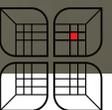
Almost all spaces receive natural light



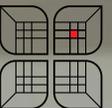
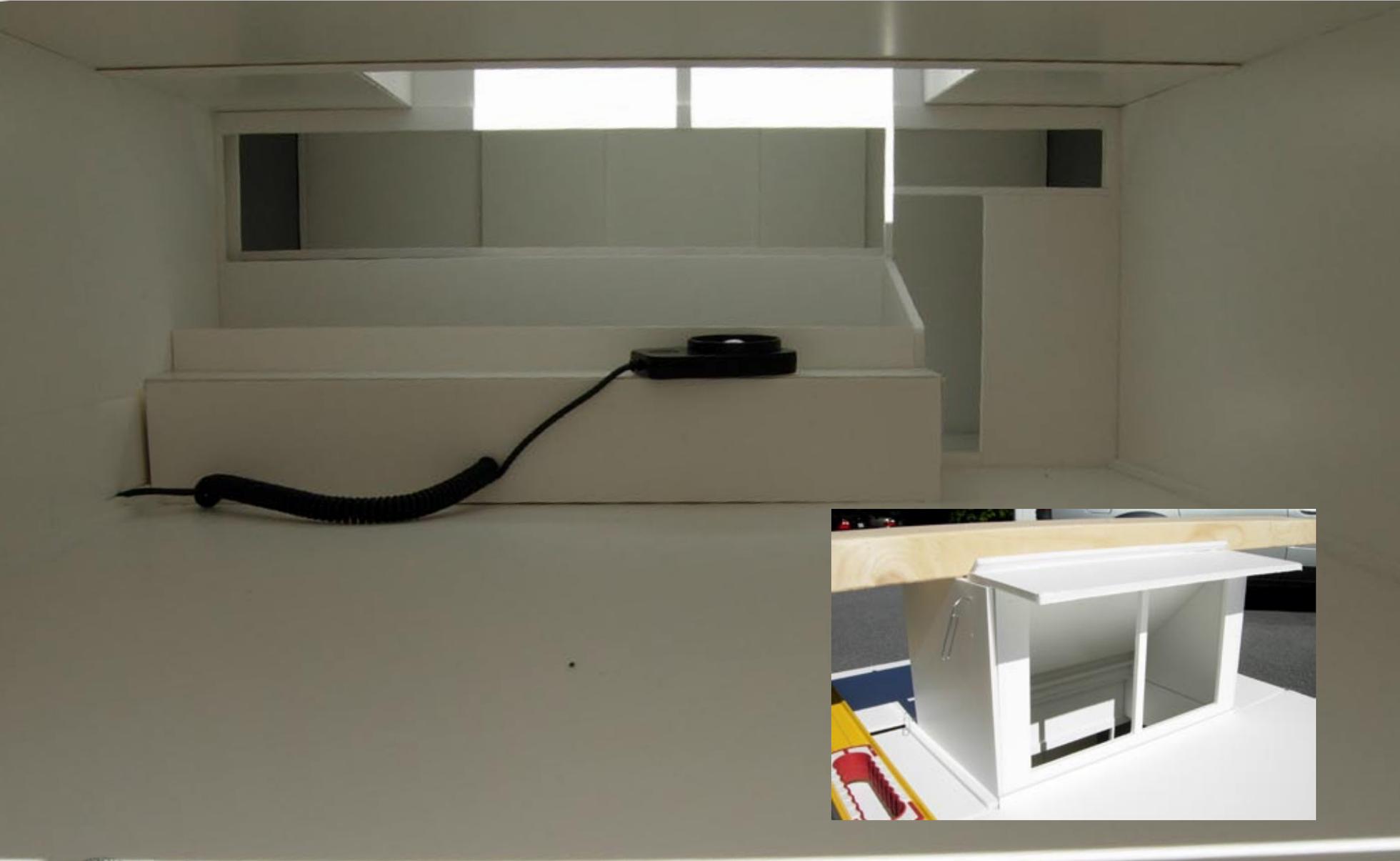
# High Performance Design Elements



