

5-1978

# Columbia East High School, Columbia, South Carolina

B. Paul Pushkar Jr.  
*Clemson University*

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COLUMBIA EAST  
HIGH SCHOOL

B. PAUL PUSHKAR JR.  
TERMINAL PROJECT  
COLLEGE OF ARCHITECTURE  
CLEMSON UNIVERSITY  
SPRING SEMESTER 1978

COLUMBIA EAST HIGH SCHOOL

COLUMBIA, SOUTH CAROLINA

by B. Paul Pushkar, Jr.

A terminal project submitted to the Faculty of the College of  
Architecture, Clemson University in partial fulfillment of the  
requirements for the degree of

MASTER OF ARCHITECTURE

May 1978



Robert Eflin, Committee Chairman



Frederick G. Roth, Major Advisor



Gayland B. Witherspoon, Head  
Department of Architectural Studies



Harlan E. McClure, Dean  
College of Architecture

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To my Mother and late Father, whose  
guidance and love have given me support  
and inspiration.

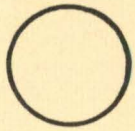
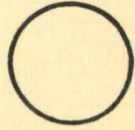
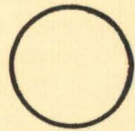
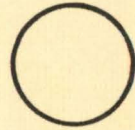
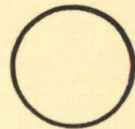
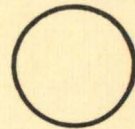
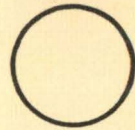


## ACKNOWLEDGEMENTS

This project owes its completion to many people for their help and support. I would like to particularly thank Harlan McClure, and my committee, Robert Eflin, Clarence Addison, and George Polk; Richland County School District #1 administrators Stonewall Richburg, Harold Vaughn, and John Stevenson; Columbia High School assistant principal David Gantt; the Central Midlands Planning Commission and typist Carol Hood.

Additionally, I would like to thank Wes Stokes, Newman McGarity, Jorge Caputi, Dwayne Vernon, Tom Hund, and Mike Taylor for their assistance and moral support; Cynthia Davis, Rebecca Blanton, and Doug Kinard for production assistance, and finally and most importantly Andy Hall, without whose tremendous help and support this project would not have been possible.

APPROACH





The problem to be solved and analyzed is to design a new secondary school for Richland County School District #1; inherent in this problem is a master plan for their site and an analytical modification of their program requirements. However, pertinent research is an initial and inseparable phase of design, and this manuscript is a record of that research. The research presented in this manuscript records a three-phase development leading up to the final design solution:

1. search, or material gathering,
2. analysis, and
3. synthesis.

Material gathering should provide all the applicable data necessary for conceptual design. This search entails an enormous amount of analytical research through topics related to the subject, and should provide aid in defining the problem. The research begins with the most abstract concepts and works toward particular details. This extensive overview provides a base broad enough to proceed with the next phase.

It would be a mistake to assume that analysis begins only when the search has been completed. Indeed, analysis is the part of the search in choosing pertinent material, for simultaneous search and analysis is inseparable. When the material gathering is essentially complete, then a further analysis can be begun to refine the data and collect the applicable material into a cogent, comprehensible form. In this study, case studies were chosen through search; these schools then are analyzed to determine

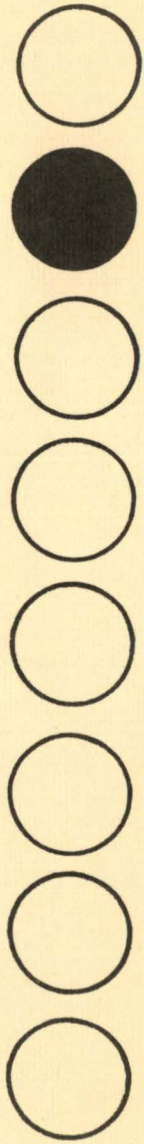
which bear certain characteristics applicable to a secondary school for Richland County.

Finally, all the products of the search and the analysis have been distilled and refined, which provides the synthesis. If the search and analysis have been properly prepared, the synthesis is a logical deductive process which should reduce the variables of design and provide a strong direction in beginning schematic studies. This phase points out the important determinants particular to the project in mind; it shows how all the preceding research assembles certain parameters for design. For instance, varied data such as educational philosophy, traffic patterns, owner profiles, and studies of singular schools, to name a few topics, is gathered; this data, after analysis, directs the designer to formulate a problem statement from the synthesis which will lead directly to three dimension design.

This process allows the designer to utilize his research to its fullest advantage, to draw from a vast data bank of resources those things which can have a direct impact on the design, in this case, a secondary school for Richland County. The problem statement is the basis for design, eliminating variables such as the current diatribe on open plan versus traditional plan or terminating discussion on the merits of housing vocational centers close to the resource center. Therefore, the problem statement is the summit of the analysis, the distillation of all variables influencing the design, and the beginning point for design itself.



PROBLEM



Richland County School District #1 is one of the larger school districts in South Carolina, covering some 482 square miles of Richland County, including the entire city of Columbia, and a much larger area outside the city limits. In 1976-77, the district had approximately 32,000 students. Seven high schools are scattered about the district; the newest of these, completed only a few years ago, is Columbia High School, replacing a center city school.

Columbia's growth is no different from most urban areas of the 1970's. People continue to locate in the suburbs rather than the center city areas, and these fringe areas are growing at an astounding rate. The Lower Richland area of the county is predicted to be the next boom area of the county until 1990 when the growth rate will begin to taper off. In a report prepared by the Central Midlands Regional Planning Council, Educational Needs Study for the Central Midlands Region, the area's growth is described:

This area offers major growth potential in the next twenty years. Its vast open areas close to the city of Columbia, offer excellent sites for major subdivisions and to a lesser degree apartment projects. In the near future, two major highway projects will make this area even more attractive to development. The first of these is the improvement of the southeast traffic corridor of metropolitan Columbia which will include the extension of Shop Road to a planned extension of Hallbrook Road . . . The second is a new freeway connecting I-26 in Lexington County with the Shop Road extension and ultimately I-20 near Alpine Road.<sup>1</sup>



This growth makes evident the fact that a new high school will be needed in the Lower Richland area within the next ten years.

The administration of Richland County School District #1 is currently wrestling with the potential overcrowding. As of the 1977-78 school year, there were seven high schools within the district: three were operating close to capacity, (Columbia, Dreher, Eau Claire); three were operating well under capacity, (Flora, Johnson and Keenan); and one was operating well over capacity, (Lower Richland). With the imminent growth of fringe areas and the immediate and critical overcrowding of one school, it is obviously vital that something be done.

Two options present themselves for the district:

1. A new high school can be begun immediately to reduce the load on Lower Richland High School, or
2. Rezoning of the entire district, with bussing and reshuffling of students, can adequately house all students without overcrowding any one school for the next few years.

This terminal project will investigate the first option open to the school district, namely, to construct a new high school in the Lower Richland area of the county. The need is obvious from population projections. The site is under consideration for purchase by the school board; its location, between the overcrowded school, Lower Richland, and a near capacity school, Dreher, is also located near planned traffic improvements. The

site is handsome and spacious, and contains many amenities for a school development. The program, with modifications as appropriate, will be similar to one used by the district in construction of the new Columbia High School, prepared by professional architectural educational consultants.

Additionally, the district is concerned with vocational education at the secondary level. County-wide, the district is trying to offer vocational courses for all students.

"Vocational education is one part of the total career education effort in the district. It encompasses a variety of courses that are designed to help students learn specialized job skills that will enable them to secure gainful employment upon graduation from high school."<sup>2</sup>

Career education concerns such major areas as trades and industries, home economics, office occupation, distributive education, and health occupations. Due to specialized facility needs, only some of these courses are able to be implemented into regular high school curricula; the district also maintains two career education centers: Lynhaven, serving the north central sections of the district, and Lower Richland, serving the southern part of the district.

Demand for vocational education is high due to several reasons, such as reduction in the undesirable stigma attached to vocational courses, a demand for students trained with these skills, and a school population growing faster than the facilities and curriculum expansion. District administrators are also looking into the situation of expansion of the vocational system in the

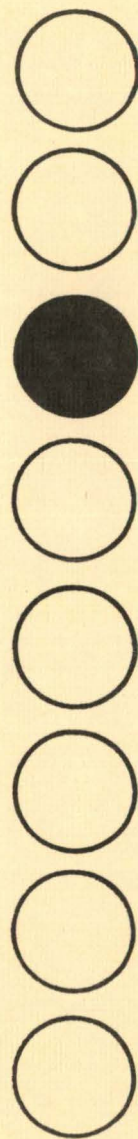


Lower Richland area to relieve some of the load from the Lower Richland Career Education Center. Several possibilities exist with this potential new construction:

1. build only the career education center,
2. build only a new high school on the site,
3. build both the career education center and the high school on the site, or
4. build a new high school with career education center to be added later.

This terminal project will consider the fourth option, namely the construction of a new high school, with a planned addition of a vocational career education center for the future.

SECONDARY EDUCATION





# HISTORY

From the colonial period, with the Latin grammar school for privileged families, to the late Eighteenth Century with the "English" schools as practical but private education for the well-to-do, secondary education was a privilege for the elite, not an established right for the general public. The Nineteenth Century set the stage for secondary education as we know it with the first public school in Boston in 1821. Landmark legal decisions through the century shaped policy, from the 1874 Kalamazoo, Michigan case which established the right of communities to maintain free high schools on tax revenue, to the Civil Rights Act of 1964, which declared the right of quality education by abolishing separate but equal facilities. These stages in the evolution of secondary school education molded the product in the taxpayer's minds of quality education for all.

Surprisingly, with such a short history and lack of long standing precepts of the status quo, secondary education still did not change much in concept until after World War II. Until then, the pattern set in Boston was a paragon revered with awe, and tampering with established methods was taboo.

The 1950's gave some fresh air to educational philosophy, particularly with curriculum revision. Generally, the task of secondary education is thought to be more than college preparatory, although the college preparatory aspect is a formidable task in itself. Now, it is realized that college careers are not the educational role to be played by every student, and curricula are being adjusted accordingly. Most educators see their tasks as preparing their students to cope with life by assuring them basic knowledge

and the ability to function as a responsible citizen. Additionally, without trying to cram unnecessary facts and figures into the student, emphasis has shifted to use of informational resource centers for the student to answer his own questions, both before and after graduation. Since all students are not alike, it is also being realized that all teaching methods should not be alike, and this more humanistic approach to education is currently causing many experiments with long standing educational concepts to be instituted.

In 1960 Douglas McGregor, MIT social psychologist, named the standard educational philosophy the "reductive" theory, whereby the

"process of ordering and forbidding . . . (is used) as a means to insure performance. It holds that people avoid responsibility and therefore must be directed and told what to do. Independence is discouraged and mistakes call for penalties."<sup>3</sup>

This formula called for an authoritarian, strictly structured curriculum geared to turning out identical products stamped with knowledge; linked with this concept was a series of standard sized classrooms as the typical school, i.e., egg crate architecture.

Additionally, McGregor identified a contrasting formula, or "developmental" theory, which assumes

"it is rational for people to seek responsibility and that they enjoy it. Individuals at any level need challenge and encouragement



to reach their ultimate potential. Everyone needs to participate in the establishment of goals and objectives for a sense of purpose, for a sense of where they are going and why."<sup>4</sup>

## TRENDS

This developmental theory, considered radical several years ago, is now a growing, and in many cases, established means of organizing our educational system. The trend toward open plan schools is a practice of matching architectural expression and educational philosophy. Yet mindless application of open planning has led to some misapplications of the system.

Problems in open planning resulted from poor design, or more often, from using an open plan with a traditional educational philosophy. If open areas designed for individual self-paced and self-motivated learning are used with a traditional authoritarian classroom design, problems in acoustical and visual privacy and ensuing distraction will result.

Therefore, a backlash has developed in some places as a reaction toward open plan schools that did not work. One can find a wide variety of philosophies, from traditional to open plan developmental concepts in school design over the last few years; however, one generally sees a combination of the best of both systems, e. g., a traditional authoritarian classroom situation that breaks out of the box into open space to be shared with other classes for team teaching, or a self-guided program of self paced instruction with satellite student "home bases" clustered around teacher-advisor work stations existing in a very typical, old fashioned school.

Unfortunately, the last bastion of change in the educational system appears to be the secondary system. The elementary school system has embraced experimentation and change with fervor; middle schools are a new, broader concept of junior high schools, and utilize some of elementary school innovations themselves; and higher education, with increased student pressure, has instituted change through student input. Yet secondary educators seem to be the most conservative and the most resistant to change. A case in point is seen with the new Columbia High School in Columbia, South Carolina. This school was designed with the mini-school concept, a series of 300 student schools surrounding a media resource center, each with its own mathematics, language arts, foreign language, social studies, and science areas, in addition to administrative offices and faculty clusters. The purpose of this concept was to reduce the large image of the school to smaller, sub-units with more human contact. The school was built with this concept; yet the faculty flatly resisted the idea, and after moving in, reverted to the departmental concept. Doubtless, part of the problem was in the lack of education of the faculty in the use of the spaces, but the example does show a not uncommon attitude among secondary educators.

