

Master's Project

submitted by

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ERIE ELEMENTARY CHARTER SCHOOL - Renovation & Addition

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Abstract:

This project explores the problem of insufficient space for an expanding charter school housed in a century-old parochial school building of the St. Mark Roman Catholic Church along the eastern-most edge of the Humboldt Park neighborhood of Chicago. The goal is to design a significant addition to link to the existing structure that will provide much needed program space and amenities upgrades in an optimal and efficient manner on a tight site.

The new addition will provide an improvement to the neighborhood such that local families whose children attend the charter school will no longer need to contend with large distances to public schools located outside of the immediate neighborhood. Moreover, additional space will permit expansion of the existing K-5 curriculum to include grades 6-8, thereby providing the added benefit to families of their children attending the charter school for a greater duration. For families with children of multiple ages in the elementary school years, the benefit of siblings attending the same school for a longer duration can greatly simplify family life.



Problem:

The Erie Elementary Charter School was originally chartered to educate K-5 students. Its target constituency is low-income households with Spanish as their primary language. The school is growing at the rate of one new grade per year and has secured a state-mandated funding stream of \$12 million to purchase an existing building to be renovated and retrofitted to house some 360+ students. The expanded enrollment would be capped at Grade 8.

The present facility is a century-old parochial school building that could function more efficiently with updated mechanicals and improved program circulation. Moving the school to an entirely new site would entail a significant disruption to the mission and program of EECS. By designing and constructing an addition adjacent to the existing building, with scheduling of certain stages of the construction during summer break, these disruptions could be minimized. The completed project would accommodate the ongoing growth of the school toward fulfilling its long-term goal of becoming a K-8 charter school.

Proposed Solution:

The addition to the existing building will follow the established floor-to-ceiling heights of the original building so as to minimize ramping and accessibility issues between the two halves of the overall composite building. Entry will be from the south through an open courtyard/play area that gently slopes from grade to the lower level floor elevation, 4 feet below grade. The new addition will house eight additional grade-level classrooms, along with specialty classrooms, the library/media center, a new administrative office suite, and an enclosed greenhouse that adjoins a science classroom and a rooftop garden area. The existing building will have a secondary addition directly to the rear to provide necessary restroom facilities for each floor, as well as student lounge/study areas.



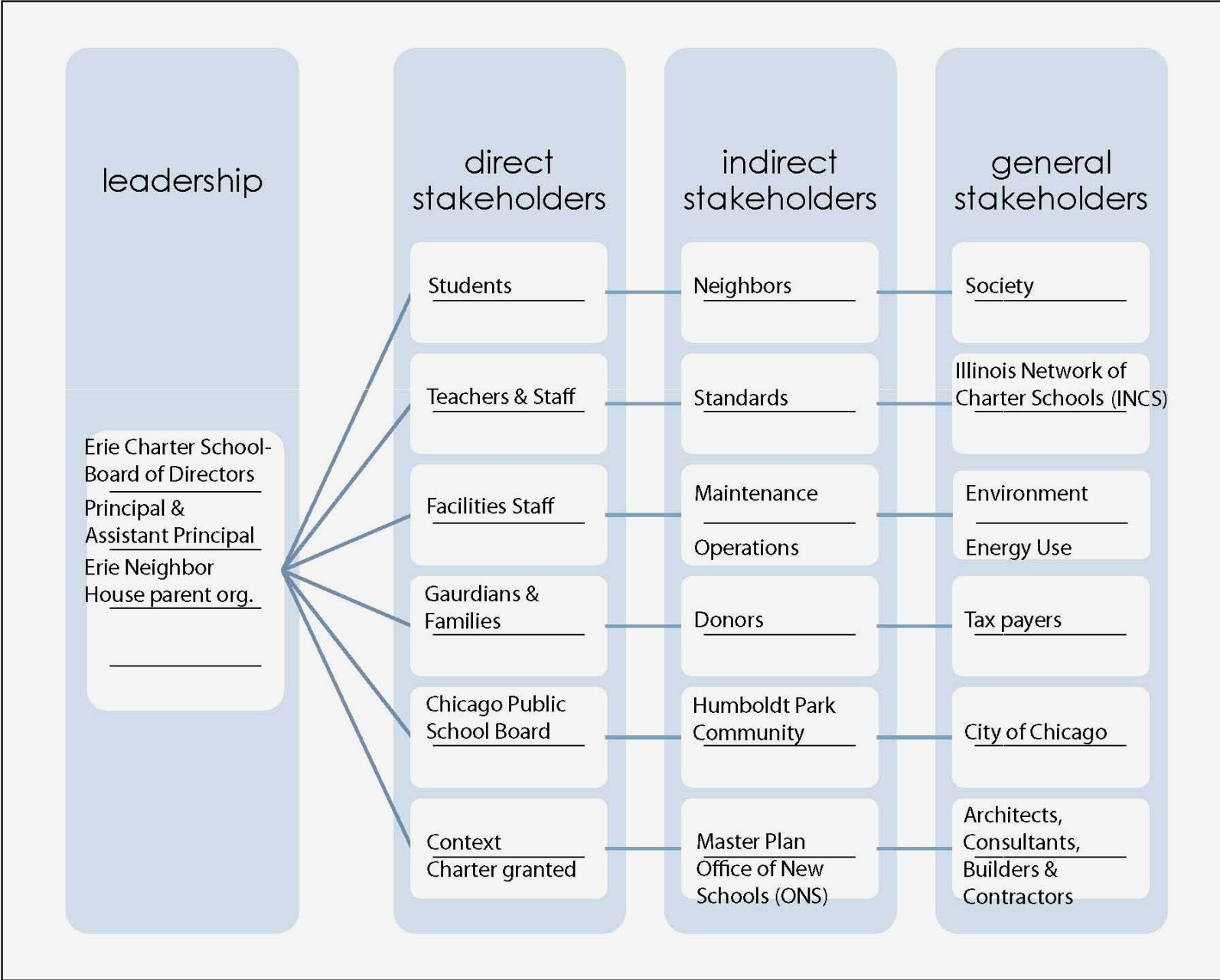
Principle Objectives:

The main objective for this renovation and addition is to create a highly functional school facility that provides a safe, stimulating, and significant education experience for neighborhood children. The intent is to create a destination in which both children and adults can take pride in its presence in the neighborhood.

Secondary objectives include a commitment to upgrading the mechanical systems for the existing building to operate in conjunction with high-efficiency systems that will be incorporated into the addition. Lots of natural light and plenty of natural ventilation will be available in both portions of the building. The dated glazing of the existing building will be upgraded to provide better natural light and insulative properties more in keeping with high-efficiency building operations.

Lastly, the design objectives will encompass an attention to building materials that both honor the passage of time and suggest a uniting of new with old in a complementary manner. Just as good educational pedagogy calls for solid foundations that are built upon, layer after layer, the overall design will suggest a similar layering pathway that links the best of the old with the most innovative of the new.

Stakeholders:



Precedents:

Chicago International Charter School - Chicago, IL

Designed by OWP/P, 2008

The design of the academic building involved converting the elementary school into a high school by slightly modifying the classrooms and creating an addition to house administrative offices, a cafeteria, a library and science classrooms. Many of the existing walls, the wood trim and terrazzo were retained. The classrooms were designed with breakout areas to allow for independent learning or special attention.

<http://www.owpp.com/content.cfm/ellison>





Precedents:

Perspectives Charter School - Chicago, IL

Designed by Perkins & Will, 2006

The new building is reflective of the unique culture that has resulted from the hard work, vision, and dedication of the school's students, parents, teachers, and administrators. Interaction and socialization among the students and the staff of the school are integral to the Perspectives way of learning. Small group spaces and other areas allow for a variety of uses and interactions beyond those that occur in the classroom. Through responsive planning and innovative use of materials and color, all while working within a limited budget, the design encourages and exemplifies the unique educational approach of the school.

