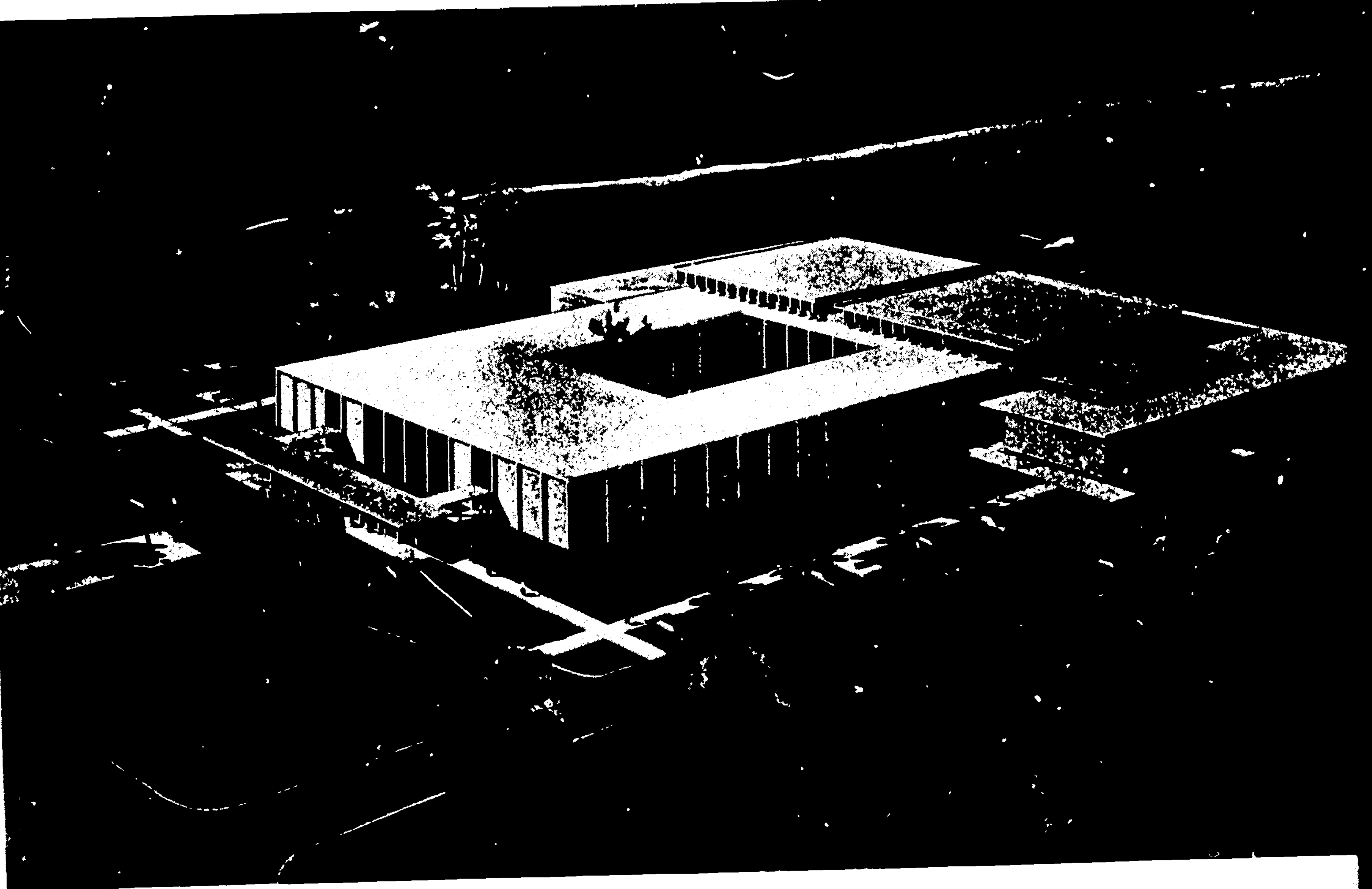
STATE OF NEW YORK
STANDARD SCHOOL PLAN
TYPE D-3



EXPANDABLE JUNIOR-SENIOR H. S. 1000 TO 1200 PUPILS • TWO-STO

STATE OF NEW YORK

STANDARD SCHOOL PLAN

TYPE D-3, TWO-STORY

JUNIOR - SENIOR HIGH SCHOOL

1000 EXPANDABLE TO 1200 PUPILS

- REPORT -

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INTRODUCTION

To the architect each new commission is a challenge to create the most useful and beautiful environment he can to safely and efficiently house a particular group of people engaged in one or more special activities.

The challenge embodied in the design of a Standard School Plan is more complicated and far reaching than that of a single specific structure because of the many possible variables in its use, location, orientation, and the abilities of the local contractors to properly carry out the architect's plan.

The contents of this report will indicate the extent of the research required to arrive at a solution which both meets the requirements of the program and allows for growth in student population and changes in teaching techniques.

EDUCATIONAL FACILITIES
AS PROVIDED IN
PLAN TYPE D-3

These correspond satisfactorily to the recommendations of the State Education Department, and as modified in conference with other educational and architectural advisors.

TEACHING SPACES

No.	Title or Use	Comments
2	Industrial Arts	Storage Additional
3	Homemaking	
5	Science	Storage Additional
2	Business Education	Storage Rooms
1	Drafting	
2	Art	
22	Classrooms	Varying in Size*
1	Music	4 Practice Rooms
1	Library	Related Areas
2	Study Rooms	
1	Auditorium	Capacity 700
1	Double Gymnasium	Showers, Lockers
1	Single Gymnasium	

*12 of the largest rooms are in pairs, with folding partitions, for team teaching

FOR FUTURE EXTENSION

5	Classrooms	
1	Industrial Arts	
1	Agriculture & Recitation	

ADMINISTRATIVE, PERSONNEL & COMMUNITY SPACES

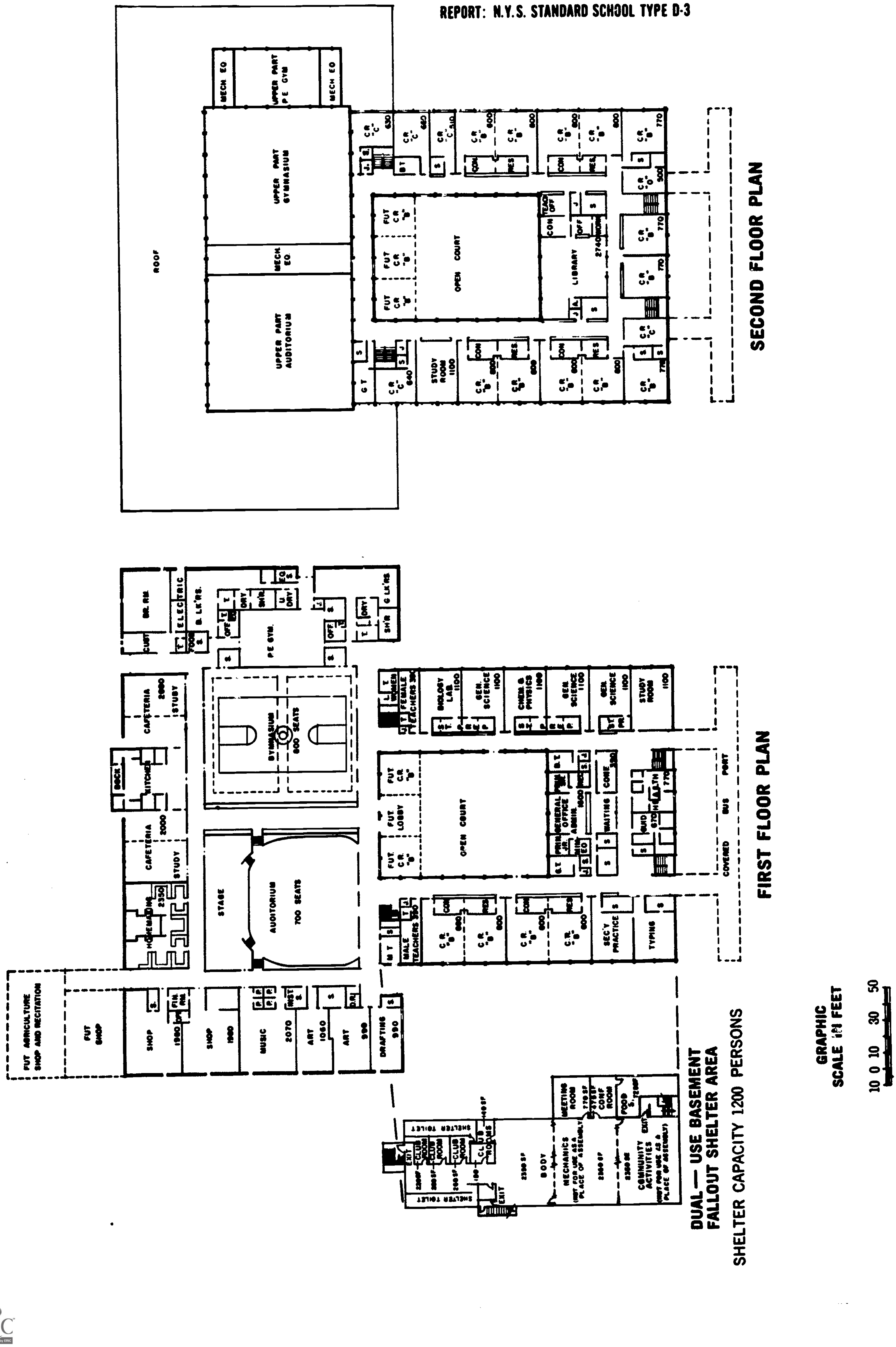
No.	Title or Use	Comments
1	Administration	Suite
1	Conference	
1	Guidance	Suite
1	Health	Suite
2	Teachers' Rooms	
2	Cafeteria	4 Study Halls
1	Kitchen	Related Areas

DUAL USE SHELTER AREA

2	Toilets	
1	Generator Room	
5	School Club Rooms	
1	Body Mechanics Area	
1	Community Activities Area	
1	Meeting Room	
1	Conference Room	
1	Food Storage	

Note: The areas of all spaces noted above can be found in the floor plans.

REPORT: N.Y.S. STANDARD SCHOOL TYPE D-3



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GENERAL DESIGN CONSIDERATIONS

Before the actual planning of this school could be started, certain basic concepts had to be determined with regard to how it should function and how these functions and other considerations would effect its physical characteristics. Our research and review of current educational and construction techniques dictated the basic concepts outlined below which helped to determine the final design solution.