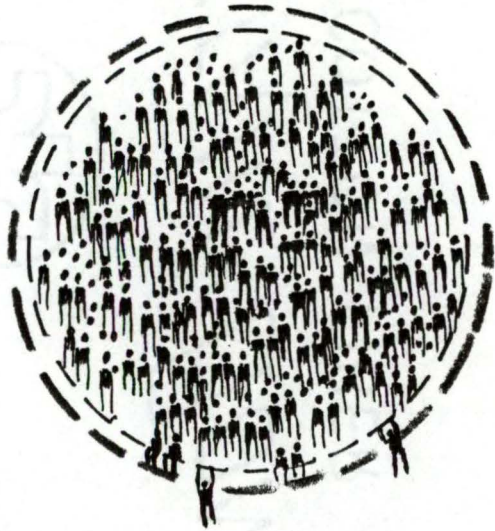
Due to the uncertain benefits of open plan schools, a resurgence of more traditional concepts seems to be more and more common. One of these alternatives of the traditional school is the mini school concept. This is little more than a division of a large school into smaller autonomous units of a more manageable size which allows better human relationships of a one-to-one nature. High schools normally have standard courses to be offered; among



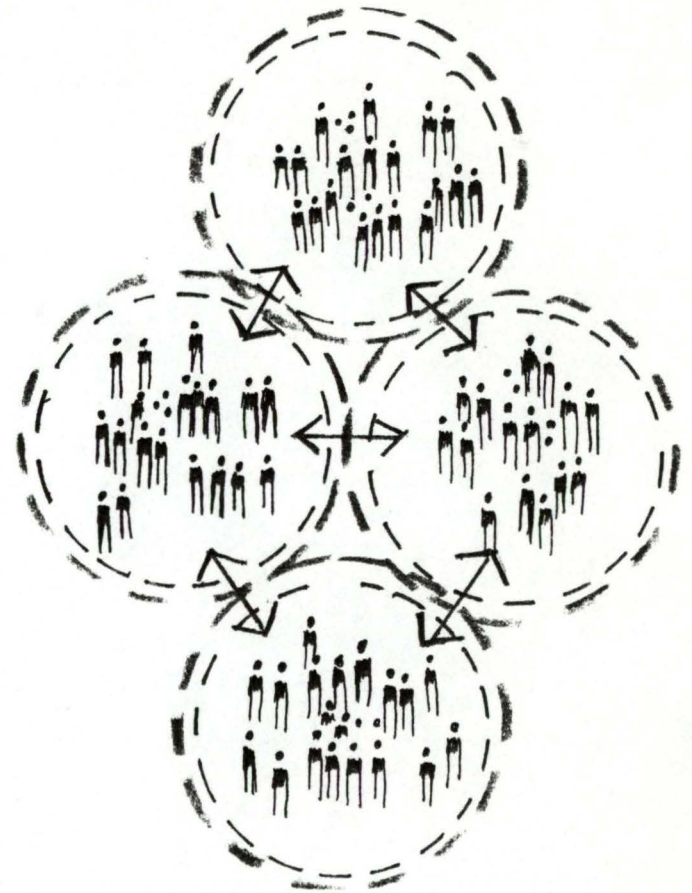
these are mathematics, foreign languages, language arts, social studies, and science. Additionally, we find fine arts, music, home arts, industrial arts, special education, and physical education in most larger high schools. These courses are most often grouped together into departments with students changing classes from one area of the building to another, similar to a small college in one building.

If areas requiring little special or expensive equipment are subdivided and grouped together, then a mini-school is the result. The resulting mini-schools would share in a unified arts complex, with fine arts, music, home arts, and industrial arts for teaching areas, and have common central administration, guidance, large lecture laboratories, advanced science, special education facilities, and physical education facilities. In the words of educational consultants, the smaller communities of sub-schools provide

"a field of action of a size where the interplay of teachers and students is close enough so that mutual help toward the goals of each student is possible. Knowledgeable human contact is the necessary means for achieving this end."<sup>5</sup>



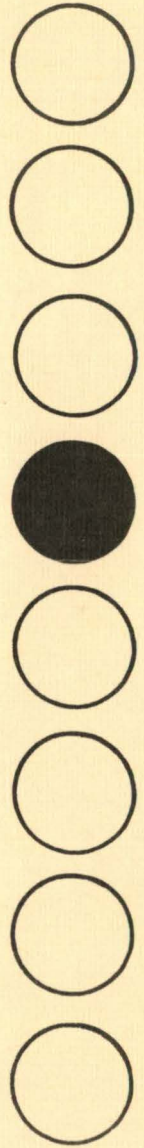
TYPICAL CONCEPT



SUBSCHOOL CONCEPT



CASE STUDIES



Research into existing high school facilities provides a good foundation for beginning studies. Although a designer's work will be unique in siting, programmatic requirements, budget, and a myriad of other parameters, a great deal can be gathered from careful analysis of previous works. In these case studies, schools were selected for outstanding features applicable to the design of a high school for Richland County. Among the features which stand out are siting, overall school image of high aesthetic standard, classroom arrangement for flexibility and changing curricula, scale relation to pedestrians and automobiles, clear interior circulation, and design for after-hours community usage. A part of these features and perhaps most important is providing handsome and exciting spaces for the students, faculty, and administrators.



Project: Dykes High School

Location: Atlanta, Georgia

Architects: Finch, Alexander, Barnes, Rothschild & Paschal  
(FABR&P)

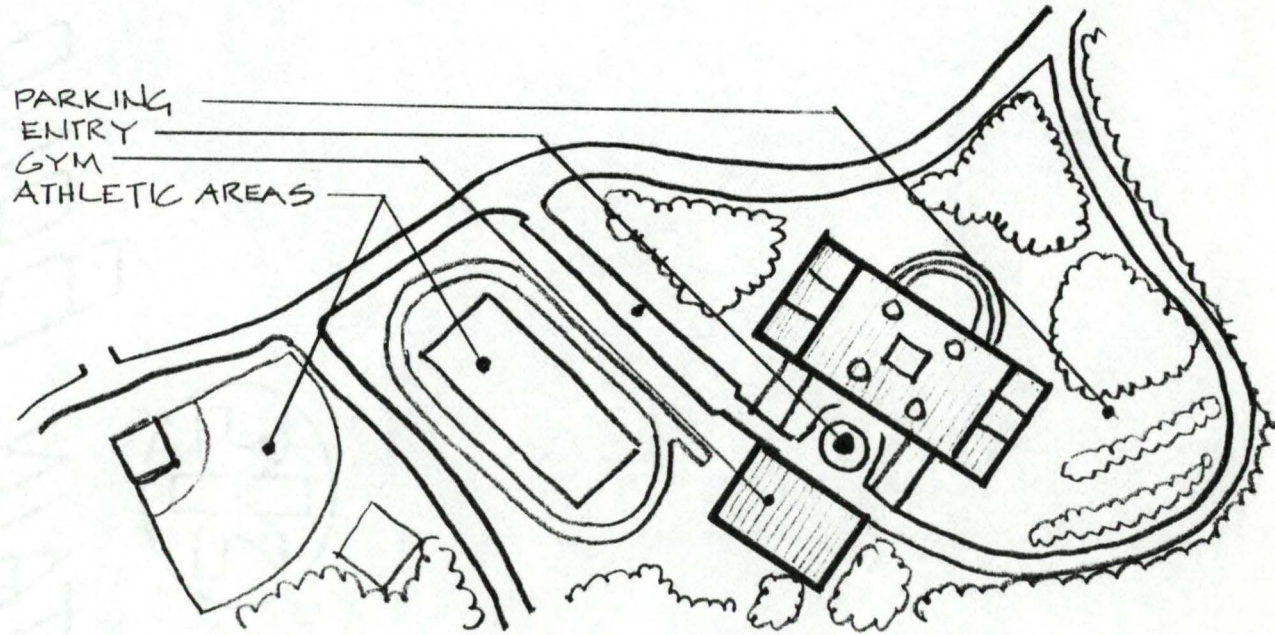
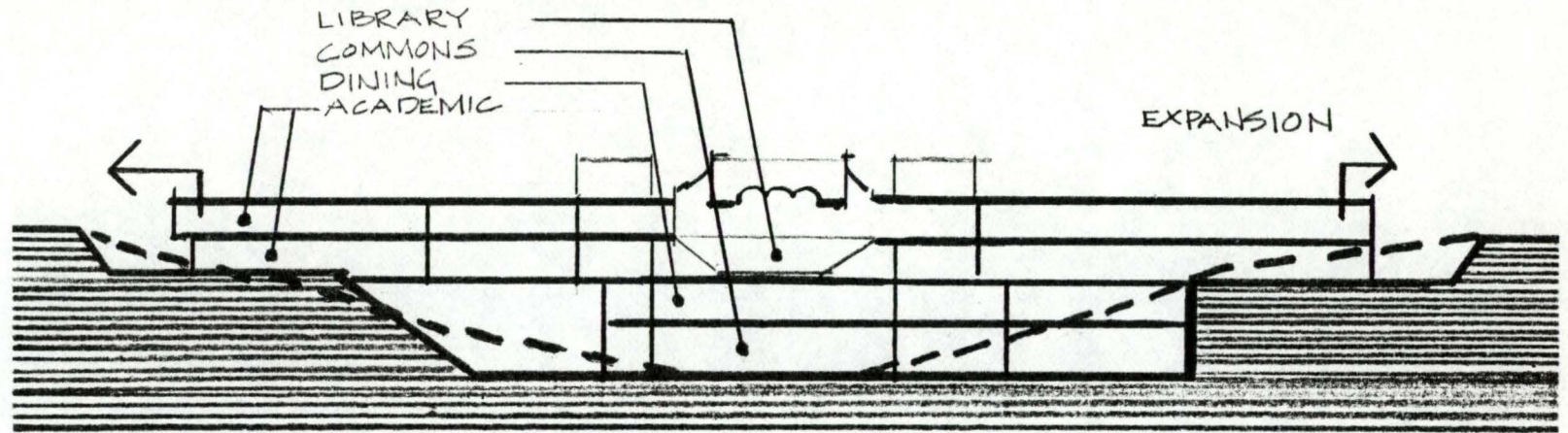
Number of Students: 1,500 expandable to 2,000

Siting is the most interesting aspect of this school, with the massing minimized by planting either end of the building into a hill spanning a gully. Entrance is gained at the lowest level, of offices, auditorium, and handsomely designed student commons area and amphitheater for student use during free time. The cafeteria is a part of a transparent bridge, looking outward, but academic floors above are inwardly oriented. The library is actually the heart of the building.

The two lowest levels have been sized for ultimate enrollment, with the instructional areas of the top floor designed to be expandable at each end. The gymnasium remains in a separate building with a public entrance on grade and a pedestrian tunnel connecting to the school. Philosophically, the school was designed with a somewhat liberal curriculum, with individual study and free use of the library encouraged. In the words of the architects, the school was designed to "accommodate continuing innovations in the educational program."<sup>6</sup>

DYKES HIGH SCHOOL

ATLANTA, GEORGIA





Project: Manse Road Senior Public School

Location: Scarborough, Ontario

Architect: Craig, Zeidler and Strong

Number of Students: 665

Secondary schools are rarely open plan in both form and philosophy of individually paced learning. Instead, they tend to be flexible in the arrangement of teaching space, without permanent division walls; in this case, the classroom situation still prevails although it is free of the "box."

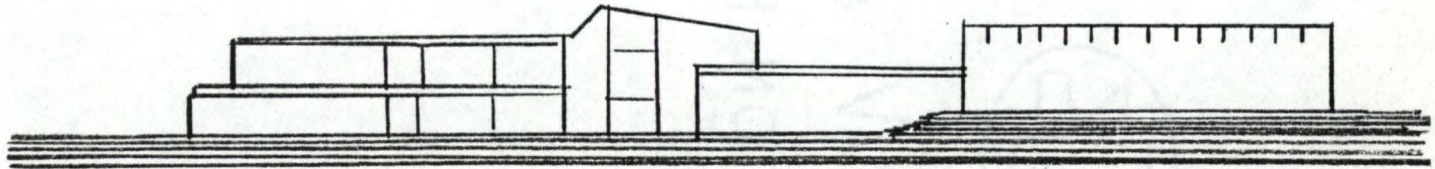
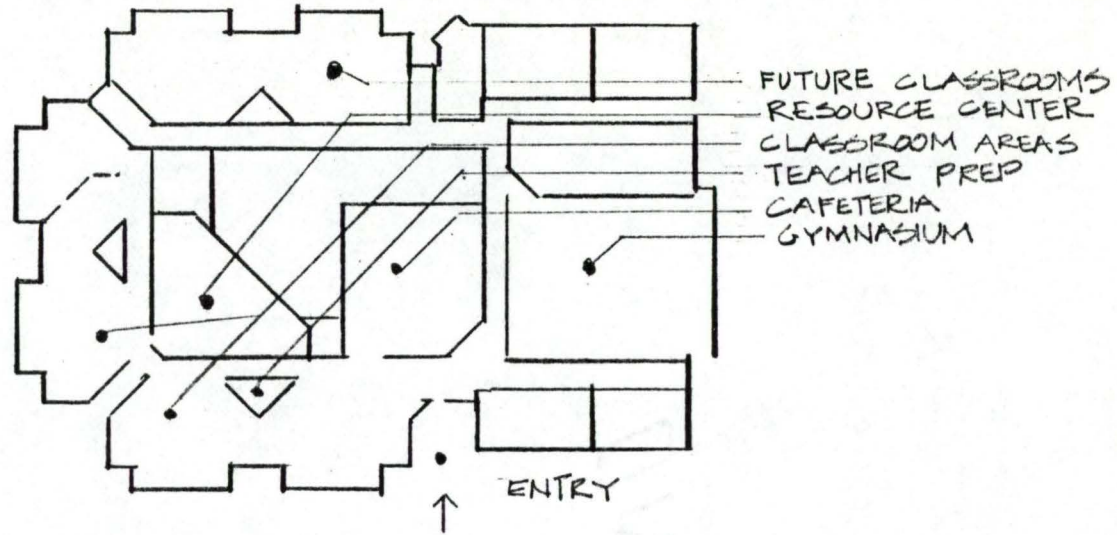
Classrooms were shaped in irregular clusters of three and grouped around a triangular resource center. This arrangement was chosen because of the flexibility and variety it allows in teaching spaces. The cafeteria, instrumental and vocal music spaces and team teaching areas flow together to provide an auditorium area. A gymnasium, industrial arts center, and administrative office area complete the program, with a planned direction for future classrooms.