<http://architecturelab.net/2008/05/15/perspectives-charter-school-chicago-by-perkins-will/>

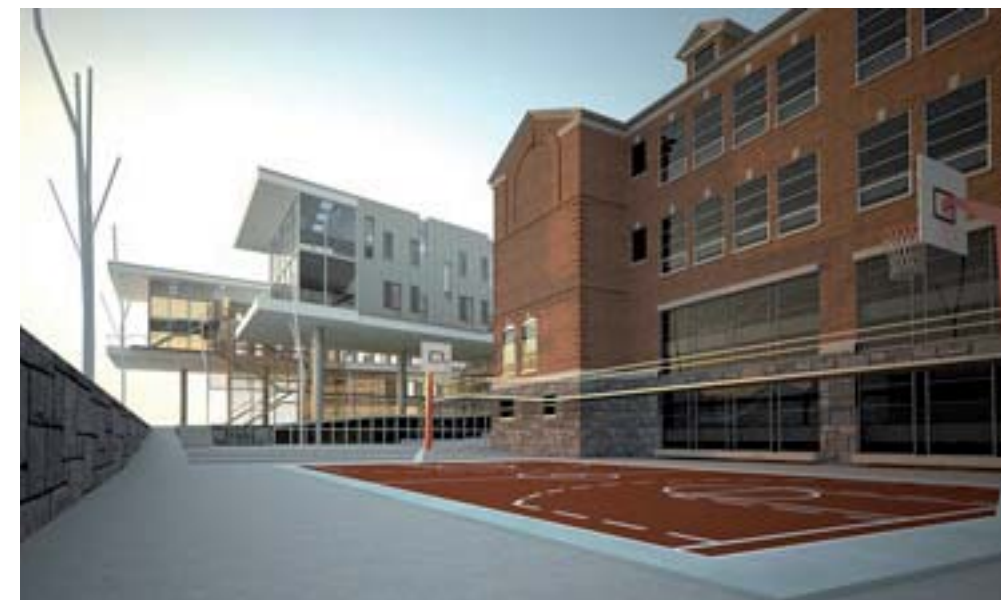
Precedents:

Robbins Elementary School - Trenton, NJ

Carlo Enzo Frugiuale & Massimo Marinelli, 2004

The design for an extension to the Robbins Elementary School addresses not just the functional demands of the brief but also its interaction with its neighborhood, thus further weaving the school into its immediate context.

The project articulates itself around the existing historic school building as it extends towards a new green space positioned on the southern edge of the proposed site. This space is seen as an outdoor resource for the school as well a potential fragment within a system of small parks in the neighborhood.



<http://www.architecture-page.com/go/projects/robbins-elementary-school>

Precedents for School Analysis:

Apollo Montessori School, Amsterdam, Netherlands
Herman Hertzberger, 1981

Burr Street Elementary School, Fairfield, Connecticut
Skidmore, Owings & Merrill, 2004

CEIP, Castelldefels, Spain
Carmen Pinos, 2006

Corona Avenue School, Los Angeles, California
Richard Neutra, 1935

Crow Island School, Winnetka, Illinois
Eero Saarinen, Perkins and Will, 1940

Davenport College, Yale University, New Haven
Connecticut
Keiran and Timberlake, 2005

Elementary School, Darmstadt, Germany
Hans Scharoun, 1951 (never built)

Gesellschaft, Lunen, Germany
Hans Scharoun, 1956-1962

Greenwich Academy, Greenwich, Connecticut
Skidmore, Owings & Merrill, 2002

High School in Sant Carles de la Rapita, Terres de L'Erbe
Carmen Pinos, 2007-2009

International Elementary School, Long Beach, California
Morphosis, 2004

Lorentzschool, Leiden, Netherlands
Atelier Pro, 2003-2006

Munkegard School (Munkegaard School), Denmark
Arne Jacobsen, 1952-1956

Paschalis School, Hague, Netherlands
Atelier Pro, 2001-2004

Perspectives Charter School, Chicago, Illinois
Perkins & Will, 2005

Primary School DeVogels, Oegstgeest, Netherlands
Herman Hertzberger, 2000

Robbins Elementary School, Trenton, New Jersey
Urban Office Architecture, 2004

Relevant Research Materials:

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Benabou, Roland (1993), "The Workings of a City: Location, Education, and Production," Quarterly Journal of Economics 108(3), p. 619-652.

Black, Sandra E. (1999), "Do Better Schools Matter? Parental Valuation of Elementary Education," Quarterly Journal of Economics 114(2), p. 577-599.

Brubaker, William C., Raymond Bordwell, and Gaylairst Christopher. Planning and Designing Schools. New York : McGraw-Hill, 1998.

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Card, David, and Alan Krueger (1992), "Does Quality Matter? Returns to Education and the Characteristics of Public Schools in the United States," Journal of Political Economy 100(1), P. 1-40.

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Krueger, Alan B. (2003), "Economic Considerations and Class Size," The Economic Journal 113, p. F34-F63.

Mendell, Mark J. and Garvin A. Heath (2004), "Do Indoor Environments in Schools Influence Student Performance? A Critical Review of the Literature." Indoor Air 15(1), p. 27-52.

Miron, Gary, and Christopher Nelson. What's public about charter schools? Lessons learned about choice and accountability. Thousand Oaks, CA, Corwin Press, 2002.

New Schools for New York, Princeton Architectural Press, 1999.

Perkins, Bradford. Building Type Basics for Elementary and Secondary Schools. New York, Wiley & Sons, 2001.

Schneider, Mark (2002), Do School Facilities Affect Academic Outcomes? National Clearinghouse for Educational Facilities. Washington, DC.

Uline, Cynthia and Megan Tschannen-Moran (in press), "The Walls Speak: The Interplay of Quality Facilities, School Climate, and Student Achievement," The Journal of Educational Administration.

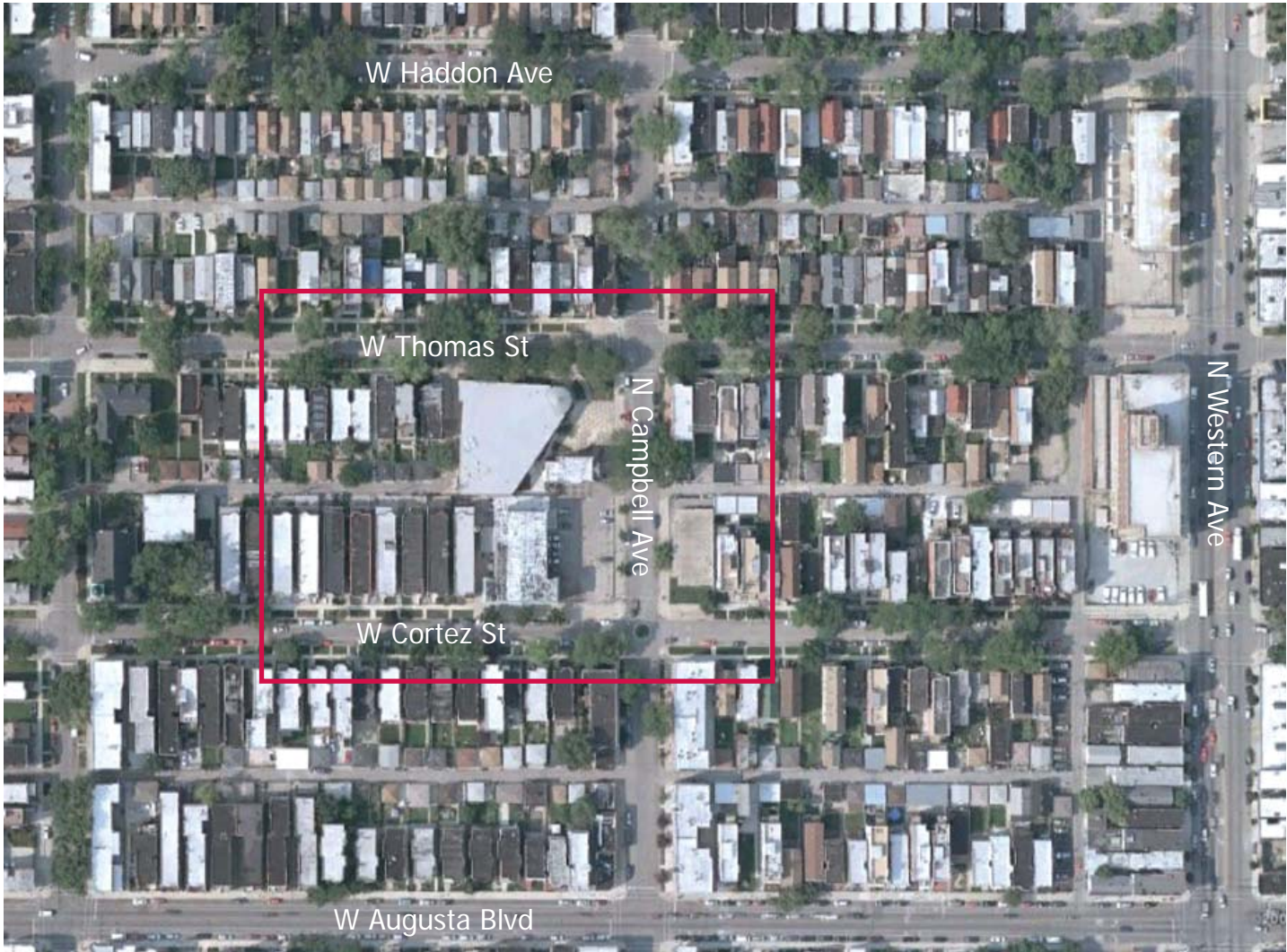
Walden, Rotraut. Schools for the Future. Hogrefe & Huber, 2009.

