HAZLETON AREA SCHOOL DISTRICT

Academy of Sciences

A ROADMAP TO INVESTING IN STEM EDUCATION

Presented by:

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MISSION STATEMENT

The mission of the Hazleton Area Academy of Sciences is to provide a rigorous curriculum with a focus on Science, Technology, Engineering, and Mathematics. A diverse team of students, educators, and the community will engage in real world project-based activities to develop a creative and collaborative learning environment to solve problems, and use technology as a tool for discovery, cooperation, and communication.

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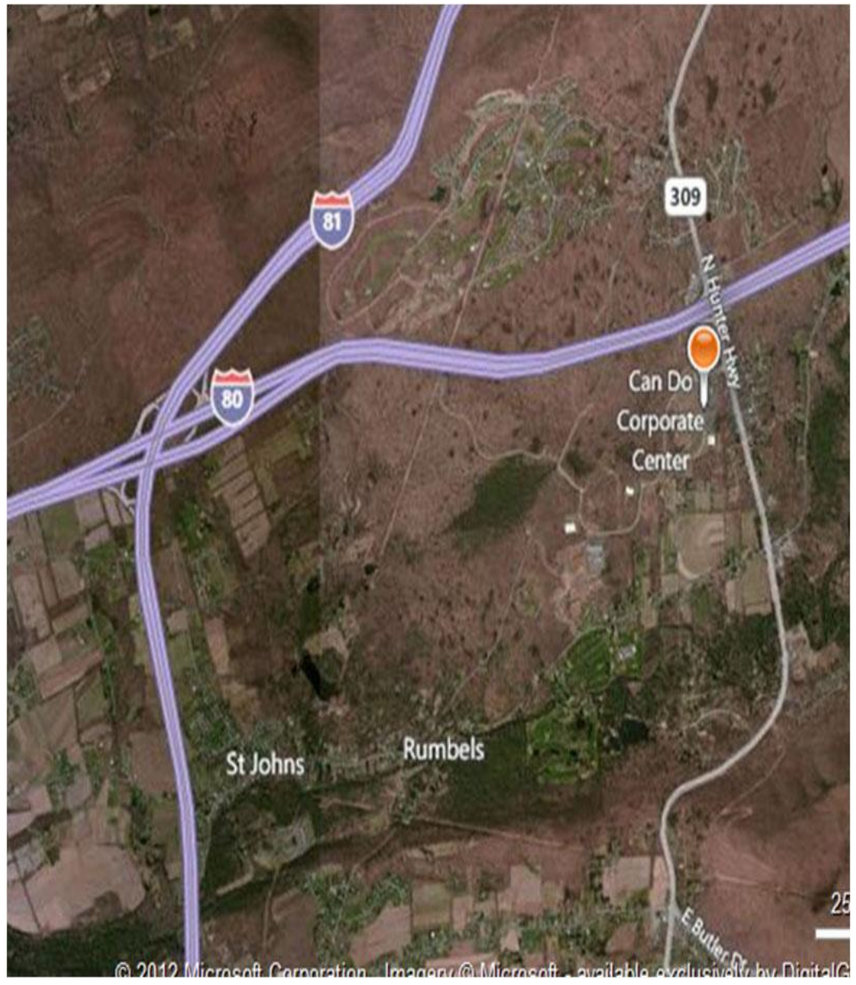
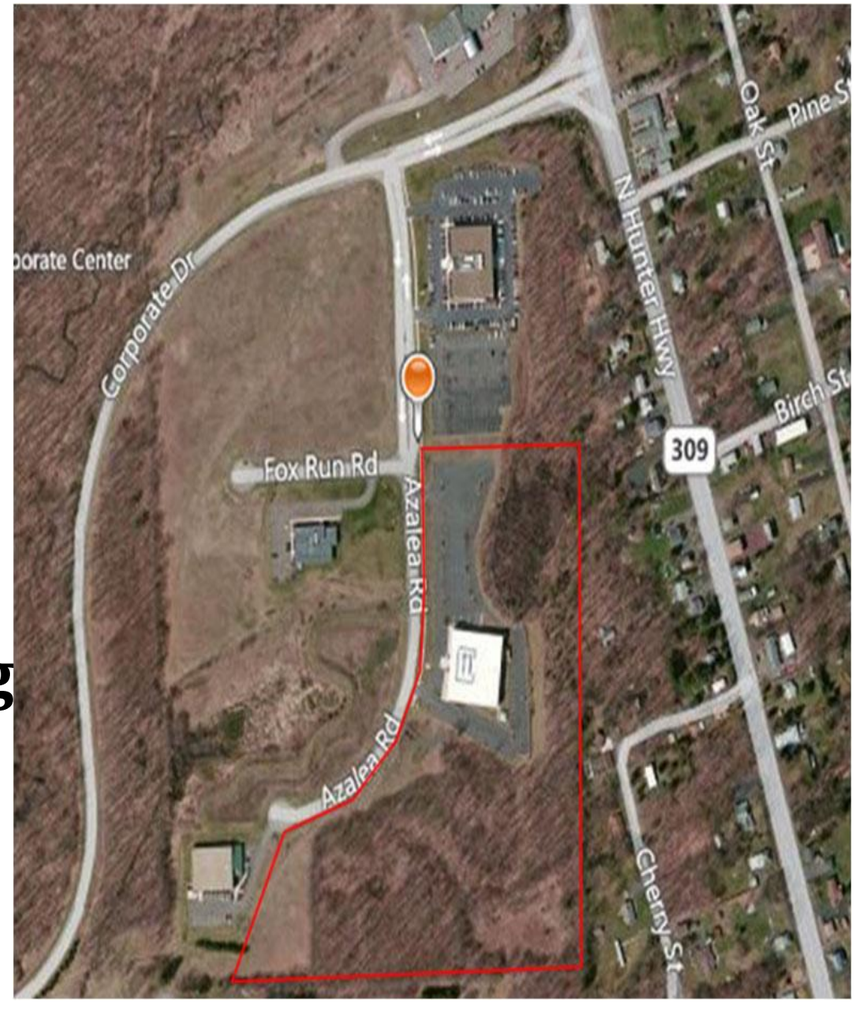
- **The CanDo Corporate Center located near the I80/I81 intersection.**



Site Location Map

- **In 2011 the District purchased 19.75 acres of land with an existing spec office building for development into a STEM Magnet School**



Site Map

Before

- **Existing Building : 55,334 sq. ft.**
- **Student Capacity : 500**

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What is a S.T.E.M. School?