A. EDUCATIONAL CONCEPTS

A study of various teaching techniques being currently used or proposed for use in Junior and Senior High Schools indicated that the following ideas should be reflected in our planning:

1. Teaching Methods are more informal, more democratic with more discussions in class. Classes are frequently divided up into special study groups which engage in more extensive research and laboratory type work.

2. Curriculums. More intellectual and scientific subjects are desired and are being offered without lessening the well rounded program aimed at developing all of the students potentialities. Education should aim at "wholeness". Even avocations such as art and music must be learned while we are young if they are to have any opportunity to be practiced and developed as the child matures.

3. Teaching Areas. To be effective, they must provide a good seeing, hearing and feeling environment. A child must be happy and comfortable to learn well. To keep teaching areas clean and uncluttered more enclosed storage area and a minimum of dust catching surfaces must be provided for good housekeeping.

4. Use of Spaces. The newer teaching techniques indicate frequent regrouping of students into groups of various sizes to do different things. Some areas should be larger than normal classroom size for combined instruction or demonstration, others smaller for conferences (10-15), joint research and individual research and experimentation.

B. CONSTRUCTION METHODS & STRUCTURAL SYSTEM

1. This two story building must be class "A" construction as defined by the New York State Local Finance Law.

2. The structural system employed should be fire resistant to reduce hazards and fire insurance rates to a minimum.

3. The structural system and construction methods employed should be directed toward simple, repetitive units as nearly modular as possible so as to insure fast, economical construction. Standard types, size and length of materials should be used when possible to insure good competitive bidding. Roof and

B. CONSTRUCTION METHODS & STRUCTURAL SYSTEM (Continued)

floor spans should be designed so column locations will permit maximum flexibility in the type and location of interior partitions.

4. Consideration must be given to various types of both steel and concrete structural framing systems in order to select the one which best satisfies the foregoing requirements.

C. MECHANICAL AND ELECTRICAL SYSTEMS

1. The heating, ventilating and lighting of all occupied areas must be accomplished by the method best suited to the type, size and use of each space. They must be easily and separately controlled for maximum student comfort at all times.

2. Extreme, unusual or experimental systems should be avoided to allow open bidding, control costs and insure ease of installation and maintenance.

DESIGN SOLUTION OF EDUCATIONAL REQUIREMENT

A. TEACHING METHODS

1. The growing secondary school student population throughout New York and across the nation has generated two basic problems. The first is the obvious need for more secondary schools. The second, is not so obvious but may be more far reaching in the importance of its proper solution. This problem is how to maintain and improve the quality of instruction in our secondary schools in this period of rapid expansion.

   A growing shortage of fully trained teachers who are specialists in their field of study point up the need for maximum utilization of these highly capable teachers. This fact led to the creation by the National Association of Secondary School Principals, of a commission on the experimental study of the utilization of the staff in the secondary school. Under the direction of Professor J. Lloyd Trump of the University of Illinois, a distinguished group of educators worked for two years preparing a document entitled "Images of the Future", otherwise known as the "Trump Report".

   The most important suggestions coming out of this report may be summarized as follows:

   a. Reorganization of Instruction:

      Most instruction should be ordered so as to provide more opportunity for individual study, more participation in small discussion groups, and increased attendance at large classes given by gifted teachers.

   b. Rearrangement of Curriculum and Class Schedules:

      In the high school of the future these elements should be much more flexible. There should be less reliance on the standard 40-45 minute period, and adult supervision should be available as needed.

   c. Changes in Staffing Patterns:

      Much greater utilization of instruction assistants, clerks, general aides, and other types of relatively unskilled educational labor is foreseen. There should be greater reliance on team teaching and the highly skilled specialist.

   d. More Extensive Use of Technological Aids:

      Clearly we are at the beginning of a period in which television, tape recordings, teaching machines and electronic devices of all kinds will be enormously significant.

A. TEACHING METHODS (CONTINUED)

These and other new methods of improving secondary teaching such as the "CORE" and "TIME BLOCK" concepts were taken into consideration by the architect in the final arrangement and detailed design of the teaching spaces in the school.

2. It was recognized that a "STANDARD" plan must be designed to accommodate current teaching methods in standard classroom spaces and still have the flexibility to provide the kinds of rooms required to effectively apply the new teaching techniques discussed above.

3. Thus the final arrangement groups two standard size classrooms with two smaller multi-use educational spaces into a multi-use teaching suite as shown in illustration 1.

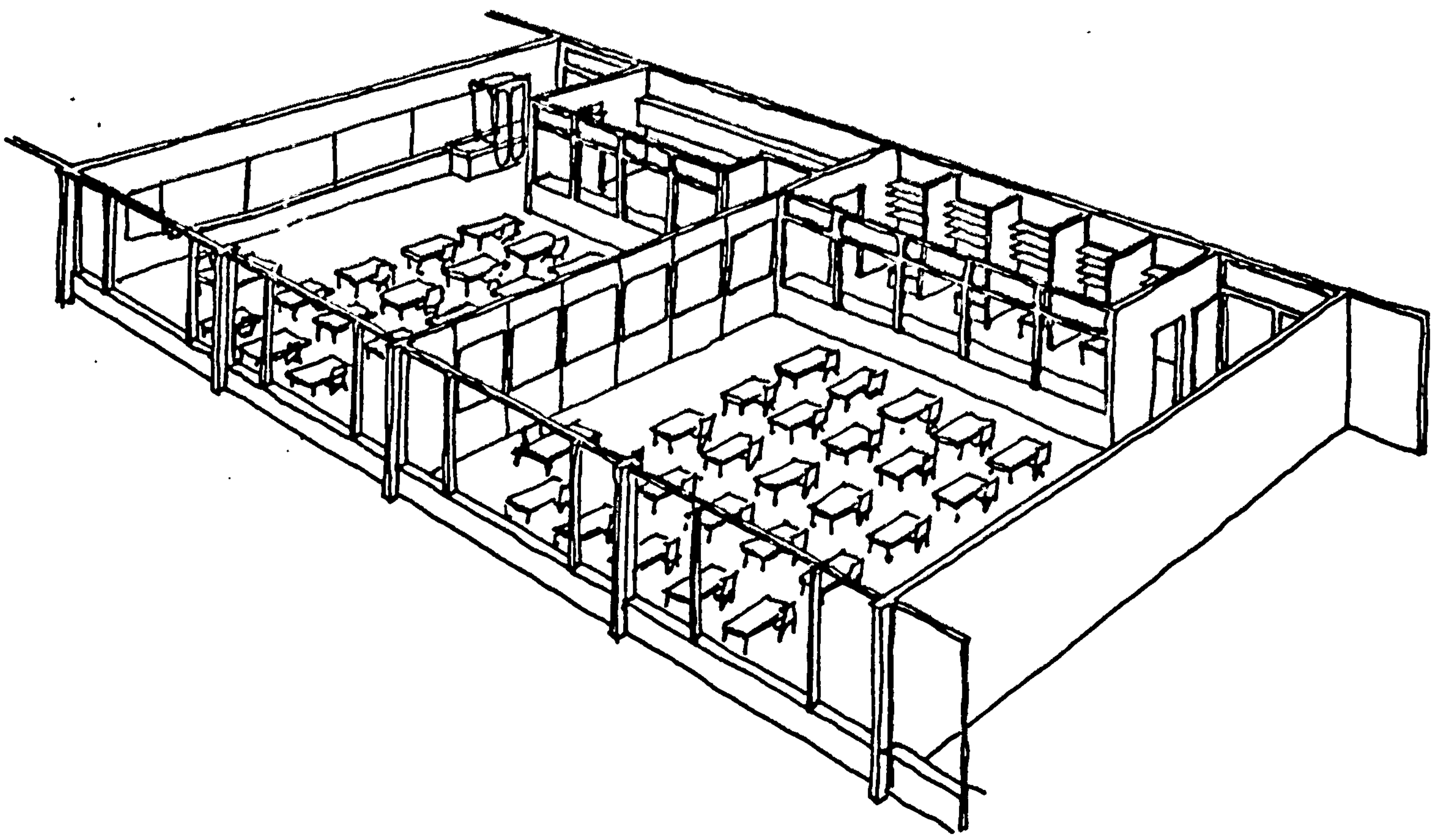

Illustration 1

The two classrooms are divided by a special folding door with a sound reduction factor of approximately 40 decibels and equipped with chalkboards and tackboards as required. When the folding door is closed, each classroom functions as a standard recitation room for 30 students. The two smaller rooms can be used at the same time for resource material centers, individual or small group projects work, a teachers study or office area or for a special student activities room. These spaces can be supervised from the classroom or closed off by curtains over the glass partition between them and the classroom. At all times they receive "borrowed" daylight from the classroom. See the section through typical classroom in Illustration 2.

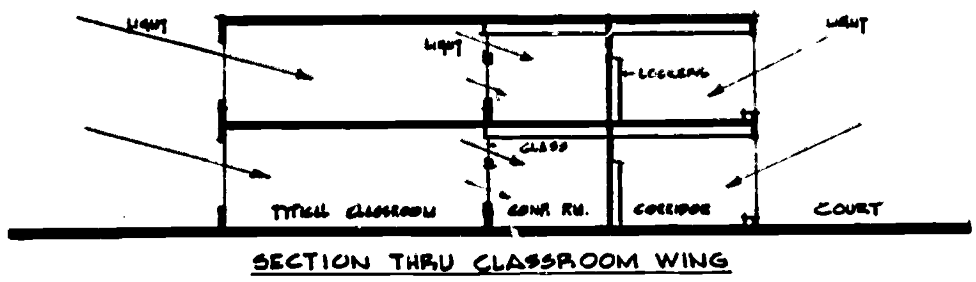

Illustration 2

To accommodate teaching techniques such as those discussed in the Trump Plan as described in Item 1 of this Section, the folding partition can be fully opened so that the 60 students of both classes can all be instructed by a single expert teacher using visual aids, such as moving pictures, slides or T.V. or performing a demonstration. This large group instruction is best utilized for the introduction and explanation of new material, motivation, planning the smaller group studies and receiving reports from special study groups. See Illustration 3.

