

A CONSOLIDATED HIGH SCHOOL FOR LINNENBURG COUNTY, VIRGINIA

by

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The primary purpose of this thesis is to investigate and analyze the present conditions and trends that now exist in the present Kenbridge and Victoria High Schools in Lunenburg County. Also, to suggest ideas and improvements for the design and planning of future schools. The secondary purpose of this thesis is the design of a Consolidated County High School to be located between Kenbridge and Victoria and to be used by both communities.

The author feels that through the consolidation of the two existing high schools, students graduating from this school will be better prepared to meet the requirements of college life and business opportunities. With the consolidation of the two high schools, a chance for a wider variety of subjects, a closer teamwork between the two communities and a higher quality of instruction will be possible. In order to obtain the best results from the students, the best of facilities and a pleasant environment are necessary.

**ONE: BACKGROUND**

THE EDUCATIONAL SYSTEM IN LUNENBURG  
COUNTY

There are, at present, two high schools located within Lunenburg County. The first, located at Victoria, was constructed prior to 1922. It consists of two main buildings constructed of masonry, a third building of brick construction at present under contract plus numerous frame units which house the agriculture classrooms and home economics unit. The present high school enrollment reaches two hundred and forty-six pupils with 503 enrolled in the grade school. The high school enrollment has an increase of twenty-three pupils within the past five years. This increase has been rather consistent for the past fifteen years.

The second high school in the county is located in Kenbridge and was constructed in 1922. This high school is located seven miles southeast of Victoria. The school plant consists of one brick building, a frame agriculture workshop and a frame home economics cottage. There are one hundred and fifty-one students enrolled in the high school which is an increase of nine pupils within the past five years. The grade school has 386 students enrolled.

Two other schools are located within the county, but these schools are grade schools. Students finishing the seventh grade in the school at Lochleven attend the high school at Kenbridge, whereas the students at the Rehoboth grade school finish their high school studies at Victoria.

The curriculum in both high schools is approximately the same as that required by the Virginia State Board of Education, with a few exceptions, as would be expected in such small county high schools. In some cases, a subject that does not interest enough students to justify teaching it will not be taught; some other subject which has a larger enrollment will be offered instead. This procedure may prevent some students from acquiring credit for a subject which, although not necessary for graduation, is required for entrance to certain institutions of college level.

History, English and Mathematics are required for high school graduation. The average class in these two high schools consists of about twenty-seven pupils in these subjects. In subjects that are not required for graduation, this average drops to 12 - 15 students, and in some classes the enrollment drops down to as low as four students per class. This approximate situation exists in both schools.

Both schools have adequate cafeterias for the serving of hot meals to the students at noon time. The high school at Kenbridge serves between 380 - 400 meals per day. This number is for the entire high school and grade school. The Victoria High School serves approximately 350 meals to its entire student body.

Indoor athletic programs do not exist at either high school, since neither school possesses a building that can be used for a recreational program during inclement weather. During basketball season, both teams



use the Community Building in Victoria as their home basketball court. This situation, at times, gets rather involved especially when there are other local functions scheduled at the same time and place.

Kenbridge and Victoria are both located in the important bright leaf tobacco section of the state. As can be seen, the rural population will be quite large. This will mean that the larger percentage of the pupils depend upon school buses for their transportation to and from school. Approximately two-thirds of the students of the Victoria High School depend upon school buses for their transportation whereas in Kenbridge, one hundred and twenty students of the 157 students in the high school ride the school buses.

Due to the large number of pupils living in the country and depending upon buses for transportation to and from school, the school bus routes are rather long. The average length is about thirty miles for a round trip in each school. This means a trip of at least an hour and a half from the time the first pupil is picked up until the school is reached.

SURVEY AND APPRAISAL OF THE PRESENT  
FACILITIES

In the appraisal of the present facilities, each school will be discussed separately in order to show the existing disadvantages. All data and information were secured through interviews with the present principals of the respective schools.

Kenbridge High School has an auditorium that is in no way sufficient for its intended use. Its present capacity is between three hundred and fifty and four hundred seats. A balcony extends over one-third of the rear section of the lower seats, and could be used to increase the seating capacity of the auditorium, but at present is functioning as the library. The auditorium as arranged at present will not hold the entire student body (grade school and high school combined). The stage is small and very congested. A music room is off to one side and is not soundproofed. An additional music room entirely separated from the auditorium, is located on the second floor and is used for individual pupils who are interested in private lessons. There is no possible way to enlarge the size of the auditorium in order to increase its seating capacity. The proposed additions to this school would mean added enrollment, and at the same time would mean that there would be a larger group of students that could not be seated in the auditorium.

There are no facilities at all for any recreational program during inclement weather. The State Board of Education requires as much as one hour of each school day to be set aside for organized athletics. This is impossible in inclement weather without a gymnasium, therefore group study hall is held during the recreational period on days when the weather is not suitable for outdoor activities.

The Home Economics Cottage is a separate unit from the main school building. It is adequate during fair weather. In bad weather, rain-coats and wet weather gear are piled wherever there is room due to inadequate closet and storage space.

The original wooden floors and stairs of the main building still remain. In places, the stairways are now supported by additional timber posts to prevent their sagging under the weight of the students at the beginning and end of class periods.

Ventilation is sufficient - at times more fresh air is obtained than is required. Lighting during overcast days could be vastly improved in order to increase the mental alertness of the students.

The auditorium of the Victoria High School had an original capacity of 650 persons. This seating capacity was reduced to 450 seats by the partitioning off of a part of the rear of the auditorium for use as needed classroom space. This in no way reduced the effective seating capacity since those seats which were lost were "dead spots" acoustically. This auditorium, as in the case of the auditorium at

the Kenbridge High School, is not sufficient to handle any type of gathering that would be anywhere near the entire school enrollment.

As stated before, there is no gymnasium or any building belonging to the Victoria High School that can be used as a gymnasium. This means that no athletic program is available for organized athletics during inclement weather. Space is available for outdoor athletics during fair weather but unfortunately the school session includes the months from November through March, the most disagreeable with respect to weather.

## THE AUTHOR'S OPINION OF CONSOLIDATION

From the beginning, the trend toward the consolidation of schools has been motivated to obtain certain definite goals. These goals were and are: (1) better teachers, (2) larger and more varied curricula, (3) more modern equipment, (4) equalization of facilities between the poorer and richer districts, (5) better administration and supervision. The consolidation of schools is more fully justified in localities where the enrollment is smaller than in areas where, due to larger enrollments, facilities are already good. A discussion of the above factors follows:

(1) Teachers and instructors of superior qualities can only be attracted and acquired if offered the enticement of attractive salaries. It is a great deal more economical to hire one exceptional teacher for a subject and have this particular instructor teach all the classes that he or she is experienced and excels in, than to hire two or more less experienced teachers and have them teach two or more different classes at two different schools. The utilization of each instructor to his or her maximum teaching ability means an efficient instructional group.

(2) In some small high schools, some students cannot acquire credit for certain particular courses in which they are interested. Although these courses are not required for graduation from high school, they may be required for entrance into some colleges. This situation could be remedied through the consolidation of small high schools. A consolidated high school, with its larger classes, can offer a greater variety of courses than can a smaller school. Graduates of a high school which offers all subjects in the state curricula

are much better qualified for college work than are graduates from a school which is more limited in its scope.

(3) One modern well-equipped laboratory is more economical and requires fewer instructors than two laboratories would require. This represents a saving in personnel, making it possible to obtain a person of exceptional qualities. Equipment and supplies for a consolidated school would not have to be duplicated, and yet a more extensive and well rounded course could be presented.

(4) Students from country or county high schools should have available to them all the subjects that are presented in the city schools. The consolidation of the Kenbridge and Victoria High Schools into a single school would present opportunities such as can be obtained in the larger schools.

(5) This school, having only one age group of students, would permit better administration and supervision by the principal and the instructors.

Throughout this opinion, the author is trying to show the benefits of consolidation. Consolidation is for the future benefit of all students, not alone for the students who are planning to attend college, but also those whose formal education ends with their graduation from high school.

TWO: ANALYSIS

## THE SITE

In the selection of a site for the erection of a school which will serve a community to the utmost, various factors are important and must be given a great deal of thought. These, among many others, are, accessibility, environment, size, orientation, topography, and soil conditions.

A school should be located near the center of the present and probable future school population which it is to serve. One hours travel, a few minutes more or less either way, is considered a reasonable maximum for high school pupils.<sup>1</sup>

The site chosen for this proposed school was due to its location on the principal route between the two communities. It is readily accessible from either town and is located just off State Highway # 40 between Kenbridge and Victoria. The site is bounded on the north by the afore mentioned highway, on the west by a state secondary and on the south by the property line of the Virginia Railway. It is limited in expansion on these three sides but can be extended, if future needs require it, in an easterly direction. The present property lines enclose an area of approximately fifteen acres. The site is approximately five minutes on the school bus from Victoria and about eight and a half minutes from Kenbridge.

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(1) American School Buildings, Twenty-seventh Yearbook, American Association of School Administrators, National Education Association of the United States, Washington, D.C., 1949 pp 73.



The environment of every school should provide to the greatest possible degree (a) safe and healthful conditions for the pupils while on the school grounds, in the buildings and in the immediate neighborhood of the school, (b) freedom from disturbing noises, such as those caused by heavy truck, automobile, railway and airplane traffic, fire sirens and factory whistles, (c) freedom from obnoxious odors, and (d) surroundings pleasing to the eye, that will tend to create a feeling of pride, happiness and contentment.<sup>2</sup>

The size of any school site should be determined by the nature and function of the contemplated educational program. In some cases, due to the limited amount of land available for the construction of a school, the most agreeable conditions as to the space relationship and the educational program cannot be fully met. However, in this case, the land available is more than adequate. For high schools, of this type, the minimum size should be no less than ten acres plus an additional acre for each one hundred pupils enrolled.<sup>3</sup> The size of the site is quite ample as is shown in the overall site plan. The closest part of the school plant is set back one hundred and fifty feet from the main highway. This distance eliminates practically all the noise that would originate from the highway and with the classrooms on the south side of the building, the building itself is a buffer to any noise that would

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(2) *Supra* 1, pp 74.