**Rigorous analysis of  
daylighting design**

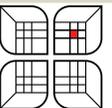
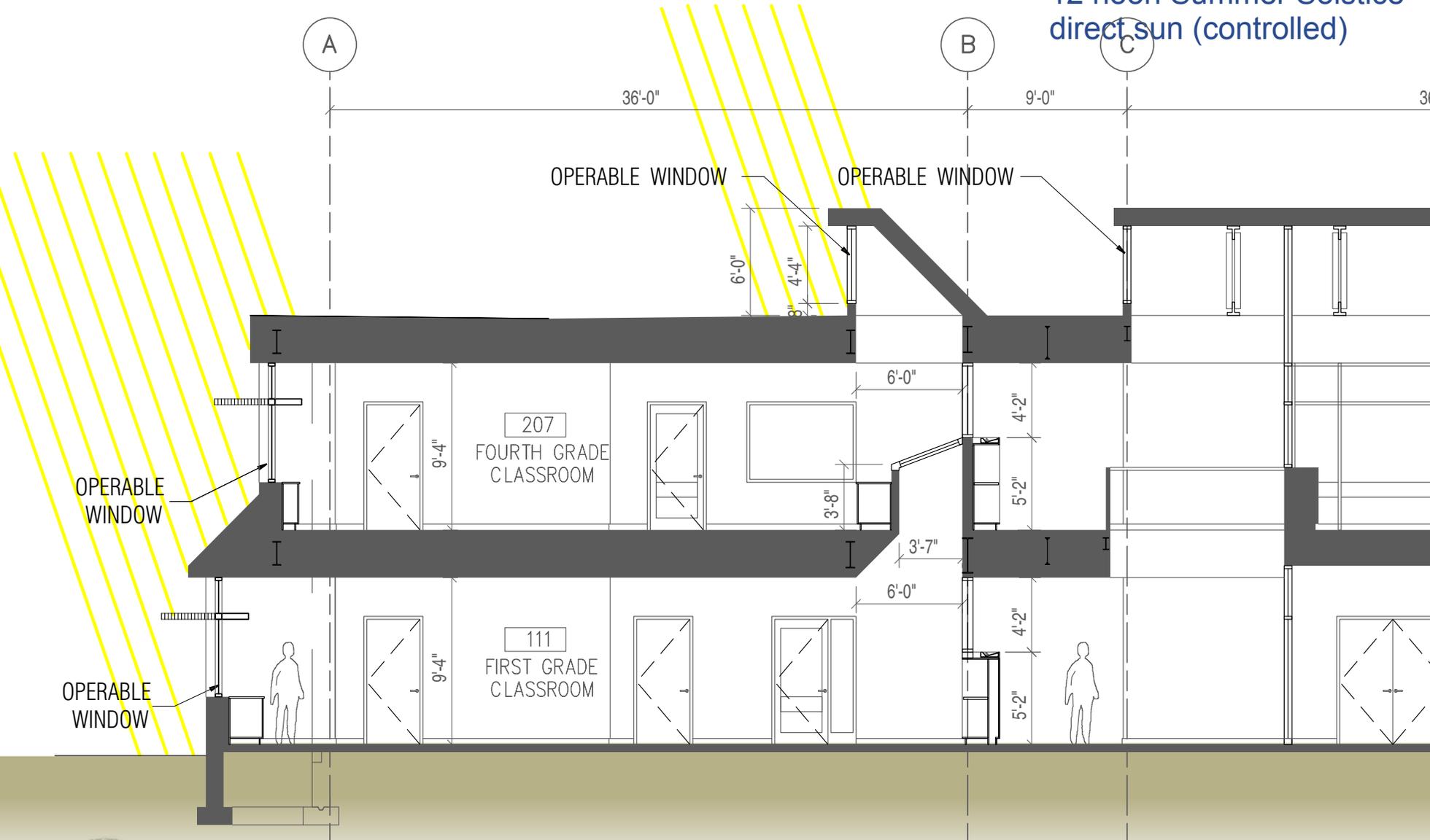


# High Performance Design Elements



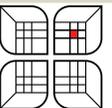
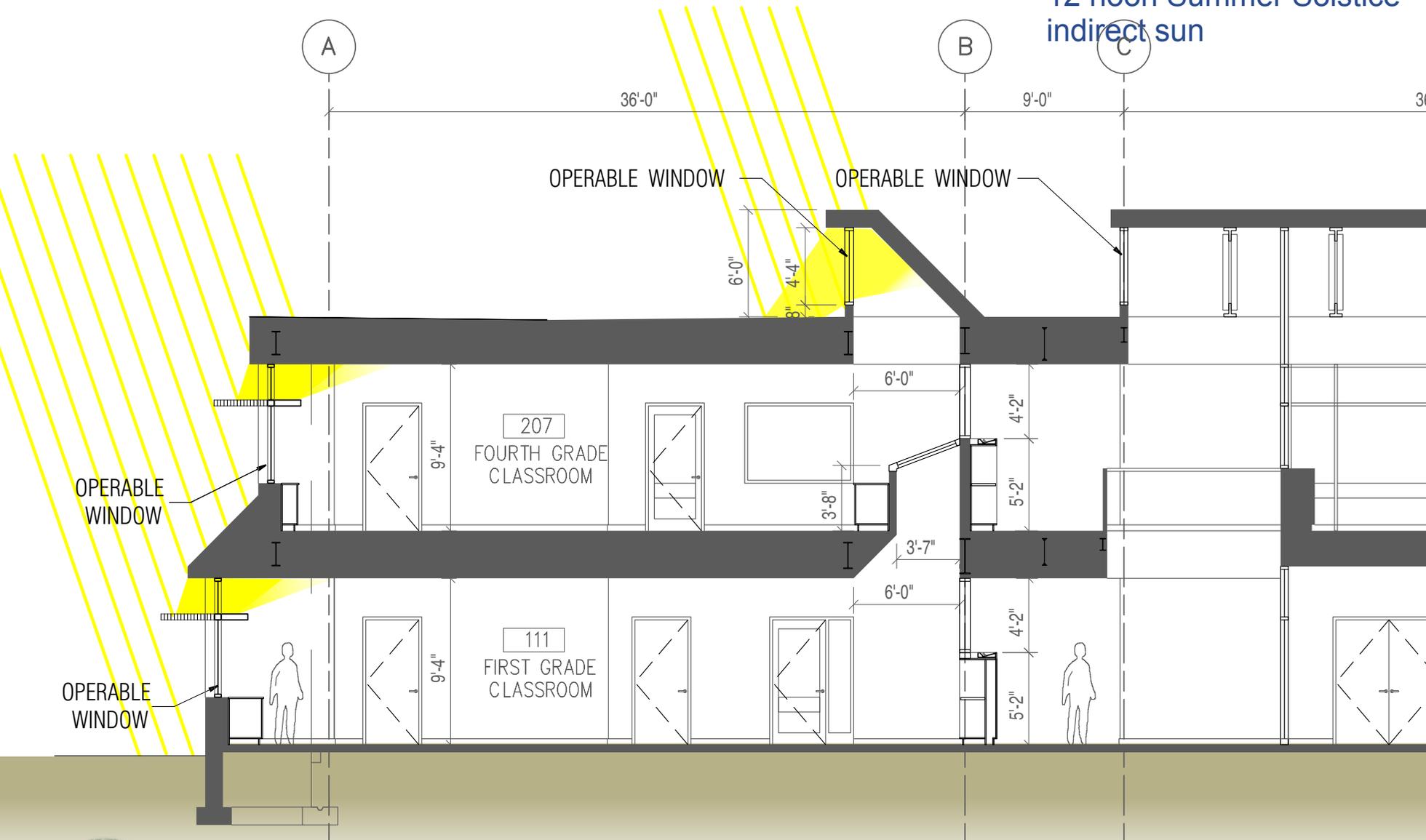
# High Performance Design Elements Daylighting

