R E P O R T R E S U M E S

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BUILDING FACILITIES--DESIGN, PLANNING, EQUIPPING, FINANCING. VOCATIONAL, INDUSTRIAL, TECHNICAL EDUCATION.

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DESCRIPTORS- *AREA VOCATIONAL SCHOOLS, GUIDES, *SCHOOL PLANNING, *SCHOOL CONSTRUCTION, FEDERAL AID, EDUCATIONAL FINANCE, BUILDING DESIGN, PENNSYLVANIA,

THE PURPOSE OF THIS MANUAL IS TO SUGGEST GENERAL PROCEDURES AND PROVIDE A REFERENCE GUIDE TO TEACHERS, ADMINISTRATORS, ARCHITECTS, AND SHOP BUILDING SPECIALISTS IN PLANNING THE TECHNICAL SCHOOL BUILDING. AREAS OF INFORMATION INCLUDED ARE (1) PLANNING AND DEVELOPMENT OF THE EDUCATIONAL PROGRAM AND BUILDING FACILITY BEFORE THE ARCHITECT BEGINS WORK, (2) TIMETABLE FOR CONSTRUCTION AND FINANCING SHOWING GENERAL STEPS AND AVERAGE TIME REQUIRED FOR PLANNING AND CONSTRUCTION, (3) THE BUILDING PROJECT PROGRESS RECORD, PROCEDURAL STEPS, AND FORMS TO BE USED, (4) CHECK AND APPROVAL OF SHOP AND LABORATORY BUILDING PLANS, (5) RECOMMENDED SHOP AND LABORATORY SIZES AND FLOOR TYPES, (6) GENERAL PRINCIPLES OF SHOP AND LABORATORY DESIGN, (7) SHOP LAYOUT AND EQUIPMENT PRINCIPLES, (8) STATE CONSTRUCTION POLICIES, PROCEDURES, AND REIMBURSEMENTS, (9) FEDERAL FUNDS FOR BUILDING CONSTRUCTION UNDER THE VOCATIONAL EDUCATION ACT OF 1963, INCLUDING INSTRUCTIONS FOR SUBMITTING APPLICATIONS, (10) FEDERAL FUNDS FOR BUILDING CONSTRUCTION UNDER THE APPALACHIAN REGIONAL DEVELOPMENT ACT INCLUDING INSTRUCTIONS FOR SUBMITTING APPLICATIONS, AND (11) LABOR STANDARDS PROVISIONS APPLICABLE TO FEDERALLY FINANCED AND ASSISTED CONSTRUCTION. IT IS ESSENTIAL TO HAVE COOPERATIVE PLANNING WITH EXCHANGE OF INFORMATION AND IDEAS AMONG ADMINISTRATORS, TEACHERS, STATE DEPARTMENT SUPERVISORS, ADVISORY COMMITTEES, AND THE ARCHITECT. (MM)

Vocational
Industrial
Technical
— Education

BUILDING FACILITIES

Design
Planning
Equipping
Financing

AVTS-V

Commonwealth of Pennsylvania
DEPARTMENT OF PUBLIC INSTRUCTION
Harrisburg 17126

April 1966

PREFACE

The increased activity in the development of area technical schools has focused attention to the problem of planning adequate shop and laboratory facilities. In the planning of these facilities, it is essential to have cooperative planning with exchange of information and ideas between administrators, teachers, State Department supervisors and coordinators, advisory committees, and the architect. These persons are responsible for planning facilities to make the building functional, beautiful, safe, durable, healthful, and at the same time economical in construction and maintenance.

The purpose of this material is to suggest general procedures in planning the technical school building and outline the State and Federal policies and procedures with respect to the financing of area vocational-technical school buildings.

Since the greatest number of shops and laboratories in area vocational-technical schools will probably be technical or industrial in nature, this bulletin provides specific suggestions for these areas in addition to the general information and procedures relating to construction.

This material was prepared by the Technical and Industrial Education staff under the direction of Robert Jacoby, State Supervisor.

April 1966

John W. Struck
State Director
Vocational Education

TABLE OF CONTENTS

PART - A
INTRODUCTION

Local school officials are now participating in the largest school building program in vocational-technical education facilities in the Commonwealth. It appears likely this emphasis will continue in the immediate years, if the needs of vocational education for boys and girls and out-of-school youth and adults are to be fully met.

By tradition and in practice there is a great degree of local autonomy in the planning and construction of building facilities, however, school plants today are costly and school officials need to avoid making mistakes that affect the building efficiency or durability.

Purpose of this Bulletin

The purpose of this bulletin is to provide a reference guide to teachers, administrators, architects, and shop building specialists who share responsibility in designing and planning space and equipment to house programs of vocational-technical education. It is recognized that every program and laboratory must be tailored to fit the specific situation regarding needs and resources, however, there are some general considerations and principles which are applicable to all situations.

All persons who review this bulletin will not necessarily agree with every detail. Specialists in planning education facilities differ in their opinions and preferences. The basic purpose, however, is to give general guidelines, in this specialized field of education, for the design of shops and laboratories, provide principles regarding equipment arrangement and layout, and fiscal reimbursement policies.

PART - B
PROCEDURE FOR PLANNING AND DEVELOPMENT OF EDUCATIONAL PROGRAM AND BUILDING FACILITY

A. Planning Before the Architect Begins Work

1. Develop the educational program plan in cooperation with the professional advisory committee following the format of Form AVTS-IV, Application for Educational Program Plan.

2. Review the preliminary draft of the educational program plan with the State Supervisor of Technical and Industrial Education and the Area Coordinator of Industrial Education. For facilities involving other areas of vocational education, consult the appropriate field supervisor.

3. Submit the educational program plan to the Department of Public Instruction for review and approval.

4. Secure the building room schedule of space allocation.

B. Room Arrangement Development

5. Consultation meeting of architect, Director of Vocational Education, and Area Coordinator of Industrial Education to discuss general principles of development of the preliminary plan arrangement of shops/laboratories and auxiliary rooms. Involve other State Department field supervisors when appropriate.

6. Preparation of the preliminary floor plan by the architect showing the building orientation and plot arrangement of shops, laboratories, and auxiliary rooms required in each laboratory.