(3) *Minimum Requirements and Standards for School Buildings in the State of Virginia*, Reprint of the Regulations of the State Board of Education of the State of Virginia. pp 5.

tend to distract the pupils in the classrooms. An even greater distance separates the classrooms from the Virginian Railway that passes through a cut at the rear of the school property. With the help of properly planted shade trees, a very pleasant and cheerful environment can be achieved.

In placing the building on the site, great care had to be exercised to prevent the distances from the building to the various roadways from becoming too great. Sounds of vehicular traffic might be reduced by this means, but if too much distance is taken, an uneconomical use of land area will result.

The site slopes to the south at sufficient gradient to carry surface water away from the building. The soil of a school area should be porous enough to absorb water which does not run off, according to recognized authorities.

The natural slope of the site permits the building as designed to be constructed with a minimum of excavation. The only excavated areas necessary, other than those for footings and foundation walls, would be the small basement area under the south part of the auditorium to be used as the boiler and storage room, and an area for the storage room beneath the kitchen of the cafeteria.

There are no water or sewerage systems from either of the two towns adjacent to the site. The needs of this school would be cared for by the sinking of a well and the construction of septic tanks and drainage

fields. Electric power is easily accessible, as the power lines from the sub-station in Victoria pass near the site boundaries.

The junction of Secondary Highway # 635 with the main highway defines the north-west corner of the site. From these roads, connecting driveways to the school have been kept few and short, to minimize traffic difficulties. Two-lane drives leading directly to the main point of discharge, and connecting with or ending in a parking lot, are usually the best solution for passenger drives.<sup>4</sup>

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(4) Supra (1) pp. 77

ANALYSIS OF ILLUMINATION

The principal aim of school illumination is to produce the conditions under which the visual tasks of the school day can be performed efficiently, in comfort, and with the least output of strain and effort.<sup>5</sup> Students should not use their physical energy and vitality to overcome the handicaps of defective lighting. As a result, school lighting today must satisfy the human being. The modern conception of lighting design is that of creating what is known as a "luminous environment".<sup>6</sup> This environment furnishes optimum visual conditions and in addition affords bright, cheerful surroundings which are beneficial both physiologically and psychologically.

Two things must be remembered in achieving this "luminous environment". First, the quality of artificial light is limited by economic factors. Vision will continue to improve up to daylight values, if the quality of light is properly controlled, and second, a simple criterion for high quality lighting is that the helios ratio (brightness contrast) of surfaces within the normal field of view shall not exceed a ratio of three to one.<sup>7</sup> Provided this three to one ratio is maintained, a splendid, luminous environment will result. However, it cannot be over emphasized that "improved lighting"

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(5) Lighting Design, Parry Moon and D. E. Spencer, Addison-Wesley Press, Cambridge, Mass., 1948

(6) Supra 5

(7) "A Simple Criterion for Quality in Lighting", Parry Moon and D. E. Spencer, Illuminating Engineer, 1942, pp 325.

does not merely consist of stepping up the intensity of the light. No less important are the elimination of glare, the brightness contrast between bright and dark surfaces, and other essential adjustments. Adding more foot-candles without taking these other points into consideration may actually bring discomfort rather than comfort.

The reflective factors of large areas within any specific room have a great deal to do with controlling the helios ratio. These reflective factors can be controlled by the selection of the proper colors and textures, so that the highest reflection factor is no more than three times the lowest factor.

Recommended reflection factors for surfaces in school buildings as established by the American Standard Practice for Lighting Schools are given in the following table:

RECOMMENDED REFLECTION FACTORS

a. Ceilings. . . . .	80 to 85%
b. Walls . . . . .	50 to 70%
c. Trim. . . . .	30 to 40%
d. Tackboards. . . . .	50 to 60%
e. Chalkboards . . . . .	15 to 20%
f. Desk Tops . . . . .	35 to 50%
g. Floors . . . . .	15 to 30%

Lighting is more complex than many people realize. Light that is

sufficient in one area for one type of job will be insufficient in another area for a different job. In the past, there has been a tendency to consider only one factor - the strength or intensity of light. Light intensity alone does not necessarily improve eye comfort and lessen eye strain, unless the quality of the light is good. Quality depends on the location of the light and the environment or surroundings of the light, including color, brightness, and reflection factors of the ceilings, walls, floors and furniture.

Each different element in a building varies as to the quality of light that is required. The illumination system should not depend upon daylight to augment the electric lighting. For this reason, school officials are especially interested in the amount of artificial light that is provided to the individual classrooms.

"School lighting is much more than glass area and wattage. It is fundamentally a matter of brightness balance of natural and artificial light sources and reflecting surfaces within the total visual environment. Although the eye adjusts readily to the environment, it cannot adjust to excessive brightness differences which exist simultaneously within the visual field. Such conditions result in eye strain and lowered efficiency. Brightness differences can be reduced by shielding the lamp, seating the pupils so that they do not face the windows, repainting with pastel paints, using lighter furniture and chalkboards and increasing the light intensity."<sup>8</sup>

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(1) "Lighting Schoolrooms", Ray L. Hamon, Chief, School Housing, Division of School Administration, U.S. Department of Education, U. S. Printing Office, Washington, D. C.

Terms Used in Lighting

- LIGHT -- radiant energy necessary to the visual process.
- LUMEN -- a unit of output of a light source.
- FOOT CANDLE -- a unit of light intensity at a given point.
- FOOT LAMBERT -- a unit of brightness of a reflecting surface or of a light source.
- CANDLEPOWER -- measure of light intensity from a point source.
- LUMINAIRE -- lighting unit or fixture including lamps.
- WATT -- a unit of electrical energy consumed by a lamp.
- GLARE -- unwanted brightness, or a brightness difference beyond the comfort tolerance.
- REFLECTION FACTOR -- the percent of light falling on a surface which is reflected by that surface.
- BRIGHTNESS -- luminous intensity created either by direct transmission of light from its source or by the reflection of light from a source.
- BRIGHTNESS DIFFERENCE -- the difference in brightness among the various reflecting surfaces and light sources within the total visual field. Both brightness and brightness difference are measured in foot lamberts.

There are five general reasons as time passes why a given lighting system may be less efficient than it was originally designed. These reasons are dirty luminaires, darkened walls and ceilings, natural reduction in the efficiency of the lamps, unobserved burnouts and under-voltage burning of lamps. For these reasons, specific lighting intensities are recommended for the best results in various and different areas.<sup>9</sup>

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(9) Illuminating Engineering, Eugene W. Schilling, International Textbook Co., Scranton, Pennsylvania 1940 pp 147

Lighting Intensities Recommended by the Illuminating  
Engineering Society

AREAS	FOOTCANDLES
Classrooms and Libraries	30
Auditoriums, cafeterias, and rooms not used for study	10
Reception rooms, locker rooms, wash rooms, stairways, etc.	10
Corridors and storerooms	5

Questions arise as to the relative merits of incandescent light bulbs and fluorescent light tubes. Incandescent lamps and the fixtures for them are less expensive than other types. The lamps have an average life of about 1,000 hours which is not affected by the number of times the light is turned on and off. They start instantaneously and burn without sound.

On the other hand, incandescent lamps have excessively high spot brightness and even in diffusing globes are too bright for general classroom lighting. They give off considerable heat which can become a problem when high levels of illumination are maintained.

Fluorescent lamps have an advantage over incandescent lamps in that they give off at least twice the amount of light for the same amount of current. The life of fluorescent lamps depends a large part on the number of times they are turned on and off. With the average burning time of three hours per start, the average rated life of fluorescent tubes is about 2,500 hours.

The fixtures for fluorescent lamps are more costly and complicated than those for incandescent lamps. Auxiliary equipment, such as



starters and a ballast, are necessary. These accessories, as well as the difficulty of cleaning, complicate the maintenance problem. A fluorescent tube is larger than an incandescent lamp bulb of the same wattage and therefore gives considerably less spot brightness.

When costs of installation and current are compared, fluorescent lighting cost more to install but requires less current to operate than incandescent lighting. Taking all the above mentioned facts into consideration, the luminaires selected for use in the school plant, with exception of the gymnasium, will be the troffer type, fluorescent fixtures mounted flush with the suspended ceiling. Incandescent lamp fixtures will be used in the gymnasium.

ANALYSIS OF HEATING AND VENTILATING  
AND MECHANICAL EQUIPMENT

1. Heating and Ventilating

Complete heating and ventilating design for this school has not been attempted. This section of the thesis is related only to the possible systems that could be used.

Some of the major purposes of the heating and ventilating systems are: (a) the supplying of heat to balance the loss from the human body through radiation, conduction, and evaporation, and to balance the losses of heat from the room through the exterior walls of the building; (b) the dilution and removal of unpleasant body odors, and in some cases, direct removal of unpleasant gases, fumes and dust; (c) the prevention of rapid temperature fluctuations beyond or even within the total acceptable ranges; and (d) adequate diffusion of heat without excessive stratification or excessive drafts.

The climate of this section of the country does not warrant the complete air conditioning of a school building. At least three air changes per hour should be provided in all classrooms and libraries.<sup>10</sup> The necessary air changes will be provided in this case by means of projected windows used throughout the building.

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(10) Supra (3) pp 12

Air movement and humidity are factors of extreme importance for the comfort of the occupants of a room.

The classrooms and most of the other rooms in the proposed building receive cross-ventilation from the exterior corridor, through ventilating windows above the lockers along the corridors. The seated pupils will not be subjected to direct drafts, as all air currents will pass above them.

The toilets are so located that they are easily ventilated without resorting to mechanical means of ventilation. Mechanical exhaust fans providing three air changes per hour will be installed in such areas as the cafeteria kitchen.<sup>11</sup>

The most desirable system for heating this school plant would be a system using radiant heating coils located in the concrete floor slab. This type of design was decided upon because all the heating mechanism would be concealed in the concrete floor slabs. It would provide the necessary amount of heat to the classrooms and to the flanking exterior corridor without the use of built-in or projecting radiators. Steam boilers would be used to heat the water for the system through the use of heat exchangers. The entire school plant would use this type of heating with the exception of the large areas in the gymnasium where unit heaters would be used.

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(11) Supra (3) pp 13

2. Electrical Equipment

In addition to being used for general lighting within the school, electricity will be used for motion picture projectors, an inter-communication system between the administrative office and the individual classrooms, electric clocks and various motors used in the laboratories and boiler room. Conduits will be placed in the flooring system during the construction of the building.