Concepts/Principles:

1. The overall design of the school will exude a welcoming atmosphere so that all who enter are enfolded in an environment that engages the senses and energizes the educational enterprise.
2. The architecture of the educational environment will encourage delight in academic excellence and instill in students confidence in their cultural and ethnic background.
3. The core mission emphasis on biliteracy in Spanish and English will be reflected in design features that promote global and cultural awareness and appreciation, such as signage in multiple languages and the use of color palettes and symbols that foster appreciation of many cultures.
4. An emphasis on excellence in education will be reflected in the building design whereby students glean a sense of the life-long journey of learning and service to humanity.
5. Good stewardship of the earth and energy will be emphasized through energy efficient design and promoting the recycling of resources used commonly in the classroom and school environment.
6. All aspects of the school will support the mission of the school to nurture and empower students to successfully and productively engage in the local community and broader society.



Site: *Erie Elementary Charter School* - located in the former parochial school of St. Mark Roman Catholic Church in the SE corner of Humboldt Park neighborhood of Chicago.



Demographics:

Community Area 23 - Humboldt Park



Location within the City of Chicago

Coordinates: 41°54'N 87°43.2'W / 41.9°N 87.72°W / 41.9; -87.72
Coordinates: 41°54'N 87°43.2'W / 41.9°N 87.72°W / 41.9; -87.72

Country: United States
State: Illinois
County: Cook
City: Chicago
Neighborhood: Humboldt Park

Area: - Total 3.6 sq mi (9.38 km²)

Population (2000) - Total 100,236
- Density 27,677/sq mi (10,686.1/km²)
population down 4.51% from 1990

Demographics - White 1.03%
- Black 24.3%
- Hispanic 73.5%
- Asian 0.26%
- Other 0.91%

Time Zone: CST (UTC-6)
- Summer (DST) CDT (UTC-5)

ZIP Codes: parts of 60622, 60624, 60639, 60647, 60651

Median income: \$28,728

Source: U.S. Census, Record Information Services

Social Context:

The Humboldt Park neighborhood of Chicago has a significant Hispanic population, comprised mainly of low-income households in which Spanish is the primary language. Typically the families are immigrants from Puerto Rico and only occasionally from Mexico or Central America. Puerto Rican families began moving into the neighborhood in significant numbers in the 1950's, and Humboldt Park has since become known as "little Puerto Rico," one of the largest Puerto Rican settlements in the entire midwest.

Opportunities for children in these households to receive an education in the Chicago public schools while maintaining fluency in their native language are severely limited. The public schools associated with this neighborhood have provided inconsistent opportunities for a good education. Charter schools provide one means of improving the school programs available to neighborhood children. Erie Elementary Charter School has as its core mission to provide bi-literate education (Spanish and English) to children from low-income, immigrant households in the Humboldt Park neighborhood.

In addition to academic instruction, the school provides other important programs to neighborhood children and families, namely a before-school enrichment time with breakfast, as well as an after-school tutoring and child-care program, both conveniently scheduled to meet the needs of working parents. One measure of the success of the school is its at-capacity enrollment year after year, as well as its growing waiting list of neighborhood families hoping to enroll their children. Another measure of success is the close-knit community that has formed among the students and families, as well as between the teachers and staff and the students and their families.

Erie Charter School Program – Initial Proposal

<u>Space Category</u>	<u>Count</u>	<u>Square Footage</u>	<u>Capacity</u>	<u>Total Program Area</u>	
INSTRUCTIONAL					
Typical Classrooms	18	900	540	16,200 sf	
Art Classroom	1	900	30	900	
Music Classroom	1	900	30	900	
Computer Classroom	1	900	30	900	
Science Classroom	1	900	30	900	
Multi-Purpose Room	<u>2</u>	<u>1800</u>	60	<u>1800</u>	
	24	6300		21,800 sf	
DINING CENTER					
Student Dining Room	1	3600		3600 sf	
Warming Kitchen	1	1800		1800	
Serving Area	1	1350		1350	
Dishwashing	1	300		300	
Recycling Area	1	300		300	
Kitchen Storage	1	300		300	
Kitchen Office	1	<u>100</u>		<u>100</u>	
		7750		7,750 sf	
SPECIAL AREAS					
Library/Resource Center	1	3600		3600 sf	
Gymnasium	1	4500		4500	
Stage	1	1800		1800	
Storage for Gymnasium	1	300		300	
General Building Storage	3	1350		4050	
Gymnasium Office	1	<u>120</u>		<u>120</u>	
				14,320 sf	
BUILDING SUPPORT					
Entry Vestibule	1	900		900 sf	
Administrative Offices	5	120		600	
Storage for Multi-Purpose	1	600		600	
Building Operations Storage	1	<u>300</u>		<u>300</u>	
				2,400 sf	66,070 SF

Erie Charter School Program – Revised Proposal for New Addition

Space Category	Count	Square Footage	Capacity	Total Program Area	New Building
INSTRUCTIONAL					
Typical Classrooms	6	900	240	5,400 sf	1st 5,512 sf
Art Classroom	1	900	30	900	
Music Classroom	1	900	30	900	2nd 7,076
Computer Classroom	1	900	30	900	
Science Classroom	1	900	30	900	3rd 7,076
Multi-Purpose Room	2	1800	60	1800	4th 5,928 (Gym??)
	12	6300		10,800 sf	
DINING CENTER (reuse existing)					
Student Dining Room	1	3600		[7,750 sf]	Connecting
Warming Kitchen	1	1800			Wing Space:
Serving Area	1	1350			+ 3,168
Dishwashing	1	300			
Recycling Area	1	300			
Kitchen Storage	1	300			
Kitchen Office	1	100			
		7750			Total: 28,760 sf
SPECIAL AREAS					
Library/Resource Center	1	3600		3600 sf	
Gymnasium	1	4500		4500	
Stage	1	1800		1800	
Storage for Gymnasium	1	300		300	
General Building Storage	3	1350		4050	
Gymnasium Office	1	120		120	
				14,320 sf	
BUILDING SUPPORT					
Entry Vestibule	1	900		900 sf	
Administrative Offices	5	120		600	
Storage for Multi-Purpose	1	600		600	
Building Operations Storage	1	300		300	
				2,400 sf	
				Total:	27,520 sf



CLASSRM CLASSRM CLASSRM CLASSRM

MUSIC ART

CLASSRM CLASSRM CLASSRM CLASSRM

SCIENCE COMPUTER

MULTI-PURPOSE ROOM
STOR

LIBRARY/
RESOURCE CENTER

STOR

GYMNASIUM

CLASSRM CLASSRM CLASSRM CLASSRM

STAGE

OFC

STOR

CLASSRM CLASSRM CLASSRM CLASSRM

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ERIE CHARTER SCHOOL PROGRAM AREAS