7. Review, revision, and approval of the preliminary floor plan arrangement.

8. Development of permanent floor plan by the architect.

C. Detailed Equipment Layout

9. Preparation of the detailed shop/laboratory equipment layouts in cooperation with advisory committees and in consultation with the State office and field supervisor staff.

10. Review of the detailed equipment layout plans by the appropriate State office staff and field supervisors.

11. Final revision of plans by the architect.

12. Final check and approval of plans by the Department of Public Instruction.

PART - C
TIMETABLE FOR CONSTRUCTION AND FINANCING

This timetable shows the general steps and average time required to plan an educational program and facility, and construct an area vocational-technical school in Pennsylvania.

Months	Weeks	
		An agreement is adopted and the Board is organized.
		A Director of Vocational Education is employed.
		A school building project application is filed with the D.P.I. (Form PIBB-40A)
		D.P.I. inspection to determine need for project.
3		The educational program is developed, submitted for committee review, and approved.
	1	Building room schedule is prepared.
6		Architect prepares preliminary building plans.
		Department of Public Instruction approves preliminary building plans.
		Steps are taken toward compliance with Davis-Bacon Act.
2		Preparation of final working plans and specifications and approval by D.P.I.
1		Bid specifications are prepared, and solicitors check for legal compliance.
	2	Bond counselor reviews architect's work, and prints are printed.
1		Construction bids are solicited.
	2	Bids are received and tabulated and tentative contract awards are determined.
	1	PIBB-40B is revised from estimated to actual plans.
		Final Department of Public Instruction approval.
	2	Apply for Federal allocation funds.
1		Bond counselor prepares and sells bonds.
		Contracts are awarded.
12		Construction of building.

PART - D
BUILDING PROJECT PROGRESS RECORD
FOR SCHOOL DISTRICT USE

Name of School _____ Project No. _____

ITEM NO.	DATE	PROCEDURE	FORM NO. USED
1.	_____	Submit application for inspection of facilities and building sites	PIBB-40A
2.	_____	Assignment of inspection order number by D.P.I.	BBCT-213
3.	_____	Inspection of existing facilities (Sec. 2506 (c))	BBCT-311
4.	_____	Development of educational specifications.....	AVTS-IV
5.	_____	Approval of site by State Board of Education	
6.	_____	Project justified and D.P.I. consultant appointed	
7.	_____	Develop room schedule	BBCT-241
8.	_____	Submit cost estimates	PIBB-40B SBA-2
9.	_____	Project approval letter by D.P.I.	
10.	_____	Preliminary building plans approved by D.P.I. and room arrangement by the Technical and Industrial Ed. Division	
11.	_____	Preliminary building plans reviewed by Department of Labor and Industry	
12.	_____	Preliminary building plans approved by Art Commission	
13.	_____	Building appraisal (addition only or alteration)	
14.	_____	Detailed equipment layout plans for special shop-laboratory areas approved by D.P.I. specialists	
15.	_____	Secure occupancy permit from Department of Highways (when applicable)	
16.	_____	Approval of final plans by Department of Health and/or Sanitary Water Board	
17.	_____	Approval of final plans by Department of Labor and Industry	
18.	_____	Approval of final plans by Art Commission	
19.	_____	Approval of final plans by State Fire Marshall (when applicable)	

ITEM NO.	DATE	PROCEDURE	FORM NO. USED
20.	_____	Approval of final plans and specifications by D.P.I.	
21.	_____	Prepare and apply for Federal allocation of construction funds under the Vocational Education Act of 1963	VE-3
22.	_____	Approval of construction and bond bids by D.P.I.	Revised PIBB-40B SBA-2
23.	_____	Building contracts let	
24.	_____	Complete agreement of lease with authority	
25.	_____	Approval of executed lease or general obligation bond resolution by D.P.I.	
26.	_____	Bonds were sold	
27.	_____	Establish temporary percentage of reimbursement by D.P.I.	
28.	_____	Submit application for reimbursement to Bureau of District and County Affairs, D.P.I. after the first rental payment.	
29.	_____	Notify D.P.I. of beginning construction	
30.	_____	Construction inspection conducted by D.P.I. (County Office submit conference report)	
31.	_____	Supplemental contracts over $1500 and change orders approved by D.P.I.	
32.	_____	Building completed - notify D.P.I. of date of completion or occupancy	
33.	_____	Final inspection by D.P.I.	
34.	_____	Submit final cost data to D.P.I.	
35.	_____	Final percentage of reimbursement established by D.P.I.	

PART - E
CHECK AND APPROVAL OF SHOP/LABORATORY BUILDING PLANS

Technical and industrial education shops and laboratories involve expensive equipment and require extensive planning to design a facility which reflects educational needs and economy in construction. Since the School Building Construction Division of the Department of Public Instruction requires that special educational areas be approved by the State Supervisors of the respective vocational fields, this procedure shall be followed in the check and approval of Technical and Industrial Education shop and laboratory plans. The local Director of Vocational Education shall consult periodically with the Area Coordinator of Industrial Education so that suggestions may be presented at the various stages of development of the program and building plans.

CONSULTATION

1. Consultation meeting of architect, Director of Vocational Education, and Area Coordinator of Industrial Education to discuss general principles of development of the preliminary plan arrangement of shops/laboratories and auxiliary rooms. (Consultation time - 1 day)

PREPARATION OF PRELIMINARY FLOOR PLAN

2. When the architect has prepared a preliminary plan showing the building orientation and plot arrangement of shops, laboratories and auxiliary rooms required in each laboratory, the Director of Vocational Education should arrange a conference with the Area Coordinator of Industrial Education and State Supervisor to review the plan. (Review time - ½ day)

PRELIMINARY ARCHITECTURAL REVIEW

3. Review of the complete preliminary building plan with the School Building Division in the Department of Public Instruction. A representative of the Technical and Industrial Education Division participates in this review.

DEVELOPMENT OF DETAILED SHOP/LABORATORY PLANS

4. Preparation of the detailed shop/laboratory equipment layouts in cooperation with advisory committees and in consultation with the Area Coordinator of Industrial Education.