The "open classrooms" are really small teaching areas with non-permanent dividers which can be opened to create a larger teaching area. Materials are standard open web joists and steel columns, on spread footings with brick as exterior finish.

Reference: Progressive Architecture, February 1971, p. 73.

MANSE ROAD SENIOR SCHOOL

SCARBOROUGH, ONTARIO





Project: Wilton Senior High School

Location: Wilton, Connecticut

Architect: Schofield and Colgar/Earl Flansburgh and Associates, Inc., associated architects

Number of Students: 2,000 expansion to 2,300

This school was a quick reaction to rapidly growing enrollment in the Wilton school district. The site was chosen along busy highway Route 7. One of its most distinctive features is its relation to high speed vehicular traffic from the road, and also its sympathetic massing to give pedestrian scale. A linear scheme was chosen because of the site and highway constraints, and earth berms and landscaping screen parking areas, complementing the image from the road.

Wilton is basically a departmentalized high school utilizing traditional education, but flexible classrooms and variations of form free the school from an egg crate arrangement. Circulation is via a double corridor through the spine of the building. A large field house is separated by a bridge and can be used after school hours. Likewise, the instructional materials center and additional classrooms are separated from the main building, connected by a bridge; this pod, like the field house, was sized for ultimate 2,300 student population.

Materials are another innovative feature. Although a standard precast prestressed concrete beam and column system is used, exterior walls are either brick/block cavity walls with infill or 18 gauge steel siding with fluoropolymer paint finish. This steel

siding was a rather new material for non-industrial use several years ago, and photographs show that use of this system has not become dated by the passing years.

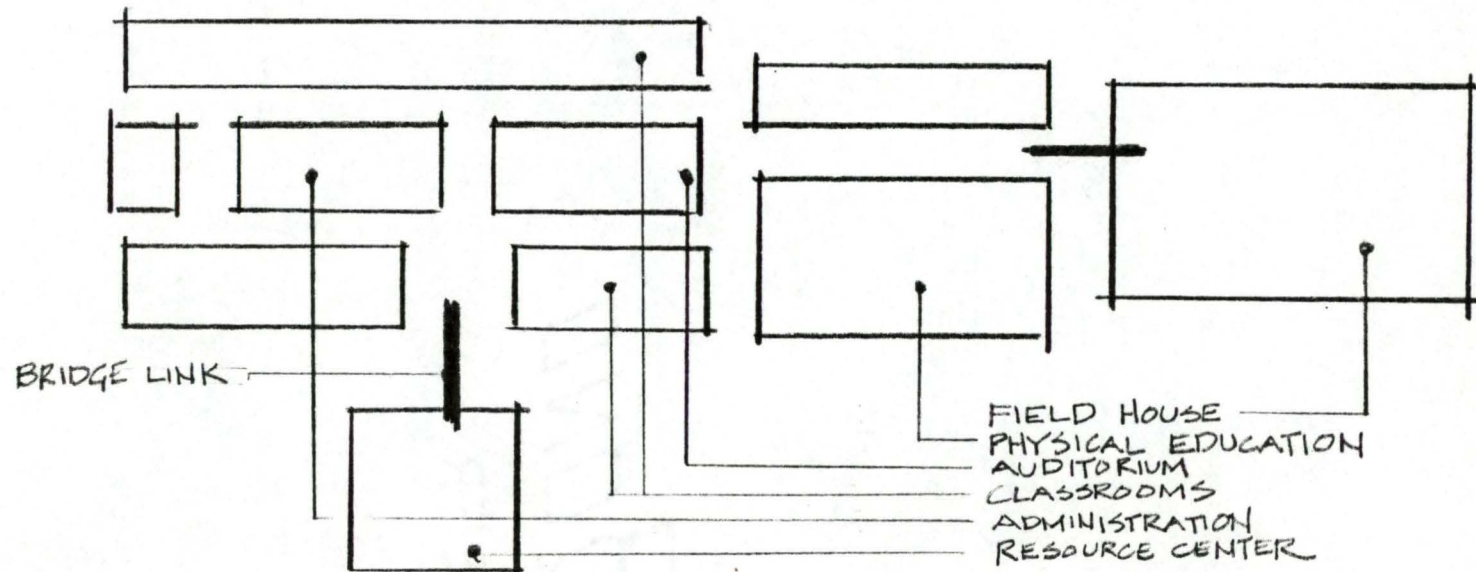
Reference: Progressive Architecture, February 1972, p. 58-61.



WILTON SENIOR HIGH

WILTON, CONNECTICUT

## SECOND FLOOR SCHEMATIC



ROUTE 7

Project: South Dearborn Community High School

Location: Aurora, Illinois

Architects: James Associates, Inc.

Number of Students: 1,000 expanded to 1,250

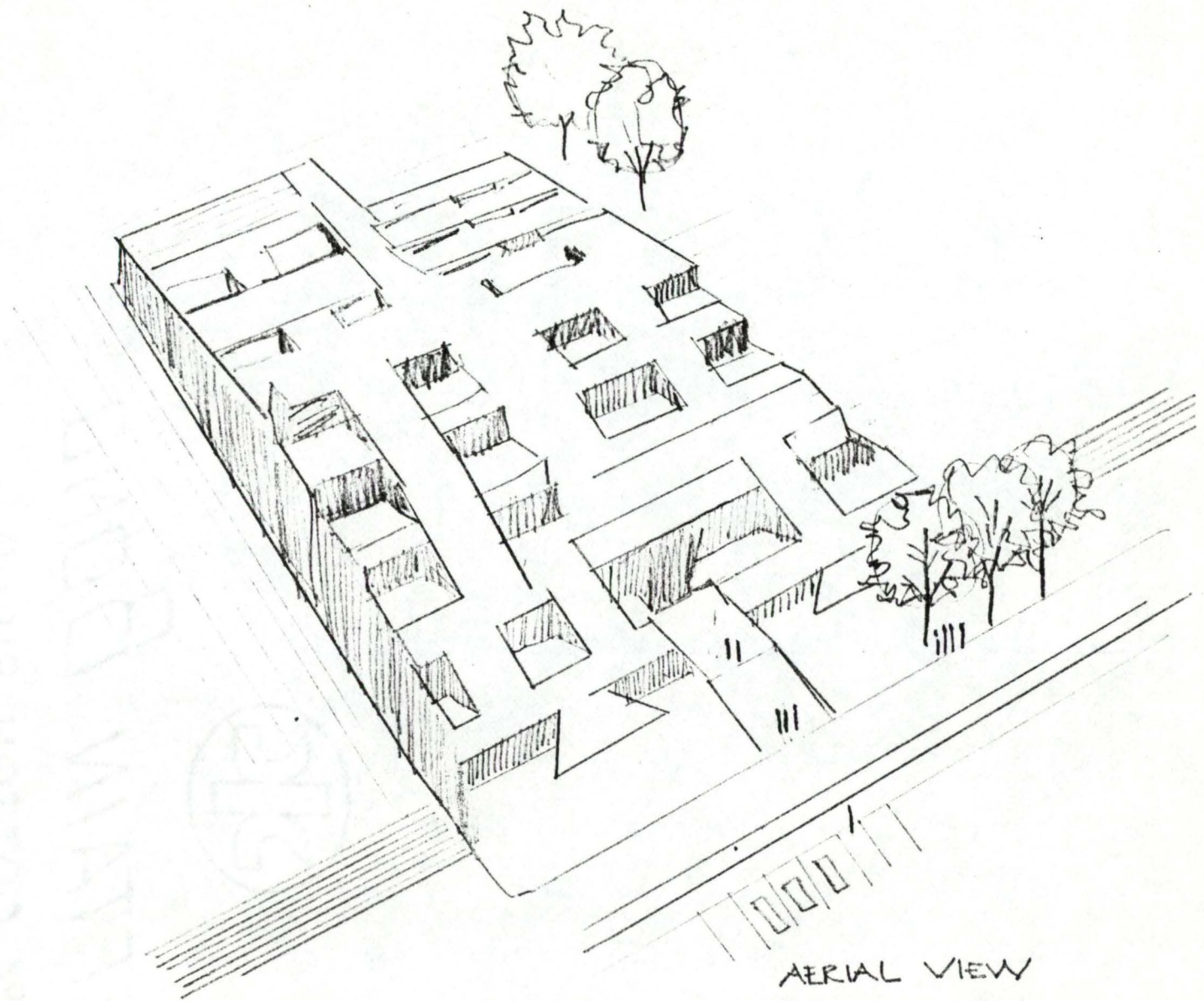
This school was selected for First Design Award of 1972 by Progressive Architecture. Its importance lies in its integration of building forms with the site and in the innovative quality of the building away from traditional school forms. It has a very comfortable, non-institutional feeling which is rare. It is planned for expansion with the core areas of resource center, laboratories, cafeteria and gymnasium, built to house the ultimate enrollment. Built on a sloping site, the building itself is sloped sympathetically with the terrain; low profile elevations create an addition to the hill. The beauty of the form results from extensive efforts to get light and air into internal areas via clerestories. Circulation is aided by use of an interior street, again departing from the typical school corridor image. Also integrated into the forms were outdoor classrooms, which visually and functionally reinforce the building's image as a part of the landscape.

Reference: Progressive Architecture, January 1972, p. 60-63.



SOUTH DEARBORN HIGH SCHOOL

AURORA, ILLINOIS



AERIAL VIEW

Project: Bulkeley High School  
Location: Hartford, Connecticut  
Architects: Caudill, Rowlett, Scott  
Number of Students: 1,800

Bulkeley High School is an urban high school with a dual function of secondary education and community use. Its exciting massing and use of glazing to show interior circulation does not give the traditional school image. Community usage for the school building after hours would utilize the auditorium and gymnasium/pool area; these areas are served by two story lobbies.

The school is divided into two equal houses that can function either vertically or horizontally, each having its own classrooms and administrative sections. This is a product of the mini-school concept, where the image of a large high school is reduced to a more humane scale.