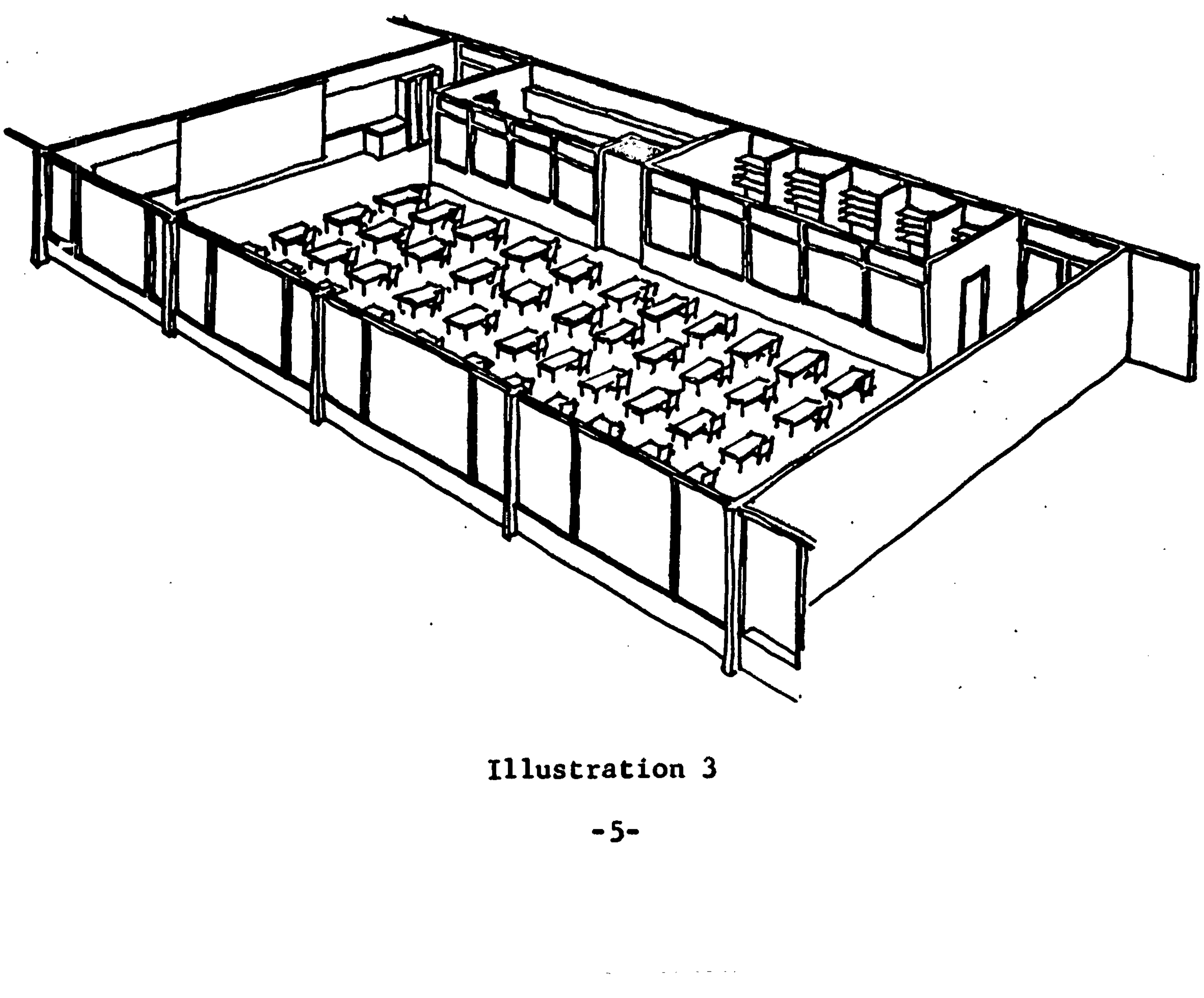

Illustration 3

During this group instruction the other teacher and the teacher's assistants can be using the conference and research rooms to check papers, plan work, etc. Following a large group instruction period, the students can be gathered into small discussion or study groups of 12 or 15 using both classrooms, conference room and research room. See Illustration 4.

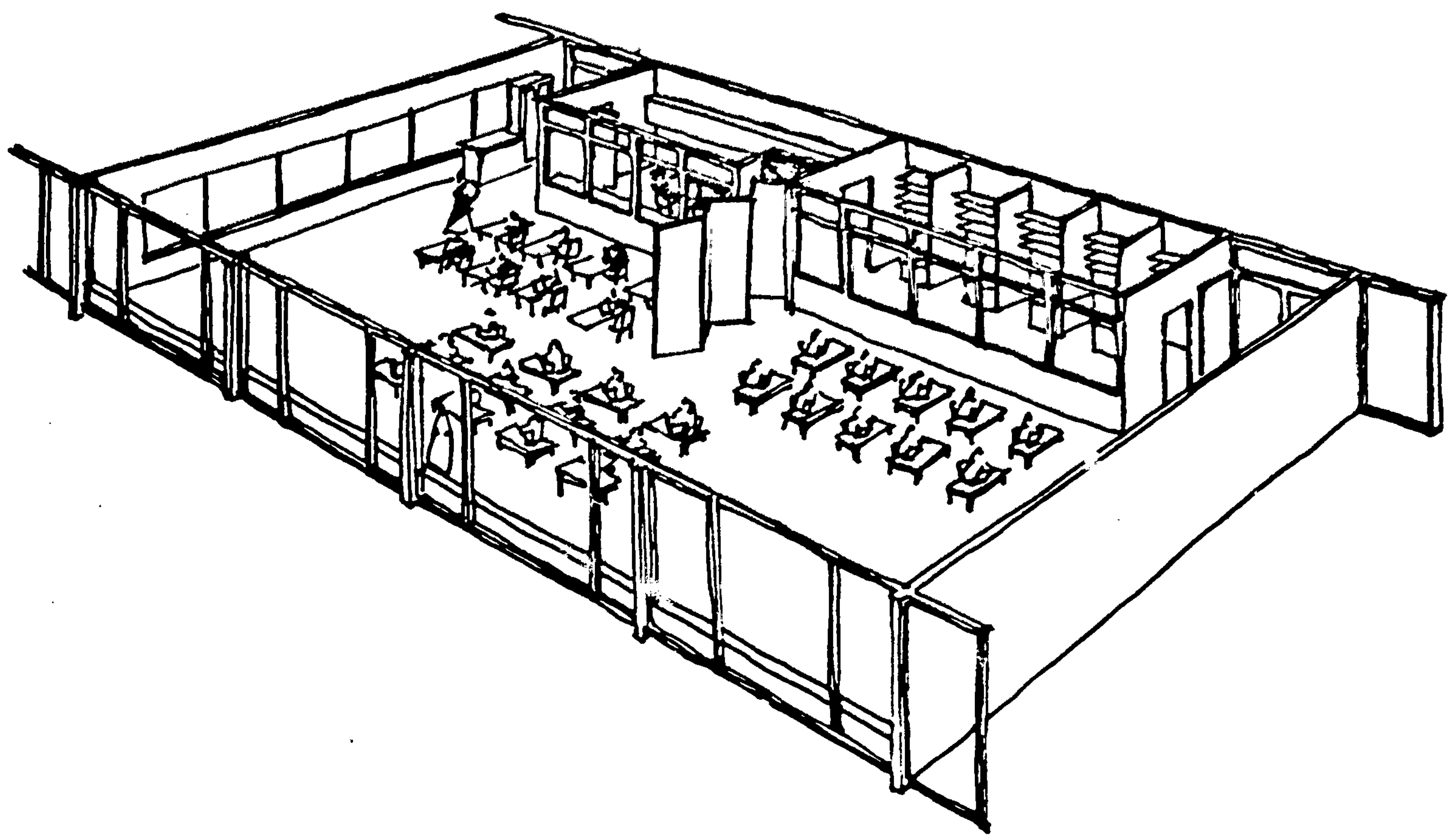

Illustration 4

These small discussion groups engage in the examination of terms and concepts and in the solution of problems. They can reach areas of agreement or disagreement on the subject matter and improve inter-personal relations.

We believe that these provisions not only look to the future but give every school board who chooses to use these plans a far more flexible building in which to plan their particular teaching program.

B. PLAN ORGAINZATION, CIRCULATION & GRADE DIVISION

1. This school has been purposely designed to be as compact as possible to achieve economy, good circulation and be adaptable to almost any shape of building site. It can and should be arranged on the site so most classrooms get East or West orientation.

2. The plan is organized into two major groupings: the academic block and the common use gym-auditorium block. These blocks can be separated by folding gates in both connecting corridors.

3. The plan does not separate the junior and senior high school students except by providing two separate entrances from the bus port at the front of the academic block and by the assignment of lockers on one side of the academic block on both floors to junior high students and those on the other side to senior high school students.

4. These two sides are divided by the jointly-used administrative, health and guidance suites on the first floor and the library on the second floor, and beyond them by the interior court. Each side of the block has two sets of stairs and toilet facilities.

5. All of the facilities used by both the junior and senior high school students and the general public have been grouped together and joined to both sides of the academic block by a wide common corridor across the end of the interior court. All of the active and noisier learning areas such as Art, Music, Shops, Homemaking, Stage, Cafeterias and Locker Rooms are grouped around the Gymnasium and Auditorium and away from the regular classrooms in the academic block.

6. All of the science rooms have been grouped together on the first floor to provide an integrated teaching service, easy access for deliveries of supplies, minimum service piping runs and access to the court.

7. Typing and stenographic classrooms are placed together and near the administrative offices so commercial students can help with school typing chores if necessary.

C. THE INTERIOR COURT

The interior court in the academic block is large enough to be developed, as the plan suggests, into a highly desirable and useful teaching area in connection with earth science, art, or other subjects, as well as being a pleasant gathering place at lunch time, between acts of a play in the auditorium or during a game, dance or other functions held in the Gymnasium. It creates a visual tie between elements on the first and second floor of the academic block and the common corridor in front of the Gymnasium and Auditorium. It affords good visual control of activities in academic corridors from the Administrative offices, and a quiet space for the Library to front on. These amenities will not be affected by the location or orientation of the school building. There is sufficient space to construct five "B" size teaching spaces and a multi-use Foyer at one end of the court for future expansion as shown dotted on the drawings and discussed elsewhere in this Report.

PROVISIONS FOR FALLOUT PROTECTION

The dual use fallout shelter included in this school was developed by the D.P.W. in cooperation with the Education Department and can be utilized in a variety of ways to augment the school program and the affairs of the community. Suggested functions which the shelter space might serve are: meetings of scouts groups on all age levels, meetings of other community organizations and school purposes such as student government quarters, publications rooms, recreation, areas for a variety of remedial purposes, administrative offices, large group instruction and audio-visual activities.

The plans for the shelter are architecturally and mechanically complete with the exception of the structural design for the sub-grade work. This work is to be completed by the adapting architect to meet whatever the existing soil conditions might be.

The size of shelter space, the capacity of the mechanical systems, and the provisions for food and water storage are based upon the expanded capacity of the school with a proper allowance for teachers and staff. Any special conditions which will affect the capacity of the school will require changes in these factors of the fallout shelter design.