## ANALYSIS OF DESIGN

### General Plan

The basic shape of the building was derived from a careful study of space requirements, the facilities required in order that the school might function with the highest possible degree of efficiency, and the relationship of the various parts of the building to one another. The shape of the site, and its relationship to the highways which serve the school were also taken into consideration. With these factors in mind, various departments which go together to make the school function properly, have specific locations within the school building. Without taking into consideration the requirements of light, circulation, orientation and accessibility of one part to another, the building would not perform the task for which it was designed.

The auditorium and the main entrance lobby were so located as to be the center of the circulation system. From the main entrance lobby, all parts of the building can easily be reached with a minimum of confusion. The necessary toilets, rest rooms, cloak room and ticket booth are all conveniently located near the auditorium. These rooms make the auditorium a potentially independent element for functions outside the regular school activities.

The administrative element and the library are placed at one end of the school plant, are easily reached by the public through a separate entrance, and, at the same time, are placed away from the noisier elements—the student parking lot, the cafeteria, and the gymnasium, located at the

other end of the building. The library and administrative wing, and the wing containing the cafeteria were placed at right angles to the main line of classrooms to improve circulation and avoid monotony of plan. Through this device the cafeteria wing also serves as a connecting link to the gymnasium.

#### Classrooms, General

The primary thought behind the location and arrangement of the classrooms was threefold; first, a pleasant orientation; second, privacy from outside traffic; and third, easy accessibility to all parts of the school plant.

The number of non-special classrooms was computed by the use of the following formula:<sup>12</sup>

$$\text{Number of classrooms required} = \frac{\text{Enrollment}}{10} + 20$$

No. of Daily recitation periods

For a contemplated enrollment of five hundred pupils, at least eleven classrooms of the non-specialized type will thus be required.

Classrooms were planned with the convenience of the students in mind. The main classrooms were located on the south-east side of the school, since a proper orientation for classrooms suggests that an east exposure is preferred, a west exposure next preferred, with a southern exposure permissible.<sup>13</sup> The orientation selected affords a pleasant view

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(12) Time Saver Standards, Architectural Record Book, pp 343  
(13) Supra (12) pp 343

and, at the same time, isolation from the sound of vehicular traffic. The corridor, which serves these rooms is given a northern exposure and acts as a buffer between the classrooms and roadway noises. The square plan for the classrooms, chosen for economy of construction, provides a variety of seating arrangements. Individual built-in lockers plus required classroom storage space separate the classroom from its flanking corridor. Ventilating windows placed above the storage areas and built-in lockers provide cross-ventilation to the corridor. The classroom entry and door are recessed to allow the door to open outward toward the corridor without restricting its flow of circulation. Classrooms on both floors are able to borrow some light, through the ventilating windows above the storage space, although the light furnished by the windows is in excess of that stipulated by code. The upper third of each window is of heat-absorbent glass and projects outward for ventilating purposes. A lower section of the window opens into the classroom and deflects the air currents over the heads of the seated pupils. The middle portions of the windows are fixed. Additional means of cutting down glare from the sun's rays within each classroom is provided by roller-type shades installed above the window spaces.

Tabulated below are the required floor areas, relationships between glass area and floor area, and square feet of floor area for each pupil:

Minimum size of classroom<sup>14</sup> . . . . . 616 square feet

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(14) Supra (3) pp 10

Actual size of classroom. . . . .	625 square feet
Glass Area Required <sup>15</sup> . . . . .	25% of floor area or 156 sq. ft.
Glass Area Provided, not including the additional glass area above the built-in lockers . . . . .	235 square feet
Minimum allowable square feet of floor space <sup>16</sup> . . . . . (per pupil)	16.5 sq. ft.

Square Feet of floor area provided for:

25 pupils. . . . .	25.0 sq. ft.
30 pupils. . . . .	20.8 sq. ft.
35 pupils. . . . .	17.8 sq. ft.

Floors in each classroom are finished with asphalt tile. A sound absorbent acoustical material will be used on all surfaces of the front and rear walls not otherwise used as chalkboard or tackboard areas.

A cool, receding color will be used in the classrooms to make the rooms appear large, and this is also suitable for rooms with a southern exposure. Chalkboards will be green in color, whereas the tackboards will be a neutral color spattered with deep color in order to camouflage the thumbtack holes and prevent the appearance of old worn-out tackboards, while the building is still comparatively new.

The audio-visual room, is not planned for use as a general classroom. It is provided with some window area, but not the minimum required for a general classroom. In keeping with its intended use, the showing of lantern

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(15) Supra (3) PP 10  
(16) Supra (11) PP 343



slides and small group showings of educational films, it will be lighted artificially, having only that window area dictated by ventilation requirements.

#### Home Economics Unit

The Home Economics Unit is designed as an integral part of the school plant. It consists of a lecture and demonstration room, an office for the instructor, storage space for the student projects and materials, and the Home Economics Apartment. It is situated at the east end of the school plant on the second floor, immediately above the library and the administrative unit.

One of its functions is to instruct and impress the students in improvements in modern home design, furnishings and utilities. To further that end, it has been planned as a living unit containing a large living room, dining area, kitchen, two bed rooms, bath and storage areas. Its fenestration conforms to that of the rest of the building, it not having been felt necessary to provide window treatment common to domestic units. All areas are well lighted, and have access to direct outside ventilation, except for the kitchen area which will be ventilated by an exhaust fan through the roof operated during student projects and demonstrations.

#### The Auditorium and Adjacent Units

The Auditorium is planned to serve two functions, that of the school and its activities, and of the community as a place of assemblage. At the present time, there is no assembly hall within the county that can seat an audience or gathering of six hundred people. The largest local

theater has a capacity of only 450-485 people, whereas none of the local churches can approach this figure.

The auditorium is centrally located for the convenience of the school activities, yet immediately served by a spacious entrance lobby thus facilitating the use of the auditorium by the public for activities outside of regular school hours. With its surrounding elements, the music practice rooms, the projection room on the second floor, the auditorium, can be used independently when the need arises. The auditorium was designed to seat six hundred persons. Allowing approximately seven square feet per person,<sup>17</sup> it has an overall area of 4,392 square feet. There are twenty-two rows of seats on either side of the middle aisle with no more than fourteen seats per row.<sup>18</sup> Small side aisles augment circulation within the area when used to full capacity.

Two dressing rooms are located next to the auditorium stage, one dressing room on either side. Both dressing rooms have access to the stage and direct access to the outside of the building. The music practice rooms are both located to the right of the auditorium stage, and are easily reached either from the auditorium or from the exterior of the building. The basement is served by a stairway at the right of the stage, which at the same time, provides easy access to the stage from the rear of the building. A general storage room, located on the basement level is easily reached from the stage by means of the stairway.

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(17) Time Saver Standards, An Architectural Record Book, F. W. Dodge Corporation, New York, New York 1946 pp 256

(18) Supra (17) pp 256

### The Administrative Unit

The Principal's office, his secretary and record files, a waiting room, the conference and guidance room, and the library, are all located at one end of the school plant and grouped together for efficiency. With these units together, all matters pertaining to the administration of the school are much more easily handled. Visitors to the school on matters of business are able to reach the administrative section without having to pass through the entire school. It is easily accessible either from the front or from the rear, two entrances being provided for that purpose. Its location, at one end of the school plant, effectively insulates it from the noisier sections of the school plant.

### The Library

The library is located next to the Administrative unit for approximately the same reasons which dictated the placing of the administrative unit. It is placed at one end of the building so that it may be in as quiet an area as possible. It is on the opposite side of the building from the athletic field and is easily accessible to the general public. It may be reached from either the front or the rear of the building, and is easily reached by pupils from all classrooms. The library unit consists of a librarian's office and waiting room, a library work room for the maintenance and up-keep of the books within the library, stack space and reading rooms. The library is separated from the work area and the librarian's office by glazed partitions. This insures both control and efficiency. The library is large enough to handle 15% of the enrollment

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at twenty-five square feet of area per person.<sup>19</sup> The workroom is provided with sinks and running water, and ample shelving for maintenance materials. Flooring will be of cork tile; the walls and ceilings will be treated with acoustical materials, having a high degree of sound absorption.

### Laboratories

Two laboratories are located on the second floor apart from the regular classrooms. Each laboratory is fifty percent larger than the regular size classroom, and provided with the necessary sinks, running water, and electrical connections. Each laboratory has a floor area of approximately 940 square feet, which is more than adequate for the required 20 square feet per person for a class of 30-35 students.<sup>20</sup> An instructor's office is adjacent to each laboratory and is fitted with glazed partitions. A storage and experiment preparation room is also provided adjacent to each laboratory, for the preparation of illustrative experiments. The instructor's office, and the storage and preparation room each, contains an area of 156 square feet.<sup>21</sup> Chalkboard and tackboard space is provided as required. Storage closets and necessary library book shelves similar to those furnished in the regular classrooms are provided.

### Commercial Classrooms

Two commercial classrooms are provided on the second floor above the

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(19) Supra (3) pp 17  
(20) Supra (19) pp 18  
(21) Supra (19) pp 18

cafeteria unit. One room is to be used for the typing classroom, and the other room for classes in dictation and shorthand. These rooms are separated from the corridor by glazed partitions so that light from two sources is available. Partitions between the two rooms are glazed, as are the partitions separating the classroom and the instructor's office. This is to insure efficiency and control from the instructor's office during practice periods. Chalkboard and tackboard space is provided in the room used for shorthand and dictation, but not in the classroom used for typing classes.

#### Cafeteria

Due to the location of the school, it would hardly be suitable or convenient for the students and faculty to leave school at noon time. A cafeteria has, therefore, been provided and located apart from the classrooms on the first floor, yet within the school plant. It is directly accessible either from the gymnasium or the outside area. For the convenience of the students who wish to wash before eating, a space is set aside at one side of the cafeteria entrance, and separated from it by "shoulder-high" partitions, and equipped with wash basins. A cheerful atmosphere within the cafeteria is insured by the use of glazed partitions, separating it from the well-lighted corridor on one side, and by large windows on the other. Asphalt tile flooring will be used for ease in cleaning.

