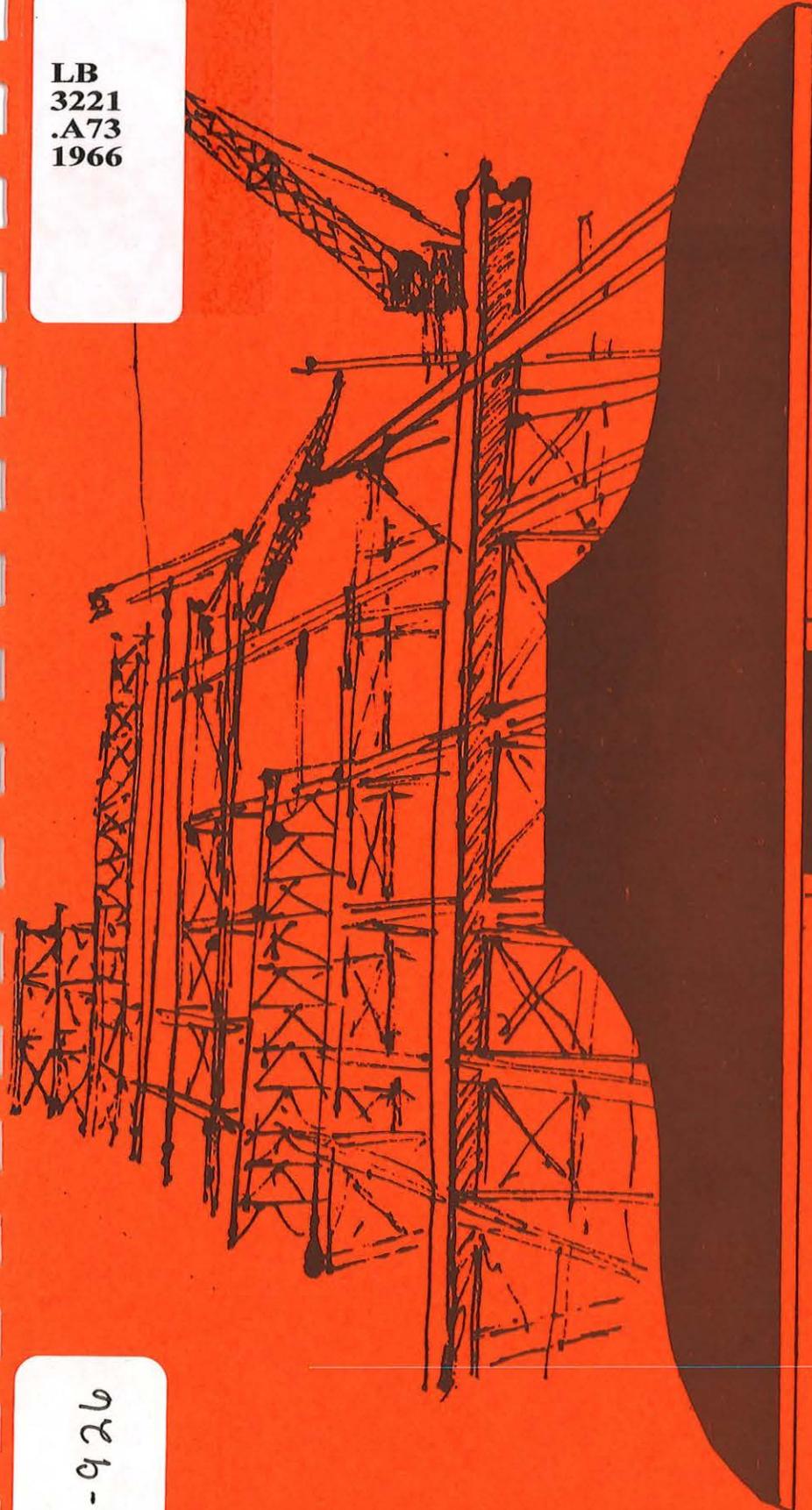


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construction guidelines

AREA COMMUNITY COLLEGE
AND
AREA VOCATIONAL SCHOOL

C O N S T R U C T I O N G U I D E L I N E S

September, 1966

AREA COMMUNITY COLLEGE AND AREA VOCATIONAL SCHOOL
CONSTRUCTION GUIDELINES*

*NOTE:

1. For purposes of these guidelines, the following definitions taken from section 280A.2, Code of Iowa (Ch. 247, sec. 2, 61st G.A.) are applicable:
 - a. "Community College" means a publicly supported school meeting the curriculum requirements of a junior college and offering in whole or in part the curriculum of a vocational school.
 - b. "Area Vocational School" means a vocational school established and operated by a merged area.
 - c. "Area Community College" means a community college established and operated by a merged area.
2. Aids and funds received by an area community college exclusively for vocational school purposes may be used only for vocational school purposes.

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Purpose of Guidelines

The purpose of the guidelines is to assist in the planning process, to encourage good school plant design, and to serve as criteria in the evaluation of area community college and area vocational school plans.

SECTION I

AREA PLANT PLANNING

Area plants should be planned and designed to function in terms of the specific philosophy and program of that individual school; they should not be enlarged high school buildings or small scale university buildings. Adequate planning can help to assure that the buildings are functional, economical, and attractive and that they are designed to meet the needs of an individual area.