*REVIEW AND REVISION OF DETAILED PLANS

5. Review of the detailed equipment layout plans by the Area Coordinator of Industrial Education in conjunction with a committee of specialists. The Area Coordinator of Industrial Education will attach a copy of suggestions to each shop/laboratory print and submit to the State Supervisor of Technical and Industrial Education. (Review time - 1 week)

6. The Technical and Industrial Education State office staff will review the plans, prepare a final compilation of suggested revisions, and forward the plans and suggestions to the local Director of Vocational Education. (Review time - 1 week)

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*Items #5 and #6 may be combined into one general meeting.

FINAL REVISION PLANS

7. The architect and Director of Vocational Education analyze suggestions and revise the detailed layout plans.

8. The local Director of Vocational Education will arrange for a final review of suggestions and revised plans with the architect; Area Coordinator of Industrial Education; administration; and representatives of the general advisory committee, school board, and State Office Staff. (Review time - 1 day)

9. Final preparation of the plans by the architect.

APPROVAL AND DISTRIBUTION OF FINAL PLANS

10. Submit six (6) copies of the final shop/laboratory detail equipment plans to the Technical and Industrial Education Division for final approval signature. Approved copies will be distributed to:

    a. The project architect
    b. Local Director of Vocational Education
    c. Area Coordinator of Industrial Education
    d. Technical and Industrial Education Division (2 copies)
    e. The Bureau of School Construction

PART - F
RECOMMENDED SHOP/LABORATORY SIZES AND FLOOR TYPES

Instructions:
1. Areas include tool rooms, storage, and auxiliary areas but not theory rooms.
2. 1 - First choice; 2 - second choice

SHOP/LABORATORY	SQ. FT. AREA	FLOOR TYPES				
		PLAIN WOOD	END GRAIN IN TAR	TILE	CON-CRETE	COMBINATION
rcraft Engine & Jets	3600		2		1	
pliance Repair	1500	1		2		2 wood & concrete
to Body Repair	3300		2		1	
to Mechanics	3000		2		1	
ilding Maintenance	2100	1				2 wood & concrete
siness Machine Repair	1500	1		2		
binet & Mill	2700	1 & 2				
rpentry	3000	1			2	
emical Technology	1800				1 & 2	
vil Technology	1500	2		1		
mmercial Art	1500	2		1		
smetology	*2750	2		1		
ntal Assistant	1800	2		1		
esel Engine	3600		2		1	
rafting and Machine Design	1500	2		1		
rafting Arch. Dsgn. & Struct	1500	2		1		
lectrical, General	2700	2				1 wood & concrete
lectronics	1500	2		1		
od Preparation & Service	**			2		1 terrazzo
oundry & Patternmaking	2700		2			1 end, grain, wood & concrete
eating & Ventilating	2100				1	2 wood & concrete
ealth Assistant	2000	2		1		
nstrumentation	1800	1				2 wood & concrete
aboratory Technology	1800	2		1		
achine Shop	3000		1		2	
aintenance Mechanic	2600	1				
etallurgy	1800				1	2 wood & concrete
edical Assistant	1800	2		1		
edical-Dental Office Asst.	1800	2		1		
ainting & Decorating	2100	1			2	

SHOP/LABORATORY	SQ. FT AREA	FLOOR TYPES				
		PLAIN WOOD	END GRAIN IN TAR	TILE	CON-CRETE	COMBINATION
Plastics	2000	2			1	
Plumbing	1800		2		1	
Practical Nursing	*2700	2		1		
Printing General/Offset	2700	2	1			
Quality Control Technology	1500	1		2		
Refrigeration & Air Condition	1800				1	2 wood & concrete
Sanitation Technology	2200		2		1	
Sheet Metal & Fabrication	2400				1	2 wood & concrete
Shoe Fabrication	1500	2		1		
Tailoring	1500	2		1		
Textile Fabrication & Design	1800	2		1		
Tool & Die Technology	2700		1		2	
Trowel Trades	2700				1 & 2	
Upholstery	2000	1			2	
Welding & Fabrication	1800		2		1	2 end, grain, wood, & concrete
Distributive Ed. Classroom	850	2		1		
Sales Laboratory	850	2		1		
School Store	850	2		1		
Distributive Ed., Combination	1600	2		1		
Warehousing	***					
Accounting	1400	2		1		
Data Processing	1800	2		1		
Duplication and Publications	2000	2		1		
Office Management	1400	2		1		
Secretarial	2400	2		1		

* Special State Board requirement
** Additional space to school kitchen depending on size of school
*** Depends upon size of school and nature of program

PART - G
GENERAL PRINCIPLES FOR SHOP-LABORATORY DESIGN

1. Partitioning between instructional areas should be non-load bearing to permit ease in re-location if a certain shop or laboratory has served its purpose and is replaced by a different course of instruction requiring a larger or smaller area than the discontinued course. Partitions should be free from mechanical and utility installations.

2. Ceiling heights are presently required to be a minimum of 9 feet 6 inches clear for classroom areas. If sloped ceilings are used in the design, the ceiling height shall not be less than 9 feet 6 inches at the lowest point. Where rafters, joists, or structural members are exposed, the 9 feet 6 inch ceiling height will be calculated from the floor line to the underside or bottom of the structural members.

   Ceiling heights for vocational shops are presently required to be a minimum of 12 feet 0 inches. For building trades shops, automotive shops, and electrical construction shops, a minimum height of 14 feet 0 inches is highly recommended.

   The building plan should be zoned into three or four zones with the same ceiling height prevailing over any one zone of shops, laboratories, classrooms, offices, and corridors. Corridor ceiling heights shall be a minimum of 8 feet 0 inches.

3. Width - length ratios should be kept as near as possible at 2 to 3 rectangular shape.

4. Multiple instructor shops and laboratories should have an additional 80% more space per additional instructor than a single instructor area.

5. Glass area to floor ratio may vary. With night hour usage nearly as great as day light hours and with summer usage indicating the use of air conditioning, a lesser amount of glass area could be utilized but in no case should window area be eliminated entirely. Window sills should be inclined and 48 inches above the floor. Sash should open near the ceiling and at the sill. Necessary screens and sun shades should be provided.

6. Lighting of 75 foot candles is recommended at the work surface by artificial lighting from the ceiling or from work station lights. Ceiling lights should be highly zoned with localized controls. Lighting should be designed shadow and glare free.

7. Ventilation standards require that dust, smoke, fumes, and gases be exhausted by exhaust systems controlled at the work station when possible. Engine exhausts should be muffled and connected to a forced air exhaust system that discharge outside the building.