A well-equipped kitchen area is located at the rear of the cafeteria. Students are fed cafeteria style by means of counters built-in between the

cafeteria and the kitchen. Lockers and separate toilets are provided for the kitchen help, and all employees enter the kitchen through the locker room where their uniforms are kept. Adequate storage space for supplies used in the preparation of meals is provided in the basement area beneath the kitchen area. A small walk-in cold storage room is provided for perishable foods on the kitchen floor, and is easily reached from the kitchen area. The cafeteria is well lighted, yet shielded from the direct rays of the sun by the covered walkway which extends along the side of the exterior window wall.

#### Art Instruction Room

This room was so located and planned as to receive as much of the desired north light as possible. With its location over the cafeteria wing, it will receive the north light from the front of the building, and light from the west. Storage cabinets for drawing boards and supplies of the students are built-in as an integral part of the room. Wash sinks are also included in the room as part of the standard fixtures for the convenience of the students. A small office for the instructor is adjacent to the instruction room, and is separated by glazed partitions. An exhibition area is available for the exhibition of student projects in the second floor lobby. The main entrance lobby on the first floor may also be used for exhibition purposes.<sup>22</sup> Movable partitions will be provided within the art room to serve as separations between its various activities.

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(22) Supra (3) pp 19

Toilets

The toilets are arranged on each floor to take advantage of economies involved in the grouping of plumbing fixtures. However, with the idea of economy in mind, the entrances to the toilets of opposite sexes are so arranged as to prevent any type of "police problem". Each toilet is provided with an ante-room or lounge. Rest rooms are provided for the female teachers.

The following ratios have been adhered to as accepted standards of good practice. "For pupils rest rooms and toilets, the following ratios of fixtures to the pupils enrolled will be observed:"<sup>23</sup>

Wash Basins

Girls	one for every 90 girls
Boys	one for every 90 boys

Water Closets

Girls	one for every 45 girls
Boys	one for every 60 boys

Urinals

One for every 35 boys

Toilets will be provided with floors of terrazzo with a non-slip

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(23) Supra (3) pp 14,15

finish. Provision will be made for at least one floor drain in each toilet, to carry off water used in cleaning floors. Toilet stall partitions will be of a type and material easily cleaned of pencil marks, and will be suspended from the ceiling to facilitate room maintenance.

#### Parking Areas and Traffic

The parking areas and driveways are so planned as to provide parking easily accessible to the buildings served. The driveways are so situated on the site that students need not cross any roadway in their normal schedule of classes. Access to and from classes and the athletic fields are free of any vehicular traffic. Parking areas are provided for school buses and for students, and are separate from those used by the teaching staff and visitors. Direct access to the gymnasium from parking areas is available for the convenience of visiting teams. Additional parking along the sides of roadways can be utilized by the public attending school athletic events.

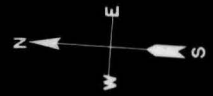
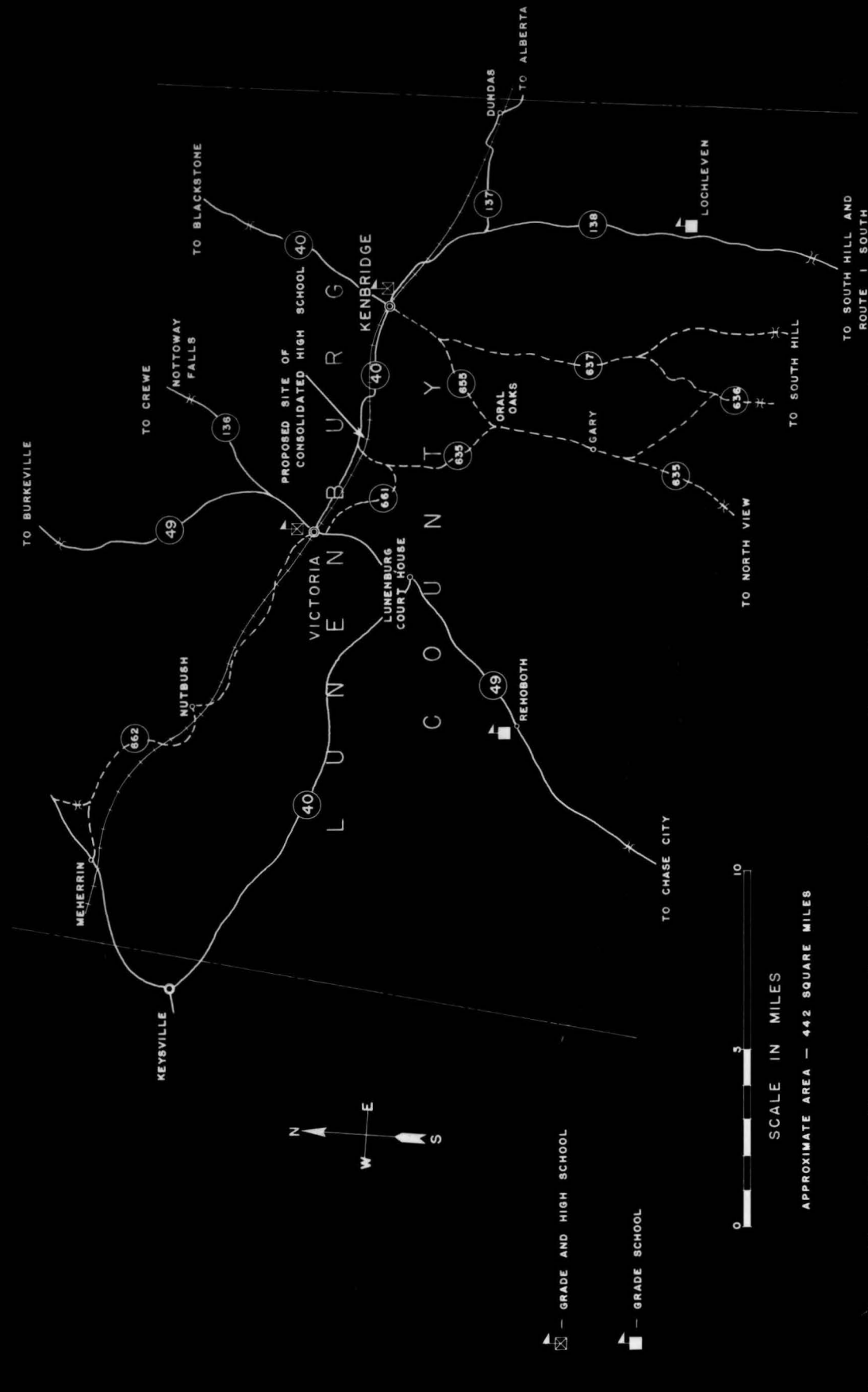
#### Agriculture Shop Building

The detailed planning of this unit has not been included with the school plant, although a location for this building has been suggested in the overall plot plan. It is felt that the existing buildings and facilities present in the two communities can suffice in the matter of farm implement repair and manual training of outside classes. The actual instruction of the agriculture educational curriculum, now taught in the high schools can be held in the regular classrooms that will be provided in the agriculture shop building. This building will be planned in



conjunction with the vocational agriculture curriculum with regards to the prescribed lecture courses and laboratory sessions. These classrooms will be designed to function with the normal school curriculum and will be available for easy access to the vocational agriculture laboratory equipment.

**THREE: DESIGN  
ILLUSTRATIONS**



SCALE IN MILES

APPROXIMATE AREA — 442 SQUARE MILES

— X — GRADE AND HIGH SCHOOL

— ■ — GRADE SCHOOL

LUNENBURG COUNTY  
 LOCATION OF SCHOOLS AND PRINCIPAL HIGHWAY ROUTES —



THE SCHOOL — VIEWED FROM THE NORTH - WEST

VIRGINIAN R. R. RIGHT-OF WAY LINE

FUTURE ADDITIONAL BLEACHERS (TEMPORARY)

PERMANENT BLEACHERS

AVAILABLE SITE FOR TENNIS COURTS

FUTURE AGRICULTURE SHOP BUILDING

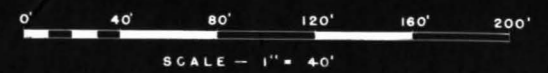
SCHOOL BUS AND STUDENT PARKING

ADMINISTRATIVE PARKING

ROUTE 635 - TO ORAL OAKS (ASPHALT)

PROPOSED SITE DEVELOPMENT FOR A CONSOLIDATED HIGH SCHOOL LUNENBURG COUNTY, VIRGINIA

EXISTING BUILDINGS



APPROXIMATE SITE AREA - 15.5 ACRES



PROPERTY LINE

90

95

100

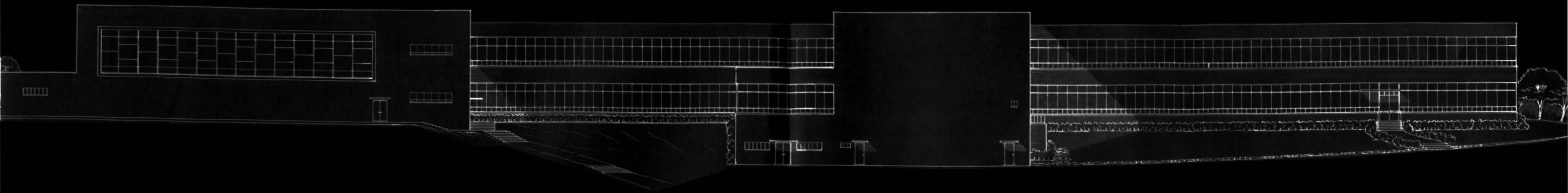
105

90 95 100 105

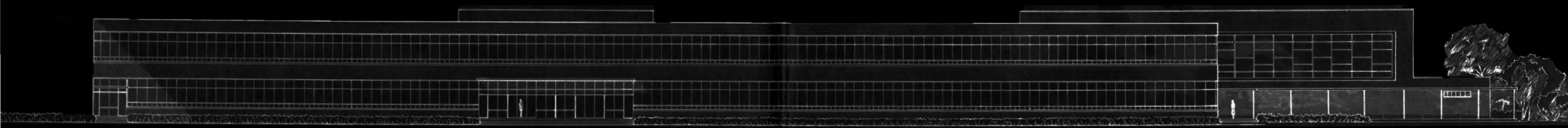
← KENBRIDGE - 4.52 MILES

VIRGINIA PRIMARY HIGHWAY (40) (CONCRETE)