Since the area plant will probably be constructed in several phases, it is essential that a great deal of attention be given to the long-range planning procedure. If a good plant is to be developed to meet the needs of the area, a comprehensive educational plan must precede the architectural planning, which includes a master campus plan.

Detailed accurate educational planning is a prime prerequisite to excellence in architectural programming and planning. The architectural design can be no more functional than the educational plan on which it is based. Thus, it is essential that the Area Superintendent and Board assume the educational planning responsibility to assure that a plant is constructed which meets the area needs.

Planning Steps

The following steps are those which an area school board and staff might follow in developing a good area school plant:

1. Determine the educational philosophy and the educational goals for the institution.
2. Conduct surveys to ascertain employment opportunities and the interests and needs of those students in vocational programs.
3. Determine facilities needed by:
 - a. computing estimated future enrollments; b. identifying instructional spaces; c. determining auxiliary spaces; and
 - d. evaluating existing facilities.
4. Develop a comprehensive educational plan with the assistance of consultants.
5. Retain an architect to assist with the master plan, the site selection and development and to design facilities for the initial construction.
6. Determine the financial resources for the building program.
7. Develop written educational specifications. (More detailed information on developing the educational specifications is included in a following section.)
8. Prepare schematic plans, for the initial stage of construction, based on the master plan and the written educational specifications.
9. If bond money is to be utilized in the construction of this building, submit the general scheme to the voters for approval.
10. Carefully review the preliminary plans and submit them to the various governmental agencies for approval. Preliminary plans include: (1) educational specifications; (2) the master campus plan; (3) location of facilities on the campus, and existing facilities; (4) schematic elevations and floor plans; and (5) outline specifications of materials.

Required Planning Procedures

1. All building plans and specifications for construction shall be submitted to the State Board of Public Instruction for review and approval of educational adequacy.

Building plans will be submitted to the State Department of Public Instruction for review at the completion of two phases of their development. These two stages are: (a) the final schematic plan selected by the area board; and (b) the final preliminary working drawings adopted by the area board. The final preliminary working drawings shall be approved by the State Board of Public Instruction.

After the State Board of Public Instruction approves the building plans, no major change regarding educational adequacy may be made during subsequent phases of planning or construction, unless a copy of said change is filed with and is approved by the State Board.

2. Each Merged Area Board shall present evidence of adequate, preliminary planning along with the preliminary building plans and specifications. Preliminary planning includes: (1) tentative program approval; (2) a master campus plan; (3) written educational specifications; (4) site plot showing location of proposed facilities, and existing facilities; (5) schematic elevations and floor plans; and (6) outline specifications of materials.
3. After a tentative approval has been received from the State Board of Public Instruction, evidence shall be submitted indicating the

approval by the State Fire Marshal and by the State Department of Health has been obtained, when required, before final approval will be made by the State Board of Public Instruction.

Educational Specifications

A written educational plan for those buildings that are currently to be constructed shall be developed. These specifications should contain an explanation of the educational program including a description of those activities which are to be performed, the anticipated programs to be involved and how they are grouped, a description of any furniture, equipment or instructional material that is of a special nature, and any special utility services that will be required.

A detailed description of special storage or special design features may be necessary in a particular space to assist in carrying out the unique function of that area. It is with these detailed descriptions and their performance specifications that the architect and educational consultant will work to determine the size, shape and special orientations required for each facility.

The purpose of educational specifications is to provide a written document for communication purposes between the educator and the architect so that functional spaces may be developed which will serve the educational program. Perhaps the most difficult part of any school construction program is the writing of good, clear, concise educational specifications. It is essential that the educator communicate clearly and effectively with the architect if a good plant is to evolve. A school plant should be developed to accommodate a particular type of educational program rather than to alter the program to fit the restrictive limitations of a building.

The administrator must accept the responsibility for making educational decisions and in developing and preparing the educational specifications and should then serve only as a consultant and advisor to the architect during the architectural planning phase. On the other hand, the architect should serve as a consultant during the educational planning phase and should be given great freedom during the design and architectural planning. The planning of any school structure is a cooperative venture and one requiring team work between educators, consultants, architects, board members, and advisory committees and must be based on mutual respect and understanding to achieve the best results.

SECTION II

AREA SITES

Buildings and sites together provide the setting for the development and successful operation of a good educational program. Therefore, the importance of selecting a good site cannot be over-estimated. The following guidelines should be considered in providing the framework necessary for a satisfactory site election.

A. Physical Characteristics:

1. Sufficient amount of useful land.
2. Acceptable shape and contour
3. Sufficient elevation and proper drainage
4. Acceptable soil conditions

B. Environment

1. Clean and quiet surroundings
2. Free from external hazards (railroads, airports, etc.)

C. Accessibility

1. Safety and convenience of approach
2. Centrally located in the contributing area
3. Proximity to public transportation

D. Services (Availability)

- | | |
|-------------------------------|----------------------|
| 1. Sewer (Sanitary and Storm) | 4. Electricity |
| 2. Water | 5. Fire Protection |
| 3. Gas | 6. Police Protection |
| | 7. Postal Service |

Size of Area Site

All sites for area schools shall be approved by the State Board of Public Instruction. The minimum size for an area school site shall be 80 acres for the first 100,000 in total population in the merged area plus an additional 10 acres for each additional 25,000 in population or major portion thereof. Provided, however, that the State Board of Public Instruction may waive said requirement for good cause shown.