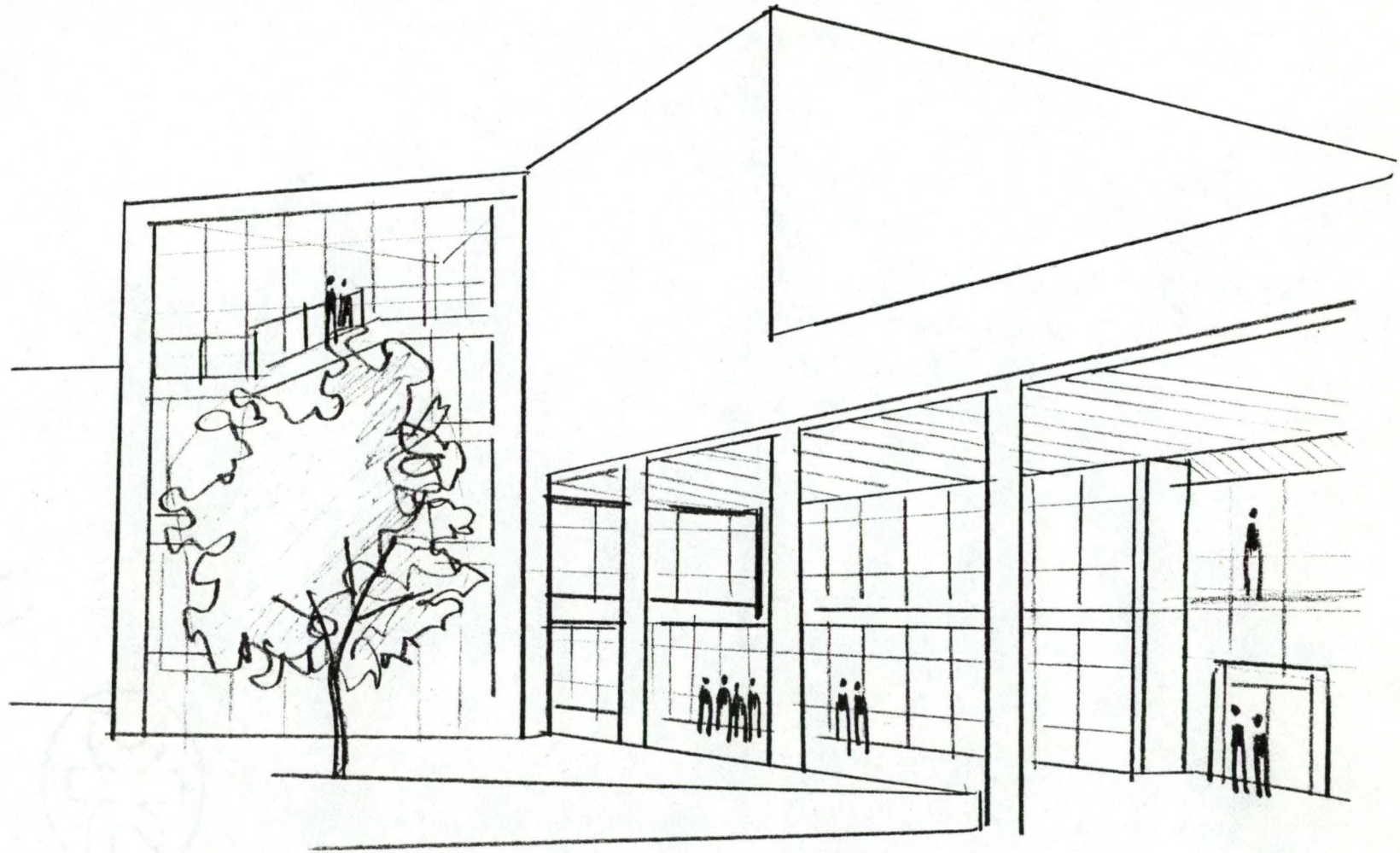
The project was fast tracked to save time and money. Metal wall panel enclosure is the primary architectural material feature, and bronze porcelain enamel finished panels are used as a cladding over poured concrete structure (necessitated by fire codes).

Reference: Architectural Record, June 1976, p. 120-121.



BULKELEY HIGH SCHOOL

HARTFORD, CONNECTICUT



Project: Burlington Senior High School

Location: Burlington, Massachusetts

Architects: Architects Design Group Inc., and Earl R. Flansburgh  
& Associates, Inc., associated architects

Number of Students: approximately 2,000

This school has several nice qualities involved with planning and layout. The circulation is along a 19 foot wide pedestrian street which allows quick movement through the building. Lockers and other corridor support areas are located off cross corridors. The street corridors give desirable order to a complex plan.

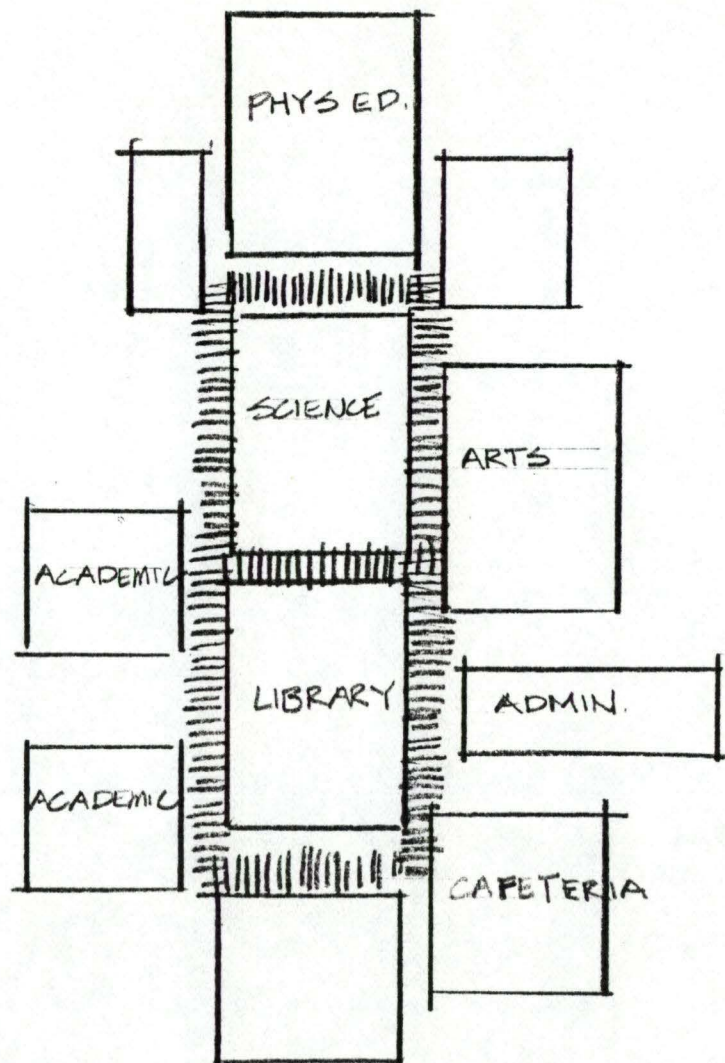
Both traditional classrooms and open plan areas are utilized. Additionally, the program contains a large auditorium, gymnasium, cafeteria, and separate physical education facilities. The exterior uses an efficient, simple repetitive concrete precast structure, yet the planning of the classroom units allows a series of outdoor courtyards at no extra cost. These courtyards help to reduce the size of an enormous school to a more human scale.

Reference: Architectural Record, December 1975, p. 90-91.



BURLINGTON HIGH SCHOOL

BURLINGTON, MASSACHUSETTS



MAIN LEVEL SCHEMATIC

Project: Columbus High School  
Location: Columbus, Indiana  
Architects: Mitchell/Giurgola  
Number of Students: 2,100

Another exhibit for the architectural museum of Columbus, Indiana, this school get high marks in overall visual appearance and creation of exciting spaces for the students. Its exterior appearance is typically Mitchell/Giurgola and distinctly non-stereotypical American high school. Gloss white aluminum sandwich panels and glazed solar gray panes are cleanly combined with brick to provide horizontal articulation of the three levels. Vertical circulation connecting these levels is denoted by skylights over stairwells.

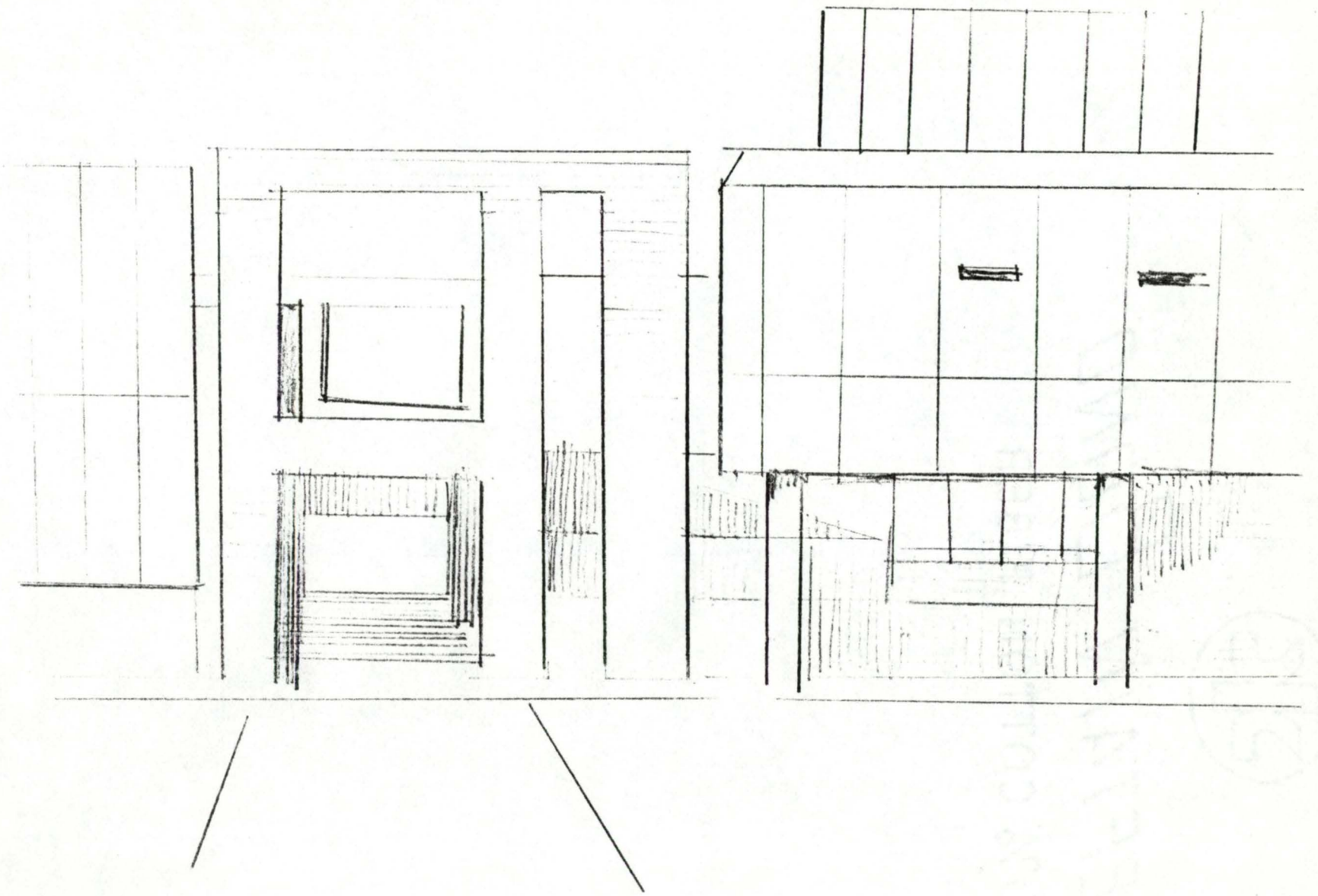
Housing many luxurious amenities such as a planetarium, television studio, swimming pool, and sundecks, the school nevertheless remained on budget at a little over 12 million dollars or approximately \$33 per square foot. Circulation along linear streets became the premise of design and this area flows into spacious student commons, lounges, and dining areas to create handsome and exciting areas for the student without waste of space. Classroom space tends to be more innovative with the curriculum calling for independent study, with close interaction between students and faculty.

Reference: Architectural Record, April 1976, p. 110-113.

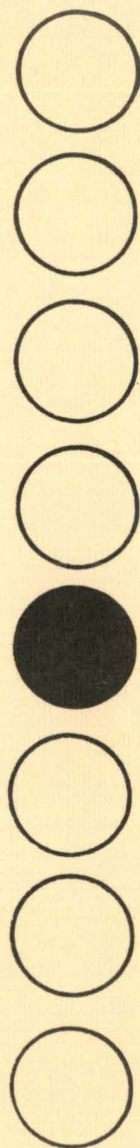


COLUMBUS EAST HIGH SCHOOL

COLUMBUS, INDIANA



SITE INFORMATION





The site under consideration for this project is an attractive tract of land on the Sumter Highway, U.S. 76, east of Columbia, South Carolina. Only seven miles from the state capitol building, the area is still rather undeveloped compared to other suburban areas of Columbia. Its siting, attractiveness, and undeveloped nature make this section of Richland County the potential boom area of the Columbia metropolitan region.

Columbia, South Carolina's largest metropolitan area, and center of state government is a typical urban area of the South, nearing half a million people in its SMSA (Standard Metropolitan Statistical Analysis) with forecasts of healthy growth. Basically, the metro area spreads over two counties, Richland and Lexington, which maintain relatively autonomous identities. Richland County contains all of the city of Columbia, and more importantly, all of Richland County School District #1, the particular setting for this project.

The school district extends from the Richland-Fairfield county line to the north, Richland District 6 line to the west, and Richard District 2 line to the east. South of the city, the district line runs along Fort Jackson to the Richland Sumter County line, to the Congaree River. This large sector southeast of the city, the most sparsely populated and least developed portion of the county, is commonly known as Lower Richland. Development exists primarily along U.S. 76 and the small communities of Gadsden, Hopkins, Eastover, Horrel Hill, and others; the remaining land is either large tracts of farm land or timber production, or swamp along the Congaree River. An exception to

this rural quality is the creeping fringe of Columbia, spreading daily away from the center city, with predictable patterns of housing developments, shopping complexes, and suburban support activities. Additionally, frontages along the Seaboard and Southern railway lines are being developed as industrial sites. South of the Sumter Highway, along Atlas and Bluff Roads, many industrial companies have located along the rail lines with the added benefit of their close proximity to the city.