VICTORIA - 2.48 MILES →

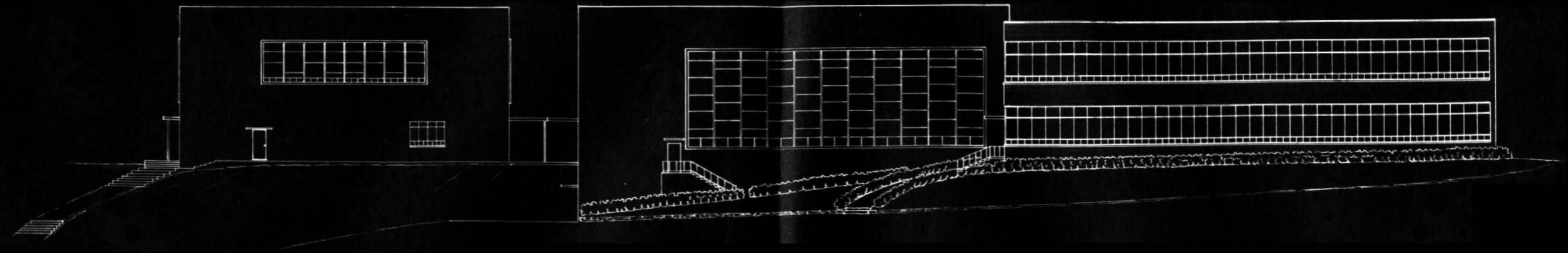


SOUTH ELEVATION (REAR)

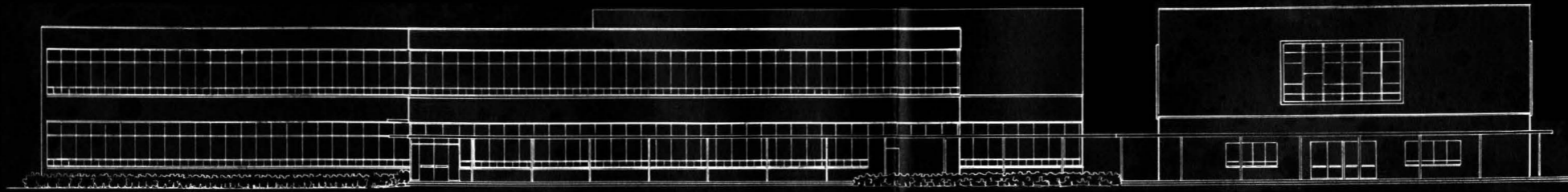


NORTH ELEVATION (FRONT)

0' 25'  
SCALE - 1/16" = 1'-0"

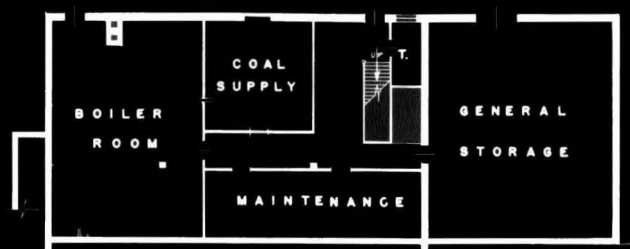


EAST ELEVATION



WEST ELEVATION

0' 25'  
SCALE - 1/16" = 1'-0"



BASEMENT FLOOR PLAN

0' 25' 30'

SCALE - 1/16" = 1'-0"



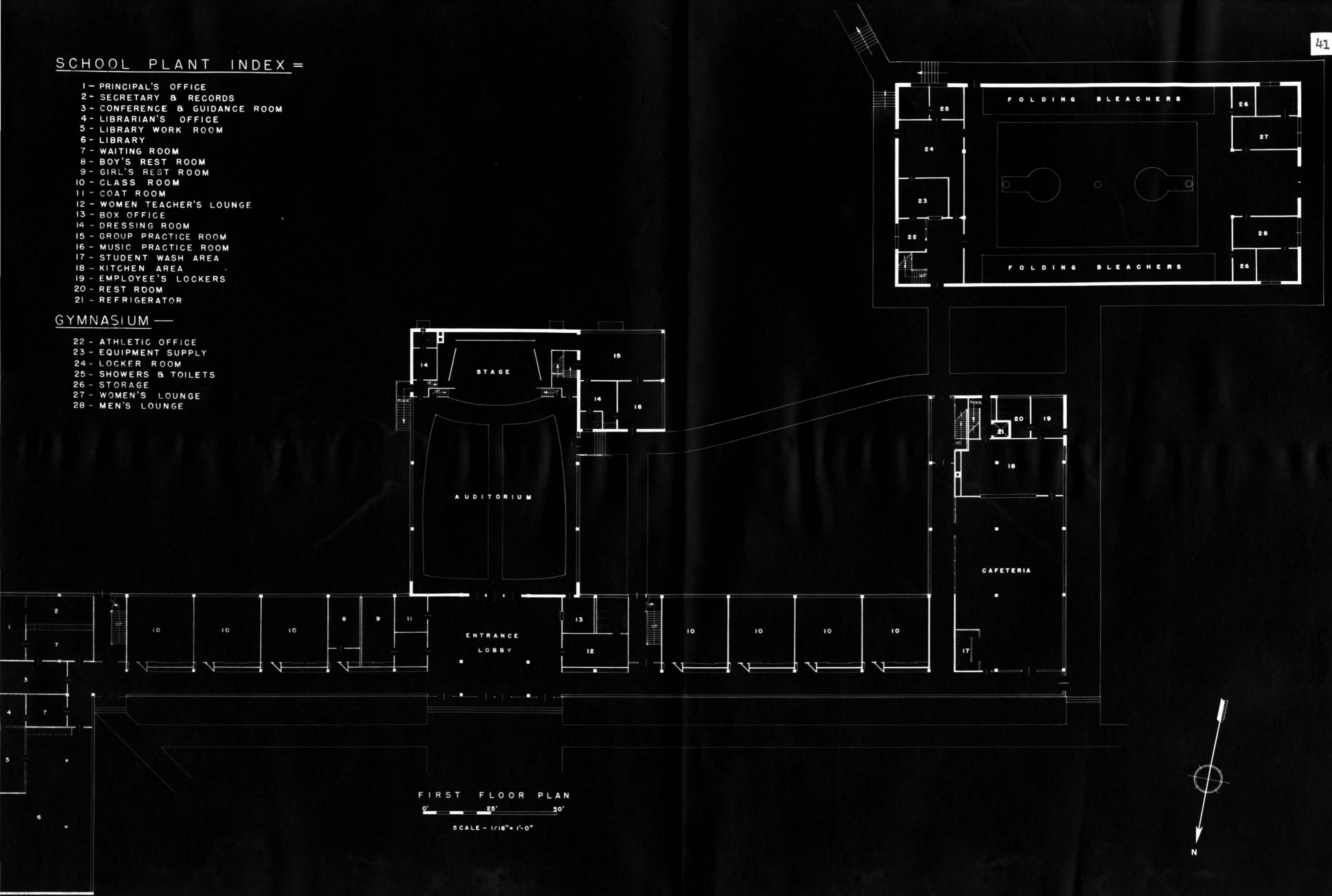


SCHOOL PLANT INDEX =

- 1 - PRINCIPAL'S OFFICE
- 2 - SECRETARY & RECORDS
- 3 - CONFERENCE & GUIDANCE ROOM
- 4 - LIBRARIAN'S OFFICE
- 5 - LIBRARY WORK ROOM
- 6 - LIBRARY
- 7 - WAITING ROOM
- 8 - BOY'S REST ROOM
- 9 - GIRL'S REST ROOM
- 10 - CLASS ROOM
- 11 - COAT ROOM
- 12 - WOMEN TEACHER'S LOUNGE
- 13 - BOX OFFICE
- 14 - DRESSING ROOM
- 15 - GROUP PRACTICE ROOM
- 16 - MUSIC PRACTICE ROOM
- 17 - STUDENT WASH AREA
- 18 - KITCHEN AREA
- 19 - EMPLOYEE'S LOCKERS
- 20 - REST ROOM
- 21 - REFRIGERATOR

GYMNASIUM —

- 22 - ATHLETIC OFFICE
- 23 - EQUIPMENT SUPPLY
- 24 - LOCKER ROOM
- 25 - SHOWERS & TOILETS
- 26 - STORAGE
- 27 - WOMEN'S LOUNGE
- 28 - MEN'S LOUNGE



FIRST FLOOR PLAN  
 0' 25' 30'  
 SCALE - 1/16" = 1'-0"



SCHOOL PLANT INDEX =

- 1- HOME ECONOMICS OFFICE
- 2- KITCHEN
- 3- DINING AREA
- 4- LIVING AREA
- 5- BED ROOM
- 6- BATH
- 7- WAITING ROOM
- 8- BOY'S REST ROOM
- 9- GIRL'S REST ROOM
- 10- CLASS ROOM
- 11- AUDIO-VISUAL ROOM
- 12- PROJECTION & FILM ROOM
- 13- STORAGE
- 14- INSTRUCTOR'S OFFICE
- 15- PREPARATION & STORAGE
- 16- LABORATORY
- 17- ART STUDIO
- 18- SHORTHAND & DICTATION ROOM
- 19- TYPING ROOM