Site Development

The arrangement of buildings and the landscaping of area sites should be considered in the master plan.

The buildings should be located back from the streets and drives to isolate instructional spaces away from traffic noise and to lessen the danger to pedestrians. There should be a limited number of points of entry to the area school site in order to facilitate traffic control.

Walks should be direct and convenient to the buildings to be served. Width of walks should provide multiple lanes of approximately 22 inches, with a minimum of three lanes.

A large area will be required for parking since many students will commute. Although there will be some sharing of rides, it may be advisable to provide parking spaces in a number equal to one-half of the enrollment. Approximately an acre is required to park each 125 cars. The parking areas should be lighted and shall have an all-weather surface.

SECTION III

PHYSICAL FACILITIES

The fundamental consideration in the design of any school plant is the educational program to be served, and a structure is not a good school building unless it implements the program for which it was designed.

PART I - General

General Consideration

There are certain general considerations that should be an integral part of any construction project. These are: (1) the architectural character; (2) the expansibility of the facilities; (3) the flexibility of the building; and (4) a design that will be functional for the physically handicapped.

Architectural Character

A school building should denote clean, simple lines and provide a pleasant environment in which individuals may learn. It should not be a monument to posterity. An attempt should be made to achieve economy in terms of value received for every dollar spent. This does not mean that material with the lowest initial cost is the most economical material to buy. Many cheap products are very costly to maintain.

There is intangible, but nonetheless real, value rising from buildings that are aesthetically pleasing. Dollar value alone cannot be the only criterion used to determine architectural quality. The architect should be charged with the responsibility of achieving a satisfactory balance between the aesthetic and the practical--thus achieving a truly economical and architecturally sound building or campus.

Expansibility

Many of the area plants will be constructed in stages. Therefore, the initial units should be designed within the guidelines of a carefully defined long-range plan.

Some general rules for expansibility are:

1. Mechanical systems should be designed to adapt to future plans.
2. Access to heating lines, water lines, electric service, clocks, and public address systems is desirable when future additions can be foreseen.
3. Plan corridors to permit other units to be added.
4. Consideration should be given to the availability of materials used in the initial construction for future expansion.

Flexibility

Interior flexibility is another quality which must be given careful consideration. The program of the future is unknown so space provided should have maximum convertibility. For example: the ultimate enrollments may require a larger library; therefore, adjoining space might be planned which could later be converted for library use. This premise should probably be followed in planning for many of the area school facilities. Therefore, the necessary mechanical services should be so planned as to accommodate easy conversion.

Some of the considerations of flexibility are:

1. Interior partitions should be non-load bearing.
2. Utilities should not be located in partition walls.
3. Fenestration and structural members should be designed to permit relocation of interior partitions.

4. Inflexible items, such as toilet rooms and stairwells, should be grouped and so located as not to limit expansions.

A statement from the architect shall be submitted with the final preliminary working drawings showing that the structure or structures designed are flexible and can be expanded.

Functional for the Physically Handicapped

All area facilities shall be made accessible to and functional for the physically handicapped (Chapter 139, Acts of the 61st G.A.).

Administration

The amount of administrative space and the arrangement will depend upon the size of the school. The location of this space should be easily recognizable, and accessible to the public as well as the rest of the school.

Offices

Several kinds of offices and work spaces are necessary in a well-planned and functional administrative suite.

Administrative offices. The administrative head of the school and other administrative staff should have private offices.

General Offices. General offices should be clustered in an area accessible to the central administrative office. Offices for registration, fee collection, counseling, placement, and other services should be designed to facilitate the traffic flow of large groups of students.

Other areas which should be located to facilitate their use by the general office personnel are:

1. Vault: A fire-resistant vault should be provided for storing permanent records.
 2. Workroom: A machine and duplicating room should be provided.
- Staff Office. A work office should be provided for each instructional staff member.

Conference room. An attractive conference room should be provided for area board meetings and to accommodate orientation meetings for visitors, advisory committees, and other groups that may meet at the area school center.

Counseling. Counseling facilities should provide space necessary to meet the needs of the area school. Each counselor's office should have a floor area of at least 120 square feet. The office should be designed for uninterrupted privacy. If practical, it should be located on outside walls with windows.

First Aid Room. These facilities should provide the space and equipment necessary to meet the needs for first aid treatment at the institution. A toilet should be located immediately adjacent the first aid room.

Bookstore

A place should be provided where books and supplies may be purchased. A store might be located in the Commons area, or a space close to the administrative offices might be assigned to serve this function.

Size. The size of the store will vary greatly depending on the variety of course offerings, the enrollment, and the various needs of the students.

Equipment. A bookstore should be equipped with perimeter shelving and a great deal of display area including some counters.

Storage. A store room which can be locked should be provided for the bulk storage of books and supplies. The bookstore and the store room can be combined into one space if this arrangement would better meet the needs of certain area schools.

Service Building

Consideration might be given to a central service structure which would house a central heating plant, provide a receiving area, and house equipment necessary to maintain the campus buildings and grounds.