STEM- Science, Technology, Engineering, and Math

The Hazleton Academy of Sciences STEM School will be an academic choice for all highly-motivated students

- **Students will learn in a challenging, technology rich environment**
- **Learning will be problem-based, project based, and integrated between disciplines.**
- **Flexibility and visual control of spaces within the cluster allows for constant monitoring and interaction of students and staff.**
- **Students will work to develop solutions for local and global problems.**
- **Research projects, job shadowing, co-ops, guest speakers, and science competitions will be integrated into the curriculum.**

Project Based Learning

- Student Designed , Curriculum Based Projects
- Real-world problems
- Public Discussion and Presentation of Projects which allow creativity by students
- Research and reference requirements
- Scientific argumentation skills

Laboratory Centered Instruction in the Sciences

- Formal Lab Reports in Industry Based Format
- Utilizing Cutting Edge Laboratory Technology
- Student Based Inquiry and sharing of data across the world
- Participation in Interscholastic Academic Competitions in math and science

21st Century Career Skills

- Computer Based Online Learning Activities
- Integration of Technology Skills and Application in Project Based Learning Activities
- Focus on critical thinking, communication, collaboration, and creativity

Real World Authentic Learning Opportunities

- Job Shadowing
- Cooperative Learning/ Internship
- Field Trips
- Guest Speakers

The STEM Curriculum

Cross-curricular integration of Math, Engineering & Computer Technology

- Integration of Math in Life Sciences
- Engineering
- Application of Literature and Writing in Science
- Software Applications

Cross-curricular teaching of humanity courses

Advanced, In-depth, Accelerated Curriculum

- Exercise Higher Order Thinking Skills
- Self Paced
- Self Directed
- Extra-Curricular Independent Study

Student Directed Classroom Activities

- Debates
- Presentations- focus on public speaking and professional writing skills
- Career Exploration
- Demonstrations

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College Courses and Partnerships

Partnerships will be critical for the success of the HAoS. Students will have opportunities to take college classes at area colleges while enrolled at the Hazleton Academy of Sciences.

Partnerships have been formed with:

The Commonwealth Medical College- REACH-HEI program- Beginning in the spring of 2012, 23 students began attending a program offered by the Commonwealth Medical College where the students work with medical college students on inquiry-based laboratory experiments, research, and presentations. The college will follow these low income students through their college careers to offer support to the students. Additional partnering experiences are being explored.

King's College REACH-HEI Program- eight economically disadvantaged students began a similar partnership program with King's College in the fall of 2012 where they work with college students doing research and experiments. Additionally, students will spend two weeks this summer at the college studying science with college students.

PSU Hazleton, Wilkes University, Bloomsburg University, King's College, LCCC, and McCann School of Business and Technology- the colleges have offered reduced rates for college classes for academy students. The academy is seeking scholarship funds for economically disadvantaged students.

Wilkes University - students will take classes that are co-taught with high school teachers and college professors at the Academy of Sciences in engineering and math and graduate with 21 credits towards an engineering degree. Students will pay $70 per credit.

Pennsylvania State University Hazleton Campus-Developing a co-teaching model with PSU Hazleton to teach Engineering Design and Manufacturing Based Calculus. A cost of 25% of full tuition has been negotiated.

Wilkes University – students began taking online college classes in the fall of 2012 and will continue in the summer semester and next year.

Industry and Business Partners

- **Area businesses have been supporting the school through donations, providing guest speakers, and providing job shadowing experiences.**
- **PPL has donated $10,000 to the school for supplies and scholarship money for students in need who are taking college classes.**

Examples of STEM Electives

- **Anatomy and physiology**
- **Microbiology**
- **Genetics**
- **Immunology**
- **Organic chemistry**
- **Pharmacology**
- **Introduction to engineering**
- **Computer programming language**
- **Probability and statistics**

Sample Careers-(technical or advanced degrees required)

- Physical therapy
- Physical therapy assistant
- Physicians assistant
- Pharmacist or pharmacy assistant
- X-ray technician
- Medical technician or technologist
- Doctor
- Computer analyst
- Computer programmer
- Mathematician
- All types of engineering – 2 and 4 year

Pilot Program - 2012-2013

Students in grades 9-10 enrolled at the Hazleton Area High School entered a pilot program for the STEM magnet school.

Students were exposed to learning in a rotational model that included some online learning, real-world problem based projects, and whole/small group instruction.

Guest speakers and visits to colleges, industry, and health care agencies were made part of the program.

School Opening - 2013

The Hazleton Academy of Sciences, 40 Azalea Drive, Drums, PA 18222 (CAN-DO Industrial Site) opened September 5, 2013.

Application Process

- **Students complete an application**
- **Criteria has to be met and maintained**
- **We are looking for hard workers, not just students with the best grades**

Criteria- a 70% is required

- **Grades**
- **PSSA scores**
- **Teacher recommendations**
- **Extracurricular activities**
- **Solving an inquiry-based science problem**
- **Interviews when students are close to 70%**

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STUDENT DEMOGRAPHIC

Accepted Students				
Middle School	Free lunches	Reduced lunches	% Free and reduced	Minorities
Drums	1	5		0
Freeland	5	2		0
HEMS	12	4		9
Heights Terrace	3	0		3
McAdoo-Kelayres	3	1		0
Valley	3	2		2
West Hazleton	8	1		7
Totals	35 free	15	40%	21 students = 17 %

Demographics of All Applicants versus Accepted Students

	Total of All Applicants	% of All Applicants	Total of All Accepted Students	Accepted Students
Free lunch	105	42 %	35	28 %
Reduced lunch	21	8 %	15	12 %
Full Pay	121	49 %	74	60 %
Minorities	70	28 %	21	17 %

Total Applicant Statistics

- Students complete an application
- Criteria has to be met and maintained
- We are looking for hard workers, not just students with the best grades

STUDENT DEMOGRAPHIC

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New 9th Grade Students

- 20 new applicants starting now (S2)
- 12 accepted for this year
- 126 current 9th grade students (1 girl is definitely moving at the end of the school year)

Free lunch	12	60 %
Reduced lunch	1	5 %
Minorities	8	40 %

New 10th Grade Students

- 13 new applicants (1 is coming from PA Cyber next fall)
- 1 on wait list-watching grades due to an 80 GPA currently

Free lunch	8	61 %
Reduced lunch	1	7 %
Minorities	4	31 %

Total Applicant Statistics

- 247 8th grade students applied
- 124 accepted- one more will be accepted once I receive transcripts that were requested 4 times, plus 4 phone calls to MMI over 3 weeks.
- Students have to return intent to attend sheet, signed by a parent or guardian by January 28, 2013.
- 60 students are on a wait list in case students do not choose to attend
- 68 students were not accepted

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Traffic Patterns:

- ***Bus Drop-Off & Pick-Up***
- ***Car Drop-Off & Pick-Up***
- ***Deliveries***
- ***Visitors***