8. Corridors should be double loaded, and kept to a minimum, particularly, in the part-time school as traffic is infrequent and of low volume. They should be carried through to outside walls for possible future expansion. They should be anti resonant and treated against noise reverberation.

9. Plot size and orientation of building should provide for future expansion.

10. Heating should be automatically controlled and locally zoned providing 65° F at 60 inch elevation from floor in areas requiring physical activity and 72° F in areas involving sedentary activity.

11. Air conditioning should provide space cooling a minimum of 5° F below outside temperatures and specialized equipment environment in accordance with manufacturers recommendations for temperatures and humidity. Space humidifiers and dehumidifiers should provide humidity control between 40% and 70%. Climate controlled buildings should have a minimum percentage of window area.

12. Utility supply main capacities should be based on liberal estimates of future needs. High utility demand shops should be located near the source of power.

13. Aerial contaminating shops and laboratories should be located so that prevailing winds will carry fumes away from building or the various exhaust systems provided with appropriate exhaust collection or treatment equipment.

14. Single story shop buildings are recommended. Where stairs and elevators are necessary they should be located in separate enclosures off the corridor ends.

15. Related activity shops should be grouped near each other to provide facility in cross scheduling specialized units of instruction. e.g. Welding shop should be located near auto body, auto mechanics, machine shop, structural metal, etc.

16. High noise level shops should be isolated so that they do not disturb other areas.

17. Heavy equipment shops must be located on ground floor.

18. Adult education usage dictates planning for independent access of individual areas; independent utility controls; and extensive parking facilities.

19. Instruction rooms for theory, reference work, and related studies, should be interspersed with shops with one theory room serving 2 to 3 shops depending upon ratio of theory instruction to practicuum in shops concerned.

20. Exhibit and display cases - lighted and locked - should be provided in lobby and corridors. Corridor cases can be viewed from both the corridor and individual shops.

21. Foundation, wall, and roof must be properly load stressed if future expansion indicates an upper story.

22. Walls in corridors, classrooms, and shops should be treated for ease of cleaning to a height of six feet. Light shades of color should be used on all walls and ceilings.

23. A first aid or health room must be provided in each building.

24. Lavatory, fountain, and common wash fountain should be provided in each shop with adequate personnel assembly space about each common wash fountain.

25. Finish room and drying storage (dust proof) is necessary in the plans of some shops. Approved finish materials storage is required. Exhaust ducts from finish rooms must be kept to minimum length and should be de-mountable for periodic inspection and cleaning or equipped with approved filters.

26. Master power control panel with lock and pilot lights should be located in each shop near instructor area with emergency stop buttons controlling all power located at three other remote areas in shops equipped with hazardous equipment.

    The Department of Labor and Industry requires a minimum of two (2) emergency control points.

27. Visual command and supervision of all auxiliary instructional areas must be provided the shop and laboratory instructor-- photo dark rooms and special dressing rooms excepted. Instructor offices, finish rooms, etc., extending across lines of vision should be furnished with transparent material.

PART - H
SHOP, LAYOUT AND EQUIPMENT PRINCIPLES

1. Workbenches storage cabinets, lockers, tables, chairs, and shelving should be standardized in size, construction and finish as much as possible.

2. Project assembly areas for large job assembly must be provided as required with clear floor space or table space.

3. Project storage for pupil work in progress must be provided in some shops. 18" to 24" cubicles are recommended. 40 cubicles would be required for two sections of day pupils and two sections of adults for a total of 80 students with two students per section sharing one locker. The openings should face the shop area and could not be over three or four cubicles per tier high respectively.

4. Tool panels of the lock type (wall mounted or rolling) should be located near the work stations for regularly used tools and instruments. Work station panels are acceptable for some tools. Special or little used tools and reserve tools should be provided a special tool room or cabinet.

5. Supply storage for week to week usage must be provided in each shop. If there is not central storage or warehousing class, each shop must be provided with reserve or seasonal storage space. The space required is determined by the nature of the shop or laboratory. Overhead loft storage may be utilized in certain laboratories with stairs rather than ladder access.

6. Shelving in cabinets and shelf areas should be adjustable except where safety indicates rigid construction.

7. Fire extinguishers of appropriate type must be located and properly mounted conspiciously near points of hazard. Consult with fire underwriters.

8. First aid kits must be provided at the instructors station in each shop. Special eye baths are required where acids and caustics are used.

9. A library of special reference materials must be provided in each shop.

10. A theory and reference work area must be provided if regular theory is not adjacent and in view of instructor.

11. Portable electric hand tools require double electric outlets on power circuits every 10 feet on bearing walls and drop outlets at the same interval over other areas of shop space.

12. Finish for furniture and equipment should be standardized in light shades of grey, buff, blue or green.

13. Moving parts of machines should be finished in vivid red, yellow or orange color to contrast with the non-operating machine body color and stock being worked upon.

14. All stop switch control levers and buttons should be of vivid red finish and start switches finished in standardized green, black, or white. Quietly operating machines should have red operating indicator lights.

15. Noisy equipment should be muffled; mounted with shock and vibration proofing mounts; mounted out of contact with pipes and sound transmitting structural members of building.

16. Relationship of usage must be considered in arranging machines, work stations, and tool panels. They should be grouped for sequence or association of operations, related activities in close proximity, and a minimum of travel. Stock roughing equipment should be located near the stock source.

17. Travel aisles four to five feet wide should provide for free flow of student traffic to connect common usage machines with other common usage areas of shop.

18. Stock feeding and off-bearing clearances must be considered in locating and orienting some machines.

19. Spacing between machines, benches and aisles should be approximately four feet.

20. Hazardous machines must be adequately guarded and safety zones for operator clearly marked with safety floor treatment within the operator zone.

21. A clear floor space of six feet should be provided in front of entrances, exits, tool panels and wash fountains.

22. Equipment other than portable types should be fastened securely to the floor or heavy benches. Place equipment to allow for ease of cleaning around the base.

23. Parallel and perpendicular alignment of equipment is recommended except where greater safety and accessability can be attained by oblique orientation with walls.

24. Waste and refuse receptacles of appropriate size and type should have planned locations. Specialized drains must be adequately provided and conveniently located. Drains for inflamable materials shall not be connected to the building sewer system.