The location of the shelter under the building was made to obtain the best protection at the lowest possible cost. A change in the location of the shelter will necessitate additional shielding design. Shielding has been obtained by both separating with distance and with mass, the planes on which radioactive particles will rest in relation to the shelter area. It is to be noted that any dimensional or material changes in the area above the fallout shelter may effect the shelter design. For this reason the minimum mass of the interior partitions, floor construction, and total overhead construction upon which the shelter calculations have been based are indicated on the drawings. If materials of lesser mass than the tabulated values are used, redesign of shelter will be required. It also has been assumed in the calculations, that finish grade is never below the bottom of the first floor slab around the shelter area. It is, therefore, necessary to maintain this grade in order to avoid redesign of the shelter.

The shelter plan indicates emergency water supply in a group of tanks within adjacent crawl space. Wherever an adequate supply of well water can be obtained it is suggested that the adapting architect substitute it as the fallout shelter water supply, thereby omitting crawl space for this area. The plans show self-contained toilet facilities in the form of sanitary tanks fitted with toilet seats. Wherever a septic tank and leaching field are available and the supply from the well is adequate, it is suggested the adapting architect substitute a system using periodic flushing of waste.

Generator capacity should be checked, however to be sure that an adequate power supply is made available, during the emergency period, for these possible substitutions.

The shelter area is designed for a minimum protection factor of 100 by use of "Design and Review of Structures for Protection from Fallout Gamma Radiation", an official Office of Civil Defense, Department of Defense Publication. In this respect it meets requirements of the New York State Civil Defense Commission.

Any changes to the shelter as specified and shown on the drawings should be discussed with and approved by the New York State Civil Defense Commission.

PROVISION OF FACILITIES FOR PHYSICALLY HANDICAPPED

To provide easy access to the school building for those pupils who may be in wheelchairs or using crutchers or braces, the two entrance walks under the covered bus port will be gently pitched upward from the street curb to the first floor level at the main doors. Doors in general, including Double Doors, are three feet wide and will permit easy passage of wheelchairs.

If the Local School Board using these standard plans determines that it will be necessary to provide an elevator to lift wheelchair pupils to the second floor, this can be accomplished by requesting their adapting Architect to replace the dumbwaiter now provided adjacent to the Library on the second floor and the main office on the first floor, with a hydraulic lift type elevator with a 4'-0" x 5'-0" platform which will hold one wheelchair and an attendant. The lift machinery can go in the crawl space and the roof will not need to be altered. This elevator will provide all of the lifting of books and supplies for which the dumbwaiter is now designed.

On the first floor, a special toilet stall with a 2'-8" wide door and grab bars on both sides for the use of wheelchair students is provided in the Boys' and Girls' toilets which open onto the main cross corridor between the academic block and the gym-aduitorium block of the school. The drinking fountains in this corridor near the door to each toilet are semi-recessed and set 30 inches above the floor, for easy use by students in wheelchairs. All lavatories are set 31" above the floor and mirrors placed on walls other than those in front of lavatories. There are no raised saddles in any interior doorways which would be difficult for a wheelchair to negotiate.

PROVISIONS FOR FUTURE EXPANSION

As indicated on the key plan and the working drawings, five additional "B", 770 sq. ft. Classrooms and a 770 sq. ft. multi-purpose foyer can be added inside the court on two floors at the Gym-Auditorium end, each with direct access to one or two corridors. The court window wall along column line (13) can be moved out to a duplicate new row of columns along column line (16). Double columns at (M) & (M') would be repeated at column line (16) so the 1" expansion joint can be extended thru the new floor & roof slabs & between the double beams & double columns. New materials such as concrete, reinforcing, block, etc. can be lifted into the court by large crane if it cannot be brought in via corridor. The new roof can be drained down to court and connected to court drain. The new foyer in the center of the first floor addition can be put to excellent use for display area, student club meetings, gathering area for crowds before, between acts and after plays, basketball games, dances, etc. It has direct access to the court which can be similarly utilized in good weather.

At the rear of the building next to and in line with the shops, is space for the addition of two more shop spaces and an extension of the corridor to connect them. In both cases, when the exterior brick veneer facing are removed, the structure is exposed for easy connection to these extensions. Mechanical and electrical services have been sized for extension to these new Classrooms.

The Music Suite is designed for the anticipated maximum of 1,200 students. In the Library, and additional 340 square feet was added to the required 2,400 square feet to take care of initial and future space needs. If more space is needed, book stacks can go into the adjacent Conference Room and the Teachers' Office used for conference space. All common use facilities such as Toilets, Cafeteria, etc. are designed for the 1,200 maximum student capacity.

Provisions have been made for extending all mechanical services into those areas shown on the plans as "Future Expansion" areas.

It is recommended that all new additions be structurally self-supporting where they abut the original structure, thus no special structural connections for future additions have been provided. When designing footings for the columns adjacent to the proposed additions, the adapting architect should extend such footings to take the "future" columns.

CONSTRUCTION METHODS AND MATERIALS

A. MODULAR DIMENSIONS

The program for all the New York State Standard Schools calls for the use of a four inch (4") module throughout the design of the building to simplify dimensioning on plans and to utilize modularly designed building componants to speed construction and reduce to a minimum the cutting and wastage of materials. As explained in the section on structural design, a basic grid of 14'-0" x 14'-0" was established for this building because it best suited the required size and shape of most of the teaching areas called for in the program. All exterior elements such as windows, brick walls, doors, concrete roof tees, etc. as well as the basic concrete structure are designed to be 14'-0" in width or subdivisions of 14'-0" such as 7'-0" or 3'-6". Interior dimensions are in increments of 4" wherever possible.

B. EXTERIOR DESIGN AND MATERIALS

After numerous studies of the exterior to determine how to best express the final plan, it was decided that the two primary blocks, Academic and the Multi-Use Gym-Auditorium Block, should be treated differently one contrasting with the other, and each expressing its primary function.

1. In the two-story Academic Block, strength and design interest is added to the continuous window walls by expressing the 8" x 15" concrete columns outside the window wall. The modular regularity of each of the 14'-0" window bays creates economies in multiple use of a typical two-story window-wall panel set between columns.

   A two inch thick, box section aluminum window was selected for rigidity, long maintenance-free wear and ease of operation. In each classroom the window group includes one large casement for a secondary means of exit in case of fire. The insulated panels between the sash are made of a laminated sandwich panel using one inch of foamglass between two one-eighth inch cement asbestos panels. These being inert materials, they are less liable than enamelled metal panels to expand and contract and become delaminated. The exterior surface of these panels will have a special hard glazed finish similar to glass-weld, the interior surface can be painted where exposed. The character of this part of the building is basically light and open.

2. In contrast, the Gym-Auditorium Complex has been given a strong, solid appearance to support the dramatically expressed long-span concrete tees which form the roof over both the Gymnasium and the Auditorium. In this section the columns are kept within the structure so the brickwork will not be interrupted and will present a strong feeling of mass.

C. INTERIOR DESIGN AND MATERIALS

1. Due to the strength and fireproof characteristics of the concrete columns, beams, floor and roof slabs, these elements are left exposed wherever possible to express this strength and save the cost of covering them with other materials or unnecessary suspended ceilings. Column spacings have been arranged inside this school to minimuze interference with the placing or moving of interior partitions.

2. All the materials specified and detailed for use on the inside of this school have been selected for one or more of the following important characteristics: long wearing, low maintenance, esthetic beauty including ease of inter-relation of colors or textures, and reasonable cost. The following are examples of the special merits of various materials that are being used:

   a. Floors. In the kitchen area and second floor toilets a relatively new Latex Terrazzo is being used because it can be applied directly to the structural floor slab in only one-quarter to three-eighths inch thickness which means no slabs have to be depressed to receive it. It is good looking, tough, stainproof and replaces successfully a variety of other expensive materials such as 2-1/4" thick standard terrazzo, quarry tile and ceramic tile. The fact that large areas will be covered with this material will reduce its unit cost. In the corridors, etc. vinyl-asbestos floor tile has been called for in lieu of asphalt tile, rubber, cork or others, because it is a tough, inert, fire resistant materials that won't soften or dent easily, is easy to maintain with less waxing and is moderate in cost.

   b. Walls. All walls are basically modularly shaped block in heights to exactly fit under beams so no cutting is required. In all rooms such as classrooms where reducing the transmission of sound is important, regular concrete block is used with painted finish. In the exposed walls of gymnasiums, auditorium, library and other areas, the block is light-weight concrete to give more sound absorption.

   c. Moveable Partitions. Considerable work has been done in recent years by various partition manufacturers to create a moveable or foldable partition with a sound transmission reduction factor equally as satisfactory as the usual masonry partitions being used to separate classrooms in current school work. After a careful investigation, the architects for this project have selected three types of folding partitions which have satisfactory sound attenuation ratings and physical characteristics best suited to the purposes for which they are recommended for use. By the time this school is constructed there will, no doubt, be manufacturers other

C. INTERIOR DESIGN AND MATERIALS (Continued)

than the ones listed below who can meet their standards of construction and sound control so that bidding need not necessarily be limited to the manufacturers here listed.

Classrooms

The partition selected for use between standard classrooms as shown on the plans, is the E.F. Hauserman Company, "Operable Wall". This wall is to be installed between the bottom of a concrete beam and the floor slab. The panels are four (4) feet wide and 2-1/4" thick, made of 20 gauge roller-level steel face panels with baked enamel finish and filled solidly with rockwool insulation. Each horizontal and vertical edge shall have a neoprene gasket to provide a sound seal. Each door will hang from a double overhead track and be furnished with a porcelain enameled steel chalkboard on the side forming the front of a classroom and a cork tankboard on the opposite side. This partition has a sound transmission loss which averages at least 35 decibels in the frequency ranges from 125 cps to 4000 cps, and 38 decibels in the speech privacy range between 250 cps and 2000 cps.

Cafeterias

To divide each of the two large cafeterias, all that was required was a compact, easy to operate, durable folding partition with good sound attenuation characteristics. The two doors selected to meet these requirements are the Modernfold Doors, Inc. "Soundmaster-240" with a rated sound transmission loss of 37 decibels, and the Holcomb & Hoke Manufacturing Company, Inc. "Fol-Door Soundguard" with a rated sound transmission loss of 32.4 decibels.

Gymnasium

The folding partition selected for the Gymnasium is a motor operated coiling action movable partition made up of Douglas Fir 1" x 2" solid wood slats with tongue and groove edging, arranged vertically and held together by prestressed aircraft cable. This partition has the advantages of low cost, light weight, exceptional durability and great flexibility under body contact. It has a sound reduction factor of 19 db. It coils up compactly on one side for storage and can be opened or closed by switch on both sides and both ends. The wood is finished natural.