PROPOSED SITE PLAN

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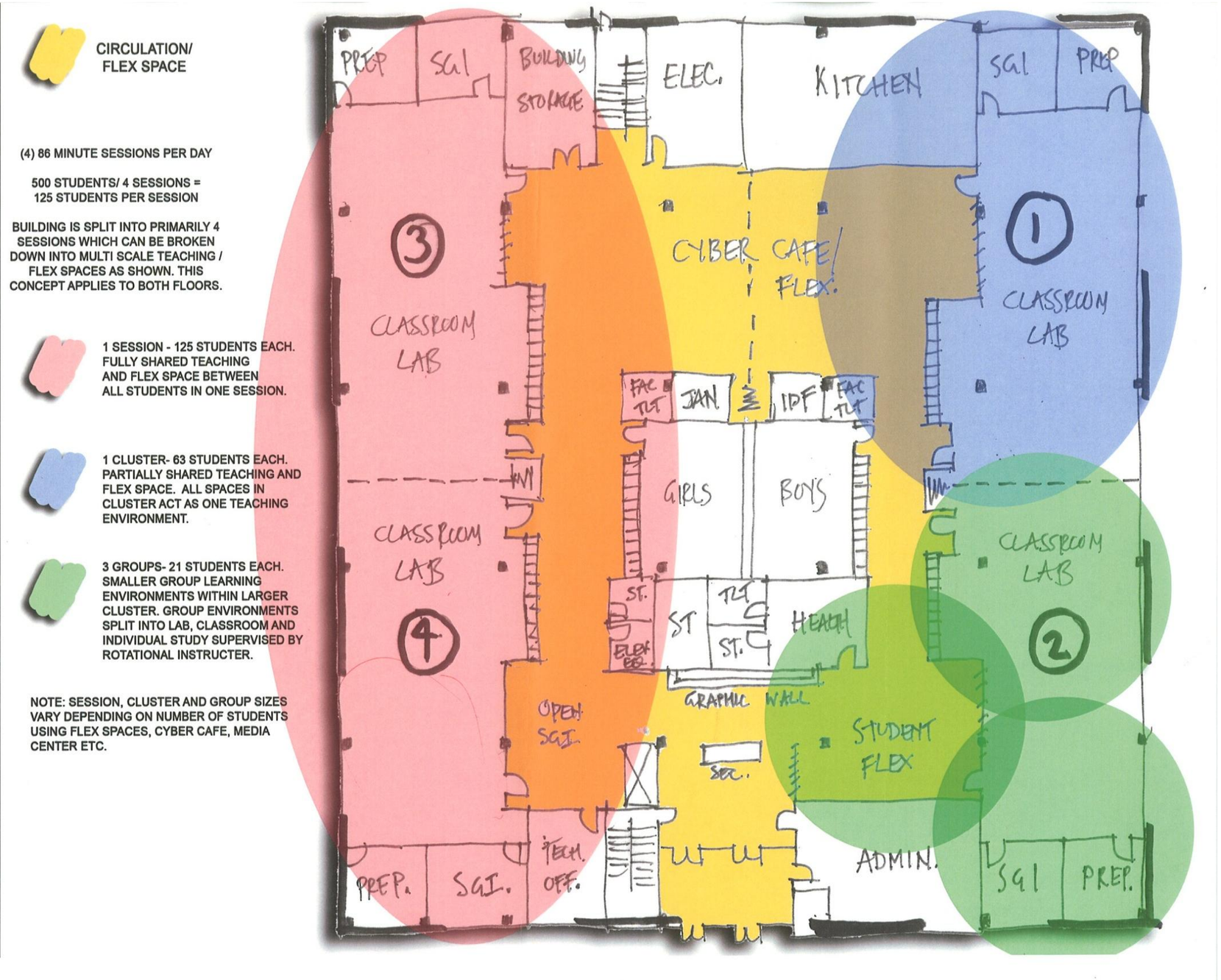

Rotational Model:

•Learning will be problem-based, project based, and integrated between disciplines.

•Instruction using a mixture of online learning, hands-on activities, one-on-one, small and whole group instruction, and research.

•Research projects, job shadowing, co-ops, guest speakers, and science competitions will be integrated into the curriculum.

CONCEPTUATL FLOOR PLAN

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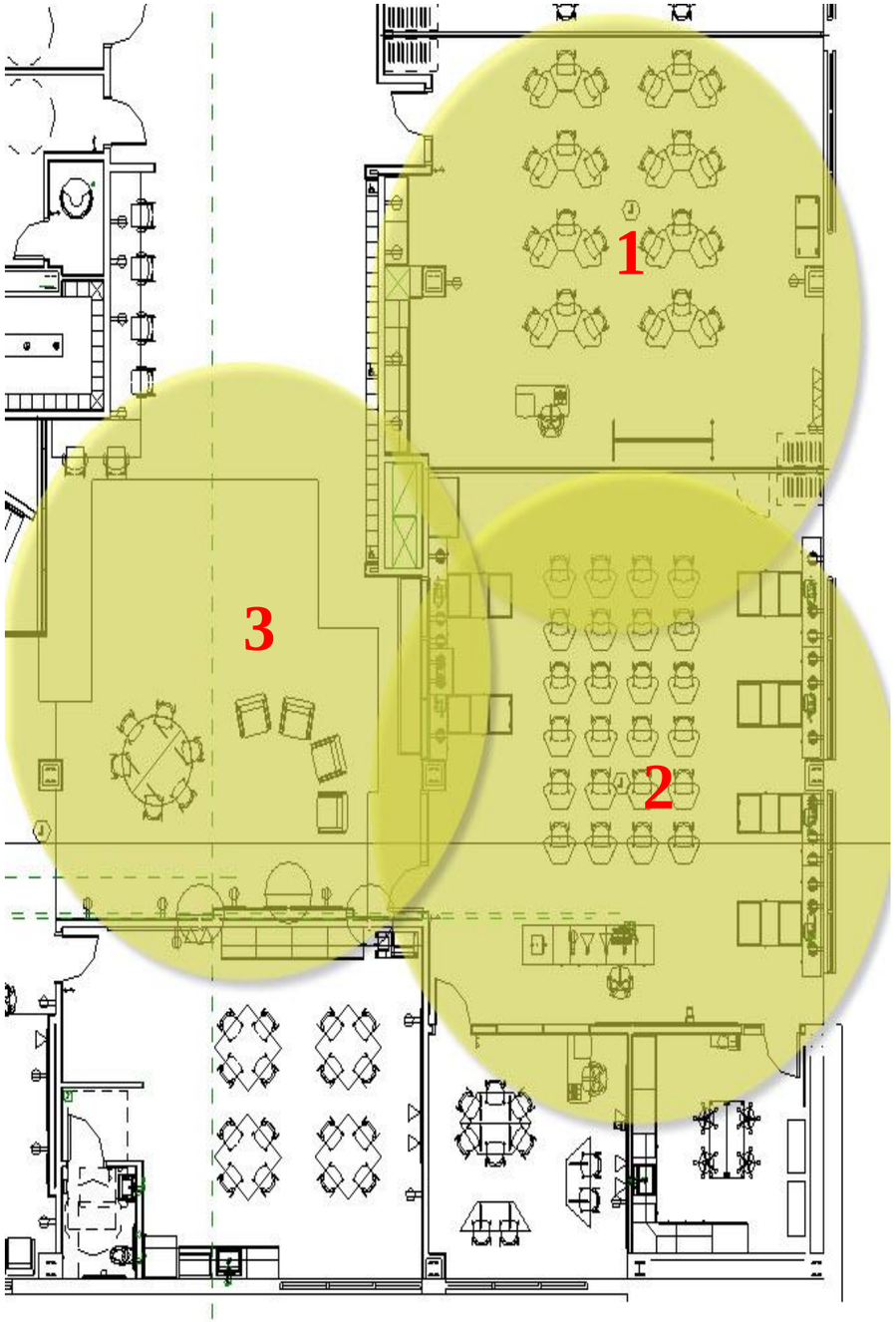
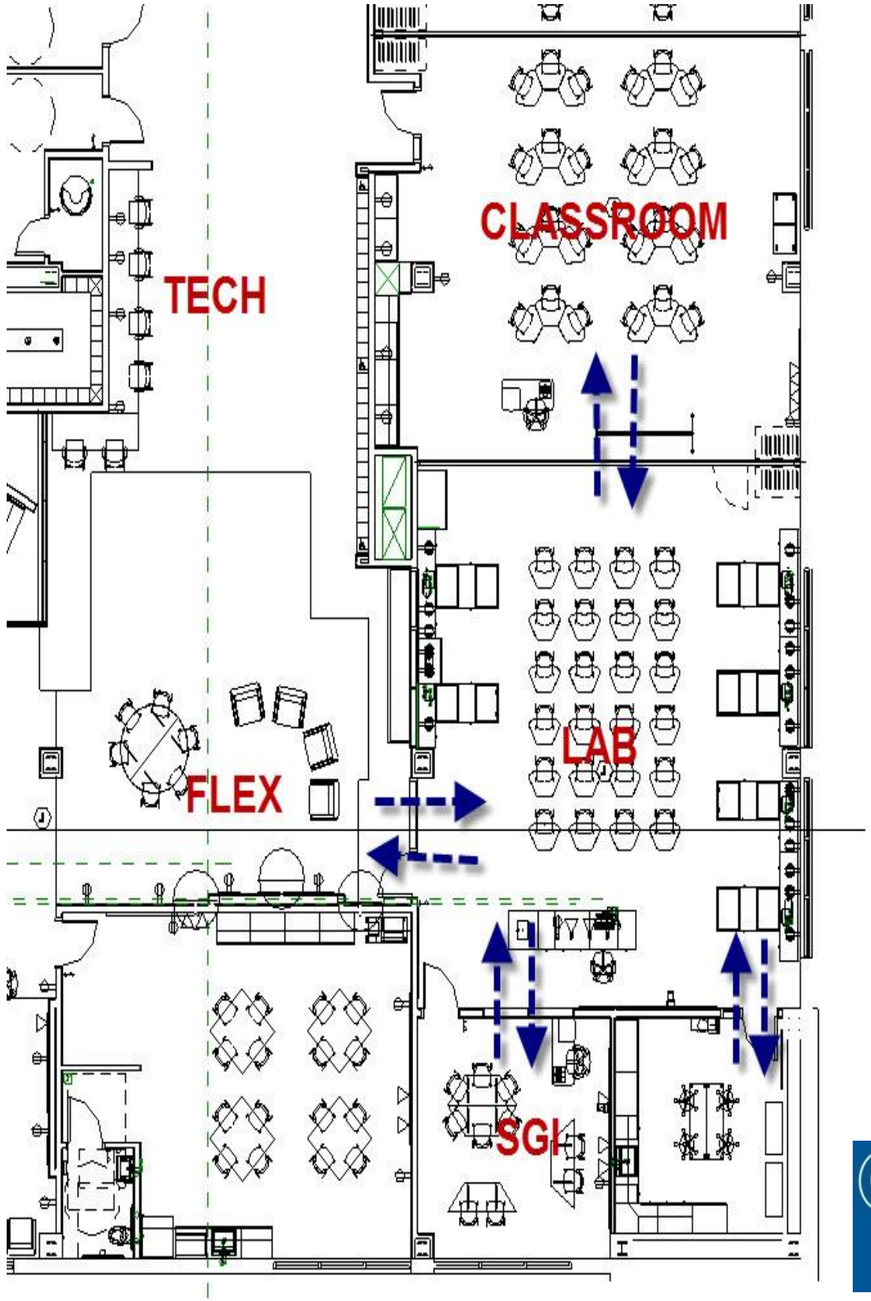