Classrooms

A regular or interchangeable classroom is one that does not contain special equipment which might limit its use, but is one that could be assigned any period of the day for various subject fields.

Size. A regular area school classroom should contain a minimum of 750 square feet; however, this should not preclude the possibility of planning special rooms for large group lecture or for small group seminar purposes.

Facilities. Each classroom shall have:

1. At least two (2) electrical outlets,
2. At least sixteen (16) lineal feet each of chalkboard and tackboard space,
3. Movable furniture,
4. Shelving for reference materials, and
5. Light control to facilitate the use of visual aids.

Science

Science facilities should provide the space and equipment necessary to teach the sciences.

Location. Science rooms should be placed together in a science wing or building to permit sharing of common teaching materials; however, a special purpose laboratory might best be located in another section or in another building. Biological science rooms are best located with a southern or eastern exposure to permit optimum lighting for plant growth.

Size. Each science laboratory should contain a minimum of 1200 square feet of floor space exclusive of storage facilities. This should not preclude the planning of a large laboratory for large group laboratory instruction, if desired. An additional 200 square feet of storage space should be provided for each room.

Facilities. Each science lecture room should have a demonstration table at least 36 inches high and be equipped with service utilities. Each room should be adaptable for audio-visual equipment. Safety features such as master shutoff controls and fuses or circuit breakers should be provided. Chemical storage rooms should be ventilated. Each room should be equipped with first aid kits. A preparation room should be provided.

Shower. Consideration should be given to an emergency shower.

Commons

The commons is essentially an informal student center which may be regarded as the hub of the student activity; however, it may also serve a

part of the instructional program. The food service facilities can be used to train students in cooking, baking and restaurant management. An area of the school plant shall be provided where students may gather informally and where food is available.

Location. The commons should be located so that the cooking odors will not permeate through the entire building. The commons should have direct access from the corridors and should have convenient access from the outside. Lunch traffic should be planned to avoid interference from corridor to service area, to tables, to soiled dish return and to corridor.

Size. The area of the kitchen should be thoroughly planned to adequately handle the diverse dining requirements of the area vocational facility with particular attention paid to the commuter's requirements. The commons should provide 15 square feet per pupil to be seated for dining purposes.

Utilities. All utilities -- gas, electricity, water, and sewer -- should be provided.

Physical environment. The following should be provided in all commons:

- (1) sanitizing devices for washing and sterilizing all dinnerware and utensils;
- (2) sanitary storage facilities; (3) adequate light; (4) cheerful colors;
- (5) good ventilation; (6) sanitary conditions; (7) proper acoustical treatment; and (8) screens for windows and doors where required.

Vending areas. Vending machines from which sandwiches and soft drinks can be procured are being used on many campuses. This permits the student

who only wants a light lunch an opportunity to do so without waiting in long lines.

Storage. There should be appropriate storage facilities for the food service and space to store cafeteria furniture when this area is cleared for student activities. Consideration should also be given to a satisfactory receiving area. The receiving platform should be so located as to permit direct access for the receiving of food and for the removal of waste materials.

Washroom. Toilet, washroom, and locker space should be provided near the kitchen for the employees.

Miscellaneous. Additional things that might be considered for the student center are: staff dining; recreational spaces; and meeting rooms.

Instructional Materials Center

An instructional material center shall be planned as a part of the master campus plan and some space made available for library services within the initial construction.

Library

The library section of the instructional materials center should include: (1) a reading room, (2) office space, (3) storage space for books and materials, (4) work space for the library staff, and (5) conference rooms.

Reading Areas. The reading area should seat about 25 per cent of the full-time equated-day student enrollment. In an area plant this facility should provide space for commuting students as well as a place to select materials and do research.

The library should provide for thirty-five (35) square feet per occupant plus space for book shelving. Study tables for seating four students are recommended, as well as individual study carrels.

Storage space for books and materials. Display and storage for a minimum of 10,000 books, a reference collection, 100 periodicals with back issues for at least a ten-year period, 4-6 newspapers should be provided. The storage of back issues of periodicals and newspapers might be placed on microfilm to save space.

Shelving and other necessary facilities should be available in each department for housing materials on temporary or permanent loan from the materials center.

Shelving in the library should be open free-standing stacks arranged for visual control.

Office space. The office area may be furnished with regular office furniture and should contain 120 to 200 square feet.

Work space for the library staff. A workroom should be provided with a sink with hot and cold water, a work counter, table and chairs, a typewriter and desk, book shelving, electrical outlets, storage cabinets, and other pertinent equipment. This area should have direct access to a delivery platform.

Conference rooms. Conference rooms should be acoustically treated to provide sound control and contain some windows in at least one wall for visual supervision. These rooms should be equipped with electrical

outlets and some shelving as well as with a table and chairs. One conference room may be designed to accommodate typing.

Equipment. A circulation desk, a card catalog, a card file, bulletin boards, racks for magazines and newspapers, display counters, and filing cabinets are some of the items of equipment required in a library. Consideration should be given to incorporating an advance retrieval system in the library complex.

Physical environment. The general atmosphere should be pleasant and conducive to study. Excellent illumination, acoustical comfort, and climate control (air conditioning) are absolute essentials to a facility of this type.