ENTRY

OFC OFC

OFC OFC OFC

STOR

STUDENT DINING ROOM

SERVE

KITCHEN

OFC RECYC D/W

STOR

STOR

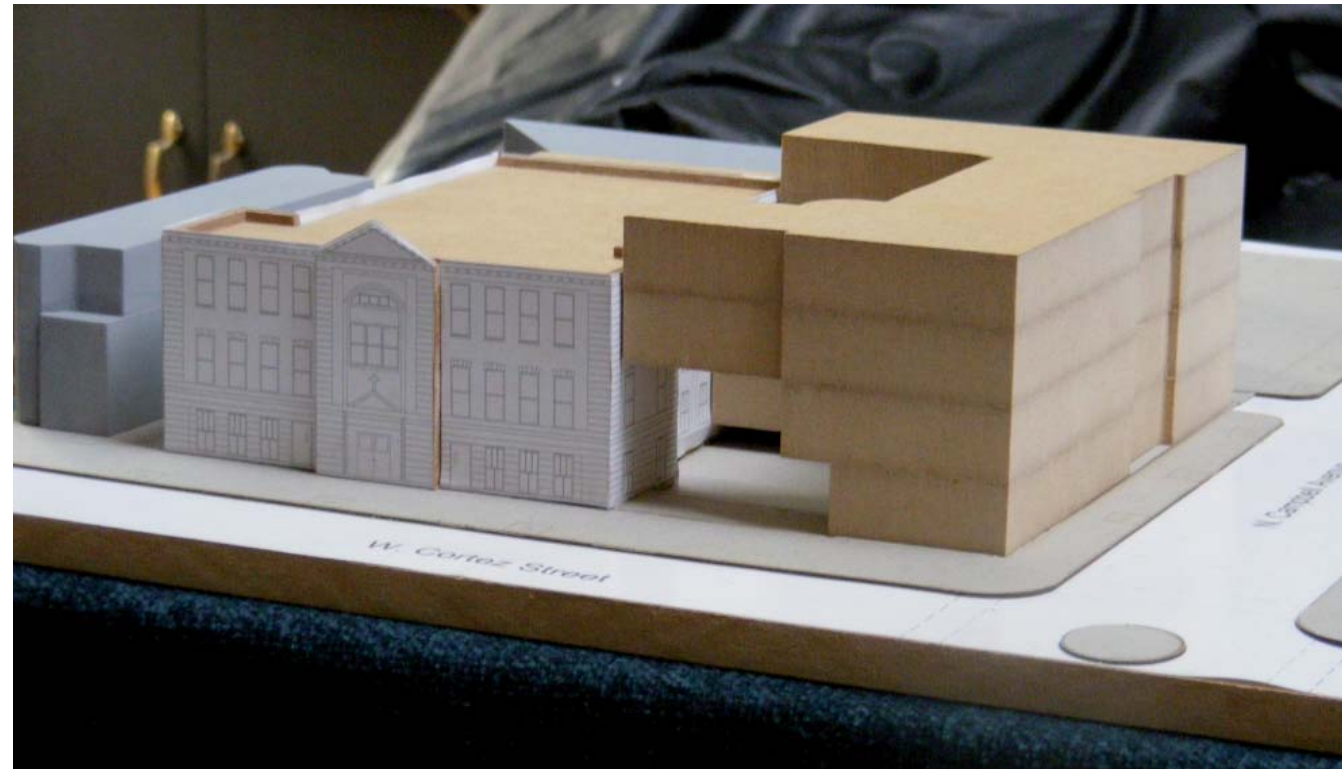
Concept #1



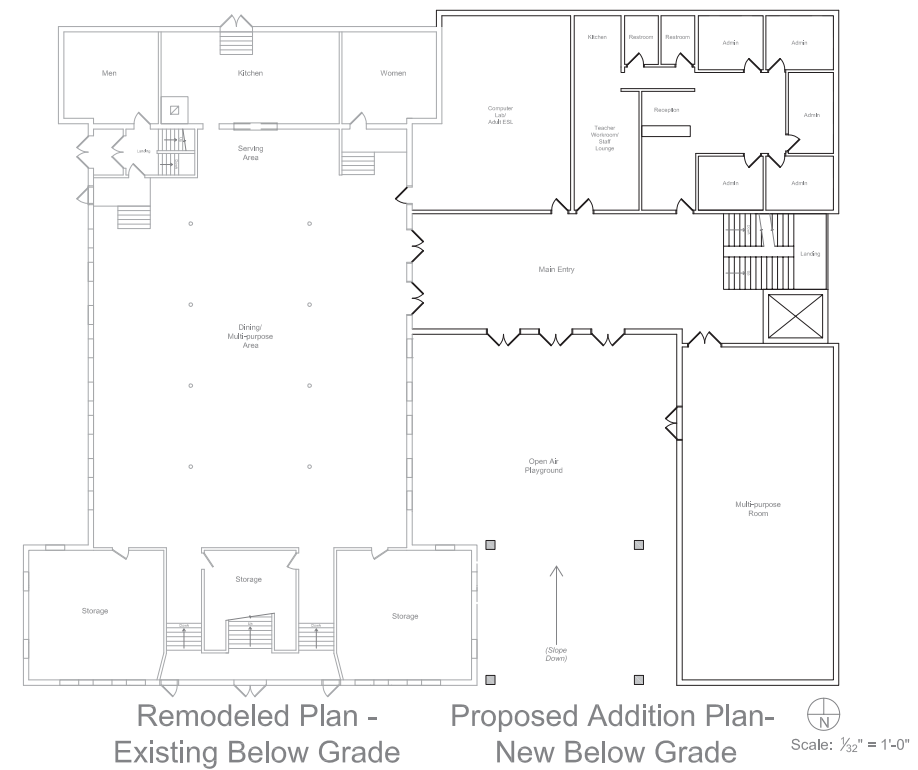
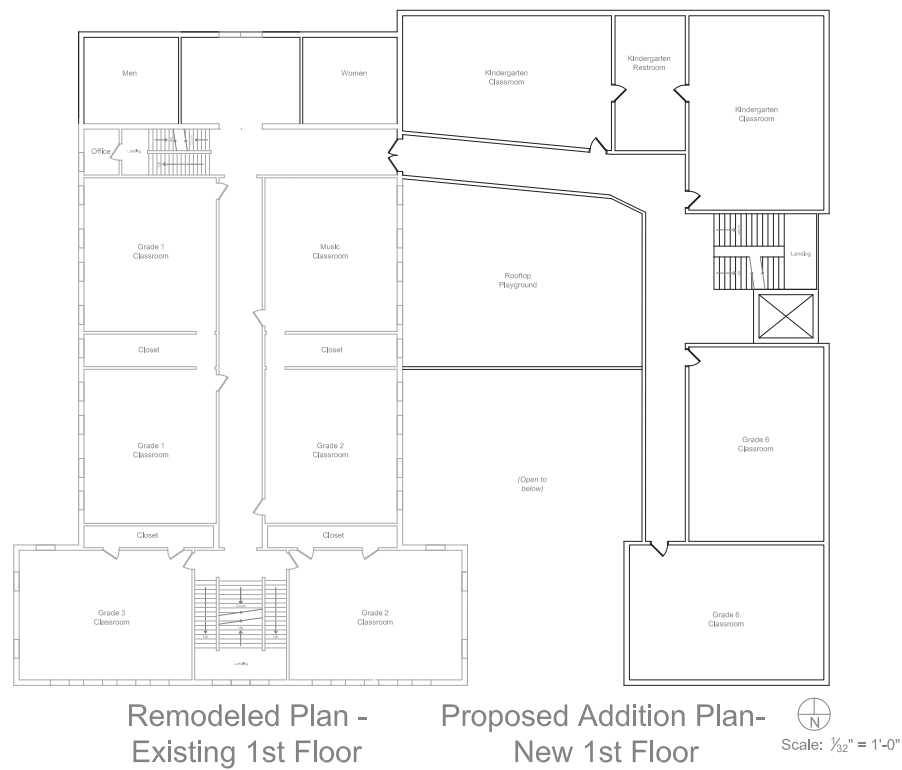