25. Lines of danger from normal or defective machines or materials must be guarded and the machine located so that students and visitors are not in the line of danger.

26. Equipment should be arranged to allow easy positive supervision which permits the teacher to observe the entire open shop area from any point in it.

PART - I
THE STATE CONSTRUCTION POLICIES, PROCEDURES, AND REIMBURSEMENTS

GENERAL INFORMATION

Priority to Area Vocational-Technical School Building Applications

1. An area vocational-technical school building project is on the priority list for building reimbursement at the signing and filing with the School Building Division, Form PIBB-40A, "Application for Inspection of School Facilities and Building Sites."

2. The vocational-technical school application, when received by the School Building Division, will be assigned the regular building project number but drawn from the regular list for priority reimbursement processing in numerical order.

Participating District Distribution of Building Costs

3. All expenses in connection with the establishment of area technical schools shall be borned by the school districts participating in the proportions agreed on by the respective districts. (Section 1845)

4. Commonly accepted plans for sharing capital outlay costs are (a) market value and (b) fixed school district percentage related to the district quota of pupils.

Ownership of Property

5. All property shall be owned jointly by the several school districts participating in the establishment and operation thereof, in the proportion the contribution of each to the cost of acquisition, construction and improvement bears to the total cost. (Section 1845)

REIMBURSED SPACE ALLOCATIONS AND PUPIL RATED CAPACITY

6. The educational program plan including program size and course offerings for the area vocational-technical school is prepared and presented for review and approval of the Department of Public Instruction.

7. The number of shops and laboratories and the specific course titles are approved and certified to the School Building Division by the Technical and Industrial Education Division on Form AVTS-IV, "Application for Educational Program Plan" before a room schedule is prepared.

8. For determining pupil rated capacity of a part-time building 1.44 pupils is assigned for each 100 square feet of approved shop-laboratory floor space.

9. A full-time area vocational-technical high school shall be rated in the same manner as a regular high school except that (1) 85% of scheduling usability applies only to the academic wing of the building and (2) all shops and laboratories shall be assigned a rated pupil capacity of 24 pupils.

The room schedule space allocations represent shop-laboratory instructional area, tool room, storage, wash area, etc., but do not include theory rooms.

11. On an area vocational-technical school building being expanded and altered, the reimbursable base amount is determined by multiplying pupil rated capacity times $3000 and subtracting the appraisal value of the existing structure.

FISCAL DEFINITIONS

12. Project costs are all necessary costs and expenses incurred as the result of the construction and equipping of an area vocational-technical school. (Item G, form PIBB-40B)

13. The approved reimbursable cost of a project shall be the product of the pupil rated capacity as determined by the Department of Public Instruction at the time the project is approved and $3000 plus the reasonable and necessary costs, expenses, and interest incurred as a result of the construction. Such costs include acquisition and preparation of land, sewage treatment, machinery, equipment, furniture, architect fee, contingencies, etc.

14. The reimbursable project percentage is derived by dividing the project cost into the approved reimbursable cost.

STATE REIMBURSEMENT ON BUILDINGS

15. The State rental reimbursement to each school district for the building project is made on the basis of market value of real estate in the participating districts regardless of the ratio of responsibility assumed by the respective districts. (Section 2574-d)

16. School districts shall be reimbursed on amount determined by multiplying the district's capital account reimbursement fraction or fifty percent, whichever is more, by the district proportionate share of the total reimbursable building rental. (Section 2575-b)

17. School districts having a zero capital account reimbursement fraction are eligible for 50% of the district's proportionate share of approved building rental.

18. Because of the increased State reimbursement and Federal allocation of funds for area vocational-technical school buildings, it is possible to finance projects over a shorter period of years, thus reducing interest costs and increasing the reimbursable percentage of the project.

19. Complete, full-time area vocational-technical high school buildings are reimbursed in the same manner as part-time service center buildings under Section 2575 (a and b) however, different procedures are used to determine pupil rated capacity.

20. An area vocational-technical school building being rented, rather than rented for amortization of debt, is approved by the School Plant Division for occupancy but does not receive State reimbursement.

REIMBURSABLE CONSTRUCTION COSTS (SECTION 2574)

21. The approved building construction cost and the interest on such construction cost computed for the term of the lease shall not exceed the product of the rated full-time pupil capacity and three thousand dollars ($3,000).

22. Reasonable and necessary costs, expenses, and interest incurred as the result of the construction of an area vocational-technical school are applicable for full reimbursement in addition to the construction costs. These items include:

    a. Cost of acquiring land including cost of acquisition, title search, legal fees, test borings, surveys, and interest on such costs.

    b. Cost of preparing land for use including rough grading, fine grading, seeding, storm drainage, walks, roads, fences, and foundation plantings and the interest on such cost.

    c. Cost of sewage treatment as required by the Department of Health and the interest on such cost.

    d. Cost of machinery, apparatus, furniture, and equipment, and the interest on such cost.

    e. Cost of all other necessary expenses including bond discount, interest during construction, authority and trustee expenses, inspections, architect's fee not exceeding 6% of construction cost, financial advisor, printing, advertising, and interest on such costs and interest changes.

EXAMPLE

BUILDING REIMBURSABLE PERCENTAGE AND ANNUAL AMORTIZATION RENTAL

VE-3A

General Information

.Number of approved shops-laboratories: 16
.Pupil capacity 640 Pupil rated capacity 520
.Amortization rate 20 years @ 3% interest rate = $67.22 per $1000

Building Construction and Other Costs (From PIBB 40-B)

1. Structure costs		$875,000.00
a. General construction	628,000	
b. Electrical	92,000	
c. Heating and Ventilating	81,000	
d. Plumbing	74,000	
2. Costs other than structure		$435,000.00
a. Acquisition of land	25,000	
b. Preparation of land	20,000	
c. Sewage treatment	20,000	
d. Machinery, apparatus, equipment furniture	285,000	
e. Architect fee	53,000	
f. Contingencies	20,000	
g. Other necessary expenses	12,000	
Total Construction Cost and Bond Issue to Finance		$1,310,000.00

Construction Cost and Interest Shall Not Exceed Pupil Rated Capacity x $2200*

Structure Construction Cost and Interest (Reimbursable Variable)