12 noon Summer Solstice  
direct sun (controlled)



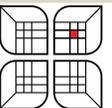
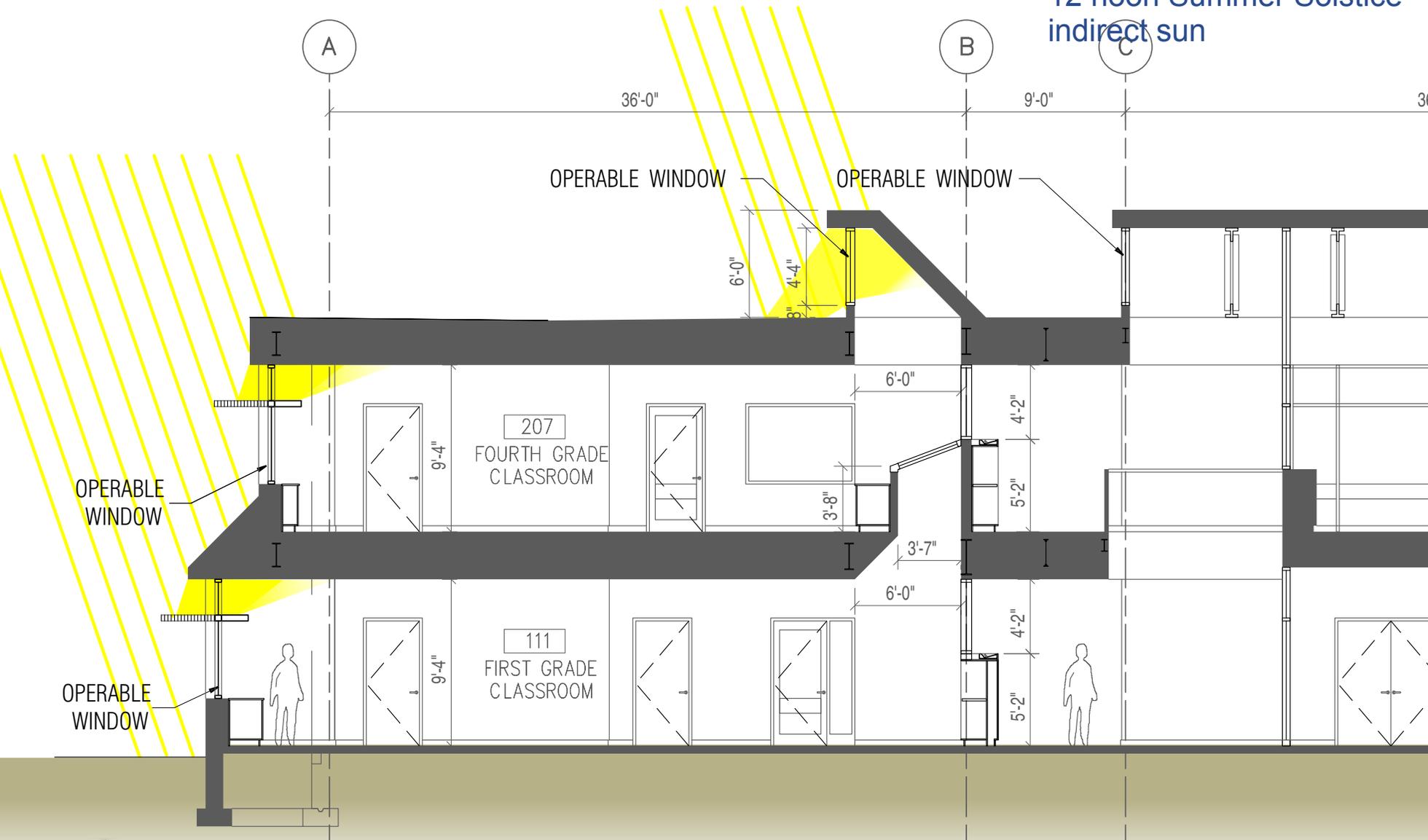
# High Performance Design Elements Daylighting