Rotational Model Refined:

- **Instruction using a mixture of online learning, hands-on activities, one-on-one, small and whole group instruction, and research.**
- **Flexibility and visual control of spaces within the cluster allows for constant monitoring and interaction of students and staff.**



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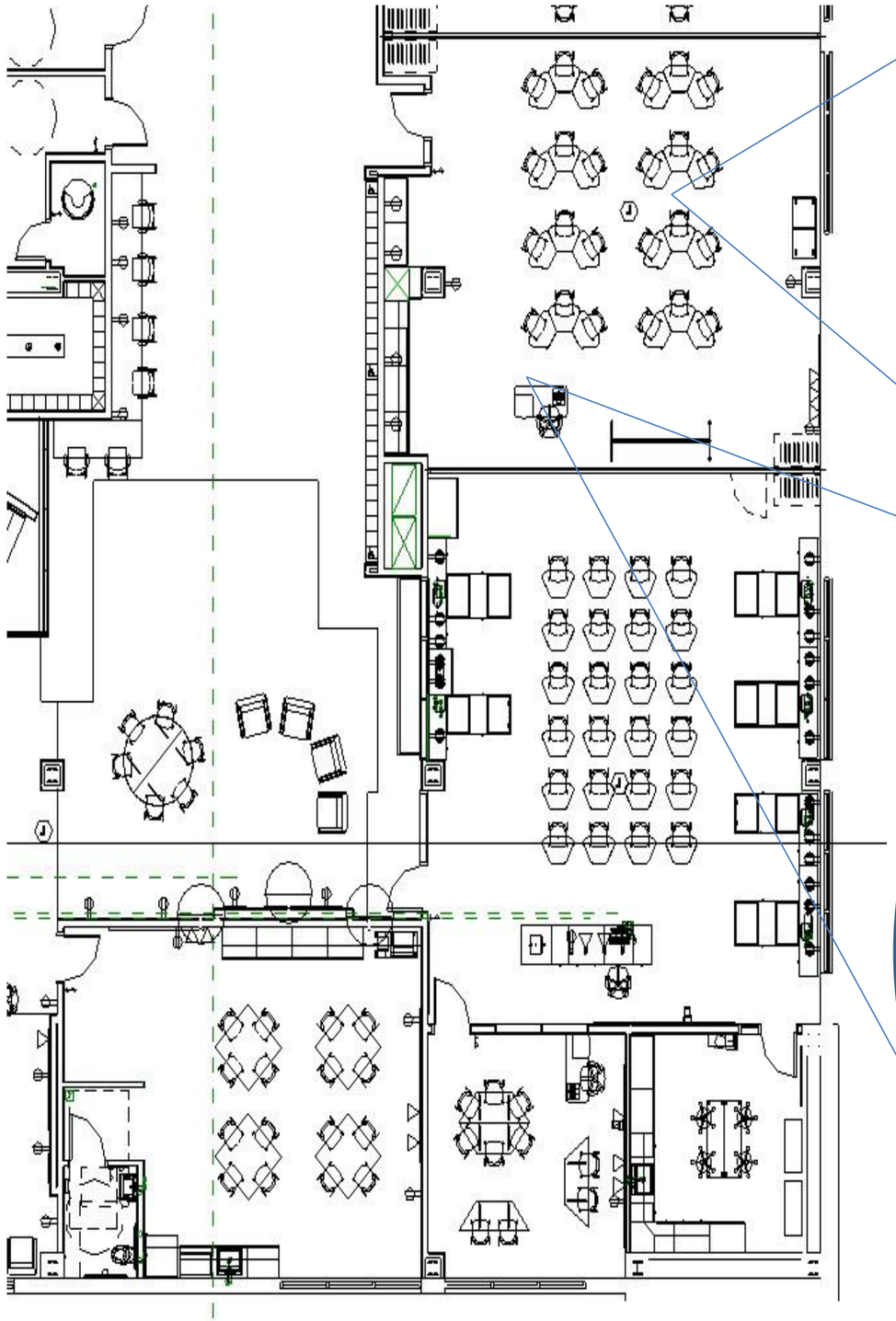