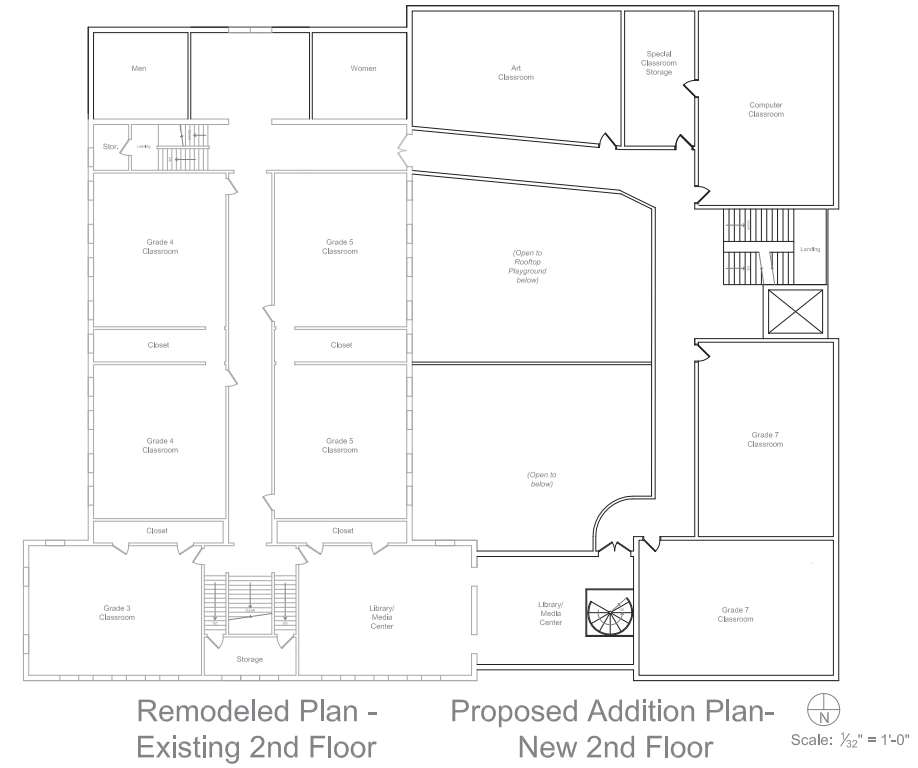
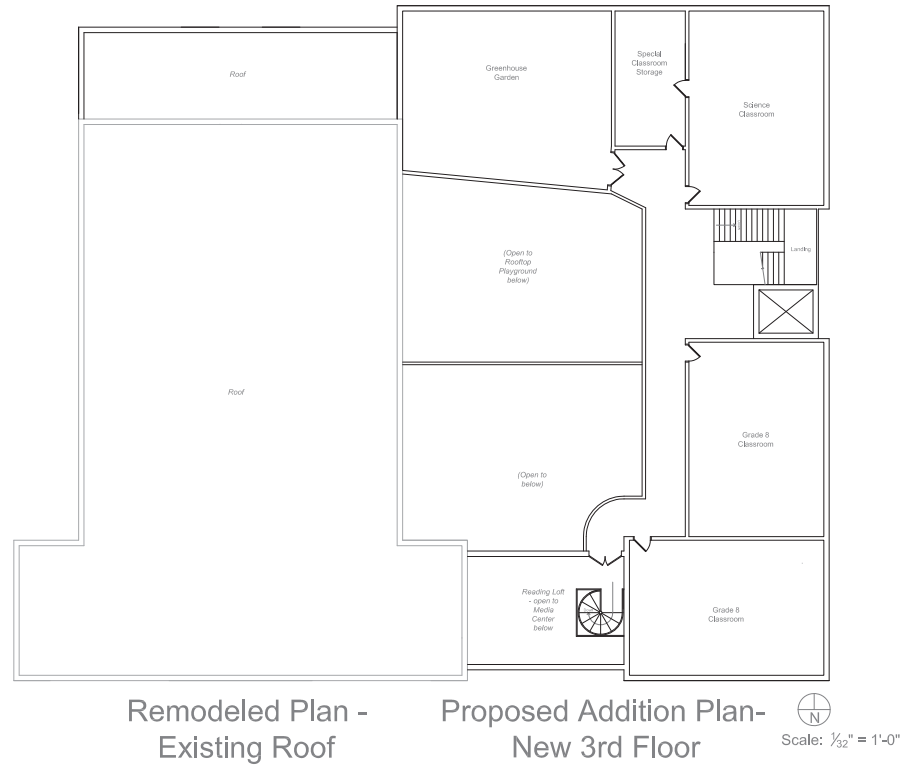
Concept #2



Concept #3



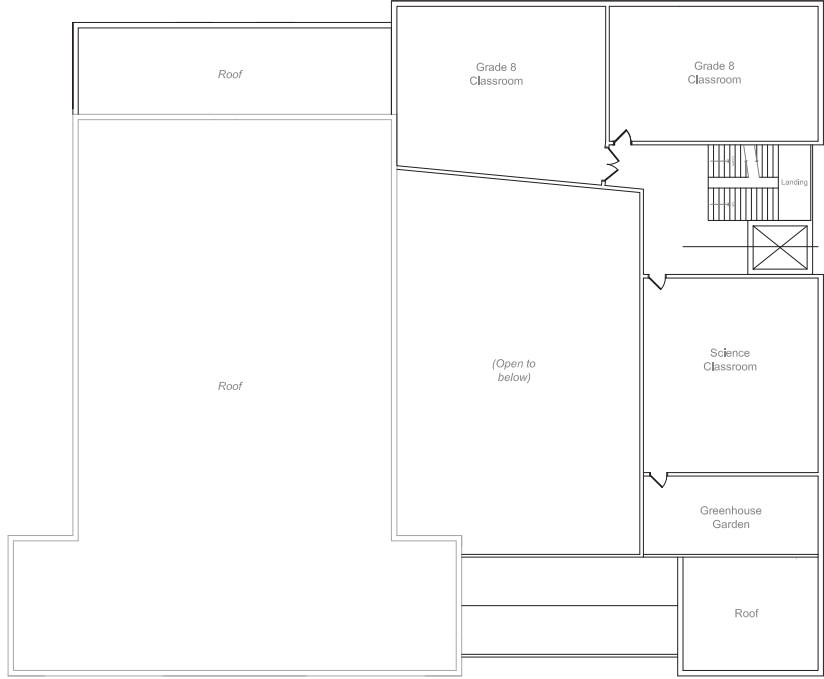
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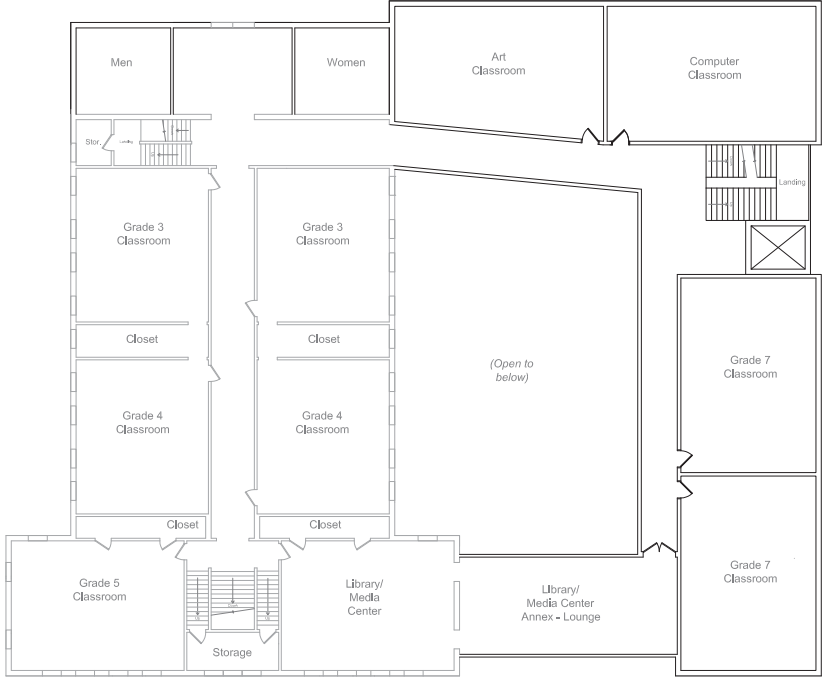
Concept #4