12 noon Summer Solstice indirect sun



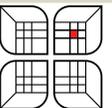
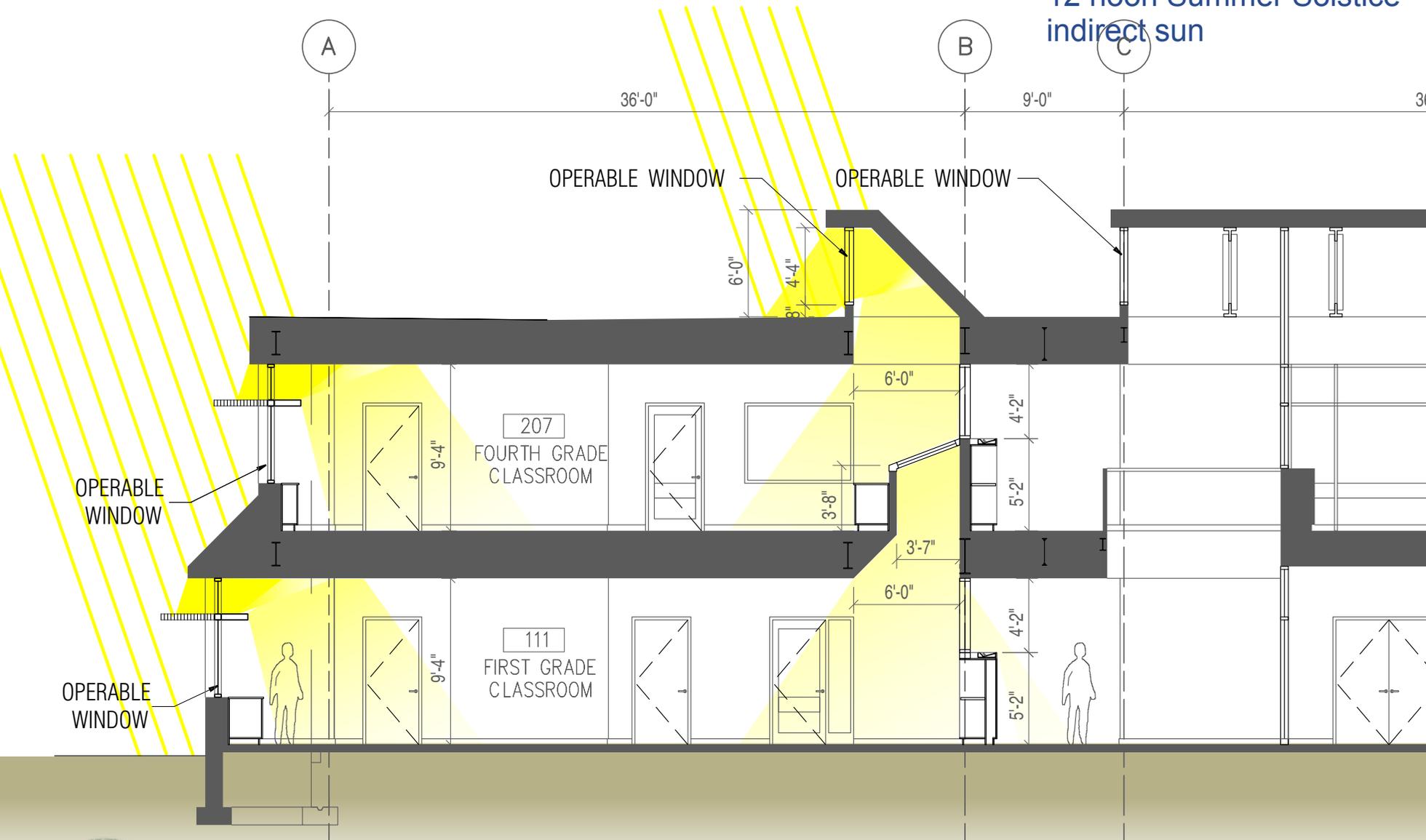
# High Performance Design Elements Daylighting