Flex Classroom Design Concepts

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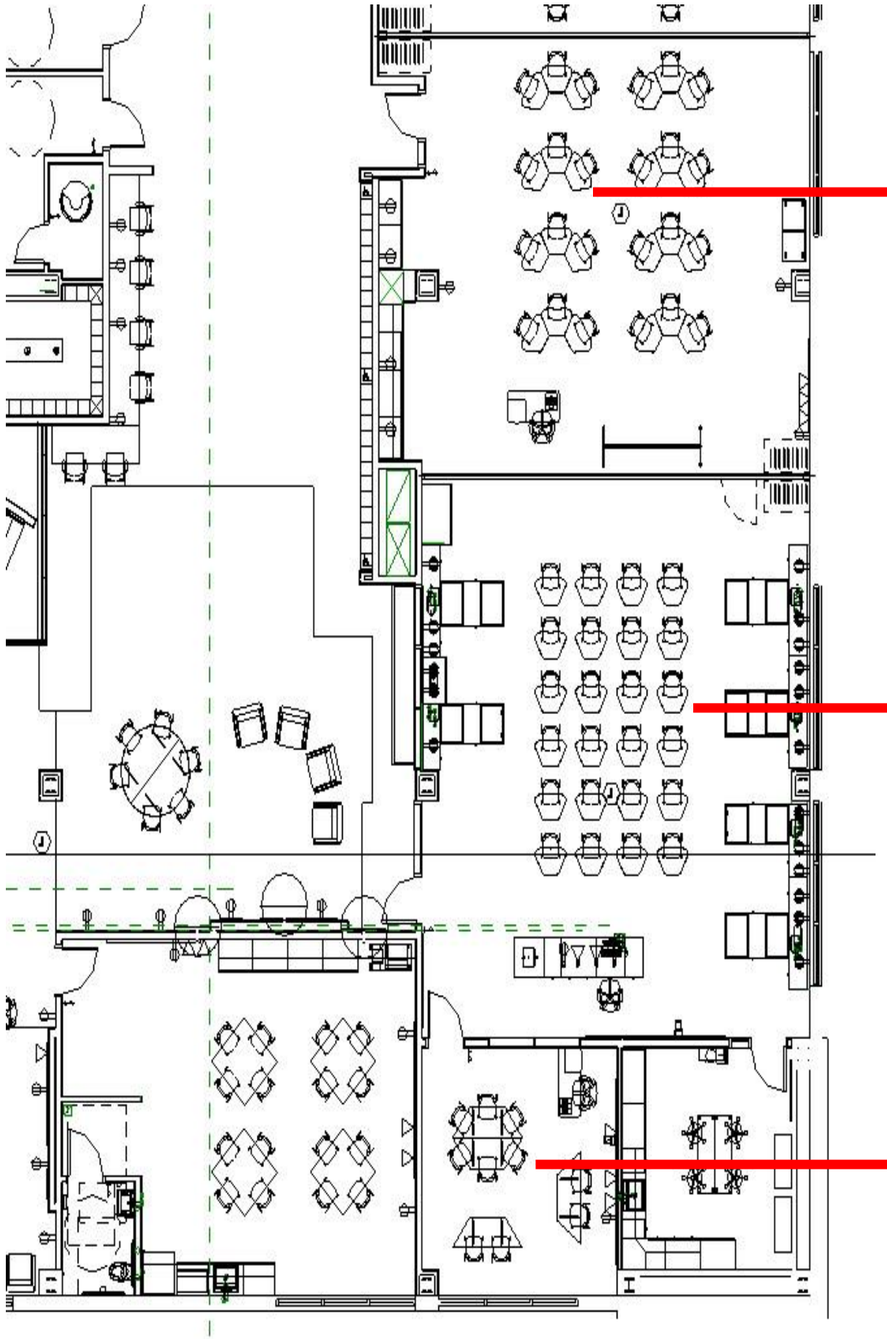
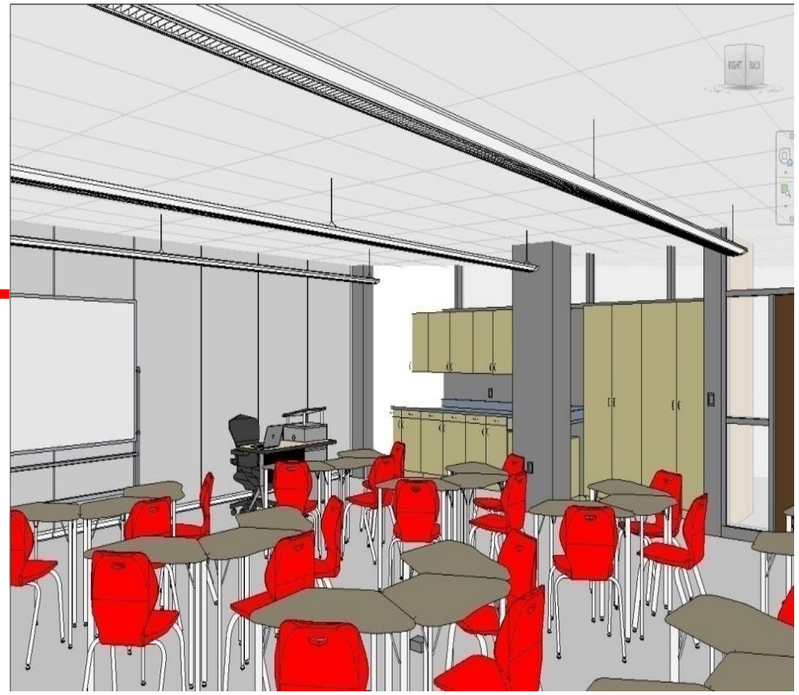
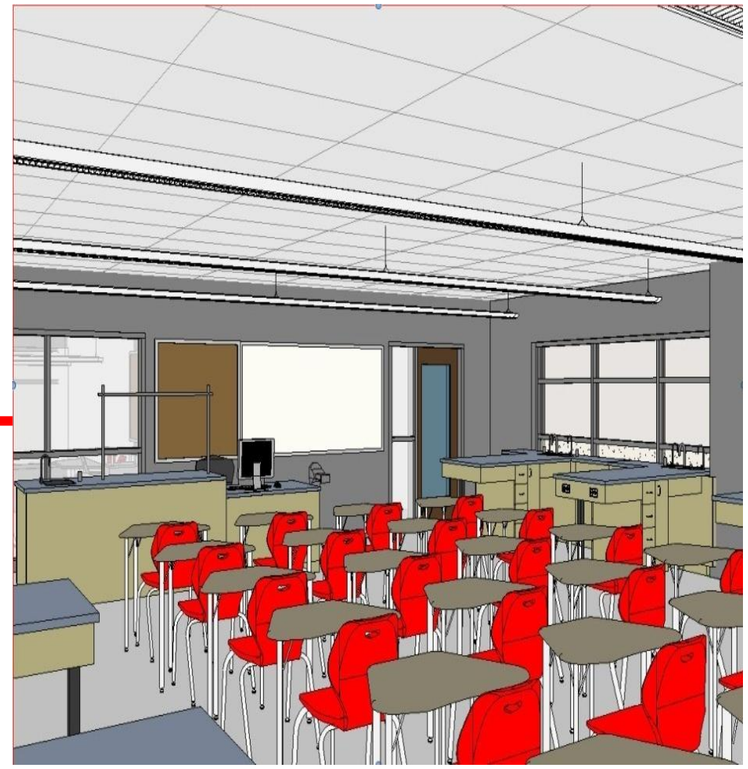