HOME ECONOMICS APARTMENT

GYMNASIUM —

- 20- FIRST AID ROOM
- 21- STORAGE
- 22- LOCKERS (GIRLS)
- 23- LOCKER ROOM
- 24- SHOWERS & TOILETS

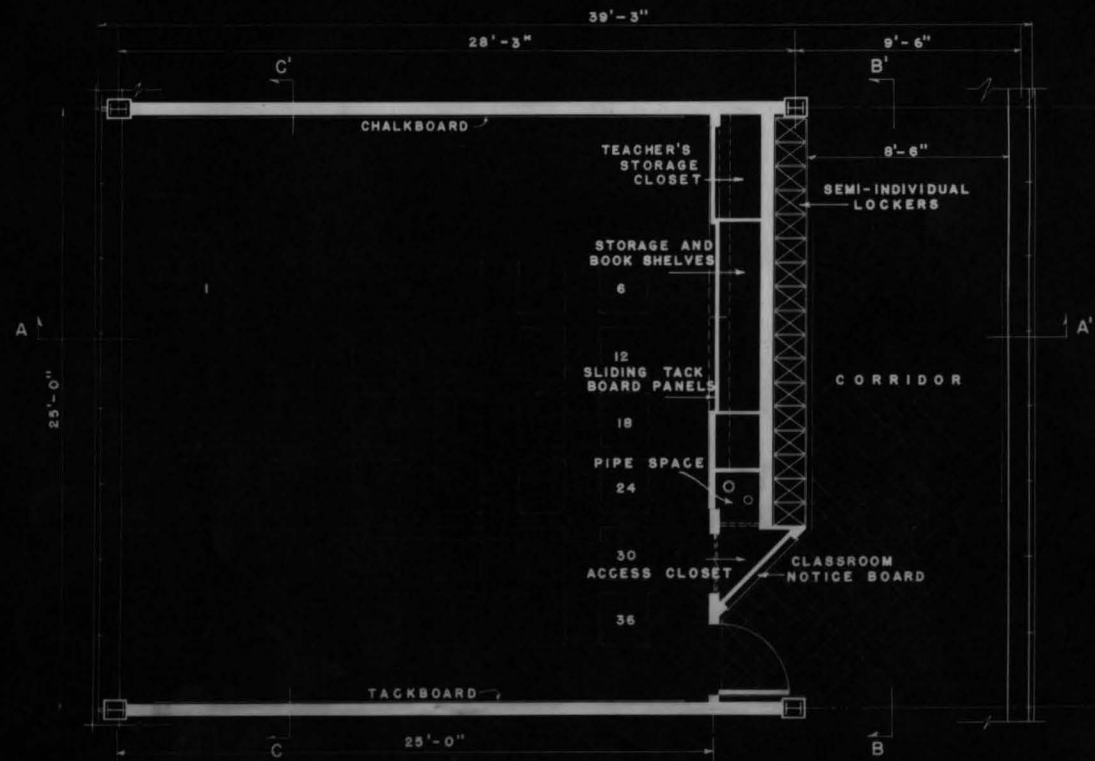
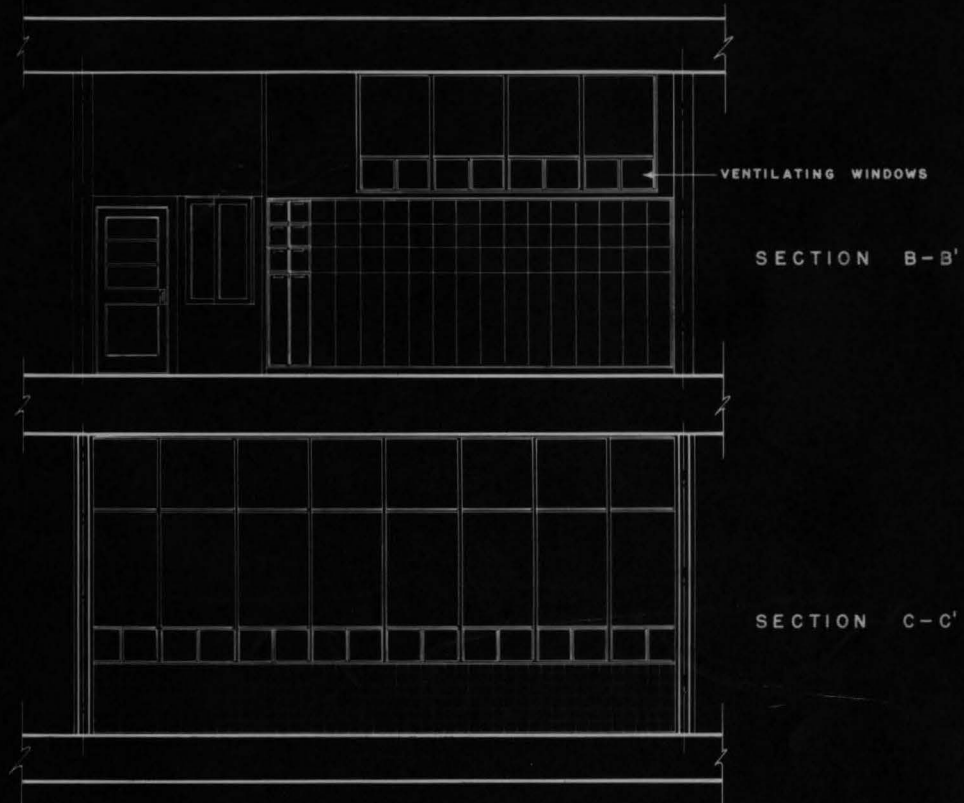


SECOND FLOOR PLAN

0 25' 50'

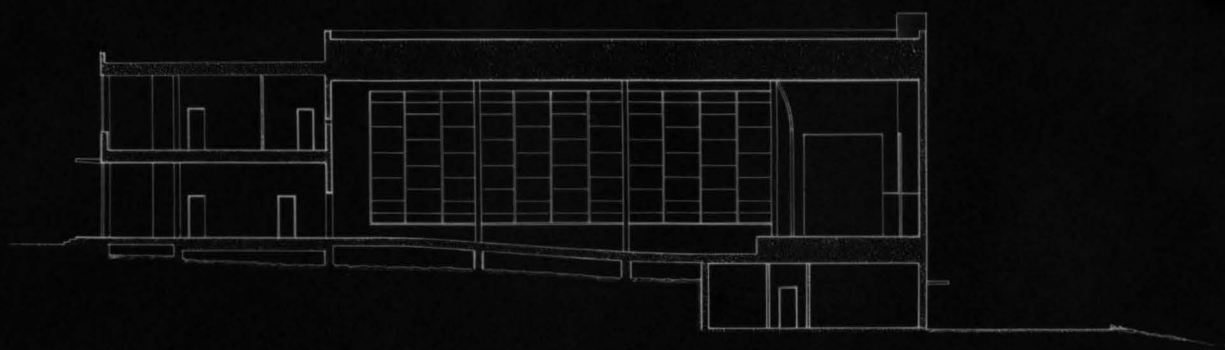
SCALE - 1/16" = 1'-0"





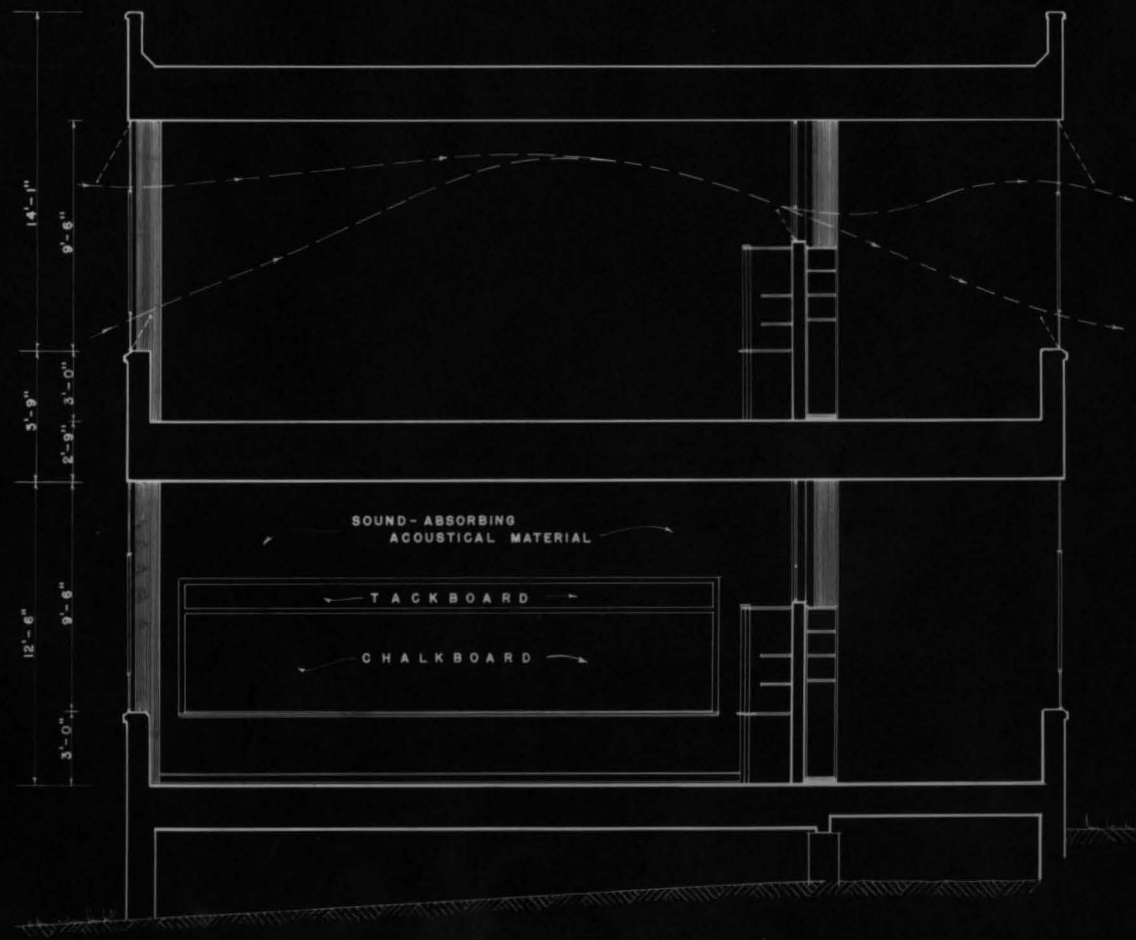
TYPICAL CLASSROOM PLAN

SCALE - 1/4" = 1'-0"