12 noon Summer Solstice indirect sun



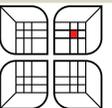
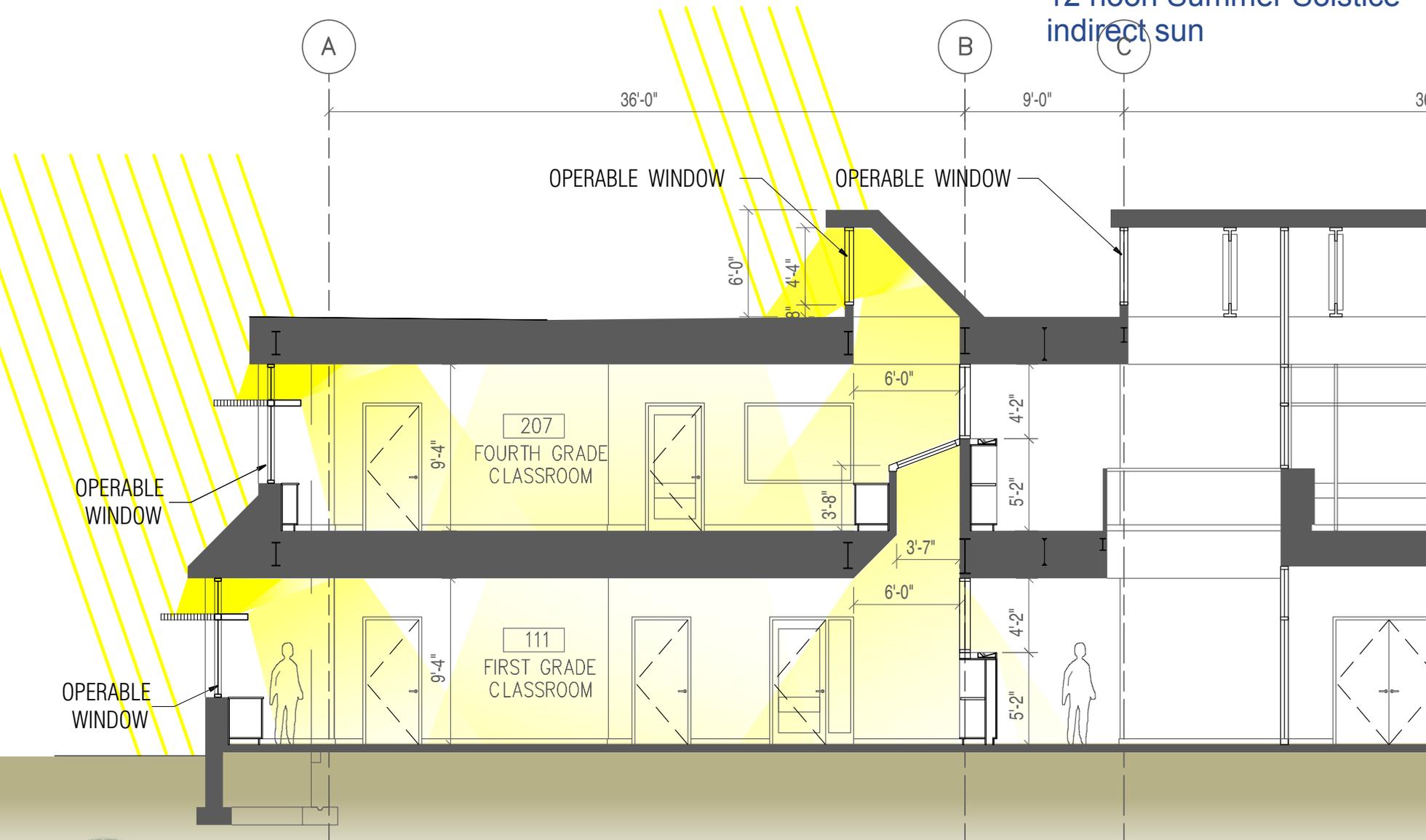
# High Performance Design Elements Daylighting