Conceptual Classroom



Conceptual Science Lab

Conceptual Small Group Room

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Design concepts:
Various Screen Shots

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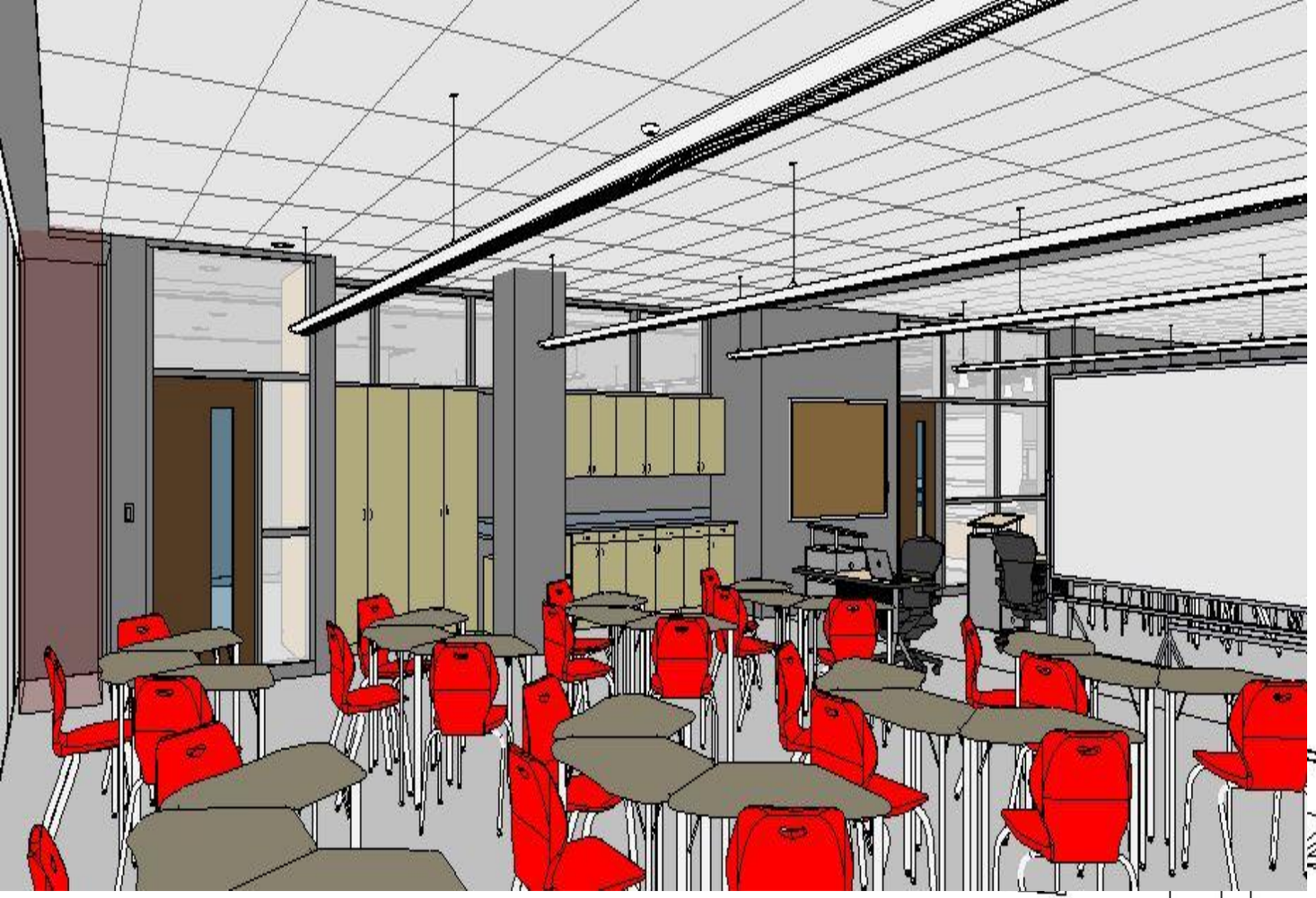
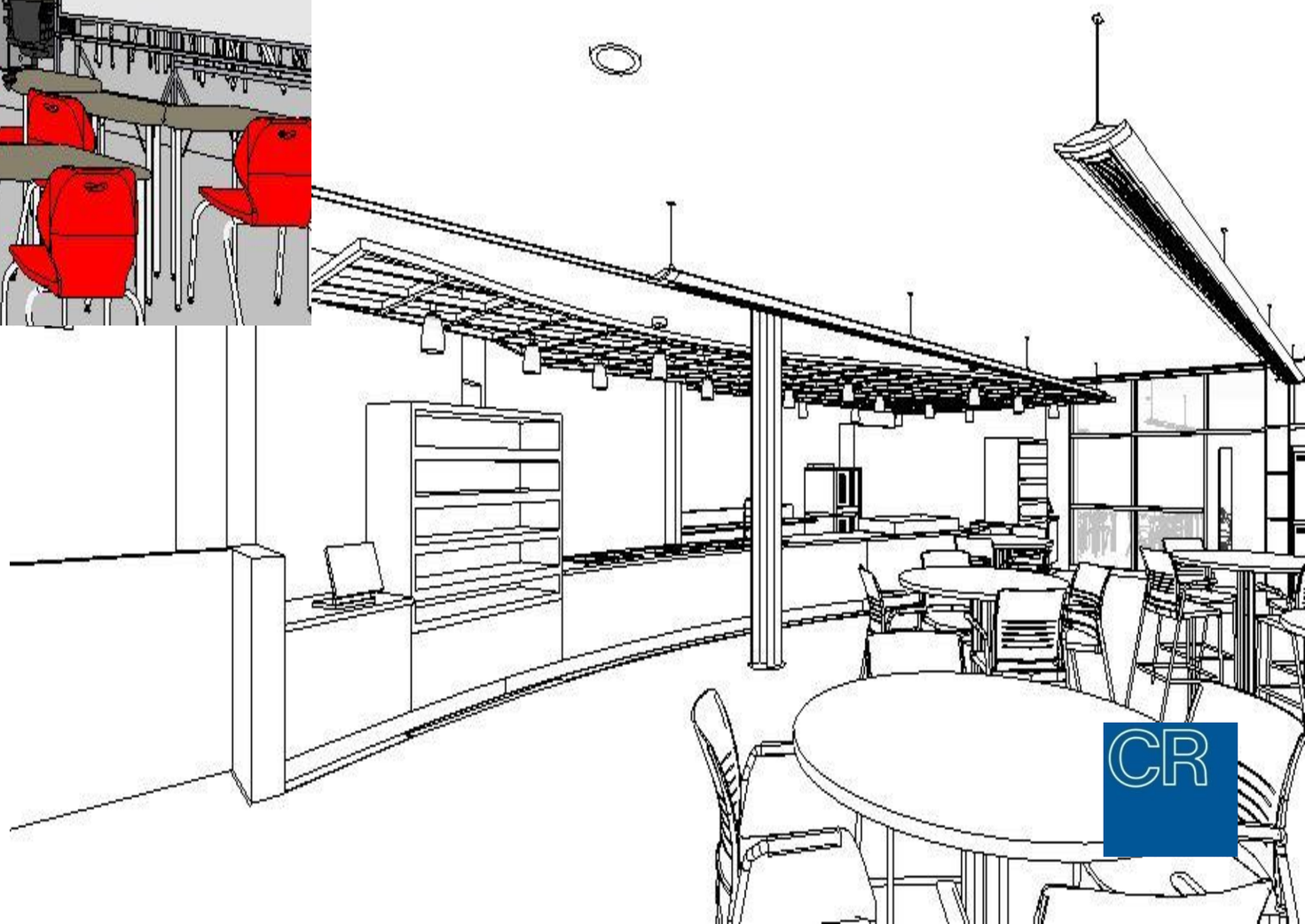
Various Screen Shots