The site to be used for this terminal project is a large piece of property on the outskirts of Columbia with frontage on the Sumter Highway. The property extends from the southern right of way of the highway to the Seaboard Coast Line Railroad, and encompasses farm land and wooded undeveloped areas of rolling terrain. The highway frontage is located directly across from Universal Road. From this high point of land, the site slopes down toward the west to a small drainage creek. Except for a large wooded area, trees and shrubs grow along fences, serving as windbreaks for the agricultural land. Except for a farm house, with a handsome tree lined drive, and a few out-buildings, the land has no other buildings. Railroad right of way cuts through the southernmost sector of the property.

Climate for the region is generally temperate, with long, hot humid summers and relatively mild winters. Rainfall is heaviest from June to September, and averages 50 inches a year, with very light average snowfall. Temperatures range from average extreme of 15 degrees Fahrenheit to 105 degrees Fahrenheit. Outdoor activities are normally possible around the year. The high heat and humidity makes air conditioning a necessity.



Richland County School District #1 uses boundary lines from schools to assure an appropriate racial blend in the schools. These lines change slightly from year to year, but generally they define certain neighborhoods. Reinforcing the neighborhood identity is a system of feeder schools: certain elementary schools feed directly to several middle schools, which feed to one high school. Since the new high school will be relieving the load on Lower Richland High School, and a partial potential load from Dreher High School, the feeder systems of these schools can be examined to determine the analytical breakdown of the new high school. Possible elementary feeder schools would be Atlas Road, Burnside, Meadowfield, and Mill Creek; the possible middle school feeders would be Caughman Road and Olympia. The zones of these schools determine the neighborhood analysis area of the new high school's population, and allow a demographic study of the potential student.

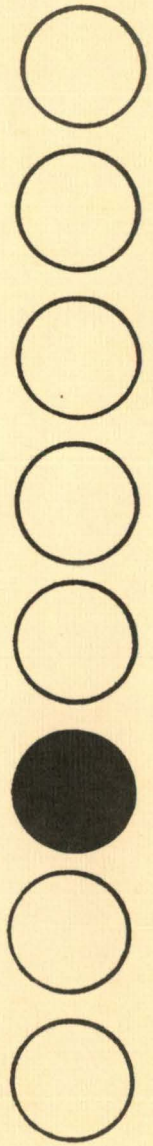
Two types of neighborhoods can be seen from the following data; the three neighborhoods with the most vigorous growth rates also have the highest median incomes. The majority of the surrounding areas house either end of the economic spectrum, either high middle class families or low lower class income levels. Business and industry concentrations are rather light, while growth rates are substantial, indicating a rise in population and housing.

Several new developments and improvements in traffic corridors in the area will have a significant effect on the growth of the Lower Richland area. The new Southeastern Beltway, connecting I-26 in Lexington County to I-20 in northern Richland County will

swing near the site. When I-77 is complete, this beltway will be a major north-south bypass for the metropolitan area and will make development of the Lower Richland area much more attractive. This beltway will connect with the proposed Shop Road extension. This arterial, (Shop Road extension) will be a "five lane extension of an improved Shop Road from South Beltline Boulevard to the Sumter Highway."<sup>7</sup> The Shop Road extension will pass directly south of, or possibly through, the southern sector of the site for the new school, and will be a major route from the Lower Richland area to the central city. The third arterial change in the area will be the Hazlewood Road from the Sumter Highway to an interchange with the Shop Road extension. Hazlewood extension will pass directly west of the site and will serve as a major neighborhood route, rather than a thoroughfare.



PROGRAM



The following programmatic spatial requirements are based on a professional analysis done by an educational consultant for the district for the new Columbia High School. Since the size and scope of this project are similar, the Columbia High School program has been used as a base of operations.

The new school will be built initially to house 1,200 students, with additional space projected to house 2,000 students or more. The specifications for space are within the 1970 state requirements. Present and future course offerings have been considered. Estimation of space has been computed from analysis of the level at which the courses are normally given, the desirable capacity of students in each section and the frequency that each course meets per week. An interdisciplinary approach is encouraged for all instruction.

The school should be organized as a series of 325 student high schools, with four built in the initial phase and more to be added as needed. Each sub-school will have teaching space for mathematics, language arts, foreign languages, social studies, and science, in addition to offices for administrative deputies. Central to all schools should be a resource center, planned to accommodate 2,000 students. All sub-schools would share a complex containing fine arts, music, central administration, guidance, large lecture laboratories, advanced science, special education facilities, and physical education facilities. A single cafeteria can serve the first four sub-schools, with a second cafeteria added when expansion becomes necessary. However, the kitchen should serve the ultimate enrollment.



The school should be planned with no barriers to physically handicapped faculty or students. Vocational education, including industrial arts and home economics should be planned for a later addition. Business education will be provided in the first phase. Due to the large gymnasium, an auditorium is not specified in the first phase, nor is it listed in expansion proposals.

## EACH SUB-SCHOOL (325 students)

Classrooms or Equipment Space	6 @ 825 =	4950
Seminar Rooms	3 @ 150 =	450
Large Seminar Rooms		325
Science Lab (subdividable)		1450
Lab Preparation and Storage		400
Faculty Office Area		400
Student Commons		400
Faculty Student Lounge		480
Lockers		<u>625</u>
	Each Sub-school	9480
	6 @ 9480	<u>SUBTOTAL 56880</u>

## SHARED BY 2 SUB-SCHOOLS

Lecture		1650
Waiting		250
Office		150
Conference		250
Toilets		<u>1300</u>
		3600
	3 @ 3600	<u>SUBTOTAL 10800</u>

It is suggested that "classrooms and equivalent" to be treated as traditional classrooms and some open space for flexible use. The science area in each sub-school is intended primarily for biology, general science and anatomy. Each science area will require service islands. Foreign language rooms will be equipped for wireless transmission with portable equipment. Each sub-school should be closely related to the resource center.<sup>8</sup>



## RESOURCE CENTER

Individual Study Area Seating 200 @ 35 sq. ft.		6500
Stacks		3000
Offices	2 @ 150 sq. ft.	300
Workspace		300
Graphics		375
Darkroom, Preview, and Taping		225
Office and Conference		400
Equipment Center		800
Repair and Storage		450
Departmental Offices	7 @ 140 sq. ft.	1000
Conference/Seminar	7 @ 140 sq. ft.	<u>1000</u>
	SUBTOTAL	14130

The majority of this area will be open. Attention should be paid to adequate lighting and sight lines.

## DINING

Cafeteria		8325
Service		1250
Kitchen		2500
Student Commons	2 @ 1000	<u>2000</u>
	SUBTOTAL	14325

## ADVANCED SCIENCE AND MATH

Labs	2 @ 1700	3400
Math Lab with Computer Terminal		700
Faculty		<u>400</u>
	SUBTOTAL	4500

## ART CENTER

Art Studio		1225
Material Storage		250
Student Storage		425
Faculty		380
Ceramics		<u>425</u>
	SUBTOTAL	2705

## MUSIC DEPARTMENT

Instrumental Rehearsal		1350
Instrument Storage		350
Practice	6 @ 50	300
Faculty		275
Music Library		425
Robe & Uniform Storage		150
Choral Rehearsal Room		<u>1225</u>
	SUBTOTAL	4075



## BUSINESS DEPARTMENT

Typing	750
Bookkeeping	850
Office Practice	1000
Classroom	700
Faculty	<u>375</u>
	SUBTOTAL
	3675

## PHYSICAL EDUCATION

Double Gym	14500
Lobby	2000
Toilets/Storage	1400
Multi-Use Gym	7500
Boys Dressing	1520
Boys Showers	525
Boys Toilet	150
Boys Office/Dressing/Shower	260
Boys Coach	260
Boys Varsity Lockers	800
Boys Varsity Equipment	600
Boys Varsity Training Room	275
Girls Dressing	1520
Girls Showers	675
Girls Toilets	175
Girls Varsity Lockers	425
Girls Varsity Equipment	375
Girls Varsity Training Room	240

		50
Girls Office		260
Girls Coach		<u>260</u>
	SUBTOTAL	33720

MISCELLANEOUS EDUCATION

Remedial Reading Lab		650
Special Education		700
Health Education		750
Text Storage		450
Faculty Lounge	2 @ 1000	2000
Driver Education		<u>1000</u>
	SUBTOTAL	5550

ADMINISTRATION

General Office		750
Principal		225
Conference		300
Office		275
Work		350
Health Waiting		250
Nurse's Office		100
Exam Room		200
Cot Rooms	2 @ 120	<u>240</u>
	SUBTOTAL	2490



## GUIDANCE

Waiting		650
Work Space		450
6 Offices @ 200		1200
Conference		<u>400</u>
	SUBTOTAL	2700

## STUDENT CENTER

Annual & Newspaper		300
Student Government		450
Club Rooms	2 @ 360	<u>720</u>
	SUBTOTAL	1470

## SERVICE

Building Service/Shop		1000
Toilets	2 @ 850	<u>1700</u>
	SUBTOTAL	2700

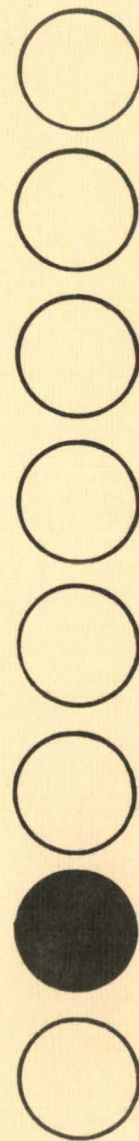
## TOTAL ANNOTATED SPACE NEEDS

SUBSCHOOLS	6 @ 9480	56880
SHARED SPACE	3 @ 3600	10800
RESOURCE CENTER		14130
DINING		14325
ADVANCED SCIENCE & MATH		4500
ART		2705
MUSIC		4075
BUSINESS EDUCATION		3675
PHYSICAL EDUCATION		33720
MISCELLANEOUS EDUCATION		5550
ADMINISTRATION & HEALTH		2490
GUIDANCE		2700
STUDENT CENTER		1470
SERVICE		<u>2700</u>
	NET AREA	159720

$$\text{Gross Area} = \text{Net} \times 1.5 = 239580$$



SYNTHESIS



## SUMMARY

From the preceding research and analysis, we have gathered together many topics relative to the design of this terminal project. In summary, the following statements present the major items:

There is a proven need for a new high school in the Lower Richland area, due to real and projected growth patterns in the region.

The site is an actual parcel of land under consideration for purchase by the school board.

A vocational school will be added later, but provisions for its linkage with the existing school must be provided.

Due to the conservative nature of secondary educators and the philosophy of the school district, the traditional classrooms with authoritarian teacher will be the predominant mode of education. This traditional philosophy should take advantage of some open space for flexibility.

The subschool concept will be used, both for its ease of expansion and the reduction of the large high school image.

From case studies, the following are items to consider:

Siting is important, particularly where there is much freedom for development and expression. The building can either make a strong direct statement free of the site



(Dykes, Columbus East) or a strong subordinate statement blended into the site (South Dearborn).

Spaces for students - lounges, commons, outdoor areas - are vital, whether amphitheaters (Dykes), outdoor classrooms (South Dearborn) or indoor commons (Columbus East).

Nearly all of the schools studied use the library as the heart of the building. Most schools in the case studies had planned expansion as a part of their program.

Although a variety of educational philosophies were embraced, classroom spaces have been designed with certain flexibility (Manse Road, Bulkeley).

Visual appearance from the automobile is important (Wilton, Columbus East); relation to the pedestrian is equally important (Wilton, Burlington).

Community use after hours should be considered (Bulkeley, Wilton).

Handsome and exciting areas should be designed to get away from typical institutional school buildings (Columbus East, Bulkeley, South Dearborn).

Circulation is important and can be a logical generator for design (Burlington, Columbus East) or can be expressed in the exterior form (Bulkeley).

Following are items summarized from area and site descriptions:

The site is currently of the edge of creeping urban development and rural farmland.



Neighborhoods for the school population show a mix between high and low income families.

Traffic improvements will have a major impact on the site, with two large arterials planned for two sides of the site, and a major U.S. highway along the third.

Programmatically, the school should be designed to initially house 1,300 students in a series of 325 student subschools sharing commons areas; expansion to 2,000 students should be planned. Vocational education also will be added at a later time. Facilities such as physical education, resource center, kitchen and large lecture labs are sized to accommodate a 2,000 student capacity.

# PROBLEM STATEMENT

The problem to be considered by this terminal project will be to design a new secondary school for Richland County School District #1 in the Lower Richland area of the county. Both the site and program are developments from consultation with the client and represent real items rather than speculations.

The school will be built with a sub-school concept.

Traditional classrooms with a certain degree of flexibility and limited open plan areas should be provided.

The sub-schools should have direct access to the resource center.

Immediate design and expansion should be planned as stated in the programmatic requirements.

The school should make a strong statement on the site, either as a blend with the site or a statement free of the site.

Community use of the gymnasium should be accommodated. The gymnasium should be able to be opened after school hours.

Exciting and handsome spaces for students should be provided, giving each student a sense of ownership and pride in the building. Student commons areas should be designed as gathering places.