12 noon Summer Solstice indirect sun

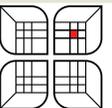
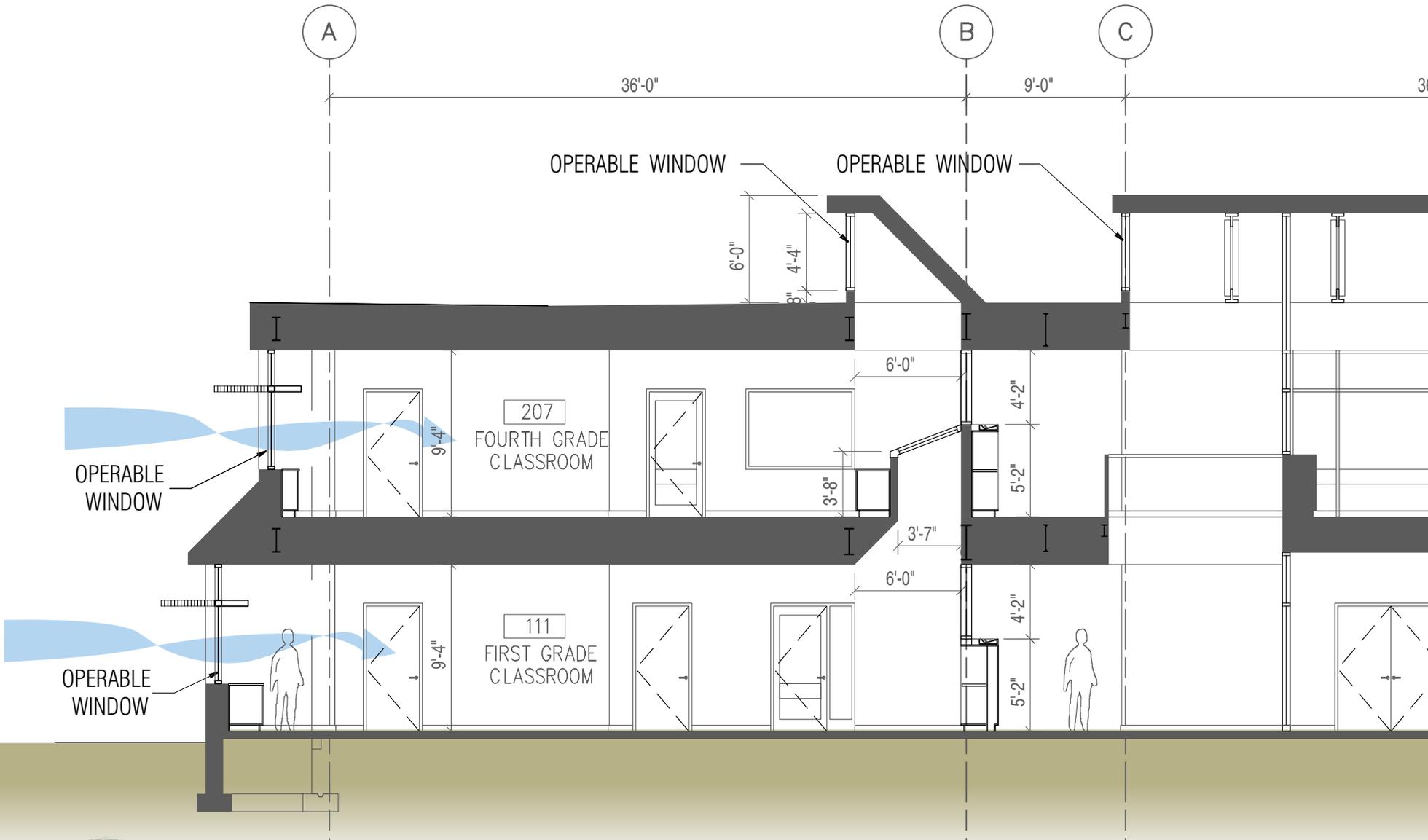


# High Performance Design Elements Daylighting

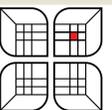
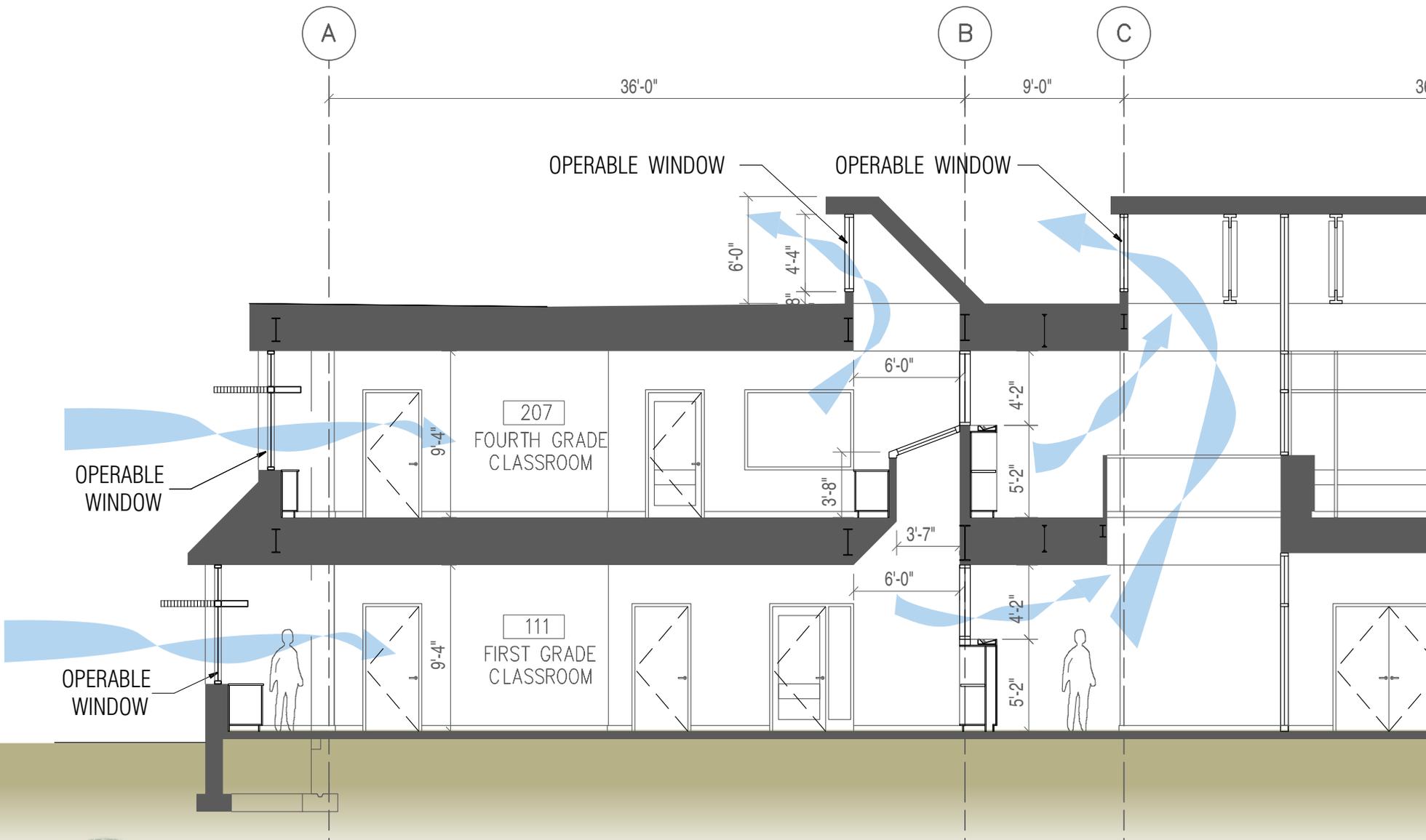
12 noon Summer Solstice indirect sun