D. SPECIAL DESIGN FEATURES

During the early design studies for this school, many new and different arrangements of the required facilities were tried and rejected because of poor overall circulation, excessive land use or unjustifiable cost. However, a few special features were included to add to the ease of operating the building. All main exterior entrances are at grade to facilitate the movement of handicapped children and ease the delivery of supplies. A dumbwaiter is included near the bus port entrances which is large enough for a book cart or janitor supplies on a dolly so that heavy materials do not have to be carried to and from the second floor. To do this job and aid crippled children to reach the second floor, a small size hydraulic elevator could be installed in room 1/17 and 2/44 opening on the corridor, in lieu of the dumbwaiter. The hydraulic lift has the advantage of needing no overhead machine room projecting through the roof and has a very smooth and quiet operation.

E. ALTERNATE BIDDING ON EQUIPMENT

All equipment for Shops, Home Economics, Art, Science Rooms, Library, Kitchens, etc. which must be permanently attached or connected to mechanical services has been called for on various sheets of the working drawings and listed under separate headings in the specifications.

The Architects strongly recommend that all of this fixed equipment be included in the General Construction Bid so the General Contractor will be solely responsible for furnishing, installing and connecting all such items.

At the option of the Local School Board, this equipment could be purchased directly by the school, to be delivered at the proper time to its final location in the building by the vendor. The specifications would have to be modified slightly to accomplish this and to be sure each of the prime contractors included a figure in his bid for attachment, or the making of mechanical, sanitary or electrical connections.

STRUCTURAL SOLUTION

A. CONSIDERATIONS REGARDING CHOICE OF STRUCTURAL SYSTEM

The choice of a structural framing system for a school depends on column spacing, proportion of bay areas, number of stories, available construction depth for beams, necessity of suspended ceilings, and permissible column dimensions. The availability of construction materials and skilled labor is also important in the choice for the structural framing system.

a. Column Spacing

Based on the approved preliminary architectural conception, it became apparent that there were three principal areas to be framed:

1. Corridors with 14' spans.

2. Classrooms with spans of 28' to 42'.

3. Auditorium and Gymnasium with 100' spans.

Because of the modular requirements, either 7'-0", 14"-0", or 28'-0" was to be considered for the column spacing along the outside walls. The 7'-0" spacing would have been suitable for the spacing of windows, but columns would have become so small as to be architecturally ineffective. The 14'-0" and the 28'-0" spacing would have suited the size of the classroom, but the 28'-0" spacing would have resulted in greater framing costs and appeared less pleasing to the architects. The 14'-0" spacing of exterior columns was chosen. In order to maintain maximum flexibility in the locating of room partitions, the interior columns were located along the corridor, 42'-0" from the outside walls.

b. Proportion of Column - Bay Areas

The typical bay areas for the classrooms thus became 14' x 42'-0", a very oblong proportion. Bay areas for typical corridors became 14' x 14' or a square proportion.

A square column bay leads to the consideration of a two-way slab or a coffered two-way joist framing, but a rectangular column bay calls for one-way slab strips or parallel joists spanning in the short direction. Accordingly, we arrived at the use of 14'-0" long steel joists for classrooms and typical corridors with the structural steel layout and at the use of one-way slabs over classrooms with two-way flat slabs over the corridors for the concrete layout. The typical span of 14'-0" was too short for an economical application of a coffered grid ceiling.

c. Determination of Beam Depth & Widths for 2nd Floor & Roof Slabs

With schools, like most structures, it pays to keep the construction depth to a minimum to save on wall height and building volume to be heated or ventilated.

c. Determination of Beam Depth & Widths for 2nd Floor and Roof Slabs (Continued)

After the decision had been made to use a cast-in-place concrete structure of the spans outlined above, the first object was to arrive at a uniform and economical construction depth for the beams, because many would be exposed in the classrooms. While it was realized that deeper beams with a resulting smaller amount of reinforcing steel would lower the cost of the structural framing, it was reasoned that an increase in depth would not only raise construction costs because of higher walls, but would also permanently raise the cost of heating and other mechanical devices because of increased building volume. It was, therefore, decided to use beams of minimum depth.

At the beginning, it was planned to use a transverse system of framing with continuous beams over the classrooms. A continuous beam action induces very high negative moments of the columns however, with resulting extremely high compression in the lower part of beam legs. Positive moments, on the other hand, cause compression in the top only which the adjoining slab can help to resist by flange action.

It was, therefore, found advisable to prevent, where possible, the formation of negative moments in the long classroom spans and to use to the utmost the compressive strength of the monolithically connected top slabs. Low negative moments were obtained by joining only slender flexible members to the end of the long classroom beams. Such members are through corridor slabs and the slender interior columns. Care had to be exercised to prevent high local stresses at the connection between the stiff and slender members, which tend to act as so-called "stress-raisers". The wedge shaped thickened slab band along the corridor column line was arrived at for this reason and will have the desired "stress relieving" effect.

At connections where the use of continuous beams could not be dispensed with, such as at columns D-5, D-6, etc., haunched beams, tapering off in depth as quickly as possible were used.

After the depth of beams had been established, it was realized that the controlling factor for the width of the beams was to provide sufficient space to arrange bars in not more than two layers in the bottom of the beams. End shear would have been easy to deal with, since the wider beams would straddle the narrower columns on at least three sides. There are, however, numerous column connections along outside walls where the classroom beams cannot be connected with a greater column width, in order to permit vertical passage of Venetian Blinds. It was at such points that shear became a controlling factor and this accounts for the rather crowded, but not abnormal arrangement of reinforcing bars.

c. Determination of Beam Depth & Widths for 2nd Floor and Roof Slabs (Continued)

Roof loads are somewhat lower than second floor loads, but requirements for minimum depths and for economy in the re-use of form work made it advisable to use similar construction depths for both the second floor and the roof slabs.

d. Necessity for Using Suspended Ceilings

The use of suspended ceilings for classrooms is advisable where light floor systems, such as open web steel joists with 2" concrete flooring are used between stories to deaden sound and cover structural members. For roof slabs, such soundproofing would not be necessary but disregarding the aesthetic effect, such suspended ceilings under roof slabs are also desirable for classrooms, kitchen and laboratories, with any floor construction where flanges and trussed web members offer shelves and pockets for the accumulation of dust and dirt. This was a strong argument in favor of a concrete floor and roof construction, so suspended ceilings could be dispensed with in most of the classrooms, thus saving the cost of their construction.

The use of suspended ceilings along corridors is, however, advisable to provide space for piping and ducts. For the same purpose, a shallow beam depth along corridors is necessary to allow free passage of utilities.

e. Column Construction

Column sizes are dictated by code requirements which control structural behavior and fireproofing qualities. Non-fireproofed steel columns are permissible for one-story construction and were, therefore, considered in such parts of the structure where they have to support roof loads only.

In the two-story portion of the structure, it was desirable for architectural reasons to expose the exterior wall columns. Concrete columns were chosen at such locations for both the steel and the concrete design. The code requires such concrete columns to have a minumum sectional area of 120 sq. in. and a minimum thickness of 8", thus an 8" x 15" size was selected. These columns could have been either precast or cast-in-place, but difficulties with connecting precast columns to the floor beams lend to the final use of a cast-in-place column construction. It was found to be more economical and better structurally to make all interior columns poured-in-place corcrete also.

Columns in the one-story portion of the structure can be considered as posts for which the structural code prescribes a minimum thickness of 6". Concrete filled square steel pipe columns have been built into the one-story exterior walls of the Gym-Auditorium half of the

e. Column Construction (Continued)

building. The connection between such steel pipe columns and the concrete beams they support has been worked out to assure a monolithic, satisfactory connection with a smooth, pleasing appearance.

f. Special Consideration for Auditorium and Gymnasium Roof Spans

These two structures are located on the same axis side by side, separated only by a corridor. In the early stages of design, it seemed promising to connect these two roofs, either by a slightly pitched continuous steel truss construction or by some continuously arched or framed concrete roof construction. The underlying thought for the latter was to find a roof shape which would have permitted the travel of a sliding formwork across the length of the covered area.

Although it was found that a solution using standard open web steel joists of the long span series was very economical, these were not compatible with the otherwise all poured concrete structural system.

It was found that, using the concrete "Single Tee" type of construction, which is somewhat related to the steel joist construction, offered economy. Furthermore, this solution lent itself to the visual expression of the structural functions by introducing a massive cantilever action around the borders of the Gymnasium and Auditorium roof.

While it might be most economical at many locations in the State to use plant fabricated standardized precast or prestressed concrete Tee constructions, it was felt that this project should indicate a solution with a type of "Single Tee" girder that could be constructed by any contractor in remote areas, who has not had the advantage of experience in prestressed concrete construction. For this reason, a solution with "Single Tee" beams is shown on final drawings that call for the use of regular bar reinforcing. While prestressed "Single Tee" girders could have been made with a standard depth of three feet, the conventionally reinforced girders called for, must have a depth of 5'-0". This greater depth causes a greater weight of the beam to be handled by cranes, if precast.

These girders could be cast on the ground in the immediate vicinity of their final position so that they could be raised by a crane on either end, from casting position into final position. They also could be precast on an elevated platform at their correct final height and rolled side-ways into position on small roller beams, which are commercially available for the transport of heavy objects. They could also be cast-in-place singly or in lots of two or three in final position on an elevated staging which could be lowered and moved side-ways after each concrete pour.

These girders have to be cast with a camber as indicated on the drawings to compensate for their dead load deflection. Bearing the girders on a cushion of thin sheet lead is contemplated, so that they can deflect to a certain degree without causing bending moments due to an eccentricity of their reaction on the supporting framework. The top of supporting end beams on which the "Single Tee" roof girders are seated is practically level all around the area to be covered. This should make it possible to make substitutions for this roof construction without too much difficulty, if the school board so desires.

B. RECAP OF REASONS FOR THE CHOICE OF THE CAST-IN-PLACE CONCRETE CONSTRUCTION

At the outset, it was decided to choose, either a complete steel or a complete concrete structural solution, so that the contractor would not have to employ too many different trades and let too many different subcontracts.

Since the major part of the costs is in the classroom construction, this portion became the deciding factor for the selection.

Framing costs and construction depths seemed to be about equal for steel and concrete construction. Cast-in-place concrete construction, however, offered the advantages of a monolithic, fireproof, structure wherein suspended ceilings could be eliminated in many areas and the fireproofing of steel columns and beams avoided thus reducing construction costs.

Prestressed or precast concrete construction of commercially available standard slab sections was also considered but not employed becuase of the predominantly long spans in the classrooms and inherent connection problems.