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Design concepts:
Various Screen Shots

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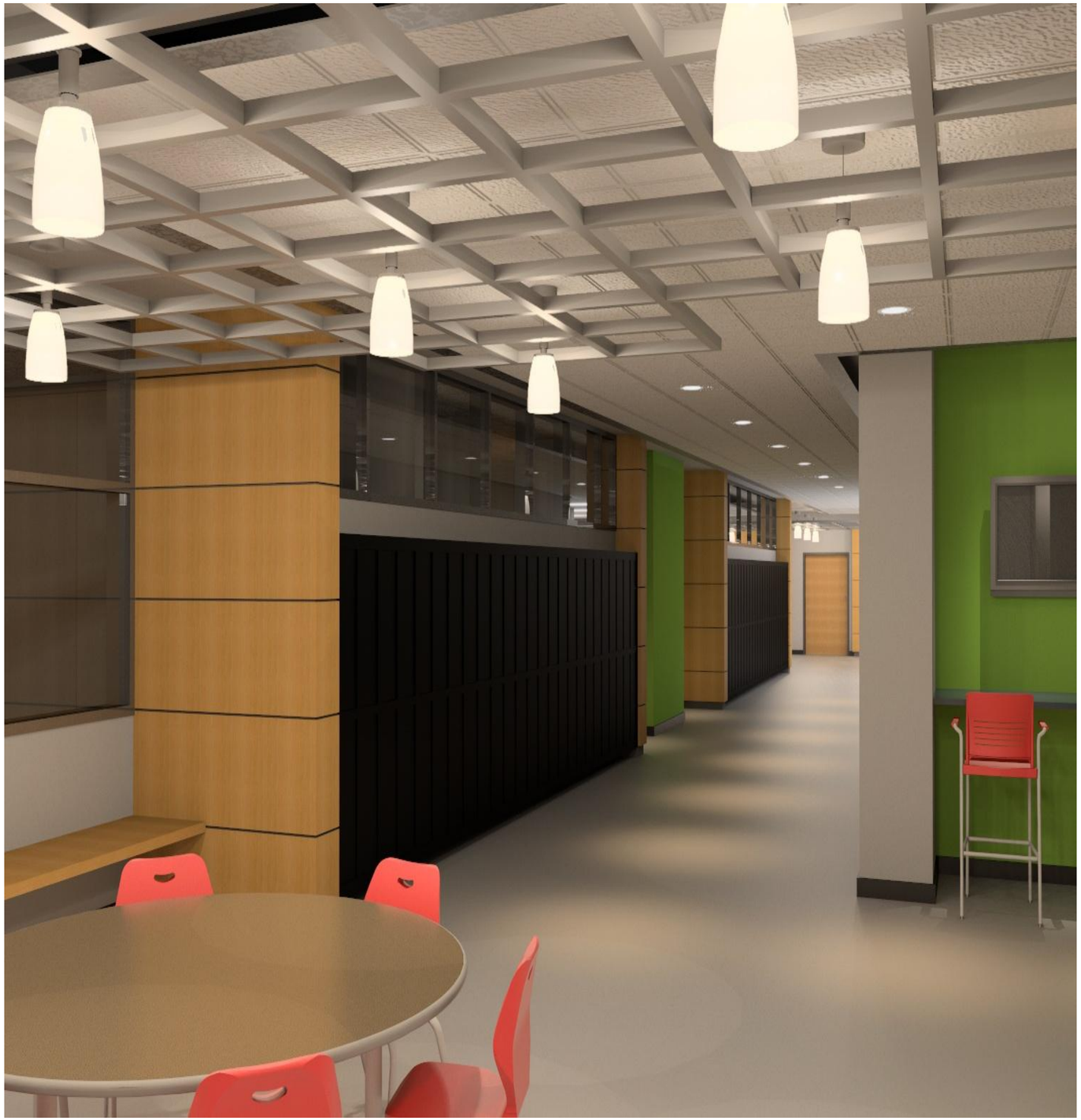
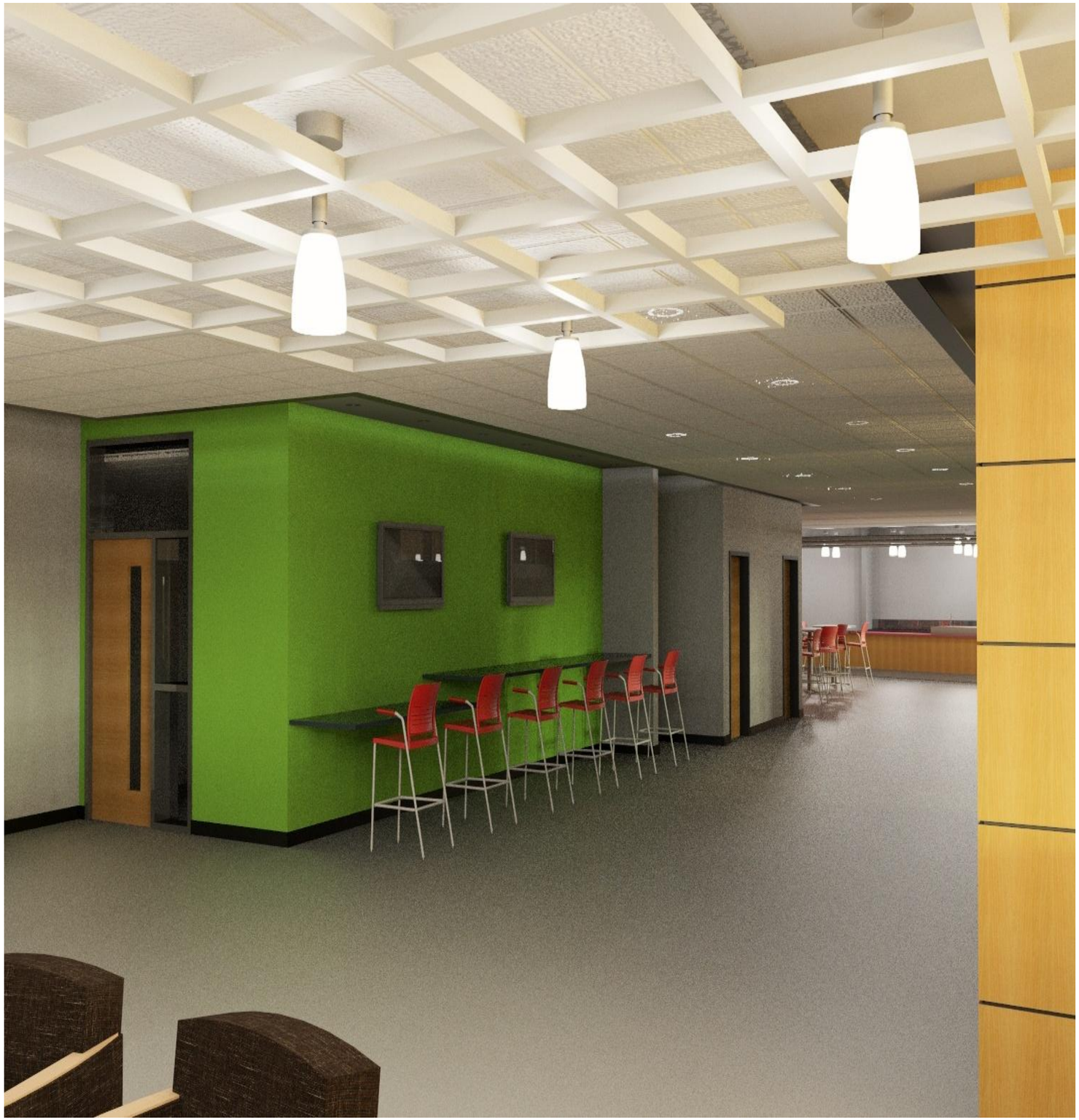