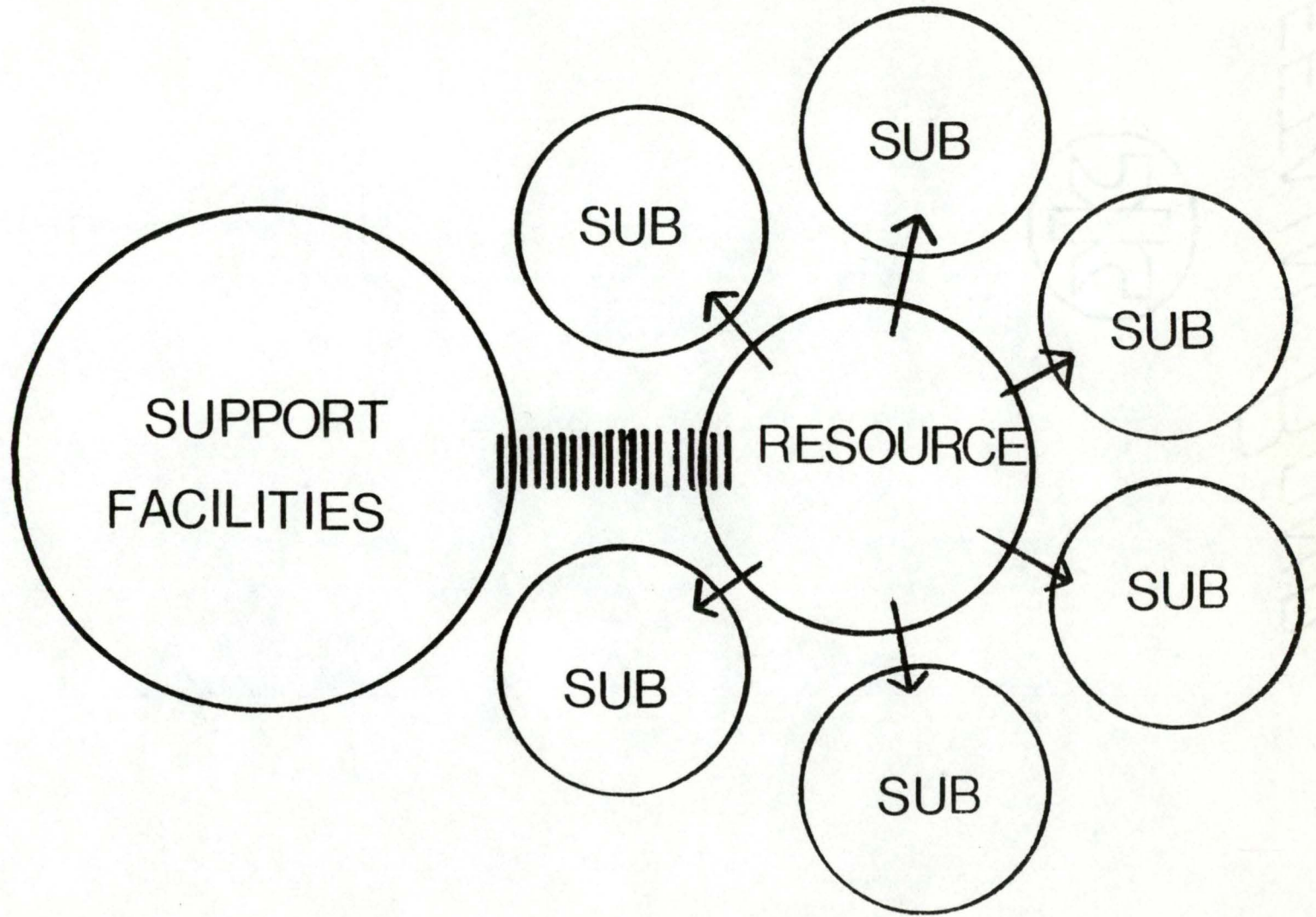
Energy conscious design should be utilized. Berms and minimal glazing are a means to this end.

Accessibility and image from the road and entrance is important.



SOLUTION





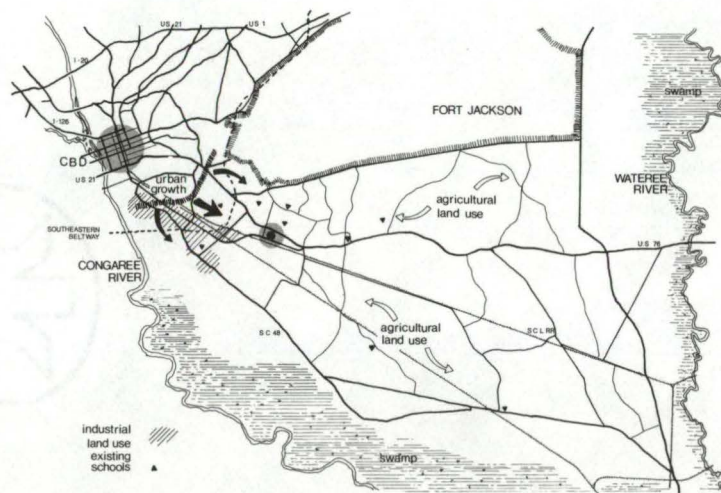
DESIGN

CONCEPT

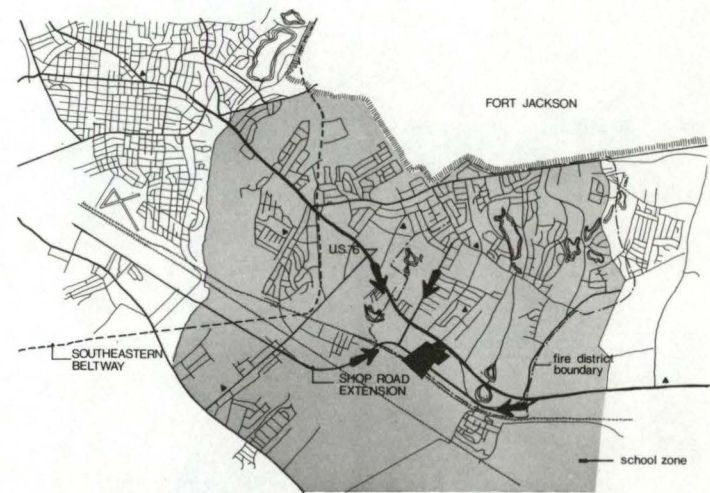
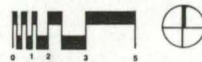