# High Performance Design Elements Ventilation

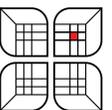


# High Performance Design Elements Ventilation



# High Performance Design Elements

- Classrooms connected to Natural rhythms of Sun and Wind, as well as views
- Well Insulated
- Displacement air system
- Energy recovery wheels
- Overhangs for south facing windows
- Reduced lighting power density (entire building)
- Occupancy sensors in most spaces
- Daylight harvesting controls for whole building

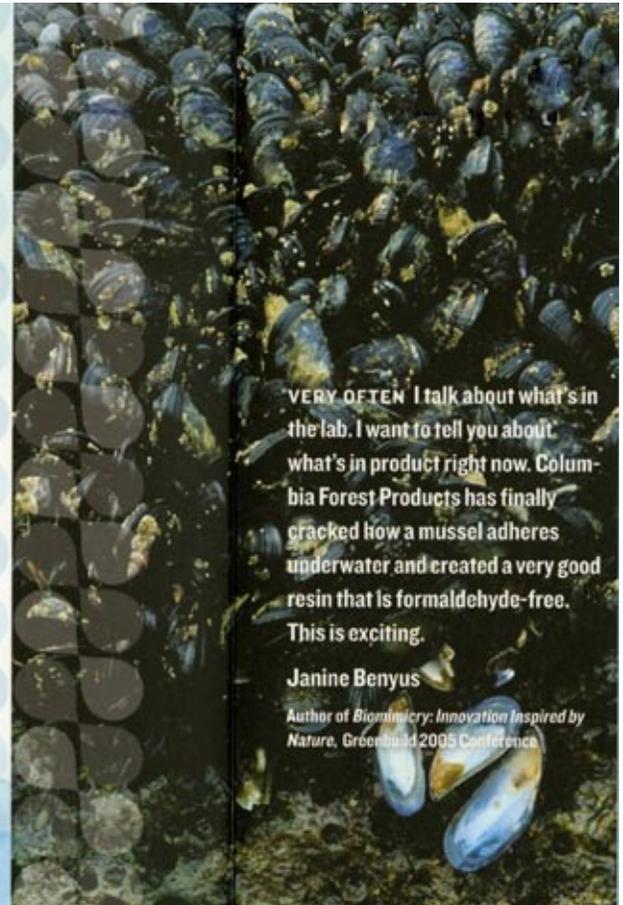


# High Performance Design Elements

## PureBond

100% FSC Certified/ No Urea-Formaldehyde

Columbia Forrest Products' PureBond formaldehyde-free technology involves a patented, soy-based adhesive cooperatively developed by Columbia, the College of Forestry at Oregon State University and Hercules Incorporated. Hercules has awarded Columbia a license to utilize its patented adhesive system on an exclusive basis for all of Columbia's North American decorative panel markets.



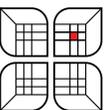
VERY OFTEN I talk about what's in the lab. I want to tell you about what's in product right now. Columbia Forest Products has finally cracked how a mussel adheres underwater and created a very good resin that is formaldehyde-free. This is exciting.

**Janine Benyus**

*Author of Biomimicry: Innovation Inspired by Nature, Greenbuild 2005 Conference*



Traditional UF plywood and PureBond plywood after ANSI HP-1-2004 cyclic boil test



# High Performance Design Elements

Massachusetts Collaborative for High Performance Schools (MA-CHPS)

## MA-CHPS SCORECARD

42 12 7 Total Project Score				Total Possible Points 89			
Yes	?	No	Points	SITE	Possible Points	16	
Y				SP 1	Joint Use of Facilities		
Y				SP 2	Joint Use of Parks		
1			1	SC 1.1	Sustainable Site Selection		
1			1	SC 1.2	No Development on Floodplains		
1			1	SC 1.3	No Development Near Wetlands		
1			1-2	SC 1.4	No Development on Greenfields		
1			1	SC 1.5	Centrally Located Site/Smart Growth		
1			1	SC 1.6	Reduced Building Footprint		
1			1	SC 1.7	Sustainable Site and Building Layout		
			1	SC 2.1	Locate Near Public Transit		
1			1	SC 2.2	Pedestrian/Bike Access		
			1	SC 2.3	Minimize Parking		
1			1	SC 3	Post-Construction Stormwater Management		
			1	SC 4.1	Design to Reduce Heat Islands, Non-Roof		
1			1	SC 4.2	Design to Reduce Heat Islands, Roof		
2			2	SC 5	Exterior Light Pollution Reduction		