Rest rooms. Toilet facilities should be provided in close proximity to the instructional materials center.

Audio-Visual Education Center

The audio-visual section of the instructional materials center should provide for: (1) office space, (2) a dark room, (3) equipment storage, (4) a work area, (5) a room for graphic productions, and (6) an audio booth.

The following are suggested minimum space allocations:

Offices.	400 Square Feet
Dark Room.	140 Square Feet
Equipment Storage.	240 Square Feet
Work Area.	240 Square Feet
Graphics Area.	240 Square Feet
Audio Booth.	80 Square Feet

Consideration should be given to the storage of programmed material and to electrical systems necessary to make use of these materials. Also, it may be desirable to provide coaxial cables or conduit to classrooms to facilitate the use of closed circuit and video taped materials.

PART II - Vocational-Technical Related

Shop Areas

The shop facilities should be so planned as to provide opportunities for educational experiences of an occupational nature.

Flexibility. The shop building arrangement should be flexible to meet the needs of changing programs. An area vocational shop module should provide a potential open space of not less than 4800 square feet. This does not mean that the above 4800 square feet cannot be divided into smaller functional units.

Shape. The shop should not have a ratio of length to width of more than 2 to 1.

Ceiling height. Because of the possibility that areas used for one activity may later be assigned for an alternate use, the minimum ceiling height should be no less than 12 feet.

Related Area. A shop should provide for tool storage, clean-up facilities, project storage, office space, material storage, and other related areas as needed (related facilities are in addition to the 4800 square feet module mentioned above).

Inflammables. Oils, paints and other highly combustible materials should be stored in a fire-resistive space with special ventilation, alarm systems and fire fighting equipment.

Location. The vocational shop facilities should be located so as to permit easy access for the delivery of materials. The shops should be located so that the noise can be isolated from classroom areas not directly connected with the shops.

Floor drain. Consideration should be given to the provision of drains in certain vocational shops.

Electrical. Special attention should be given to the electrical requirements, and sufficient power should be provided to operate machines, etc., as prescribed in the educational specifications.

Doors. All shops will require at least one outside door to facilitate the delivery of materials and supplies. In some shops it may be desirable to provide an overhead door or doors to accommodate vehicles or large pieces of equipment. Any shop designed with a large door shall also provide for a smaller separate personnel type entrance.

Ventilation and take-up system. All shops should be equipped with a mechanical ventilating system and certain shops will require a take-up or vacuum system.

Orientation. All shops should be grouped in such a way as to provide natural relationships with adjacent facilities.

Office Education

The office education facilities should provide adequate space for the activity method of teaching. Equipment should be comparable to the equipment which is used in modern business offices.

Size. The area for a clerical or secretarial program should be a minimum of 2000 square feet which would accommodate twenty-four (24) student work stations.

An office with a minimum of 80 square feet should be provided adjacent to the classroom with a window for supervision.

Facilities. All rooms should have convenient outlets for electrical machines. Each room should be adaptable for audio-visual equipment.

Sales and Marketing

A laboratory for this type of activity should contain no less than 1400 square feet plus adequate storage space. The present philosophy for sales and marketing provides for a multi-use area in which both class activities and laboratory work may be carried on in the same space. An office with a minimum of 80 square feet should be provided adjacent to classroom with a window for supervision.

Food and Nutrition

To facilitate bringing materials and supplies into the department, a location on the first floor and accessible to an outside door is desirable. A minimum food laboratory should contain at least 1200 square feet.

Food and nutrition layout. The organization of the laboratory for the training of food service supervisors and nutrition and service aides should be a large kitchen similar to that in which food is prepared for large groups. There should be open space around the various work areas so that chairs can be grouped around a work unit for demonstration purposes. In some food training rooms, it may be desirable to locate these types of facilities adjacent to or as a part of the food service center.

Clothing Services

The clothing services arrangement should be designed to provide training for employment in tailoring, alterations and clothing repair.

Facilities. This area should be equipped with tables and chairs and with sewing equipment and other apparatus as required by the course offering. Decisions as to the type of equipment and the area of this arrangement will depend on the kinds of occupational training offered.

Size. It is recommended that this space be at least 1400 square feet.

Storage. Storage for teaching materials and books will be needed. Consideration should also be given to storage of student's projects and personal belongings.

Electrical. The electrical service should be planned to accommodate the placement of equipment. However, most equipment can be purchased in portable models which will permit various arrangements for different purposes.

Child Care

In areas where there is a high maternal employment rate, the area school might give consideration to developing a child care curriculum.

Facilities. The indoor program should provide for the physical, social, emotional and intellectual development of the child. Areas for creative activities, manipulative skills, art experiences, dramatic plays, and a quiet corner for book experiences is recommended.

Size. The suggested allotment of space is 35 square feet per child, exclusive of storage and food preparation. The present trend is to prepare food in the food services center and transport it to the child care area.

Storage. A large amount of storage space is recommended for the storing of large pieces of equipment of both indoor and outdoor play.

Outdoor play areas. The outdoor play area should provide a minimum of 200 square feet per child.