Design concepts:
Corridors contain large expanses of glass into the classrooms, allowing the natural light into the landlocked corridors.



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Design concepts: Collaborative teaching and learning areas for small group brainstorming. Technology throughout the building provides for continuous connectivity and various learning opportunities.

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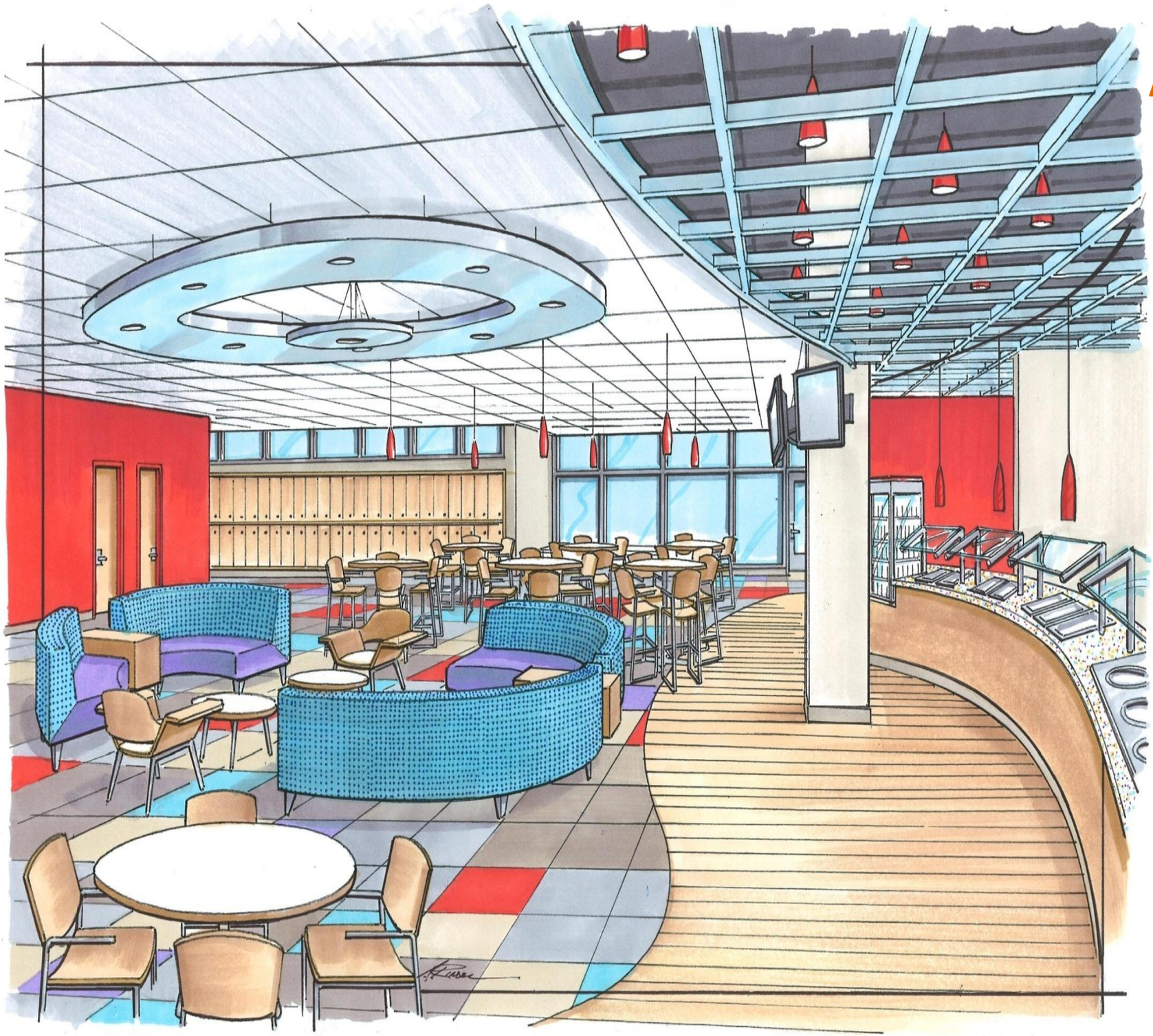

Cafeteria concept:

A large open space with a very comfortable, relaxed, flexible seating arrangement. Monitors around the space that will display current news, weather, or current school projects. Café line with various grab and go items, both hot and cold.

Construction Cost Analysis

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		Budget		Cost
1.	General Construction	$ 2,940,000	$	3,741,000
2.	Plumbing Construction	$ 809,000	$	552,200
3.	HVAC Construction	$ 1,097,000	$	1,039,000
4.	Electrical Construction	$ 1,443,000	$	743,390
5.	Technology / FF&E	$ 1,250,000	$	1,250,000
6.	Change Orders / Contingency	$ 353,500	$	379,100
7.	Subtotal	$ 7,892,500	$	7,704,690
8.	CO's Associates with Brick Repair & Mold Remediation		$	997,886
9.	Total Construction Costs	$ 7,892,500	$	8,702,576
10.	Building Purchase	$ 4,424,875	$	4,424,875
11.	Construction Inspection & Testing	$ 108,000	$	108,000
12.	A&E Fee	$ 410,894	$	410,894
13.	Financing	$ 250,050	$	250,050
14.	Total Costs	$ 13,086,319	$	13,896,395
15.	(Excluding Mold Remediation Costs)		$	12,898,509
16.	Under Budget (Excluding Mold Remediation Costs)		$	187,810

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