Precasting does show advantages for covering the longer Auditorium and Gymnasium roof spans, however, it was felt that for this comparatively small portion of the structure, the contractor should have his own choice of bringing in heavy cranes to set the long and heavy precast concrete "T" members or casting these beams in place. Thus, the architect's solution shows a structure which can be built economically not only within the shipping radius of structural plants but also on the site in more remote areas.

HEATING & VENTILATING DESIGN

A. DESIGN CRITERIA

The following are the assumptions which have been made in connection with the design of the heating and ventilating system:

1. The location will have a climate similar to Albany, New York and the winter design conditions are taken to be minus ten degrees F. (-10F) and 15 miles per hour wind.

2. No. 5 fuel oil ("cold No. 5") not requiring preheating, is available.

3. Gas is available for boiler ignition.

4. There are no unusual site conditions requiring a high stack for proper combustion or dissipation of fumes.

5. There are no special water conditions requiring chemical treatment of the water in the steam or piping systems.

B. CLASSROOM HEATING AND VENTILATING - BASIC SYSTEM

1. Heating and ventilating of "typical" classrooms is accomplished by a unit ventilator in each room augmented by finned pipe radiation under the windows, to protect the perimeter areas against downdrafts caused by heat loss and infiltration at the glass areas.

2. The unit ventilator is sized to provide at least 15 cubic feet of outside air per minute per pupil by means of an outside air louver, and circulates a total air quantity sufficient to provide at least six changes of air per hour in the room. All air, recirculated or fresh, is filtered in the unit and heated by a hot water coil, controlled by a wall thermostat. When classroom cooling is required, the thermostat reduces the water flow in the coil by modulating a control valve. If further cooling is required, the unit damper adjusts to a greater proportion of outside air, up to 100% of the unit capacity. A discharge thermostat maintains sufficient heat in the coil to maintain a minimum discharge air temperature of 55°F to 60°F as selected.

3. A separate "sun valve" on each hot water heating circuit to the unit ventilators, operates to shut off the hot water supply to the finned radiation under the windows, when all classrooms on its circuit have ceased to demand heat.

B. CLASSROOM HEATING AND VENTILATING - BASIC SYSTEM (Continued)

4. A separate "night thermostat" will start and stop the unit ventilator fans as required to maintain the space temperatures at the night setting. This thermostat also controls the circulating pump, at night.

5. The introduction of outside air by the unit ventilator fans creates a positive pressure in the classroom areas, which is relieved in the following manner:

   a. Air leakage via doors to corridors, to provide "make-up" air to the toilet rooms, and other spaces having mechanical exhaust.

   b. Air transfer via door louvers to the interior Conference Rooms and Research Rooms, which have mechanical exhaust.

   c. Gravity relief via grilles in the classroom ceilings or walls, connecting to the ceiling space above the corridor. The ceiling spaces are connected to weather-protected roof vents, by which the air is relieved. Each roof vent has a motorized damper which opens only when the classroom unit ventilator system is on the "day" or ventilating cycle of operation.

6. To minimize the distracting effect of noise which may be transmitted between classrooms via the air exhaust and gravity relief systems, exhaust and relief grilles are located generally near the corridor doors. This is the location where the normal interior building noises will most effectively "mask" distracting transmission of speech between classrooms, via the air ducts.

C. ADMINISTRATION AND LIBRARY AREAS

1. Exterior rooms are heated by finned radiation below the windows, controlled by a zone thermostat. Classroom type unit ventilators are located in the library reading room and in the general office space. In addition to heating and ventilating these immediate spaces, the units provide make-up air for the adjacent interior offices and workrooms which have mechanical exhaust. Mechanical exhaust is provided in the offices of the Junior and Senior H.S. principals, to permit louver-less doors in these rooms in the interest of privacy. Windows, of course, are openable for ventilation.

D. GYMNASIUM - AUDITORIUM - CAFETERIA BLOCK

1. The entire block is heated and ventilated by systems separate from the two-story academic block.

D. GYMNASIUM - AUDITORIUM - CAFETERIA BLOCK (Continued)

2. All classrooms in this block, plus the cafeteria rooms, have unit ventilators and windowsill radiation. The unit ventilators in the cafeterias provide sufficient outside air, and are electrically interlocked with the cafeteria exhaust fans and the kitchen exhaust fans, to prevent unbalance of supply and and exhaust in these related areas. Cafeteria exhaust fans should be "OFF" when the kitchen exhaust fans are "ON" and the interconnecting doors and pass windows are open. This procedure permits cafeteria supply air to be relieved to the kitchen, as "make-up" for the kitchen exhaust. At other times, the kitchen make-up air is obtained from the corridor by means of door louvers, and from the operable windows. The cafeteria exhaust fans can also serve as "purge" fans when the rooms are used as study halls or for community functions.

3. The industrial arts and woodworking shops have thermostatically controlled unit heaters, blanketing the windows and doors. In addition, a 100% outside air unit at the Industrial Arts shop ceiling, provides tempered make-up air for the high exhaust requirements of the furnace hood and finishing room.

4. The Music Department has heating and ventilating systems separate from the adjacent rooms to reduce sound transmission. The outside air to the large Music Room is introduced by unit ventilators, and relieved via its own roof ventilator in the vestibule. The four Practice Rooms are heated and ventilated by fan-coil "cabinet heater" located in the ceiling of the music storage room. Fresh air from the roof intake is delivered to each room, and relieved to the aforementioned roof ventilator by separate exhaust ducts. The Practice Room ductwork is acoustically lined and designed with additional turns, to absorb sound.

5. The domestic science rooms are equipped with large unit ventilators to provide tempered make-up air for the mechanical exhaust at the cooking ranges. Door louvers and wall "transfer" grilles balance the systems.

6. The locker rooms and adjacent areas are heated by finned radiation at the exterior, and provided with tempered fresh air which is exhausted via the drying and shower rooms and the toilet rooms, etc. These areas are designed for 80°F.

D. GYMNASIUM - AUDITORIUM - CAFETERIA BLOCK (Continued)

7. The two gymnasiums are heated and ventilated by fan-coil units, which can recirculate 100% of the air during warm-up periods and at night, and can provide up to 100% outside air.

8. The Auditorium is heated and ventilated by a unit similar to the Gymnasiums. Air to the Auditorium is supplied by air-conditioning type registers, designed to conform to the acoustic panels.

9. Courtside corridor heating is provided by baseboard radiation specially designed for the high heat loss of the corridor window-walls. The stainless steel enclosure provides for a separate down-draft grille on the exterior side of the heating element, and deliberately omits the usual air intake at the front of the enclosure.

10. Hot water cabinet heaters are located at all exterior entrances and at doors to the court. Wall thermostats control their fan operation, and safety thermostats protect against freezing. The heaters are of ample capacity to heat the entrances during normal traffic through the doors, and are selected to protect interior rooms, near the entrances, from cold drafts.

E. MAIN HEATING PLANT

1. Two Scotch-Marine type hot water package boilers, each rated at 60% of the design heat loss, are provided. Ample warm-up capacity is inherent in the connected systems, in that more than 50% of the design heat load consists of outside air heat load and domestic hot water heating, normally "off" during the warm-up period which occurs before occupancy.

2. In the event of one boiler being out of operation on an average winter day, either boiler, alone, would carry the building heat load. On a design day (-10F), should one boiler be unable to carry the load, one or more of the following procedures are available to maintain normal building temperatures:

   a. Adjust the burner to 110% of rating.

   b. Reduce or close entirely the outside air damper position of one or more ventilating units, such as Auditorium, Gymnasiums, etc.

   c. Reduce or shut down domestic hot water service.

   d. Place central classroom unit ventilator system control on 100% recirculation.

   e. Restore normal settings when boilers are operating normally.

E. MAIN HEATING PLANT (Continued)

3. The specified fuel oil is No. 5 ("cold five") oil, which does not require preheating for circulation to the burners. The oil burners are the rotary cup type, delivering primary air with the atomized oil, and admitting secondary air via a periphery burner front plate. Burners are equipped with electric heaters to raise the delivered oil to required temperatures.

4. Exterior, underground oil storage tanks and connected supply and return piping, fill and vent lines, and indicating gauge shall be specified by the adapting architect to suit site conditions. The tanks should be provided with a double pipe arrangement for oil suction and return, so that returning hot oil surrounds the suction pipe and the suction bell. An adequate manhole should be provided, as well as a concrete foundation and suitable anchoring as required to withstand tank buoyancy.

5. The hot water temperatures are automatically adjusted in proportion to the outdoor temperature, for closer comfort control of the various thermstatic control elements in the building.

6. A stand-by pump is provided for emergency use, should the heating hot water pump fail.

F. ROOF EXHAUST FANS

1. Roof exhausters are equipped with self-closing gravity dampers which will close when fan is off.

2. In areas which experience heavy snow, roof curbs for exhaust fans, air discharge hoods, and air intakes, should be increased to 18 or 24 inches in height as required.

G. CAPACITIES

1. The Equipment Schedules indicate sizes and capacities of Boilers, and air handling units for outside design temperatures of Minus 10°, Zero°, and Minus 20°F. Schools to be located in areas having outside design temperatures other than - 10F require adjustment of the selected capacities for all radiation, unit ventilator coils, unit heaters, and other heating equipment and appliances.

2. The Equipment Scheduels as listed include heating capacities sufficient for future expansion to 1200 students. Any modification to the architectural design, windows, or floor areas, requires a re-study of the heating and ventilating affected by such modification.

G. CAPACITIES (Continued)

3. Architectural louvers and penthouses for air handling equipment and air intakes and discharges are shown on the heating plans for information only, but are to be included as part of the general construction contracts.

SUGGESTIONS FOR THE ADAPTING ARCHITECT

A. DESIGN CRITERIA

1. The use of solar-absorbing glass for unshaded windows is recommended for east, west and south exposures if funds are available.

2. Air conditioning could be provided for the Administration Area. Packaged air conditioning equipment located on the roof could be utilized, with connecting supply and return ductwork. Another method could consist of a packaged water chiller in the Boiler Room and fan-coil units in the rooms, with the required piping, insulation and automatic controls.

3. The locations of the fuel oil tank and fuel oil fill box is dependent upon the site landscaping.

SANITARY DESIGN

A. DESIGN ASSUMPTIONS

It is assumed that public sewers, water service, and in some instances, gas services will be available at the sites. Deviations from these assumptions are covered hereinafter under the respective service headings.

B. STORM WATER AND SANITARY DRAINAGE SYSTEMS

1. Storm water and sanitary drainage systems are designed in a manner to avoid long runs of drainage piping within or below the building, where practicable, and to effect discharge of these drain lines to all points about the periphery of the building. Where sewers are available in one or more streets surrounding the site, the drain lines may be collected into one or more private sewers within the school property, complete with manholes as required, and extended to the public sewer or sewers. Where combined sewers are available, the storm water and sanitary drain lines may be interconnected outside the building walls.