1. Structure construction cost		$875,000.00
2. Annual payment to amortize $1000 over 20 yrs.	67.22	
3. Annual amortization rental	58,817.50	
4. Total structure amortization cost for 20 years		$1,176,350.00

Maximum Reimbursable Amortization Cost Based on Pupil Rated Capacity
520 pupil rated capacity x $2200 ..... $1,144,000.00

Structure Cost Reimbursable Potential or Percentage (E ÷ D4) 97.24%

Costs Other Than Structure and Interest (Full Reimbursable)

1. Reimbursable costs other than structure		$435,000.00
2. Annual payment to amortizre $1000 over 20 years	67.22	
3. Annual amortization rental	$ 29,240.70	
4. Total amortization cost for 20 years		$ 584,814.00

Total Project Annual Amortization Rental for 20 years $ 88,058.20
(D3 + G3)

Total Project Reimbursement Percentage

Total Project Amortization Cost over 20 years (D4 + G4) $1,761,164.00

Maximum Approved Reimbursable Amortization Cost (E + G4) $1,728,814.00

Total Project Reimbursement Percentage (J ÷ I) 98.15%

*$3000 after July 1, 1966

CALCULATION OF ANNUAL STATE BUILDING REIMBURSEMENTS
AND
SCHOOL DISTRICT ANNUAL COST

TOTAL BOND ISSUE TO FINANCE $__________ ANNUAL AMORTIZATION RENTAL $__________

School District	Market Value	% Market Value	School District Share of $______	Reimbursement Percent _____% x D	Capital Account Fraction	State Reimbursement (E x F)	Cost To School District (D - G)
A	B	C	D	E	F	G	H
TOTAL							

PART - J
FEDERAL FUNDS FOR BUILDING CONSTRUCTION UNDER THE VOCATIONAL EDUCATION ACT OF 1963 (88-210)

This policy and procedure is used only for the purpose of determining the Federal allocation of funds under the Vocational Education Act of 1963, P.L. 88-210.

Definitions

1. The term area vocational education facility shall mean shops, laboratories, classrooms, and related facilities approved by the Department of Public Instruction as area vocational-technical education facilities; or public college or university facilities qualifying as such under Section 8 of the Vocational Education Act of 1963, (P. L. 88-210) and Act 463 (1963) (Sec. 2575-b)

Eligible Agencies

2. Any "Area Vocational-Technical School Board" authorized to organize, establish, and operate area vocational-technical schools or technical institutes under Article XVIII (c) of the Public School Code of 1949, the Act of March 10, 1949, and amended by the Act of August 14, 1963, P.L. 1065, or any public college or university conducting vocational education programs as defined in Section 8 of the Federal Vocational Education Act of 1963 (P.L. 88-210) shall be eligible to apply for Federal building construction funds.

Purpose of Federal Funds

3. The major purpose of the allocation of Federal funds is to provide a lump sum payment to reduce the initial project cost from which the actual State reimbursement and local cost is calculated.

Use of Funds

4. Federal funds allocated to local educational agencies must be used to reduce the bond issue or retire bonds, or purchase the initial fixed equipment for the facility providing such costs of equipment are not included in the bond issue.

Payment of Funds

5. The Area Vocational-Technical Board may apply for funds on behalf of the participating school districts and payment issued in a single check drawn directly to the authority involved. It will be necessary for a municipal authority and the Public School Building Authority to include the following clause in construction contracts:

> "Lessee school districts covenant and agree that any Federal grant made available to said districts in connection with the constructing and equipping of the project may be paid directly to said authority by the Department of Public Instruction, and, authority hereby agrees to credit the entire proceeds thus received in reduction of the capital costs of said projects."

Miscellaneous Items

6. All laborers and mechanics employed by contractors or subcontractors on all construction projects assigned with Federal funds shall be paid wages at rates not less than those prevailing as determined by the Secretary of Labor in accordance with the Davis-Bacon Act, as amended.

7. Discrimination against race, color, creed, for every contract involving construction, authorization, or repair of any project shall be prohibited.

Policy for Determination of Allocation

1. The amount of allocation of Federal funds from P.L. 88-210 on account of a building construction project for a part-time school facility shall be equal to thirty-five percent (35%) and for a full-time school fifteen percent (15%) of the amount of State reimbursement calculated to be provided by the Commonwealth; provided that the total of State and Federal funds for the project shall not exceed the approved reimbursable cost of the project. For the purpose of this allocation, the amount to be provided by the Commonwealth shall be determined on the basis of the actual construction bids and other related costs amortized by a hypothetical bond issue of twenty (20) years duration at an average interest rate of three percent (3%).

2. State reimbursement shall be determined by multiplying the Capital Accounts Reimbursement Fraction or fifty percent (50%), whichever is greater, by the district proportionate market value share of the reimbursable cost. To make the calculation of the allocation of Federal funds, use the Capital Account Reimbursement Fraction of the current fiscal year and the currently applicable market values as approved by the State Tax Equalization Board.

3. Determination of preliminary estimate of the allocation of Federal funds shall be made subsequent to the issuance of an approved schedule of space allocation by the Department of Public Instruction. This estimate shall be reflected on Form PIBB-40B when filed with the Department of Public Instruction. For the preliminary estimate, the project shall be calculated as ninety percent (90%) reimbursable.

4. The Federal allocation of funds may be deducted from structure cost in making the final calculation of State reimbursement.

Instructions for Submitting Applications

5. An area vocational-technical school board may apply to the Department of Public Instruction (Form VE-3) for the allocation of Federal funds immediately upon receipt of construction bids.

6. Consult the Area Coordinator of Industrial Education in preparing the calculation on the following forms:

   a. Application for Building Construction Funds for Area Vocational-Technical Schools, Form VE-3.
   b. Building Reimbursable Percentage, Form VE-3A.

7. Submit a preliminary draft copy of the calculation to the Technical and Industrial Education Division of the Department of Public Instruction for review prior to preparation of the final draft.

8. Submit seven (7) copies of the application forms through the Area Coordinator of Industrial Education.

9. The application for allocation of Federal funds will be reviewed in the Department of Public Instruction for submission to the State Board for Vocational Education.