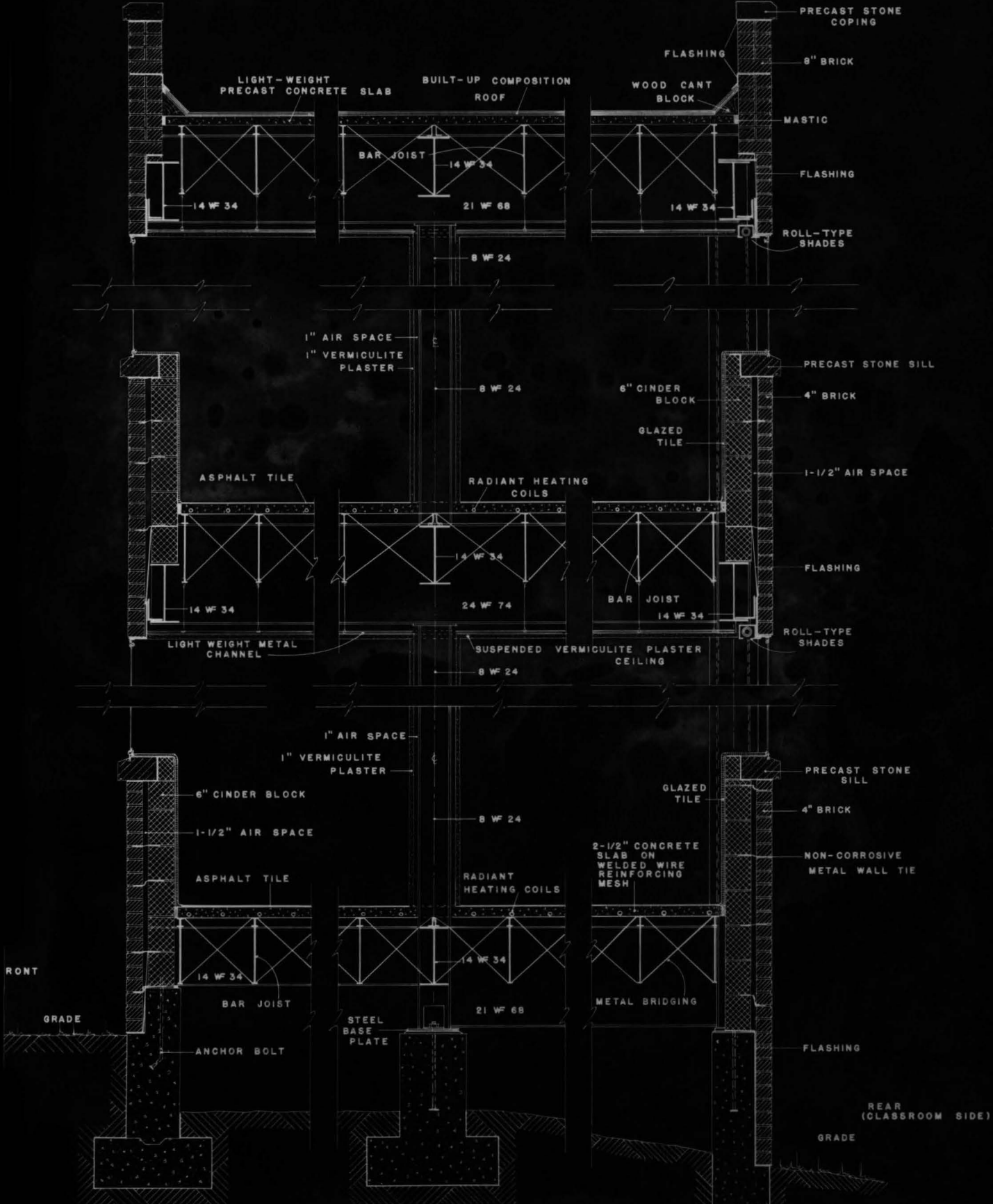
SECTION THRU ENTRANCE LOBBY AND AUDITORIUM

0' 25'  
SCALE - 1/16" = 1'-0"

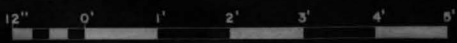


SECTION A-A' THRU CLASSROOM

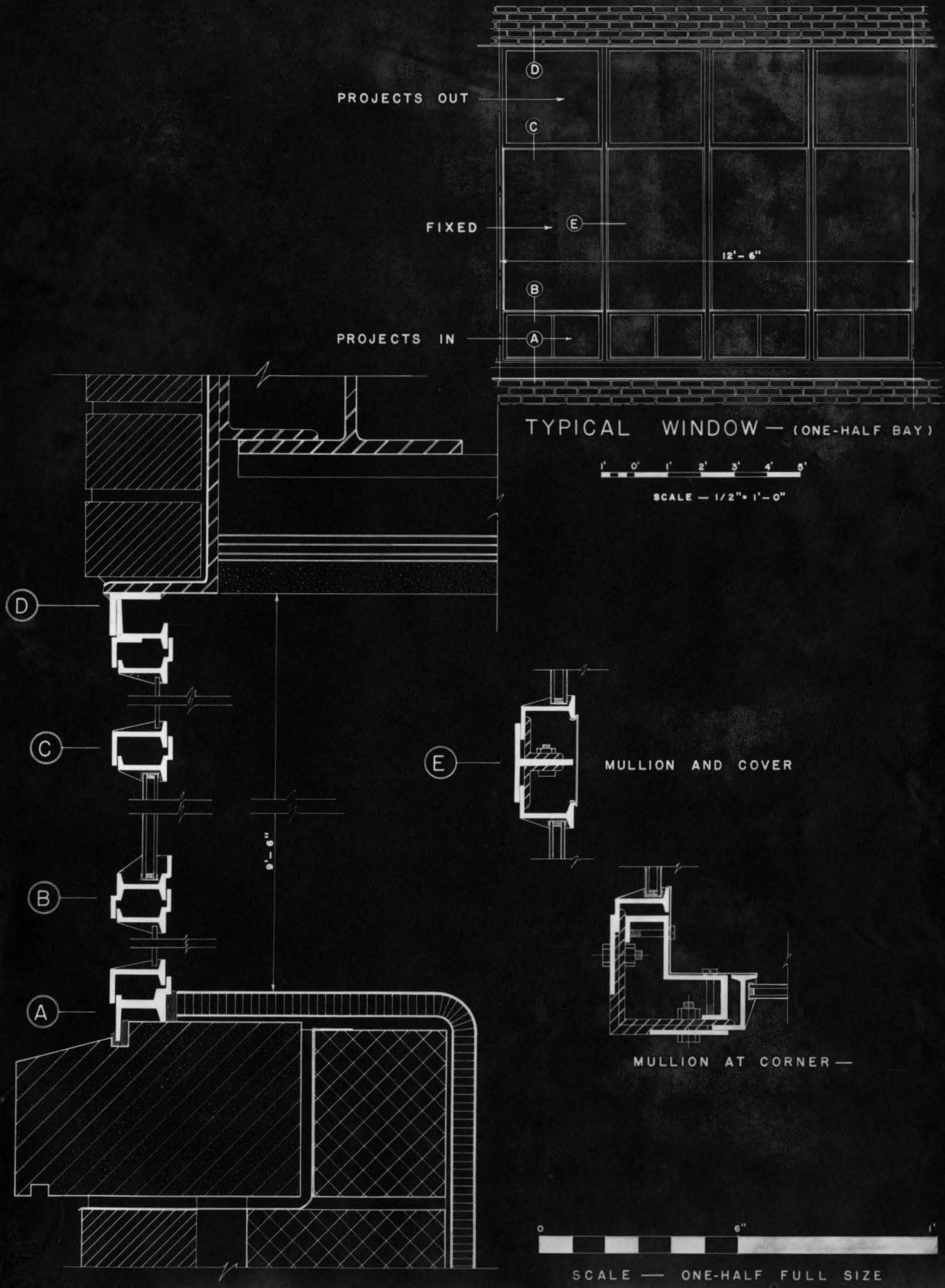
12' 0' 6'  
SCALE - 1/4" = 1'-0"



TYPICAL WALL AND CONSTRUCTION DETAILS



SCALE - 3/4" = 1'-0"