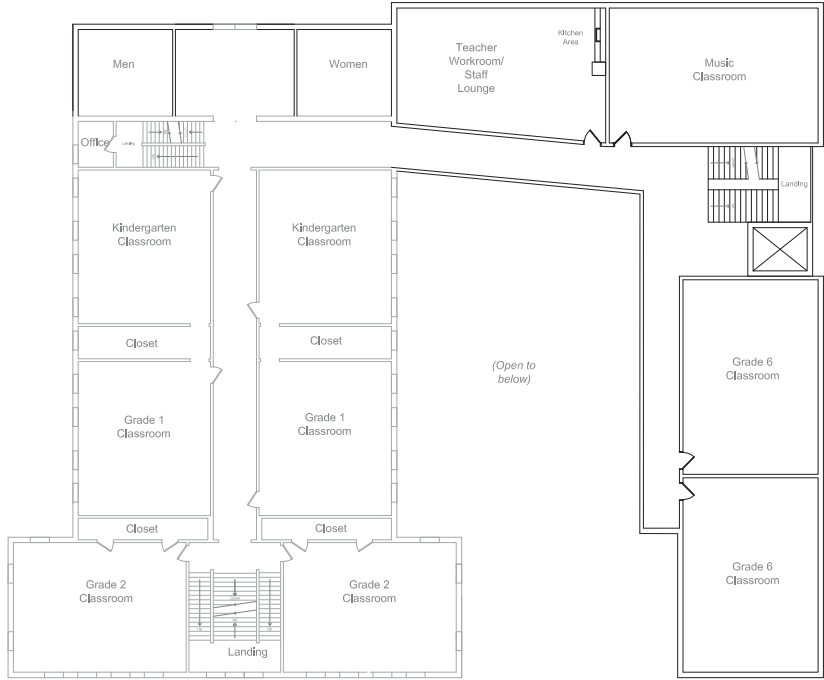
Concept #4



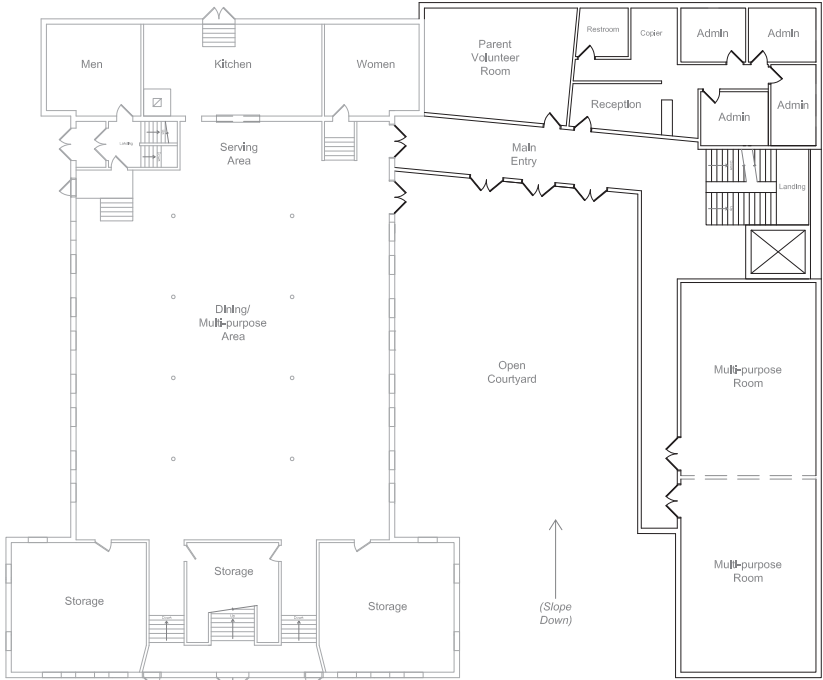
Remodeled Plan - Existing Roof
 Proposed Addition Plan - New 3rd Floor
 Scale: 1/32" = 1'-0"



Remodeled Plan - Existing 2nd Floor
 Proposed Addition Plan - New 2nd Floor
 Scale: 1/32" = 1'-0"



Remodeled Plan - Existing 1st Floor
 Proposed Addition Plan - New 1st Floor
 Scale: 1/32" = 1'-0"



Remodeled Plan - Existing Below Grade
 Proposed Addition Plan - New Below Grade
 Scale: 1/32" = 1'-0"

Concept #5 - Final



Concept #5

EECS Renovation & Addition - Lower Level

Scale: 1/16" = 1'-0"