Commonwealth of Pennsylvania
DEPARTMENT OF PUBLIC INSTRUCTION
Harrisburg 17126

VE-3

APPLICATION FOR BUILDING CONSTRUCTION FUNDS FOR AREA VOCATIONAL-TECHNICAL SCHOOLS UNDER THE VOCATIONAL EDUCATION ACT OF 1963

Name of School _____ County _____

Address _____ Fiscal Year _____

Nature of Projects _____ New Building _____ Purchased Building

_____ Addition to Building _____ Alteration

Date Construction Bids Received _____

Bid Costs of the Project Received by the Board:

A. Structure Cost ..... $_____

B. Architect Fee ..... $_____

C. Fixtures and Equipment ..... $_____

D. Site..... $_____

E. Other Costs ..... $_____

F. Total Cost of Project ..... $_____

Summary of Calculations:

G. State Share ..... $_____

H. Federal Allocation Applicable ..... $_____

I. Federal Allocation Approved..... $_____

NOTE: Please attach the calculation of the Building Reimbursable Percentage used in Column N on other side. (Form VE-3A)

LOCAL SIGNATURES

This certifies that the cost data submitted is correct.

_____ _____
Vocational Education Admin. Date

_____ _____
Chief School Administrator Date

This application was approved by the Board _____ day of _____ 19 ____.

Submitted by Authority of the Board:

_____ President

_____ Secretary

DPI SIGNATURES

_____ _____
Voc. Ed. Area Supervisor Date

_____ _____
State Supervisor Date

_____ _____
Director, Bureau Bldg. Const. Date

DPI APPROVALS

_____ _____
State Director Voc. Ed. Date

_____ _____
Comptroller Date

1/28/66

CALCULATION OF FEDERAL ALLOCATION

School District	Market Value	% Market Value	School District Share	Reimbursable Percentage ___% of M	Capital Account Fraction	State Reimbursement (N times O)	Federal Allocation ___% of P
J	K	L	M	N	O	P	Q

*Total to equal Item F on front page

PART K
FEDERAL FUNDS FOR BUILDING CONSTRUCTION UNDER THE APPALACHIAN REGIONAL DEVELOPMENT ACT (89-4)

This section presents the basic policies, principles and instructions for applying for Appalachian Regional Development Act funds to assist in financing area vocational-technical school building facilities. Since the Vocational Education Act of 1963 is the Basic-Grant-In-Aid and the funding policy of the two Federal Acts is the same, the policies and procedures for the allocation of funds under the Vocational Education Act of 1963 should be clearly understood.

ELIGIBLE COUNTIES

All counties of the Commonwealth are located in the Appalachian region except the following: Adams, Berks, Bucks, Chester, Cumberland, Dauphin, Delaware, Franklin, Lancaster. Lebanon, Lehigh, Montgomery, Northampton, Philadelphia, York.

COMMON CHARACTERISTICS

The statements of policy and procedure applicable to building construction under the Vocational Education Act of 1963 (page 20) are also applicable to building construction funding under the Appalachian Regional Development Act.

POLICY FOR DETERMINATION OF ALLOCATION

THE AMOUNT OF ALLOCATION OF FEDERAL FUNDS FROM THE APPALACHIAN REGIONAL DEVELOPMENT ACT (P.L. 89-4) SHALL BE EQUAL TO THE AMOUNT PROVIDED UNDER THE VOCATIONAL EDUCATION ACT OF 1963 (P.L. 88-210). THE AMOUNT OF ALLOCATION OF FUNDS FOR A PART-TIME SCHOOL SHALL BE EQUAL TO THIRTY-FIVE PERCENT (35%) AND FOR A FULL-TIME SCHOOL FIFTEEN PERCENT (15%) OF THE AMOUNT OF STATE REIMBURSEMENT CALCULATED TO BE PROVIDED BY THE COMMONWEALTH ON THE TOTAL COST OF THE BUILDING PROJECT.

GENERAL REGULATIONS CONCERNING IMPLEMENTATION OF POLICY

1. The Appalachian Regional Development Act (89-4) provides supplemental funds to the Basic-Grant-In-Aid program which is the Vocational Education Act of 1963 (88-210).

2. The Federal funds are applied primarily to assist in the financing of shop and laboratory facilities rather than academic classroom and auxiliary facilities.

3. The allocation of State and Federal funds is based on the local school district ability to pay its proportionate share of the project cost. This ability to pay is reflected in the Capital Account Reimbursement Fraction of the participating school district.

4. The State reimbursement policy applicable to area vocational education facilities assures a minimum of fifty percent (50%) State reimbursement of the State-Local share of the construction cost.

5. The Department of Public Instruction will make a financial analysis, based on data provided by the local educational agency, to determine the financial ability of school districts incurring indebtedness with respect to the building project to meet their share of construction cost. (Sec. 2576)(1)

6. Before approval of construction projects the State Board will determine that sufficient State and local funds are available for the effective use of the facility in the operation of the educational program when construction is complete.(2)

7. All building plans and specifications for construction and financing of area vocational-technical school facilities shall conform to requirements established by State law; the State Plan for Vocational Education; and the Department of Public Instruction.(3)

8. All policies and procedures applicable to the allocation of Federal funds are applied uniformly to all projects within the Appalachian Region as well as other areas of the Commonwealth.(4)

INSTRUCTIONS FOR SUBMITTING APPLICATIONS

9. An area vocational-technical board may apply for funds under the Appalachian Regional Development Act (Form VE-3B) after determination of funds under the Vocational Education Act of 1963, (Form VE-3) which is made immediately upon receipt of construction bids.

10. All project applications are planned jointly by the State representative of the Appalachian Regional Development Commission and the Vocational Education Division of the Department of Public Instruction.

11. Instructions and forms to be submitted as an application include:

    a. Application for Building Construction Funds for Area Vocational-Technical Schools Under the Vocational Education Act of 1963 (88-210) on Form VE-3. This is the basic grant-in-aid which has the approval of the State Director of Vocational Education.

    b. Application for Building Construction Funds Under the Appalachian Regional Development Act, P.L. 89-4. (Form VE-3B)

    c. The application must be accompanied by Information Requested for Under the Appalachian Regional Development Act, ARC Form No. 1, March 1966. Prepare this material on separate pages in descriptive form according to the outline.