Food Laboratory

Consideration should be given to providing a food laboratory. This type of facility will be required in some of the area schools to provide: (1) Basic food preparation experiences for the food service workers; (2) food preparation training for the day care students; and (3) basic home-making education for those enrolled in basic adult education classes.

Drafting

The drafting laboratory should be located in close proximity to the other shops.

Size. A vocational education drafting room should contain at least 1400 square feet plus additional area for auxiliary spaces.

Facilities. Storage cabinets, bookcases, a sink, storage for instruments, space for a printing machine should be provided.

Health Occupations

The health occupations suite should be located in a semi-isolated wing or section of the building, because of the nature of the activities that take place.

Size. Classroom space and laboratory facilities are required by the health occupations suite (size dependent upon the field of preparation). A regular classroom connected by a door to the related laboratory will serve the classroom portion of the course satisfactorily.

Each health laboratory requires a space allocation of approximately 1200 square feet. A private office for each coordinator and office space for the instructors is necessary including space for secretarial help and locker and dressing facilities for the students are required. Rest rooms adjoining the laboratories are recommended, especially in the nursing and medical assistant areas.

Facilities. Health occupation laboratories require a great deal of storage space for bedding, solutions, and supplies. If a medical technician's curriculum is included in the program, microscopes and a microscope storage cabinet are required. Also 220V current may be necessary if certain programs are offered.

Data Processing

A data processing center should be considered in each Area Vocational School to provide training where occupational demands are evidenced, as well as business and service functions. This center should be designed around a modern electronic computer and related data processing equipment.

Classrooms. One general classroom with accommodations for 25 students should be readily accessible to the center for large group instruction. Another space should be available to accommodate 20 students working in groups of one to four pupils. This room would be used both for instructional purposes and as a laboratory work area.

Terminals. Consideration should be given to the possibility of locating remote typewriter input/output terminals in several areas of the school. Terminal locations might include mathematics, science, social studies, library and administrative areas. Special planning considerations must include conduit for cable connections to the computer. One small terminal room, approximately 150 square feet, should have three to four terminals for student access at all times.

Office. The data processing supervisor should have a separate office of 150 square feet minimum. Programming and system analysis should have a minimum of 100 square feet of office space per individual.

Storage. The amount of storage space will depend upon the scope of the data processing program. A portion of the storage area should provide rather tight security for control of records, forms, etc. while other areas should have student access. Magnetic tapes or disks should not be stored

near electronic devices which produce magnetic fields of greater than 50 oersteds intensity.

Temperature and humidity. Prime consideration in planning storage and machine operation areas is to provide adequate temperature and humidity control. The optimum temperature would be 70° - 74° F. with 30% - 60% humidity.

General considerations. The floor space varies greatly with the type of machine. Equipment manufacturers will provide physical characteristics of the machines for the architect. The equipment should be installed on a raised floor or over a crawl space so that cable connections will not create a hazard.

Vinyl or vinyl asbestos floor coverings are generally recommended in equipment rooms. The ventilating fans of various machines tend to draw particles of wool or nylon from carpeting. If carpeting is to be used it should be of a short pile, close knit variety.

Proper acoustical treatment is necessary in facilities of this type.

PART III - Arts and Science Related

Art

The art facilities should be a working laboratory with several centers for work in various media.

Location. The art department should be located on the first floor for easy transfer of materials and exhibits. Natural light of an even quality such as north lighting is desirable. It may form a fine arts center with the music and drama departments.

Size. Art facilities should contain a minimum of 1200 square feet of floor space exclusive of storage area.

Storage. The storage area for art should include shelves, drawers, cupboards, exhibit counters, work counters, filing cabinets, picture files, folio trays, cubicles for unfinished projects, and book shelves.

Utilities. All utilities -- gas, electricity, water (hot and cold) and sewer should be provided.

Auditorium

The auditorium is an essential part of the cultural program and serves a community need and will permit a broadening of the educational program.

Size. The size of auditorium should depend upon school policies, size and program, and the availability of other facilities in the community.

Location. The auditorium should be located on the ground floor and partially isolated from the rest of the building. It should be accessible to school corridors and related school units such as music, speech, and art.

Large auditoriums have had poorer utilization since they are used to their full capacity only a few times a week. A divisible auditorium which can be divided into smaller instructional areas or a little theater with limited seating and more suitable for instructional purposes might be explored.

Seating. The seats should be arranged for safety, comfort, sight lines, and acoustics. The seats should be securely fixed to the floor.

The seating arrangement should follow accepted recommended layout guides to assure excellent vision. A minimum distance of 32 inches from back to back of seats is needed for comfort and safety. One-hour seating can be formed from plywood, plastic or hard surface. If two-hour seating, it should be cushioned. Discomfort is a distraction.

Stage. The stage will depend upon its intended uses. If a drama department is included, provide for a stage draft workshop, property storage room, dressing rooms with toilets and showers and a wardrobe room.

Auxiliary space. Auxiliary spaces should be provided as follows: convenient dressing rooms, a lobby, a ticket booth, checkrooms, a public telephone and public toilets.

Special considerations. Auditoriums require special consideration for temperature, ventilation, lighting, acoustics, sound and seating comfort. Reverberation time should be one second or less. The sound system should deliver 70db evenly and well distributed. Special provisions for film and slide projection, T.V., music and drama should be considered.