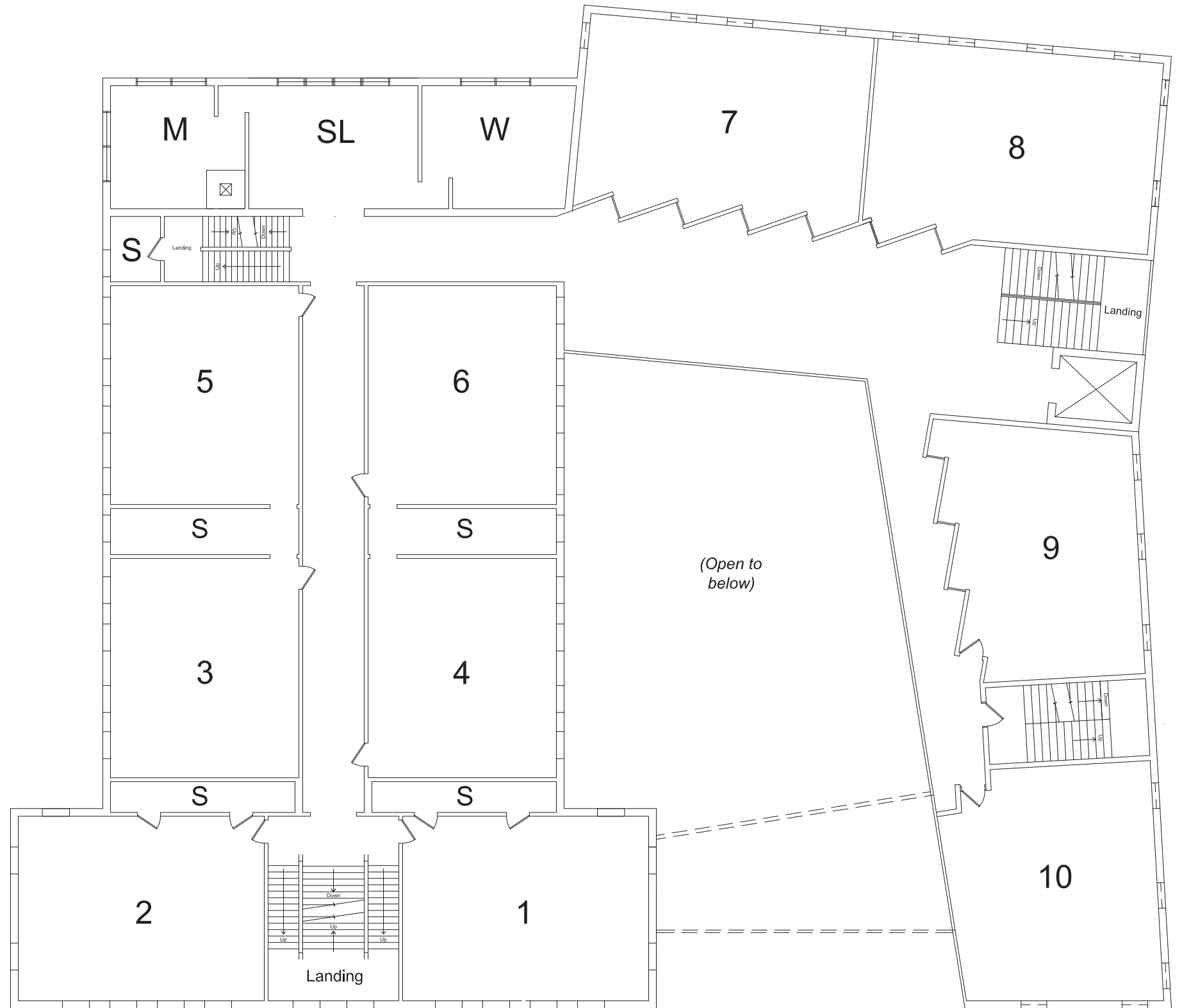
Legend - Lower Level

- 1 Parent Volunteer Room
- 2 Counselor/After School Office
- 3 Dining/Multi-purpose
- 4 Serving Area
- 5 Boiler Room
- 6 Kitchen
- 7 Main Entry
- 8 Teacher Workroom
- 9 Admin. Offices
- 10 Kindergarten
- 11 Kindergarten
- 12 Entry Court/Play
- M Men
- W Women
- S Storage



Legend - 1st Floor

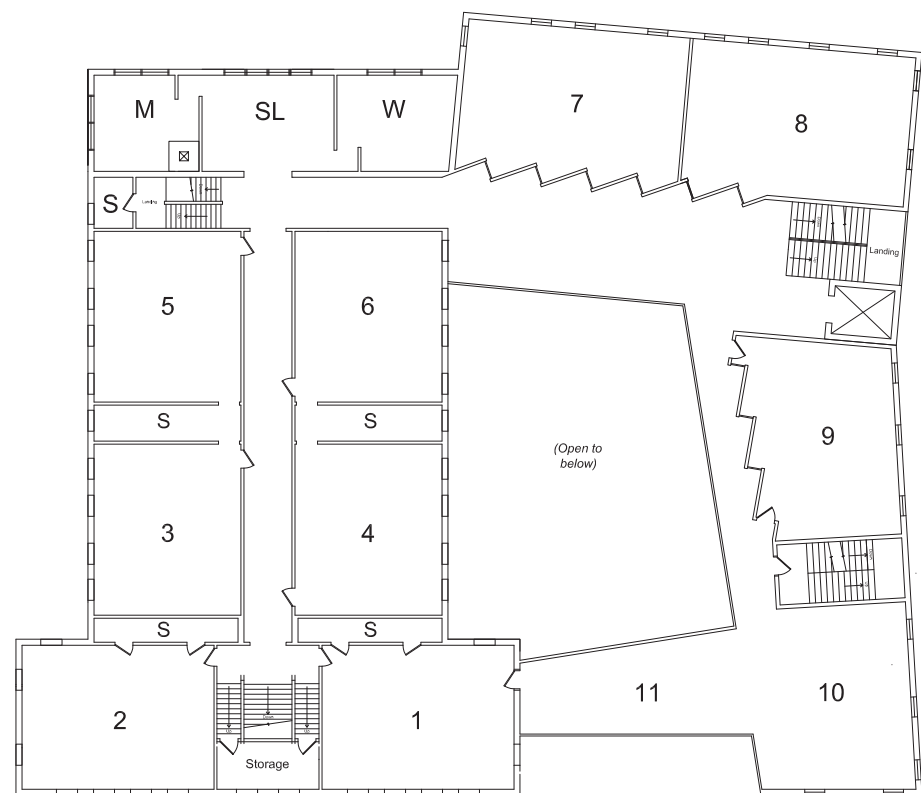
- 1 Grade 3
- 2 Grade 3
- 3 Grade 2
- 4 Grade 2
- 5 Grade 1
- 6 Grade 1
- 7 Grade 6
- 8 Grade 6
- 9 Grade 7
- 10 Grade 7
- M Men
- W Women
- S Storage
- SL Study Lounge



EECS Renovation & Addition - First Floor

Scale: 1/16" = 1'-0"





EECS Renovation & Addition
- Second Floor

Legend - 2nd Floor

- 1 Computer Lab/Classroom
- 2 Art Classroom
- 3 Grade 5
- 4 Grade 5
- 5 Grade 4
- 6 Grade 4
- 7 Grade 8
- 8 Grade 8
- 9 Reading/Music Classroom
- 10 Library/Media Center
- 11 Library Bridge/Study Carrels
- M Men
- W Women
- S Storage
- SL Study Lounge

Scale: 1/32" = 1'-0"



EECS Renovation & Addition
- Third Floor & Roof

Legend - 3rd Floor

- 1 Computer Lab & Classroom
- 2 Greenhouse/ Science Classroom
- R Roof

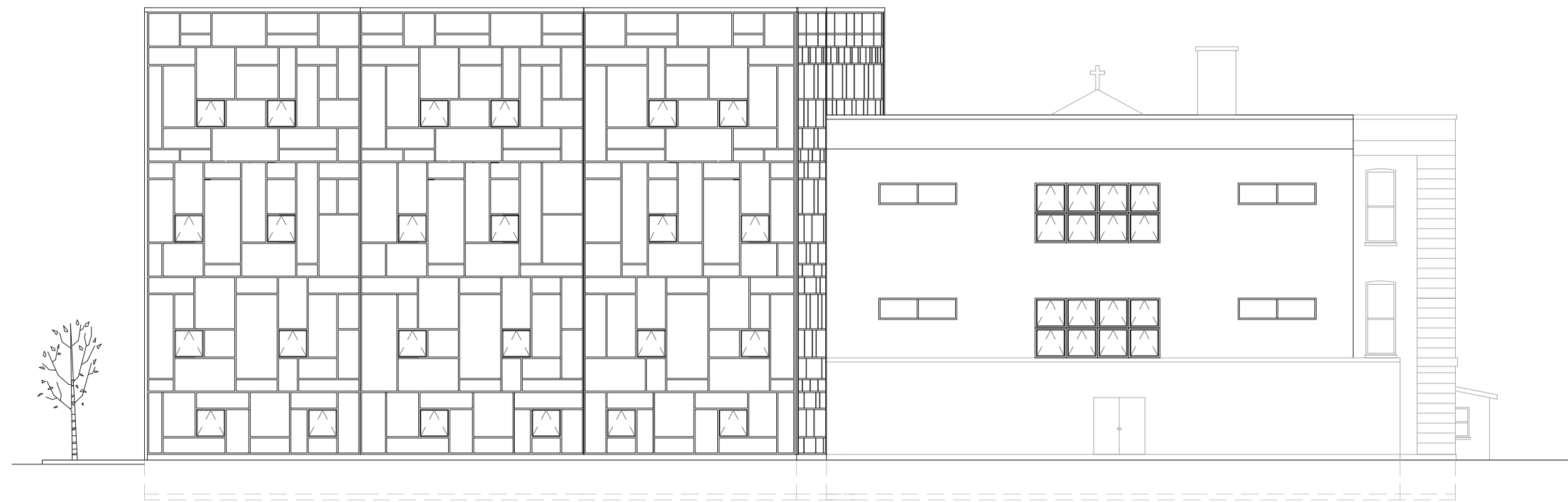
Scale: 1/32" = 1'-0"