2. The drainage design is predicated on the assumption that local ordinances will not require house traps and fresh air inlets; however, if they should be required, the traps should be installed at points of exit in crawl spaces, if any, or in trap pits. Where combined sewers are available, the storm water drain lines should be provided with traps. Where combined sewers are not available, the traps may be omitted from the storm water drain lines, and these drain lines should be collected as mentioned in paragraph 1, and discharged to storm sewers, if available, systems of drywells or to a water course, pond or recharge basin, if same are in the economically convenient vicinity. If the ultimate discharge is to other than sewers or drywells, the outfall termini should be provided with a headwall, and the pipe openings should be provided with a rodent screen.

3. Where sanitary or combined sewers are not available, the sanitary drain lines should be collected as previously outlined, and discharged to sewage disposal systems, the location and design of which should be predicated on the general terrain and the subsurface soil structure. All sewage disposal designs must be submitted through the local health office for final approval by the New York State Department of Health.

B. STORM WATER AND SANITARY DRAINAGE SYSTEMS (Continued)

4. The project is presently designed for first floor slab on grade, except in the basement fallout shelter area and in the crawl space provided for the fallout shelter water storage tanks. Where slab is on grade, cleanout plugs have been provided on all drain lines below the floor, These plugs are of the flush deck type. Storm water conductors and drain lines have been designed to avoid passing through the fallout shelter area. Sanitary drainage piping at the ceiling of the fallout shelter was not re-routed as it is assumed that sanitary facilities within the building proper will not be in service during the emergency period.

5. A sump pump has been provided in the crawl space to provide for periodic draining and replenishment of the water storage tanks. In the event storm sewers or other means of storm water disposal are located at sufficient depth to permit gravity discharge, this sump pump could be eliminated, and an open funnel drain could be substituted therefor.

6. Under the present design, the acid diluting basin is required to be installed in a pit with cover flush with the floor, to permit inspection and replenishment of marble chips as required. In the event a crawl space should be provided in this area, the diluting basin should be installed in the crawl space at an elevation to permit ready access for maintenance, and should be provided with a concrete base.

7. The grease interceptor is specified to be of a type with cover set flush with the finished floor, and it is suggested this type be provided for easy removal of grease content, whether or not a crawl space is provided. In either case, the contractor should be required to provide a concrete base to support the interceptor.

8. The finished grade about the periphery of the building is assumed to be fairly level and at an elevation of approximately 8 inches below finished first floor. A study should be made of exact grade elevations, grade beams and structural beams below the first floor level, and invert elevations of drain lines should be adjusted accordingly. Drain lines leaving the building should be provided with a cover of not less than two feet.

B. STORM WATER AND SANITARY DRAINAGE SYSTEMS (Continued)

9. The lower level of the interior court has been designed for a run-off of 100%, and the surrounding paved areas at the higher level of the court have been designed for a run-off of 75%. In the event this inner court should be changed in any manner, a re-study of the impervious surfaces should be made, and the drain lines therefrom should be corrected in size to suit.

10. A connection has been provided to receive the roof drainage from the future classroom addition in the interior court, and the storm water drain line to which it is connected has been sized to include this future drainage. No provisions have been made under this design for sanitary and storm water drainage from the future shop addition, as the location of this addition indicates that separate sanitary and storm water house sewers therefrom would be more feasible.

C. WATER SUPPLY SYSTEM

1. The water piping system is designed on the assumption that a piped water service will be available, and all pipe sizes are predicated on an assumed available pressure of 60 p.s.i.g, at the point of entry with a demand load of 206 g.p.m. Should water be available in excess of 60 p.s.i.g., the installation of a pressure reducing valve assembly at the point of entry is recommended. Should the available pressure be below the assumed 60 p.s.i.g., a re-study of pipe sizes, based on the lower pressure, is indicated.

2. It will be noted that the cold and hot water piping within the building is required to be installed in or at the ceilings of the first floor. This design was adopted in order to make the design suitable for buildings with or without crawl spaces, and for the ease of installation and maintenance. It will also be noted that in certain areas, particularly in the science rooms and in the kitchen, where island fixtures are located, the piping will be extended at or in the ceilings and dropped in partitions as close as possible to such island fixtures. Extenstions from the partitions to the island fixtures will be installed in common trenches with removable covers where such trenches are required to be provided for gas piping. Where water lines do not parallel gas piping and hence trenches will not be required, the cold water piping will be buried below the floor slab and will be of type

C. WATER SUPPLY SYSTEM (Continued)

"K" copper tubing with compression type fittings; and hot water piping will be of type "L" copper tubing, will be insulated and will be installed in split tile pipe below the floor slab.

3. Hydrants for lawn sprinkling are indicated and specified to be of the frost-proof type buried in ground with cover set flush with the grade. These hydrants are specified in lieu of the standard wall type hydrants because wall hydrants cannot be installed in this type of window wall construction.

4. Stall showers for adult use are provided with individual concealed type thermostatic non-scalding mixing valves. Showers for pupils are controlled by two master thermostatic non-scalding mixing valves (one for girls' showers and one for boys' showers). See detail on Dwg. No. 61S/3005. Each pupils' shower is further provided with a non-thermostatic mixing valve to permit adjustment of water temperature below the output temperature of the master valve, and also to effect water economy when only a minimum of shower heads are required to be in use.

D. GAS PIPING SYSTEM

1. The gas piping system is designed for the use of liquid petroleum gas, but an alternate point of entry is shown on the drawing in the event piped gas service should be available. The final contract drawings should be revised by removing the gas service not required. It will be noted that gas piping between the Boiler Room area and the Cafeteria Kitchen area is sized for both natural gas and liquid petroleum gas. The sizes not required should be removed from the drawing. Gas sizes in other areas of the building are applicable to either natural or liquid petroleum gas.

2. Gas piping within the building is designed for installation in or at ceilings of the first floor, as hereinbefore outlined for water piping. Likewise, branch gas piping to island fixtures is also indicated to be installed as noted for water piping, except that all gas piping below the floor slab will be installed in shallow pipe trenches with removable covers. As previously noted, and where so shown, water piping running parallel to gas piping below the floor will be installed in a common trench.

D. GAS PIPING SYSTEM (Continued)

3. The building is presently designed for an all-electric kitchen, and hence no branch gas piping has been indicated for kitchen equipment. However, a valved and plugged outlet has been provided for connection in the event it is desired to install gas-fired equipment at the time of construction or at some future time, and the gas piping to this point has been sized accordingly. For design purposes, a total connected load of approximately 1,300,000 B.T.U. per hour has been assumed.

4. It will be noted that the gas branch to each science room and to the homemaking suite has been provided with a solenoid-operated gas valve to control the gas equipment in each individual room for normal and emergency shut-off purposes. See detail on Dwg. No. 61S/3004. Each valve is individually controlled by a key-operated switch which will be located at the main point of egress from the room. The key-operated switch and all wiring for same will be furnished and installed by the Electrical Contractor. Key-operated switches have been selected as opposed to push button or toggle switches as a means of making them tamper-proof. In the event it is decided to provide gas-fired equipment in the Cafeteria Kitchen, it is recommended that a similar valve, strainer and by-pass be provided therefor, with key-operated switch located at the main point of egress from the area. The solenoid gas valve assembly for the homemaking suite will be installed in a metal cabinet below the ceiling in order to make same tamper-proof. Cabinets are not provided for solenoid valves for science rooms because they are located in storage and preparation rooms, and are therefor not readily accessible to students.

INSTRUCTIONS TO ADAPTING ARCHITECT OR ENGINEER

A. WATER SUPPLY SYSTEM

1. The local water authority or water company should be consulted relative to the minimum static pressure available, the required type and location of water meter and curb valve, and the costs involved for extneding the water service into the building. Such costs should be borne by the Sanitary Contractor, and should be included in his bid.

2. In the event water is not available at the site, a well, well pump, hydro-pneumatic tank and air compressor should be provided. Prior investigation should be made to determine approximate well

A. WATER SUPPLY SYSTEM (Continued)

yield in the area, and the ultimate design of the well of wells, as required, should be predicated on this investigation. In the event of low well yield, a number of wells discharging to a common underground storage tank, plus a pressure pump in connection with the hydro-pneumatic tank may by indicated.

B. GAS PIPING SYSTEM

1. In the event natural gas is available, it will be required to consult with the local utility company to determine their requirements relative to location of gas meter and gas pressure regulator, and costs involved for gas service installation. These costs should be borne by the Sanitary Contractor, and should be included in his bid.

ELECTRICAL DESIGN

A. DESIGN CRITERIA

The completed set of electrical working drawings for the N.Y.S. Standard School Type D-3 represents a design specifically arranged for adaptation on a site anywhere in New York State. The following are the assumptions which have been made in connection with the design of the electrical system:

B. ELECTRIC SERVICE AND DISTRIBUTION SYSTEM

1. The electric service has been established on the assumption that an underground primary electric service will be available at the site. The size of the project dictates the need for a transformer vault which, in the interest of uniformity and economy has been incorporated within the structure.

2. The main switchboard is of the dead-front, freestanding fusible switch type with quick-make, quick-break switches.

3. A 120/208 volt distribution system was selected as the system most suitable for a school of this type from both a maintenance standpoint and a cost standpoint.

C. LIGHTING SYSTEMS

1. Classrooms - A system of fluorescent lighting has been established for the classrooms as the type most suitable to meet the illumination requirements of the N.Y. State Department of Education. A fixture type combining neat appearance and minimum cost has been selected.

2. Auditorium - Auditorium lighting is accomplished by means of recessed incandescent downlights using economical R-40 floodlamps. Supplemental wallwash units are of the adjustable type and have been included to achieve the desirable effect of lighted walls.

3. Gymnasium - A mercury vapor lighting system has been designed for the Gymnasium area. This system, utilizing color-corrected mercury vapor lamps is the most economical system available for producing the required lighting levels. Incandescent lamps, connected to the emergency power system, have been located at intervals in the Gymnasium in the event of a power outage.

D. SOUND, CLOCK AND INTERCOM TELEPHONE SYSTEM

1. A combination public address system with call origination and synchronous wired clock system, using a common conduit system, has been recommended as the most economical method of providing these systems which are vital to the functioning of a school of this type.

2. The above system requires that programming and intercom be accomplished over the loudspeakers.

E. STAGE LIGHTING AND DIMMING SYSTEM

1. The stage lighting and dimming equipment has been designed and selected to achieve the maximum usage with minimum cost consistent with its anticipated use during both school hours and after school hours by community groups.