Music

Music facilities should provide space for the teaching of both vocal and instrumental music.

Location. Music rooms should be located near or adjoining the auditorium and/or stage. There should be direct outside access to the music department and all areas devoted to music should be in close proximity and easily accessible to each other.

Size. Vocal music rooms should provide 16 square feet per student and instrumental music should provide 20 square feet per student. These space requirements are exclusive of storage and other facilities.

Acoustics. Special sound control is essential for all music rooms. Floors, walls and ceiling surfaces should be designed for the proper amount of reverberation and absorbency.

Storage. Storage should be provided for instruments, uniforms, and music. These storage areas should be located so as to minimize the movement of instruments.

Practice rooms. Should be provided. They may vary in size but should contain not less than 60 square feet.

Language Laboratory

The teaching of modern foreign languages has changed to an audio-lingual method with emphasis on listening, speaking, reading, and writing.

Location. The language laboratory should be located free from both external and internal noise.

Size. The language laboratory should provide 30 square feet per student with a minimum area of 900 square feet.

Electrical. Special attention should be given to the electrical requirements of the console and booth. The wiring should be accessible to permit ease in servicing.

Storage. Storage should be provided for tapes, records, books, equipment, cards, and space to store apparatus not in use.

Office and work area. Office and work area of at least 150 square feet should be provided adjacent to and connected with the laboratory.

Special considerations. Special attention should be given the proper acoustical treatment of each individual student station as well as the entire room. Consideration might be given to a master switch to turn off the electrical power to the laboratory equipment. Good ventilation is essential because of the heat generated by the electrical equipment.

Physical Education

The size and number of building and outdoor facilities is dependent on the program and the number of students using the facilities at peak load. Many activities will be co-ed and geared to life-long physical and recreational activities such as golf, tennis, etc. Properly planned gymnasium floors can be outlined for many indoor sports as well as basketball.

Location. The indoor facilities should be an integral part of the school plant readily accessible to the pupils.

Indoor spaces. The indoor areas should contain at least the following: (1) separate shower rooms for both men and women; (2) locker facilities; (3) safe and sanitary shower rooms (12-15 square feet per student exclusive of related areas should be provided based on the size of the largest physical education class); (4) towel and equipment storage

space; (5) equipment drying areas; (6) in-season and off-season storage of equipment; (7) instructor's office, locker and shower; (8) toilet facilities; and (9) a first-aid room.

Outdoor spaces. Spaces should be provided for: (1) field games; (2) general purpose area; (3) tennis courts; (4) horseshoes; (5) archery range; (6) golf; and (7) other areas which will provide opportunity for life-long recreational activities.

SECTION IV

SERVICE SYSTEMS

Heating, Ventilating, Air Conditioning

Heating, cooling and ventilating systems shall be of sufficient capacity to meet the requirements within the building during the period of occupancy, under extremes in local weather conditions, without sustained operation beyond the rated capacity of the system. Because this type of institution operates during the summer, all buildings or parts of buildings, used for instructional or office purposes shall be air-conditioned.

Operative temperature. Heating systems should provide the following temperatures: (a) classrooms, auditoriums, offices, cafeterias, 70 degrees F. measured 30 inches above the floor; (b) corridors, stairways, shops, laboratories and kitchens, 68 degrees F. measured 60 inches above the floor; and (d) 65 degrees F. for toilet rooms.

Air supply. All schools should be equipped with a mechanical ventilating system and these systems should provide for the introduction of fresh air as follows: (a) in classrooms and libraries, a minimum of 10 CFM per person; and (b) in toilet and locker rooms, science rooms, food laboratories and kitchens a minimum of six air changes per hour for 100 per cent outside or 12 air changes per hour if some air is recirculated. Toilet and locker room ventilating systems should be adequate by accepted engineering standards and should involve a positive exhaust system with tempered ventilating air coming from an independent system or from the balance of the building.

Air movement. Air movement in occupied areas generally should not exceed 35 lineal feet per minute.

Special ventilation. Various areas in the school create special ventilating problems. Spaces with large numbers of people assembled should have ample ventilation and providing at least one and one-half CFM per square foot if air-conditioned and at least 15 CFM per person and at least 2 CFM per square foot using outside air and a mechanical ventilating system.

Toilet rooms, food laboratories, kitchens, and other spaces generating odors should have positive exhaust ventilating facilities.

Fume hoods in laboratories should have non-corrosive ducts and have a positive exhaust control.

Drying rooms in the vocational shops and the physical education areas should be provided with separate mechanical ventilators.

Electrical

Electrical installations are becoming more complex and increasingly important in the teaching and administrative functions of an area school system.

Service panels. Main service panels should be located so as to prevent access by unauthorized persons. All branch panels located in corridor or other places where students have access should be a flush type and should be provided with a lock. Provisions should be made for master switches for certain machines to permit electrical cut-off.

Light switches. Switches should be provided at the entrance to all spaces in the building. Such switches should be placed on the knob side of the door entrance.

Emergency lighting. Consideration should be given to emergency lighting.

Outlets. Every instructional classroom should be provided with a minimum of two grounded duplex receptacles, one located at the front and one at the back of the room.