Yes	?	No	Points	WATER	Possible Points	5
Y				WP 1	Indoor Water Use Reduction, 20% Reduction	
1			1	WC 1.1	Indoor Water Use Reduction, 30% Reduction	
1			1	WC 1.2	Reduce Water Used for Sewage Conveyance	
1			1	WC 2.1	No Permanent Irrigation For Landscaping	
			1	WC 2.2	Water Reduction and Sports Turf Management	
			1	WC 2.3	Irrigation System Commissioning	

Yes	?	No	Points	ENERGY	Possible Points	25
Y				EP 1	Elimination of CFC-based Refrigerants	
Y				EP 2	Commissioning	
Y				EP 3	Fundamental Building Systems, Training	
				EP 4	Exceed Energy Code by 20%, Prescriptive Approach	
				EP 4	Exceed Energy Code by 20%, Performance Approach	
			4	EC 1	Superior Energy Performance, Prescriptive Approach	
			1-10	EC 1	Superior Energy Performance, Performance Approach	
			2	EC 2	Minimize Air Conditioning	
			1	2-11	EC 3	Renewable Energy
1			1	EC 4.1	Energy Management Systems	
1			1	EC 4.2	Submetering	

Yes	?	No	Points	MATERIALS	Possible Points	13
Y				MP 1	Storage & Collection of Recyclables	
Y				MP 2	Site Waste Management, 75% Diversion	
1			1	MC 1	Site Waste Management, 90% Diversion	
			1-4	MC 2.1	Building Reuse, Maintain 50-95% of Existing Shell	
			1	MC 2.2	Building Reuse, Maintain 50% Interior	
2			1-7	MC 3	Combined Materials Attributes	

Yes	?	No	Points	IEQ	Possible Points	22
Y				IEQP 1	ASHRAE Standard 62.1-2004 Compliance	
Y				IEQP 2	SMACNA IAQ Guidelines	
Y				IEQP 3	Construction IAQ, Duct Protection	
Y				IEQP 4	Pollutant Source Control, Off-gassing	
Y				IEQP 5	Walk-Off Mats	
Y				IEQP 6	Drainage	
Y				IEQP 7	Irrigation Design	
Y				IEQP 8	Mold Protection	
Y				IEQP 9	Electric Ignitions, Gas-Fired Equipment	
Y				IEQP 10	Air Intake Location	
Y				IEQP 11	Duct Liners	
Y				IEQP 12	Prohibit Fossil Fuel Burning Equipment, Indoors	
Y				IEQP 13	Filter Requirements for HVAC Equipment	
Y				IEQP 14	ASHRAE Standard 55-2004 Compliance	
Y				IEQP 15	Access to Views, 70%	
2			2	IEQC 1.1	Access to Views, 90%	
0	2		1-4	IEQC 1.2	Daylighting in Classrooms	
2	1		1-4	IEQC 2.1	Low-Emitting Materials	
1			1	IEQC 2.2	Pollutant Source Control, Ducted HVAC Returns	
1			1	IEQC 2.3	Pollutant Source Control, High Efficiency Filters	
1			1	IEQC 2.4	Construction IAQ, HEPA Vacuuming	
2			2	IEQC 2.5	Construction IAQ, Building Flushout	
1			1	IEQC 3.1	Acoustical Performance in Classrooms, Max 40 NC	
1			1	IEQC 3.2	Acoustical Performance in Classrooms, Max 35 NC	
			2	IEQC 3.3	Acoustical Performance in Classrooms, Max 30 NC	
			1	IEQC 3.4	Reducing Sound Transmission	
1			1	IEQC 4.1	Controllability of Systems, Operable Windows	
1			1	IEQC 4.2	Controllability of Systems, Temperature/Light Control	

Yes	?	No	Points	POLICY & OPERATIONS	Possible Points	8
Y				P&OP 1	Maintenance Plan	
Y				P&OP 2	Anti-Idling Measures	
1			1	P&OC 1	Maintenance Plan, CMMS	
1			1	P&OC 2	Indoor Environmental Management Plan	
1			1	P&OC 3	Energy Star Equipment Performance	
			1	P&OC 4.1	Clean Energy, 50%	
			1	P&OC 4.2	Clean Energy, 100%	
2	1		1-3	P&OC 5	Innovation	

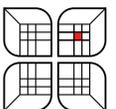
Requirement for all schools	
Requirement for green schools only	

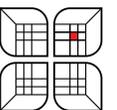
<b>Point Thresholds</b>	
30 points	- 1.5% Financing of Maximum Allowable Cost
34 points	- 2.0% Financing of Maximum Allowable Cost

Comprehensive analysis of Green building elements

Achieving MA-CHPS Certification qualifies project for MSBA Funding



# A School in a Park



# A School in a Park



*Thank You*