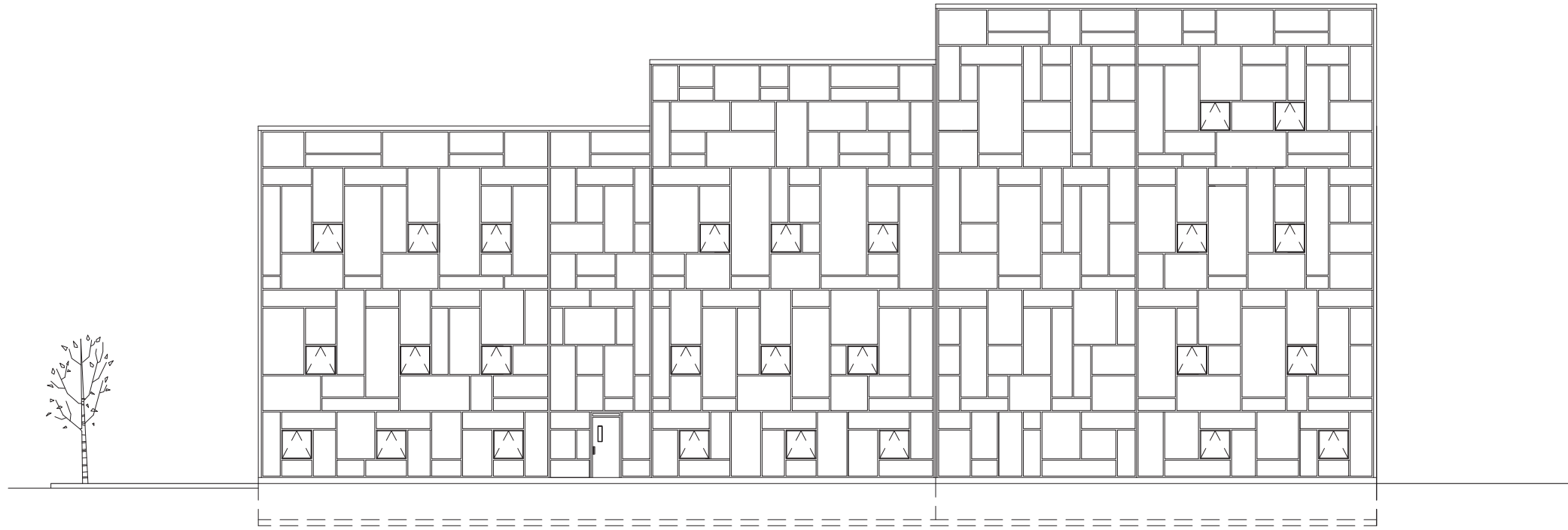
South Elevation

Scale: $\frac{1}{16}'' = 1'-0''$



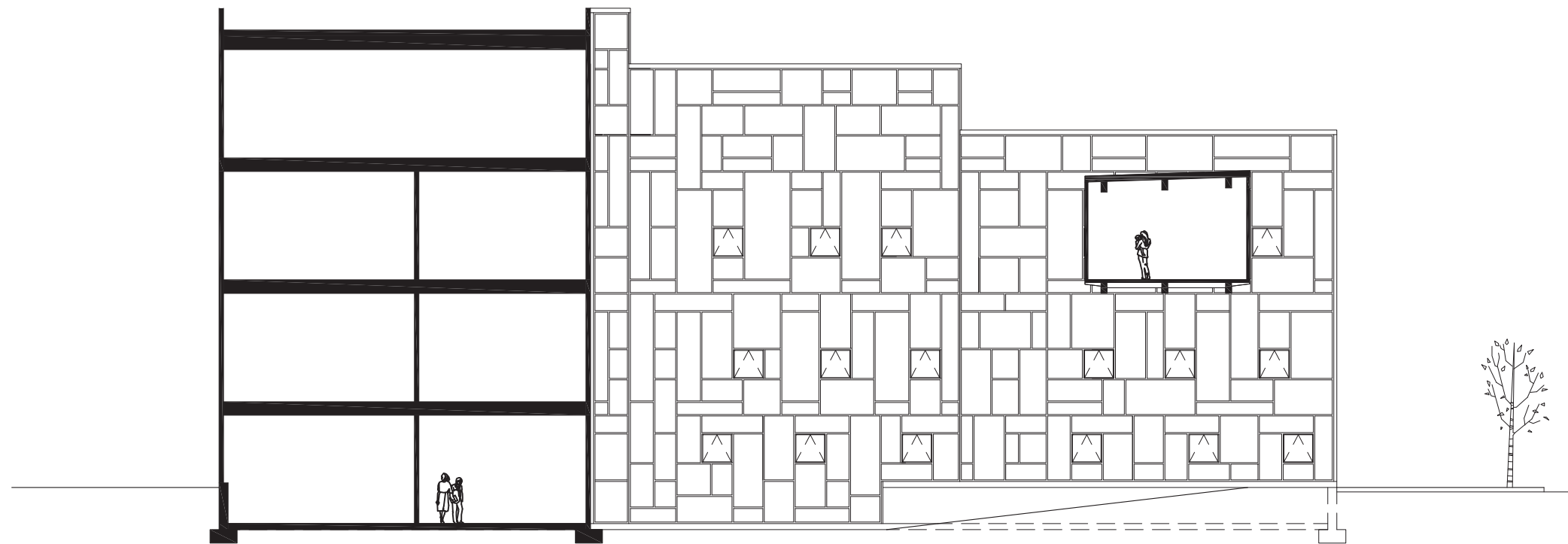
North Elevation

Scale: $\frac{1}{16}'' = 1'-0''$



East Elevation

Scale: $\frac{1}{16}'' = 1'-0''$



West Elevation - Section
(from Courtyard)

Scale: $\frac{1}{16}'' = 1'-0''$

Materials:

The existing school building is constructed of load-bearing masonry walls with timber framing and cast-iron columns spaced appropriately in the basement level. The fenestration has been upgraded at least once, and it appears to be double-glazed vinyl windows currently in place. The heating system consists of a hot-water boiler with perimeter cast-iron radiator units that seem to be operating reasonably well, though there is certainly ample opportunity for increased efficiencies regarding the heating system. There is no air-conditioning at present. The roof appears to be relatively recent, and it is unknown whether additional insulation was added during the most recent reroofing (presumably within the last 10-15 years).



<http://www.inhabitat.com/2008/05/19/greenpix-zero-energy-media-wall-lights-up-beijing/>



<http://architourist.pbworks.com/100-11th-Avenue>

Interactions:

Given the extensive use of both face- and common-brick on the exterior facade of the existing building, with large, symmetrically-placed and regularly-spaced window openings, originally designed to admit ample daylight and plenty of natural ventilation, a different type of material besides brick could provide a complementary and fresher aesthetic “look” to the whole. A glass curtain-wall system, with sufficient operable windows to permit natural ventilation, consisting of high-performance, double-glazed units with low-E coatings and argon-filled cavities, would promote natural daylight energy-savings. The mullions could be fabricated from extruded aluminum designed with thermal breaks to retard heat transfer from inside to outside (in winter) and from outside to inside (in summer).

Another material to consider using is, naturally, brick, albeit in a somewhat playful and sparing manner, to link visually to the material of the existing building. Similarly, concrete, either pre-cast or PIP (poured-in-place) could be used to good advantage. Both of these materials would tend to underscore a sense of heaviness to the overall composition. Therefore, leaning toward the lighter look of glass would heighten a sense of complementarity and contrast between the mostly-brick and mostly-glass adjacent facades.

Conclusions:

This project set out to design an addition to expand and enhance an existing century-old parochial school so that it could be transformed into a state-of-the-art facility for K-8 grade levels. This is a case in which the addition of the parts is greater than the sum of the whole.

The materials chosen for the addition provide an aesthetically pleasing contrast to the traditional brick facade of the original building. The play area, formerly the parking lot surface, is now the major portion of a safer, open extension of the welcoming entryway courtyard. The new parking lot is designed to replace the Annex Building, which seems to have been built as a temporary expedient to augment the original school. The new courtyard provides a sense of community focus in which nearly all portions of the school can receive natural light and building occupants can be kept aware of the outdoors.

This design provides extensive glazing that affords many viewing opportunities of the surrounding neighborhood, which in turn encourages students to be aware of the community and broader society. The numerous operable windows are designed to reduce the dependence on energy consuming mechanical systems that might otherwise run all year long.

Finally, the extensive glazing on the skin of the building can instill a sense of belonging and pride since the symbolism of the random sizes of glass panels suggests that there is no one size or phenotype that students must fit into in order to be a part of this school community. In other words, the irregular pattern of pieces underscores the commitment to honoring a variety of students from all walks of life, especially those who are clinging to a second language spoken at home that is other than English.