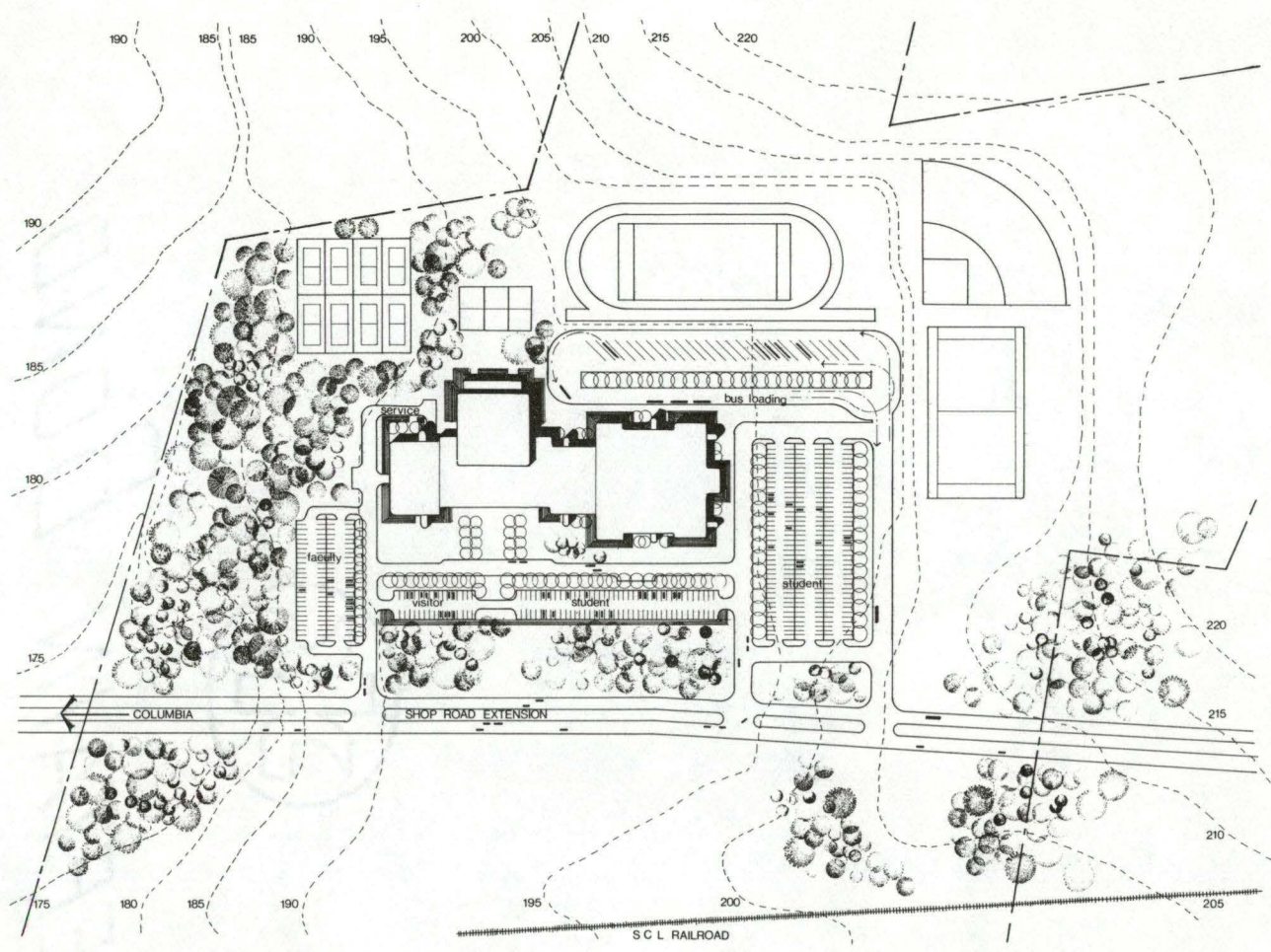
# columbia east high school

B. PAUL PUSHKAR, JR.  
TERMINAL PROJECT  
SPRING SEMESTER 1978  
COLLEGE OF ARCHITECTURE  
CLEMSON UNIVERSITY



LOCATION

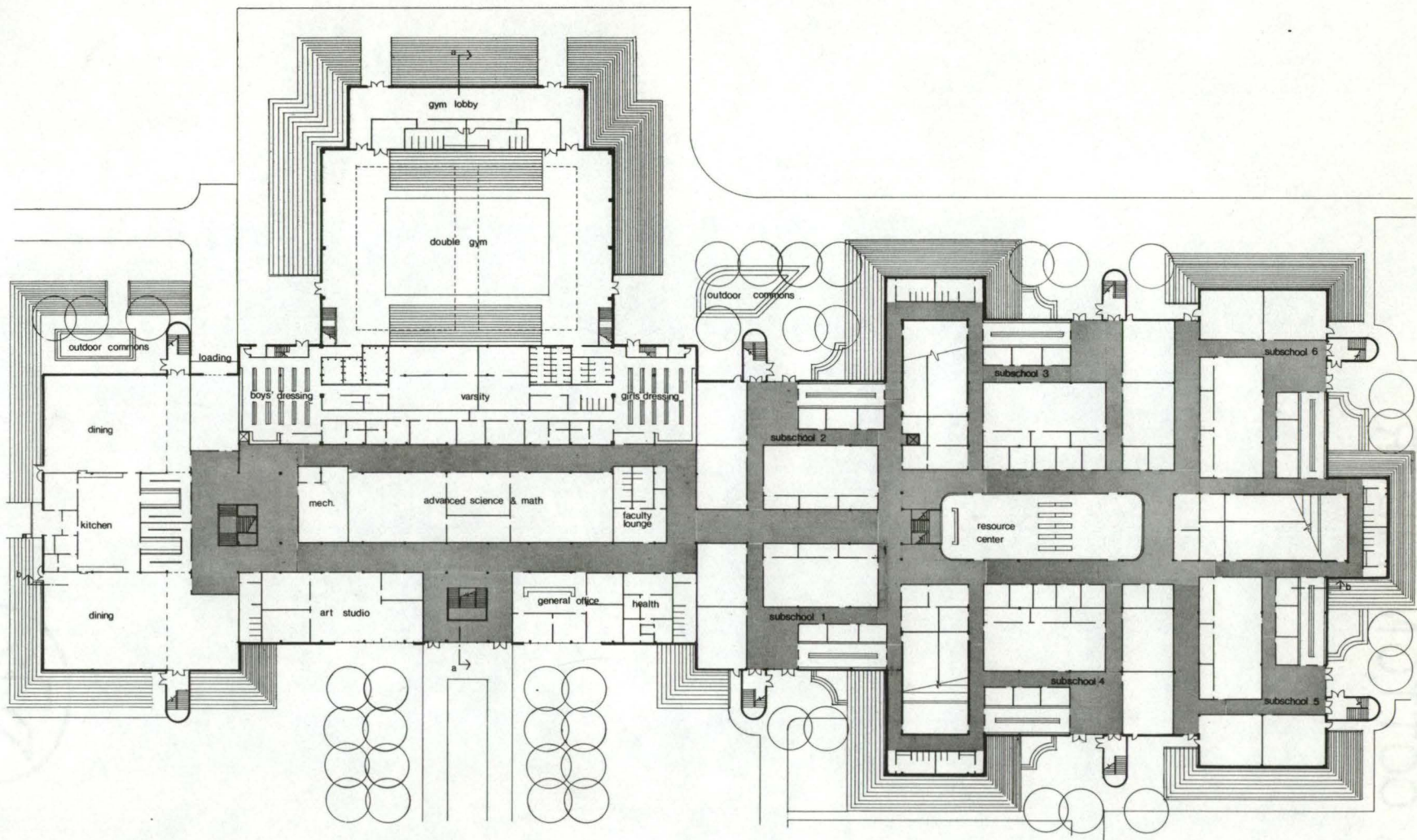




# SITE PLAN

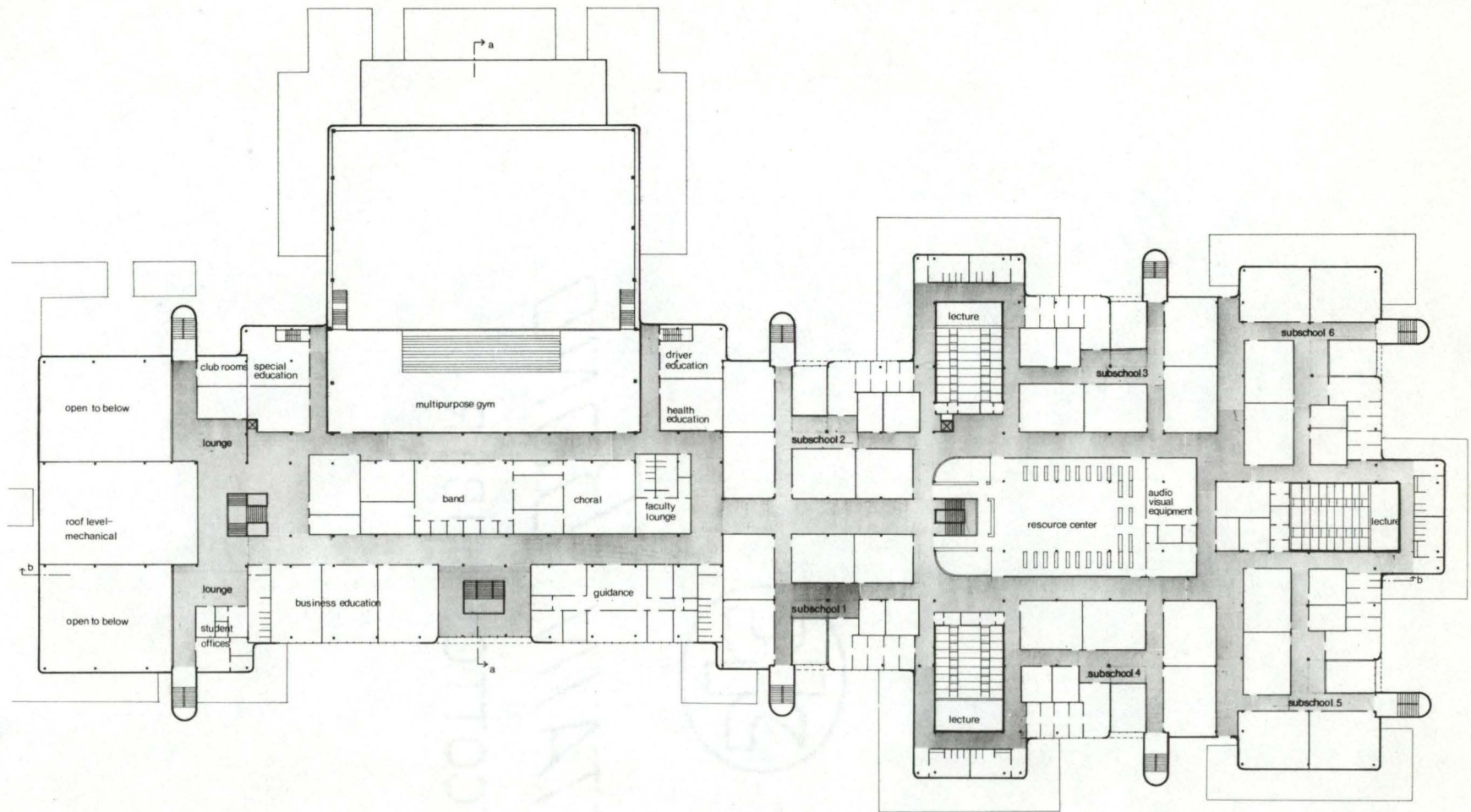






PLAN FIRST FLOOR





PLAN SECOND FLOOR





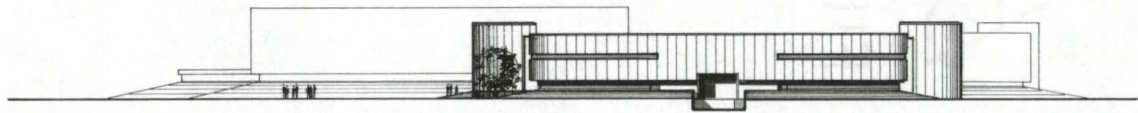
east



north



west

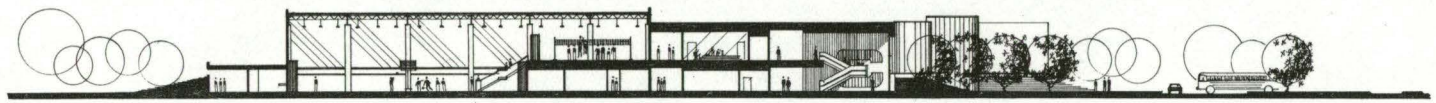


south

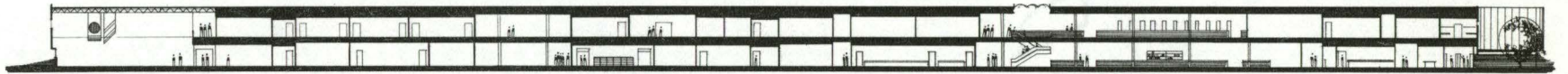


# ELEVATIONS

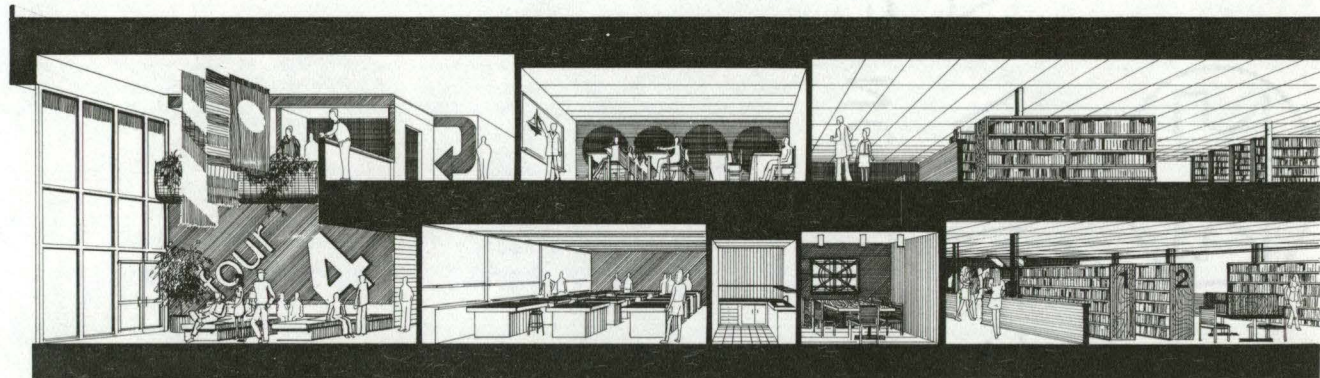




section a-a

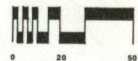


section b-b

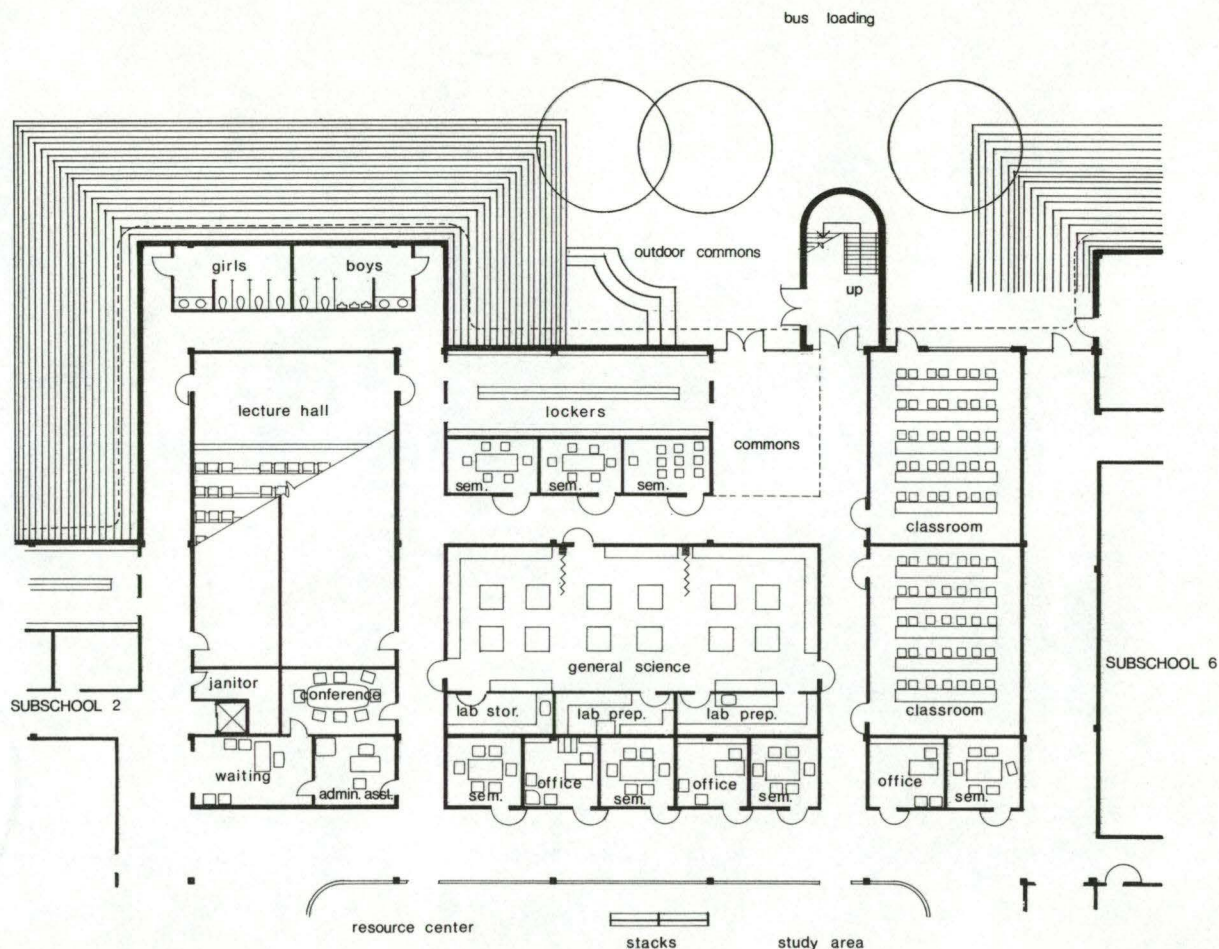


sectional perspective through subschool four

## SECTIONS

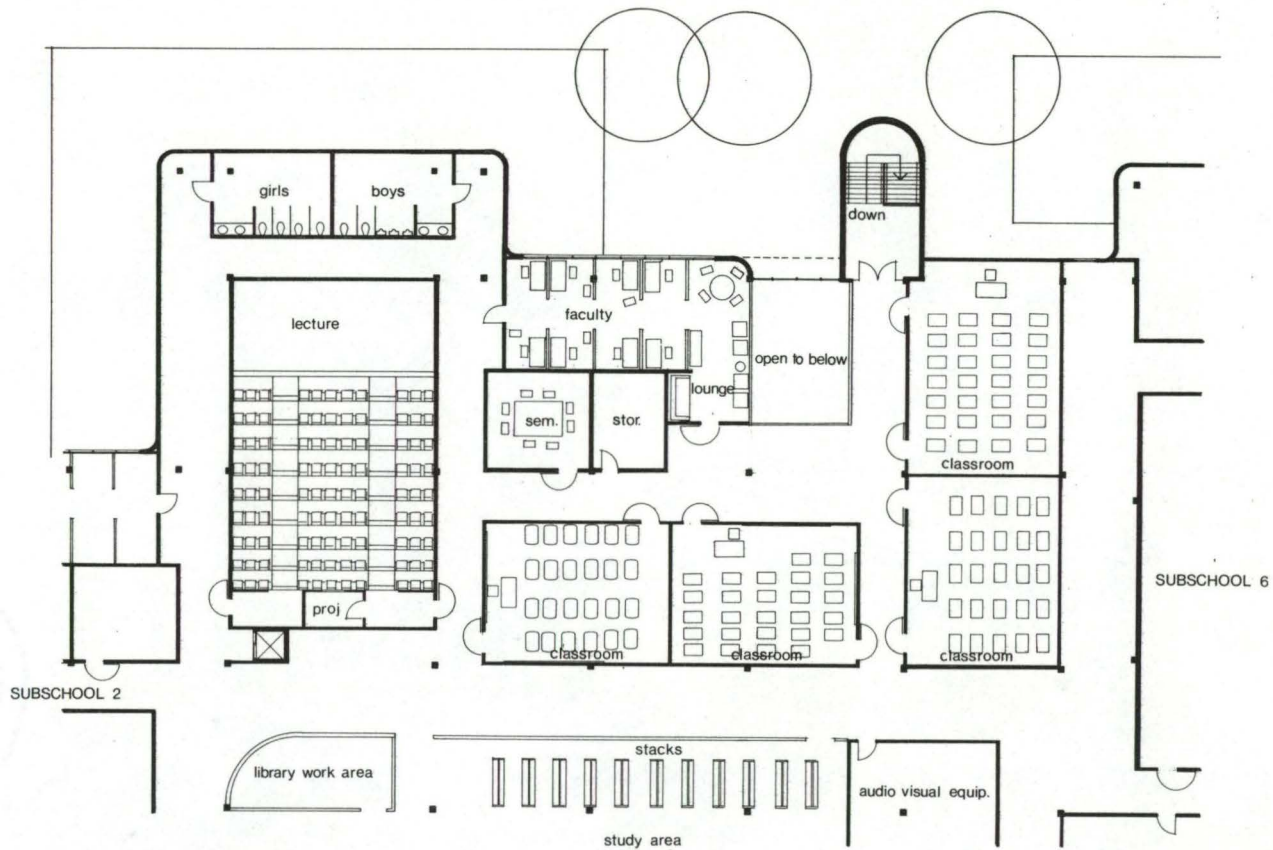






# DETAIL PLAN





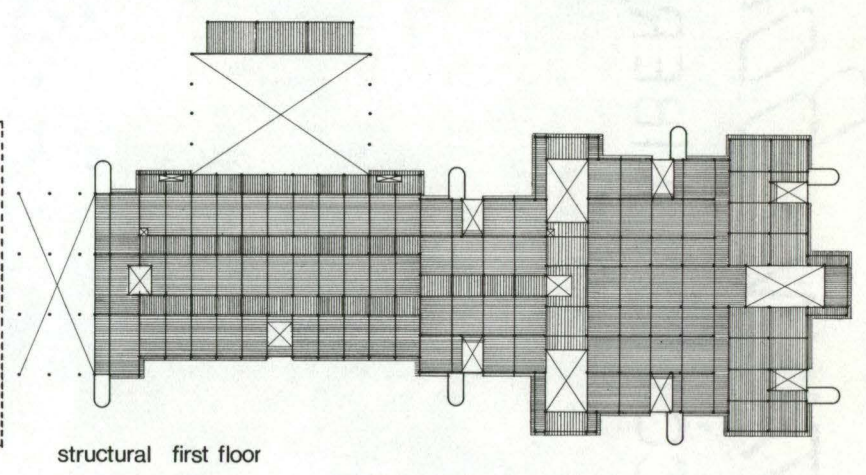
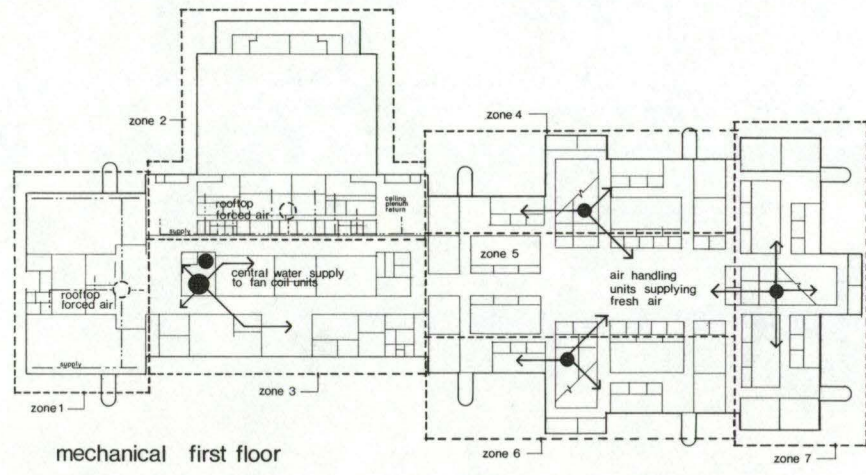
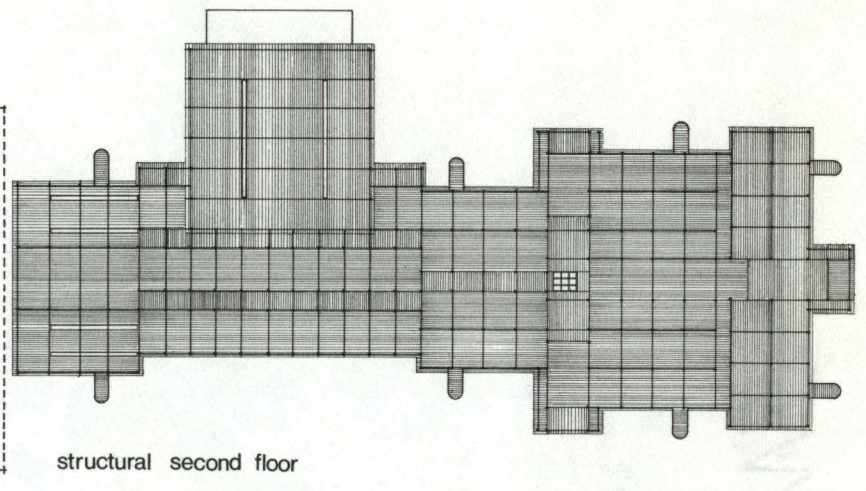
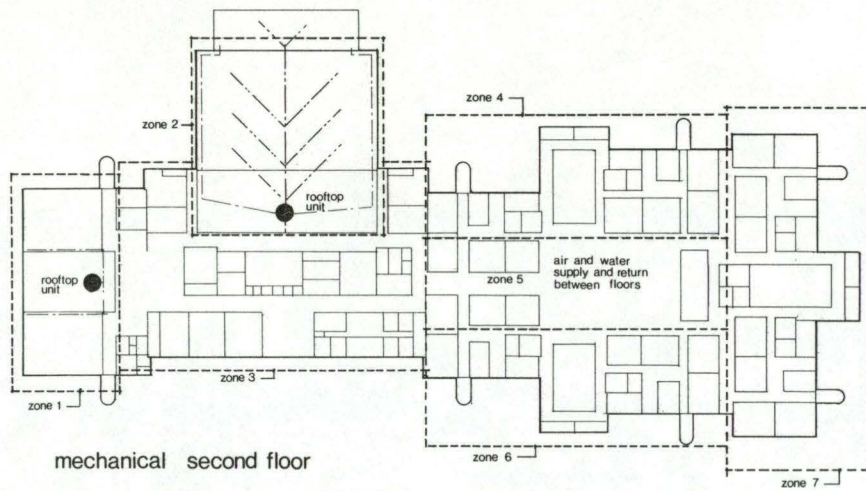
SUBSCHOOL 3 SECOND FLOOR

DETAIL PLAN

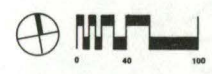


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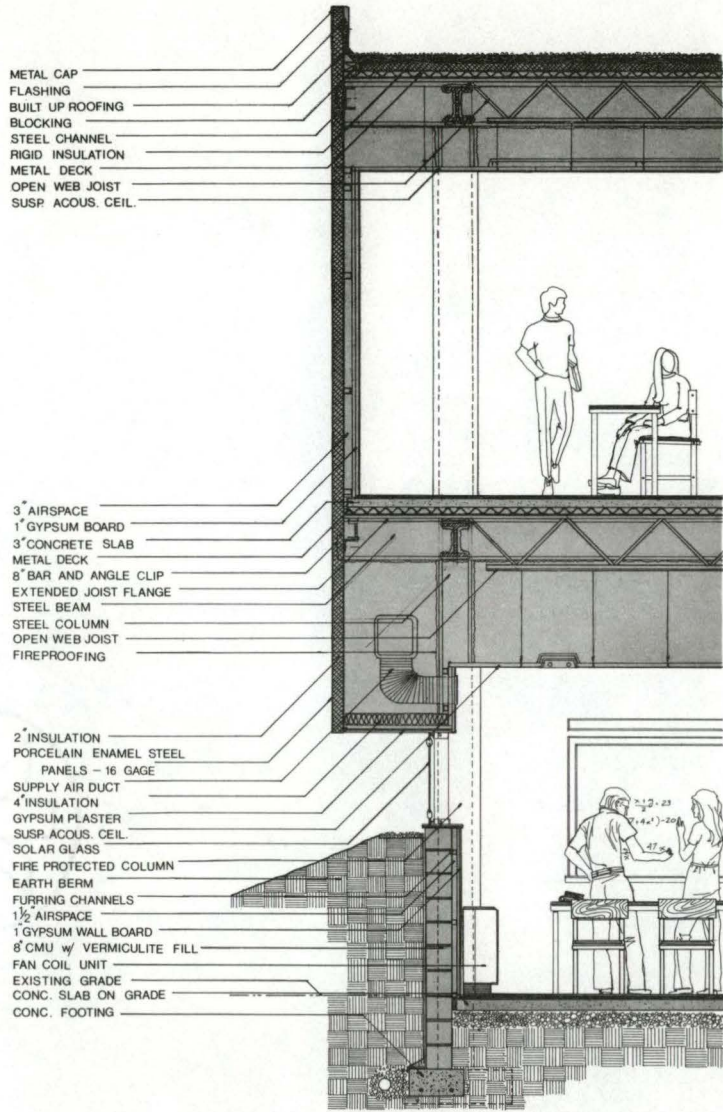