Special wiring. All lecture rooms, multi-purpose rooms or other areas used for general assembly purposes should be wired for the use of audio-visual equipment.

Special areas. Science laboratories, sales and marketing areas, home economics departments, office education departments, shop and other instructional areas which require a considerable amount of electrical equipment should be provided additional service.

Television. Raceways should be provided in all instructional areas for television antenna and/or closed circuit systems.

Lighting. Visual comfort and efficiency is achieved where the total environment has been conditioned and balanced.

The lighting should produce a uniform distribution of shadow-free and glare-free illumination.

Lighting fixtures should not produce a surface brightness on the fixture or on the ceiling that exceeds ten times the task brightness.

All areas should have lighting fixtures sufficient to provide and maintain the following minimum amount of foot-candle lighting evenly distributed at the working surface level.

- Regular classrooms 50 foot-candles
- Libraries and offices 50 foot-candles

Special rooms including:

- Science, Home Economics, Business
Education, and Shops 70 foot-candles
- Drafting Laboratories. 100 foot-candles

Sanitary Facilities

Well-located and properly maintained sanitary facilities are essential for the health and comfort of the school occupants.

Water Supply. A safe water supply which is capable of providing 30 gallons per day per person should be available to all schools.

Toilet rooms. Toilet facilities should be available for both sexes on each floor of each building.

Floor drains and hose bibs should be provided in each gang toilet room.

Soap dispensers, waste containers, mirrors, book shelves, and hand drying facilities should be provided in each gang toilet.

Warm water should be provided to all lavatories.

Water closets and urinals. The following ratio of sanitary fixtures should be considered minimum in all gang toilets.

Water Closets

- Women 1 to 45
- Men 1 to 100

A minimum of two water closets should be provided in each gang toilet. Urinals for men gang toilet rooms should be provided in the ratio of one (1) to each thirty (30) men or major fraction thereof, but are not required in individual toilet rooms.

Lavatories. Lavatories should be provided in the ratio of one (1) fixture to sixty (60) students in gang toilets. Special washing facilities may be necessary in each shop.

Drinking fountains. Electric water coolers should be provided in the ratio of one (1) to 75 students in classroom areas. There should be at least one fountain provided in each shop.

Service sink. A service sink with both hot and cold water should be provided in each custodian's closet and at least one custodian's closet should be located on each floor.

General Data

Chalkboard, Tackboard

Each shop area should be provided with a portable chalkboard 8 feet long and 8 feet of wall-mounted tackboard.

Review of Preliminary Plans

All preliminary plans for new school plants and/or additions should be reviewed with an educational facilities consultant for suggestions and improvements.

"Home Base"

Since many students will commute to the school, each student will need some kind of facility for the storage of personal belongings. In some cases this storage space may be in the instructional rooms.

Net Areas

Areas discussed in this manual are net areas. Ratio of net to gross space should allow for 25 to 100% additional space for mechanical, circulation, toilets, janitorial and construction needs (walls, etc.).

Non-Acceptable Facilities

Facilities designed primarily for athletics or recreational purposes, other than for physical education, auditoriums, and dormitories shall not be constructed with state funds allocated from the area school appropriations.

Facilities constructed with state funds appropriated for area vocational school construction shall be of a permanent type.

SECTION V

CRITERIA CHECK LIST FOR
AREA VOCATIONAL SCHOOL FACILITIES

Sites

- ____(1) A master campus plan has been developed to serve as a long-range guide in future construction. (p. 2)
- ____(2) An adequate site is available on which to construct the area vocational school plant. (p. 7)
- ____(3) Walks and drives are so planned as to facilitate pedestrian, car traffic flow, and the delivery of supplies. (p. 7)
- ____(4) All-weather parking lots which are adequate in size to accommodate the initial enrollments are included as part of the construction. (p. 7)

Buildings

- ____(5) Tentative program approval has been received prior to the planning of facilities. (p. 3)
- ____(6) Written educational specifications have been developed, and a copy is submitted for the State Board's consideration. (p. 3)
- ____(7) Proper provisions have been made for future expansion of and for flexibility within the proposed buildings. (p. 9)
- ____(8) The facilities are planned to be functional for the physically handicapped. (p. 10)
- ____(9) All administrative, classrooms, laboratories, and related facilities are adequate for the purpose for which they are designed. (p. 10-30)

- _____ (10) All buildings should be air-conditioned to accommodate year-round use of the buildings. (p. 31)
- _____ (11) All areas are adequately lighted to accommodate the specific activity for which they are designed. (p. 33)
- _____ (12) A library is included as a part of the master campus plan. (p. 15)
- _____ (13) An area of the school plant is available where students may eat. (p. 14)
- _____ (14) A satisfactory number of sanitary facilities will be available to accommodate the planned enrollment. (p. 34)
- _____ (15) There is sufficient amount of chalkboard and tackboard in each instructional space. (p. 12)
- _____ (16) The architectural character of the building is such as to provide a pleasant setting for education. (p. 8)
- _____ (17) No facility intended primarily for events for which admission may be charged, nor any facility specially designed for athletic or recreational activities other than physical education, shall be constructed with state appropriated funds. (p. 36)
- _____ (18) All facilities constructed with state funds appropriated for area school construction shall be of a permanent type. (p. 36)