2. The dimmer board is of the manual variable autotransformer type with the dimmer board located on the stage.

3. The house lights are dimmed by motorized autotransformer dimmers to allow remote operation of the house lights.

F. EMERGENCY GENERATOR AND DISTRIBUTION SYSTEM

1. A diesel fueled emergency generator has been selected for this project as the most economical type of system for providing emergency power.

2. Because the requirements for the Fall-Out Shelter demand the use of diesel fuel, no consideration was given to the use of a natural gas-fueled unit.

3. The emergency lighting and power distribution system feeds all exit lights, stair lights, selected corridor, auditorium and gymnasium units as well as supplying a source of emergency power for the fallout shelter, fire alarm system and public address system.

G. FIRE ALARM SYSTEM

1. a non-coded fire alarm system has been specified for the project as being the most economical type of system available meeting State requirements.

SUGGESTIONS FOR THE ADAPTING ARCHITECT

A. DESIGN CRITERIA

1. The drawings call for all services to be terminated at the point 5 feet from the building line. The adapting architect should extend these utility lines to their respective sources of supply in a manner approved by the local utility companies.

2. Exterior walkway and parking area lighting must be added to the site plans in accordance with the individual requirements of the specific project.

B. ELECTRIC SERVICE

1. The adapting architect should contact the local utility company and ascertain the following at the earliest possible time during the design:

   a. Location and characteristics of electric service.

   b. Transformer vault requirements.

   c. Service and metering equipment requirements.

   d. Limits of responsibility for service installation.

2. Since certain localities or utilities do not permit the installation of a transformer vault within the building, such a decision should be obtained as soon as possible.

C. TELEPHONE SERVICE

1. The local telephone company should be contacted at the earliest possible time to ascertain the available telephone service location as well as the type and size of telephone service conduit requirements.

D. EMERGENCY GENERATOR AND FALL-OUT SHELTER

1. In the event that the fall-out shelter is not incorporated as part of the adapted project, it is recommended that the use of natural gas as a fuel be investigated as a possible means of further reducing the cost of the installation.

E. ELECTRIC KITCHEN

1. In view of the uncertainties of obtaining gas service throughout the State all cooking equipment in the main Kitchen is shown and specified as electrical. The adapting architect can therefore exercise the option of using gas-fired Kitchen equipment if the fuel is available. This will reduce the cost of electric work as well as the operating cost of the Kitchen.

F. TEMPORARY LIGHT & POWER

1. In view of the unknown location of obtaining temporary light & power service, characteristics & requirements of the local utility co., the adapting architect will be required to prepare a complete temporary light & power system including specifications.

G. PROPOSED ALTERNATES

1. The basic plans and specifications include a public telephone conduit system which is listed as an additive alternate. This alternate should be accepted if at all possible.

2. The lighting fixture type specified have all been selected to achieve a reduced initial cost. Consideration should be given to upgrading the quality of these units if funds are available.

3. With respect to the sound and clock systems we again would recommend alternate proposals specifying individual systems installed in separate conduits.

4. If funds are available we would recommend the consideration of intercom telephones in lieu of call origination switches of the sound system.

5. Again if funds are available, we would recommend the consideration of an electronic type auditorium stage dimmer control system which permit scene presets and, in general, is much improved system over that presently specified.

6. Although the Gymnasium lighting system using color corrected mercury vapor lamps is extremely efficient and requires a minimum of maintenance we wish to point out that the color rendition is still not as good as warm white fluorescent and the extremely high brightness of the individual mercury vapor units must be carefully shielded.

WORK OF THE ADAPTING ARCHITECT

Every school board considering the use of this Type D-3 Standard School Plan must understand from the very outset that, before they can build this school, they must employ a competent architect-engineer to complete the construction drawings and specifications. He must complete the foundation and footing designs to satisfy the requirements of the site contours, soil bearing capacity, soil type (rock, clay or other), drainage conditions, local weather conditions and local code requirements.

When a site of adequate size has been acquired in a location suitable to the educational needs, the adapting architect must carefully locate this building on that site with respect to proper road connections, service connections, building orientation and to suit the site contours. (East or west light is preferable for classrooms.) A site plan must be prepared, locating playfields, roads, parking areas, etc. Site drainage, planting and paving plans and details and specifications must be prepared and incorporated in the bidding documents.

The school board and their adapting architect will have to make numerous decisions such as the extent of the crawl space to be used and how the structural, plumbing, heating, lighting and architectural designs will be affected. The type of heating fuel, gas, electric service, etc. must be determined, then plans and specifications adjusted to reflect these decisions.

The adapting architect is necessary for the preparation of bidding documents, administration and to supervise the construction. He must be sure that all requirements of local building, zoning, fire and utility codes are satisfied in the final plans and specifications.

To assist the local school board and their adapting architect, the following instructions and suggestions are made covering architectural, heating, sanitary and electrical considerations. In addition, a brief list of suggested alternate bids in included for the upgrading of certain basic building finishing materials.

ITEMS TO BE INCORPORATED INTO PLANS AND SPECIFICATIONS DURING SITE ADAPTION DESIGN

The following suggestions are made for consideration by the Local School Board and their adapting Architect after a site has been selected and this building located on the site:

1. CRAWL SPACE VENTS.

   If and where crawl space is used under the first floor slab, vents to the outside must be designed to suit the grading plan and located so as to adequately ventilate the excavated space but not mar the exterior appearance of the building. (Gas piping requires venting.)

2. FOOTING DRAINS.

   Design and locate footing drain lines when and where required.

3. CRAWL SPACE ACCESS DOORS.

   If a crawl space is used under the entire building, at least three access doors through the first floor should be provided in addition to the one in the Boiler Room. We suggest locating one in corridor 1/68 near column line 11 and one in corridors 1/34 and 1/144 near column line 22. In order to permit an epoxy terrazzo finish on top of these access doors, we suggest the use of "Square Manhole No. 38T-24" made by Architectural Art Manufacturers Company, Inc.

4. CRAWL SPACE FLOOR COVERING

   It is recommended that in all areas where a crawl space is left under the first floor, a 2" cement screed coat be applied over the dirt floor to make the crawl space vermin and temite proof and to minimize dampness.

5. FLAGPOLE.

   Select the type and size and locate a school flagpole. We suggest its location near the bus loading entrance.

6. SCHOOL NAME ON THE EXTERIOR

   Select the size, type and location of the letters to form the school name on the exterior of the building. This lettering should not detract from the aesthetics of the building.

7. ROOF CURBS.

   If this school is to be built in a section of New York State where unusually heavy snow is expected, we suggest that all concrete roof curbs for ventilators, etc. be increased in height as required.

8. EXTERIOR FACILITIES AND SITE PLANNING.

The following items shall be properly designed and carefully arranged for maximum usefulness and as to enhance the beauty of the school structure.

a. All required playfields, courts and bad weather hard surfacing play areas.

b. A road and sidewalk network including adequate parking areas, service roads, directional signs and good area lighting.

c. Grading, seeding and planting plans together with a good drainage plan for the entire developed outside area.

d. All outside utilities.

9. HEATING, VENTILATING AND SANITARY WORK

The Adapting Architect is referred back to the sections of this report discussing Heating & Ventilating Design and Sanitary Design for instructions regarding this work during final adaption.

10. ELECTRICAL WORK

The Adapting Architect is referred back to the section of this report discussing Electrical Design for suggestions regarding this work during final adaption.

SUGGESTIONS FOR ALTERNATE BIDS ON GENERAL CONSTRUCTION

The following suggestions are made for the consideration of the using School Board and their adapting architect. Alternate bids could be taken on the following items which, if accepted, will reduce maintenance costs, extend the useful life of the building and improve the appearance of various interior surfaces, or improve the functioning of the building.

Alt. 1. Terrazzo Floors

In Room No. Corridors	1-120 & 1-16, 1-34, 1-52, 1-68, 1-79, 1-81, 1-98, 1-44, 2-13, 2-20, 2-28 & 2-43
Janitors' Closets	1-22, 1-32, 1-49, 1-121, 1-134, 2-17, 2-23, 2-45, 2-52
Cafeteria	No. 1 Room #1-86, No. 2 Room #1-95

Use 3/8" Latex Terrazzo as specified in lieu of the Vinyl-Asbestos floor tile as specified.

Alt. 2 Glazed Strustural Facing Tile

On all exposed walls of all corridors and kitchen rooms, where vitreous enamel over 6" concrete block is specified, use 2" G.S.F.T. soaps with 4" concrete block back-up. Substitute 4" high G.S.F.T. base block in lieu of 4" high concrete block and rubber cove base - throughout building.

Alt. 3 Grey Exterior Window Glass

In those sections of New York State where the weather gets very warm and sunny in the early fall and late spring, it is strongly recommended that the window glass in all windows in classrooms and corridors which face south, east or west be changed to grey glare and heat reducing glass, similar to Libby-Owens-Ford "Parallel-O-Grey". This glass will transmit only 46.6% if the solar heat which comes through regular glass and reduces glare. Its use will also reduce the amount of ventilating required to offset the solar heat gain in rooms and corridors on very warm spring and fall days.

Alt. 4 Ceramic Tile Walls

In all toilets use ceramic tile walls in lieu of vitreous enamel over concrete block.

Alt. 5 Precast Facing Panels

On all exterior walls where brick is shown or called for, substitute precast facing panels. This materials is made with granite, vitreous or quartz aggregate cast in a matrix usually composed of white cement and various types of colorings. These various aggregates are selected for their durability, density and beauty of color and are carefully graded to size. The panels are reinforced with 4" x 4" steel wire mesh and cast under vibration in rigid molds which gives them tremendous structural strength. The aggregates on the surface are exposed mechanically to bring out all their beauty, color and texture. These panels can be produced in any shape required and are usually 2" to 2-1/4" thick. This material offers the Architect the utmost freedon in design and the opportunity to work out panels to suit his module. In this building, standard panels in a minimum number of shapes have been worked out so many can be cast from the same mold. Thus the economy of mass production is achieved together with fast erection in any kind of weather, These panels are self-cleaning and resistant to weather, due to their hard, dense surface and all but eliminate exterior maintenance.

Alt. 6 Wood Doors in Corridor

Add 30 wardrobe type wood doors in corridor 1/79 on the gymnasium side of the cooridor of the same type, size and hardware as those called for on the Auditorium side of corridor.

Alt. 7 Fuel Oil Transfer Pump

The fuel oil transfer pumps may be omitted if the oil tank is located adjacent to the Boiler Room. Two fuel oil suction lines must be installed if this alternate is accepted, one for each oil burner, and the oil burner pump capacity must be checked.

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