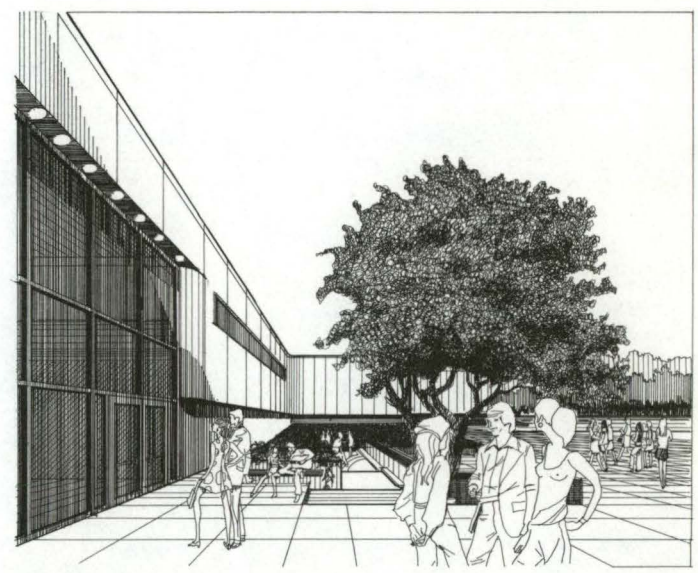
# MECHANICAL - STRUCTURAL







WALL SECTION

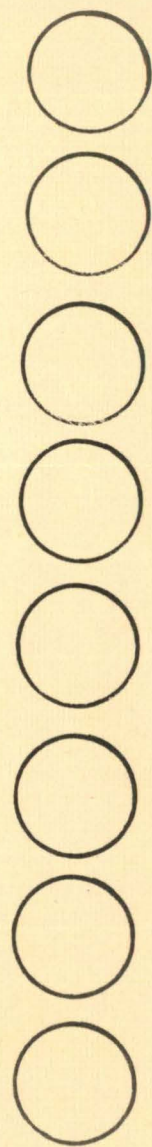


PERSPECTIVE

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<sup>1</sup>Educational Needs Study for the Central Midlands Region, Central Midlands Regional Planning Council, 1974, p. 16.

<sup>2</sup>"Information/1977-78: A Newcomer's Guide to Richland County School District One," p. 31.

<sup>3</sup>Propst, Robert. High School: The Process and the Place, Educational Facilities Laboratories, 1972, p. 21.

<sup>4</sup>Ibid.

<sup>5</sup>"Educational Specifications: Final Statement of Space Needs: St Andrews High School," Stanton Leggett and Associates, 1970, p. 2.

<sup>6</sup>Interiors, November 1969, p. 136-139.

<sup>7</sup>Coats: A Continuing Transportation Planning Program, S. C. State Highway Department and Central Midlands Regional Planning Council, 1973, p. 13.

<sup>8</sup>"Educational Specifications: Final Statement of Space Needs," p. 8.



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