Pennsylvania State Plan for Vocational Education
(1) Section 4.32
(2) Section 4.33
(3) Section 4.1, 4.12-2, and 4.39
(4) Section 4.13

12. Consult the Area Coordinator of Industrial Education in preparation of the application forms.

13. Submit twelve (12) copies of all application forms through the Area Coordinator of Industrial Education for processing to:

One (1) copy:

State Supervisor
Technical and Industrial Ed.
Department of Public Instruction
Harrisburg, Penna. 17126

Ten (10) copies:

Administrative Assistant
Bureau of Community Development
Department of Commerce
Harrisburg, Penna.

One (1) copy:

Division of Vocational and Technical Education
Bureau of Adult and Vocational Education
U. S. Office of Education
Washington, D.C. 20202

Commonwealth of Pennsylvania
DEPARTMENT OF PUBLIC INSTRUCTION
Harrisburg 17126

VE-3B

APPLICATION FOR BUILDING CONSTRUCTION FUNDS FOR AREA VOCATIONAL-TECHNICAL SCHOOLS UNDER APPALACHIAN REGIONAL DEVELOPMENT ACT

Name of School _____ County _____

Address _____ Fiscal Year _____

Nature of Project: ____ New Building ____ Purchased Building

____ Addition to Building ____ Alteration

____ Full-time School ____ Part-time School

A. Total approved cost of project ..... $_____

B. Allocation from Vocational Education Act of 1963 (88-210) (VE-3, Col. I)..... $_____ ____%

C. Fund applicable under Appalachian Regional Development Act (89-4)..... $_____ ____%

D. Total Federal funds (B + C) $_____

E. State and Local funds (A less D) $_____ ____%

LOCAL SIGNATURES

This certifies that the cost data submitted is correct.

_____ _____
Vocational Education Admin. Date

_____ _____
Chief School Administrator Date

This application was approved by the Board _____ Day of _____ 19 ____.

Submitted by Authority of the Board:

_____ President

_____ Secretary

The assurance of compliance with Title VI of the Civil Rights Act dated _____ applies to the application submitted herewith.

DPI SIGNATURES

_____ _____
Area Supervisor Date

_____ _____
State Supervisor Date

DPI APPROVALS

_____ _____
State Director Voc. Ed. Date

_____ _____
Date

_____ _____
Date

PART - L
LABOR STANDARDS PROVISIONS APPLICABLE TO
FEDERALLY FINANCED AND ASSISTED CONSTRUCTION

INFORMATION FOR APPLICANT

General Information

1. This material refers primarily to information for the applicant. Detailed information and instructions and appendix references are contained in the bulletin "Responsibilities of the State Board and Local Educational Agencies in the Administration of Federal Labor Standards under the Vocational Education Act of 1963," available from the U.S. Office of Education, Bureau of Educational Assistance Programs, Division of Vocational and Technical Education, Washington, D.C. A copy of the bulletin is in the hands of each Area Coordinator of Industrial Education.

2. Construction of school buildings with the use of Federal funds should not be started before consultation with the Area Coordinator of Industrial Education.

3. Securing a determination of the prevailing wage rates is the responsibility of applicant or owner. The Building Authority assumes this responsibility where one is established, otherwise the applicant would be the local school board.

4. Fill in all required information on Form DB-11, Request for Wage Determination including all crafts to be used on the project.

5. The normal procedure for processing applications of wage determination request is through the State Director of Vocational Education, however, by general agreement the applicant may submit seven (7) copies of Form DB-11 directly to:

   U.S. Department of Health, Education, and Welfare
   Office of Education
   Bureau of Educational Assistance Programs
   Finance and Contract Advisory Service
   Division of Vocational and Technical Education
   Washington, D.C. 20202

6. The Pennsylvania Prevailing Wage Act, as amended August 9, 1963, shall have no application to any public works subject to the Davis-Bacon Act.

7. Communications are processed from the applicant to the State Director of Vocational Education, to the U. S. Office of Education, to the Secretary of Labor.

Preliminary Procedure

8. Applicant, with the possible advice of prospective contractors or

architects, indicates or lists on DB-11 form Request for Wage Determination (Appendix A),* the crafts which are anticipated to be employed in the construction project.

9. Applicant submits DB-11, Request for Wage Determination at least six weeks prior to release of project for bidding.

10. The applicant shall include the approved wage determination and contract clauses in the specifications for prospective bidders.

11. Applicant makes certain that contract clauses (see Appendix B)* relating to labor standards are included in the contract.

12. If, after the receipt of the wage determination, the contractor plans to use employees of a class not listed in the wage determination, a report of laborers and mechanics not covered must be filed.

Procedure for Compliance

13. Applicant makes certain that contractor has posted the wage rate determination in a prominent place at the work so that it can easily be seen by the workers.

14. Applicant obtains from contractor weekly copies of all payrolls and a Weekly Statement of Compliance (Appendix C)*

With respect to the above, applicant assumes the following responsibilities:

a. Examining copies of payrolls and statements to determine compliance.

b. Submitting certification to State Director of Vocational Education indicating that the above have been received, examined, and found to be in good order; and that copies are being retained on file as indicated in (c).

c. Keeping copies of the above on file for three years from date of completion of contract for inspection by authorized representatives of State and Federal agencies.

15. Representatives of the applicant shall make such interviews on the job or such other on-site investigations as may be necessary to determine that the contractors and subcontractors are complying with the contract.

*Responsibilities of the State Board and local Educational Agencies in the Administration of Federal Labor Standards under the Vocational Education Act of 1963, U.S.Office of Education, Bureau of Educational Assistance Programs, Division of Vocational and Technical Education, Washington, D.C.

16. In event of noncompliance by the contractor, the applicant gives written notice to the contractor or subcontractor. If the contractor then fails to pay liquidated damages or otherwise fail to comply, the applicant either withholds payments or terminates the contract.

17. When the applicant finds the amount of liquidated damages to be incorrect or that the noncompliance was inadvertent, a written report or request may be made for adjustment of liquidated damages or relieved of liability.

Procedure for Reporting

18. Noncompliance reports must be submitted by the applicant when there are willful or aggravated contract violations.

19. The applicant submits to the State Board, at such intervals as the State Board may determine, reports containing information necessary for the State agency to submit semi-annual reports.

Acknowledgements

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