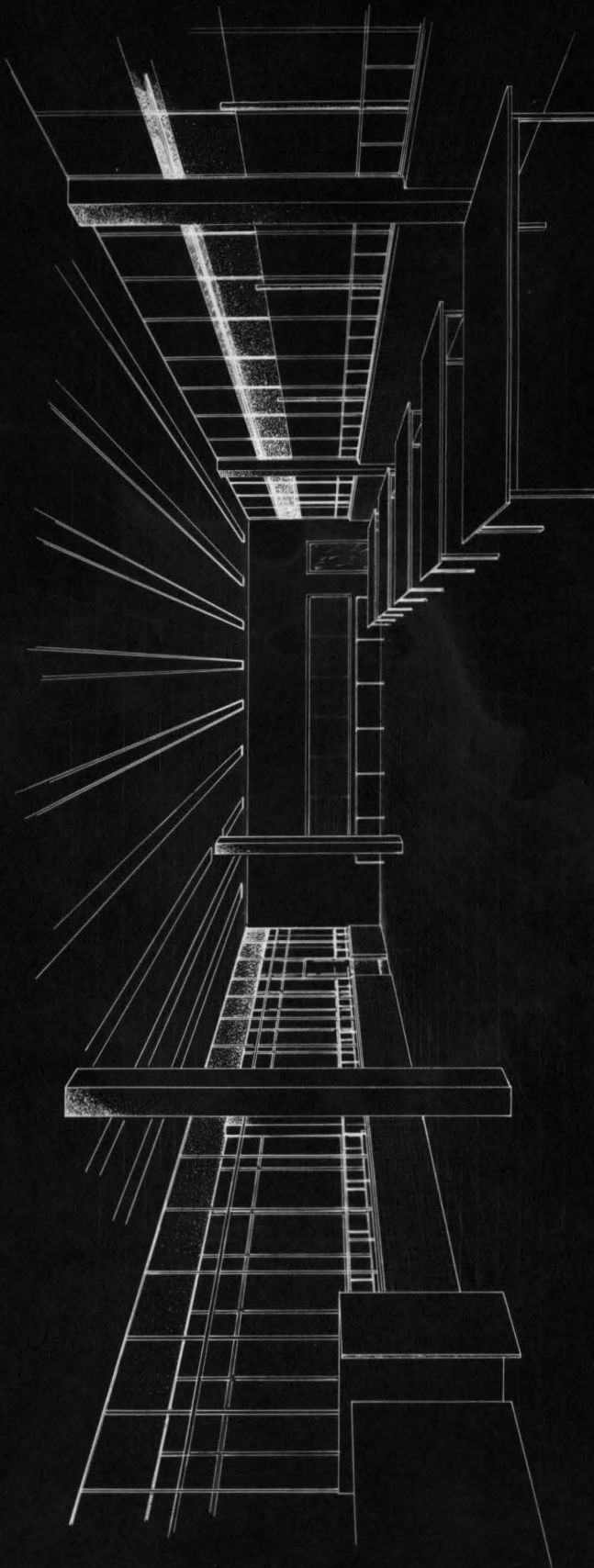


MAIN ENTRANCE —

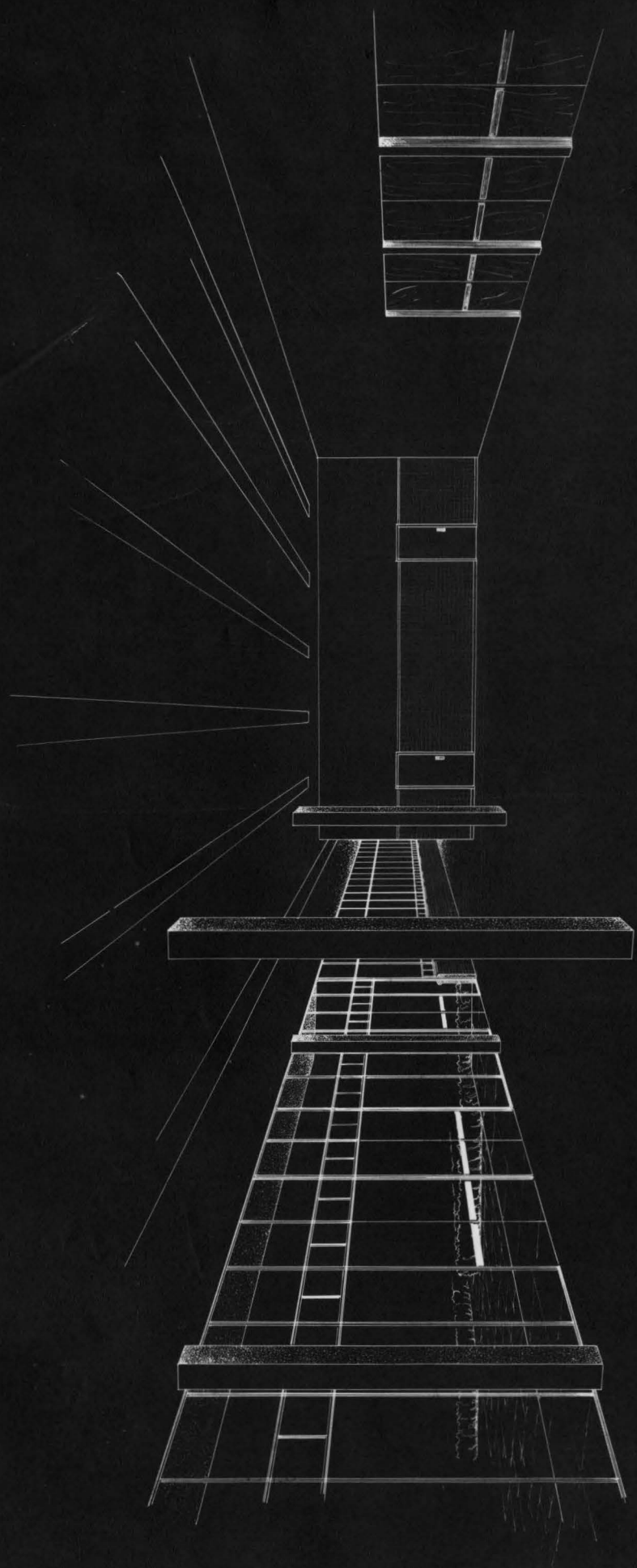


COVERED WALKWAY — LOOKING TOWARDS GYM.





INTERIOR OF CAFETERIA — LOOKING TOWARD THE KITCHEN



MAIN ENTRANCE LOBBY —

C O N S T R U C T I O N   A N D   M A T E R I A L S

1. Construction

The structural system chosen is of structural steel. Steel columns are placed on a twenty-five foot module along the length of the building. The spacing of columns from rear to front of the building provides a bay of twenty-eight feet. The exterior corridor is cantilevered from the classroom area. This results in the saving of steel that would ordinarily have been used in columns along the front of the building. Because the columns are set back from the face of the building on the rear, and because there are no columns in the front wall, it is possible to install the windows in an unbroken line.

The roof and floors are framed with steel bar joists. The floor construction is topped with a two-and-one-half inch concrete slab poured on welded wire-mesh reinforcement. Radiant heating coils are placed within the floor construction. Asphalt tile flooring is used for a covering in all places except wet areas and in the gymnasium. All areas that are to be wet down frequently will be provided with a floor drain to carry off excess water used in cleaning the area.

The floor construction is chosen because of its economy and the elimination of construction of forms. The roof construction chosen is of precast concrete slabs using a light weight aggregate. This also is selected because of economy and high insulating value. Five ply asphalt and felt composition built-up roofing is to be laid over the precast slabs. Drains

for roof water are so located that they may be carried down through the interior stack spaces, thereby eliminating the necessity of unsightly and impractical scuppers and downspouts on the exterior of the building.

The exterior wall of the building is made up of a facing of four inches of brick, and inch-and-a-half air space, and a backing of six-inch cinder block. It is finished on the interior with glazed tile. On the north wall of the library, precast stone blocks are used in place of the face brick. All walls are of a non-load bearing type.

## 2. Materials

a. Floors - The factors considered in selecting the flooring materials were resiliency, durability, economy and ease of cleaning. For these reasons, asphalt tile was selected for use throughout the major part of the building. Terazzo finish with a non-slip surface was chosen for the floor finish in the toilets and in other areas where frequent washings are necessary.

b. Walls and Partitions - Partitions are of the hollow-wall type, composed of light steel channels covered with panels of acoustical material. This system was chosen for its acoustical qualities and ease of relocation, since partitions between individual classrooms may of necessity be moved at one time or another, in order to adjust the size of the room to the size of the classes. Corridor walls and other permanent partitions, or

partitions in which doorways occur, will be constructed of six inch cinder block plastered on each side with acoustical plaster. This construction is chosen for partitions containing doors as hollow-wall construction employing light steel channel studs has not proved too successful with heavier type doors.

c. Ceilings - The classrooms, auditorium, music rooms, entrance lobby, and circulation area require acoustically treated ceilings. With sound reduction coefficients ranging from 0.50 to 0.60 vermiculite plaster, chosen primarily for its fireproofing qualities, will meet the requirements of the above mentioned areas with the exception of the library. In the latter, where a higher degree of sound absorption is desired, an acoustical tile with a higher sound reduction coefficient will be used.

e. Exterior Material Used - Brick and precast stone were selected for ease of construction and accessibility of materials. Precast stone will be used for the window sills and for the coping.

Projected aluminum windows are used throughout, with variations in the fenestration of the auditorium and the gymnasium. In the class rooms, the ventilating sections are glazed with double-strength clear safety window glass. The fixed portions, being much larger than the ventilating sections, are factory fabricated thermopane units for thermal insulation. The upper projected sections are glazed with heat-absorbent glass. The smaller ventilating windows are not double glazed in order to save weight and to make them easier to manipulate. All glazed interior partitions between instructor's offices and their respective classrooms, partitions

between the cafeteria and the corridors, and in the library are double strength clear safety window glass. Glass used in the fenestration around stairwells is of wired safety glass.

C O N C L U S I O N S

The final design of the proposed school building for Lunenburg County has been shown in the preceding architectural drawings. The areas allotted to each of the various classrooms, areas and departments which make up the school plant are shown in the following table:

Table of Areas

<u>Elements</u>	<u>Area in Square Feet</u>
<u>Administration</u>	
Principal's office, including waiting room, secretary and Records office. . . . .	925
Faculty Offices . . . . .	780
Conference and Guidance Room . . . . .	324
<u>Instruction</u>	
Classrooms (Regular). . . . .	7,800
Art Instruction Room. . . . .	1,793
Commercial Classrooms . . . . .	2,053
Audio-Visual Room. . . . .	625
Laboratories . . . . .	1,876
Storage and Preparation Rooms. . . . .	313
Auditorium . . . . .	4,392
Music Practice Rooms. . . . .	846

Table of Areas (con't.)

<u>Elements</u>	<u>Area in Square Feet</u>
<u>Research</u>	
Library. . . . .	..1,994
Library Work Room . . . . .	.. 324
Librarian's Office and Ante Room . . . . .	.. 324
<u>Exhibition</u>	
Main Entrance Lobby. . . . .	..1,400
Second Floor Lobby . . . . .	.. 555
<u>Circulation</u>	
Corridors and Stairways . . . . .	..9,538
<u>Storage</u>	
Storage Rooms. . . . .	.. 231
Classroom Storage and Individual Locker Space . . . . .	..1,072
General Storage in Basement Area . . . . .	..1,080
Kitchen Storage . . . . .	..1,500
Coat Room . . . . .	.. 156
<u>Other Elements</u>	
Lounges, Rest Rooms and Toilets. . . . .	..2,213
Box Office. . . . .	.. 156
Cafeteria . . . . .	..2,640
Kitchen. . . . .	.. 820



Table of Areas (con't.)

<u>Elements</u>	<u>Area in Square Feet</u>
Projection Room. . . . .	184
Home Economics Office and Ante Room . . . . .	313
Home Economics Apartment. . . . .	2,738
Boiler Room and Maintenance Area . . . . .	1,830
Dressing Rooms, Stage and Toilets for Stage . . . . .	1,707
<u>Gymnasium</u>	
Recreation Space . . . . .	7,500
Storage . . . . .	620
Lockers and Locker Rooms. . . . .	1,253
Toilets and Showers . . . . .	625
Public Toilets and Rest Rooms . . . . .	1,250
Circulation . . . . .	1,500
Office. . . . .	313
Area of School Plant . . . . .	52,502
Area of Gymnasium . . . . .	<u>13,061</u>
Total Area in Square Feet . . . . .	65,563

The estimated volume of the entire school plant and gymnasium is approximately 1,218,605 cubic feet. The cost of the school and gymnasium is estimated at approximately \$ 840,838. This figure was computed by the cubic foot method of estimating building costs

using the figures from the latest available building cost index tables given in the Engineering News Record.<sup>24</sup>

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(24) Specifications and Costs, by Elwyn E. Seeley, published by John Wiley and Sons, New York, New York, 1946, and Engineering News Record, April, 1951.

APPENDIX

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