

**VERMONT
SCHOOL CONSTRUCTION**

**Planning Guide
and Standards
for
Technical Education Centers**



A publication providing technical assistance to school boards, administrators and governing boards.

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Pursuant to Title 29, V.S.A. 161 the Commissioners of the Department of Buildings and General Services and the Department of Education shall develop standards for technical education center construction. This document design is modeled to parallel and connect to the current “Vermont School Construction Planning Guide” published by the Department of Education.

INTRODUCTION

This guide is to help you through the process of planning and pursuing a technical education construction project. It is to be used in conjunction with applicable construction standards governing technical center construction and State Board of Education Rules for Capital Construction and is not intended to be used in isolation or to supersede any other agency rules for school construction. While the guide alerts you to them, specific rules of state agencies that apply to school construction are beyond the scope of this document.

Described here are the procedures and standards that guide the development of a project. If these procedures are adhered to, the Departments of Buildings and General Services and Education will coordinate all relevant functions so that a project receives the necessary permits and approvals as expeditiously as possible.

In brief, the task of planning and carrying out a technical center construction project is complex. Somewhere along the road you may want to hire a consultant to oversee the process and you will definitely require the services of an architect. Just a word up-front, then, on how to choose and work with these professionals who will help you communicate and carry out the process successfully with all the agencies, boards, and other stakeholders who will be involved at various steps of the project.

Consultants

Identifying and recommending the best long-term construction project demands a great deal of time. Employing a private consultant to oversee this can be a valuable investment. There are a number of professionals available.

When considering a consultant, look for a person or firm with strong experience with the issues you may be studying and great communication skills. You will want someone who is practical and comfortable to work with and familiar with Vermont's various requirements. Finding a suitable consultant can entail a similar process to that described below for hiring an architect.

Employment of any consultant should be based on a contract that defines what services the consultant is to provide and when. It should specify how much these services will cost and the manner in which you will pay for them. It should also specify how any extra services you might want the consultant to give you beyond those described are to be billed. The board's attorney should review any contract.

Selection of an Architect

An architect licensed to practice in Vermont prepares plans and specifications for technical center construction projects involving alterations of existing spaces and construction of new space. The architect is responsible for designing the project meet the approved educational specifications and pertinent state codes and requirements.

Architecture is a competitive business; however, it does not require going out to bid. Recruiting an architect may begin with letting the design community know that you're a project in mind. A small newspaper advertisement is likely to draw a number of responses from interested firms.

Choosing which firms to interview takes a bit of work. Start by looking at the information each firm's sends you; this will usually include descriptions of recent commissions. Talk to the owners of those projects, and the general contractors. If possible, go visit some of the buildings. Look for history of good communication, imaginative design, good choices of materials in the design and good cost estimating. The Department of Buildings and General Services can assist in this process. The governing board in coordination with the Department of Buildings and General Services will want to interview a smaller number of firms.

Also, be looking to the architect to provide a design that can be expected to be economical throughout the useful life of the project. Is the firm capable of developing data on life cycle costs for the choices of mechanical and structural systems and the materials with which the project will be built? The architect should have a good record of providing prior clients with reliable long-term information.

The interview itself is an opportunity to try to assess what kind of chemistry will exist between you and the architectural firm. Discuss with each interviewee time frame of the project to see whether it actually fits the anticipated workload of the firm. Also, you should ask about the engineering services the firm will use.

What about fees? Fees vary between architectural firms and should be discussed/negotiated prior to contracting for services. What financial arrangement is the firm willing to make to do the necessary preliminary work? There are no standards on this but a common approach is for a firm to agree to do preliminary design work and cost estimating for you on an hourly rate, up to maximum figure, to prepare the project for presentation. The firm should be clear as to exactly what fees and expenses it will bill you. The firm you select will be committing real time and professional effort to your project prior to legislative approval. The board should be prepared to pay the reasonable cost of such services.

After the preliminary approval the State Board of Education may recommend to the legislature approval of your project. Once, the legislature approves the project the Department of Buildings and General Services will negotiate a contract with the architect for the final design work and project supervision. Do not complete such a contract on behalf of the Department of Buildings and General Services, if so it will be null and void.

I. TECHNICAL CENTER CONSTRUCTION AID

Title 16, V.S.A. §3448 (4)(D) requires that the State Board of Education present the house and senate institutions committee with its annual capital construction funding request that includes the cost of construction or purchase of proposed new technical center buildings, or extensive additions or alterations to existing technical center buildings. However, unless otherwise determined by the general assembly, the state board may approve not more than one significant proposal for aid under this subdivision every three years. Request for state assistance for minor additions or alterations to a technical center building shall be made under subdivision (A), (B) or (C) of this subdivision.

Title 29, V.S.A. §161 requires the Department of Buildings and General Services be responsible for design, construction or purchases of any new building or extensive additions or alterations to any existing buildings, for use as a technical education center, funded by state monies, regardless of any other source of funding. All such state monies shall be appropriated to the Department of Buildings and General Services for this purpose.

There are a number of steps that must be followed to receive all possible state financial assistance for a project. These are described in the section on "Procedures". All projects must meet eligibility requirements and are subject to design standards established by various state agencies.

Site acquisition costs and most moveable furnishings and equipment are not eligible for construction aid. However, site development is an eligible expense. The Department of Buildings and General Services and the Department of Education will determine the eligible cost.

II. THE PLANNING PROCESS

A. STEPS IN THE PLANNING PROCESS

Because of the level of state participation in the costs of the project, the departments of Education and Buildings and General Services are charged with insuring that a proposed construction project is needed and will meet the needs of students and the region in the most efficient manner possible. In order to do this, these departments work closely with a region throughout the planning process. There are specific steps in the planning process that insure these outcomes. Some of the steps described may not apply to certain types of projects or might occur concurrently with others. As you - the board overseeing the center and individuals charged with heading up the construction project - confer with the Departments of Education and Buildings & General Services on your project you will be advised of those steps that can be omitted or occur simultaneously.

1. Notify the Commissioners of Education and Buildings & General Services that your region is pursuing a technical center construction project. Set up a meeting to review these procedures and get clarity on the process.
2. Complete a facility analysis to identify the school building deficiencies and space needs and **establish urgent need**. This study may include input from the other agencies with rules affecting school occupancy such as the Department of Labor and Industry or the Agency of Natural Resources. Schools should ask state agency representatives to identify areas of the buildings or sites not in compliance with state rules or regulations. Consider alternative education and physical solutions available.
3. Submit to the Commissioner of Education for approval the facility analysis and alternative educational and physical solutions available.
4. The Department of Education will schedule a pre-construction evaluation. During an inspection, the Department will use the facility analysis to verify the demonstrated need for the proposed project.
5. The department representative will advise the board if urgent need has been established.
6. Prepare to submit to the Commissioner of Education a **proposed set of programs** that the project will accommodate.
7. The Department will review the projected programming/services and advise the board on approved programming.

8. Develop education specifications for the approved programming. If collocators are part of the project, have collocators prepare specifications for their programs of studies and specific space needs.
9. The Department will review the specifications and advise the board on the specifications that will guide the planning of the facility.
10. With the help of an architect, use the facility analysis, the findings of the state inspection to determine the feasibility of resolving the needs of the technical center. Provide the architect with the approved educational specifications, and program of studies and the reports on hazardous containing materials in the school building. Assess whether an addition or alternations at the existing site will meet the needs of the school; or if a new school seems a wiser choice.
11. If construction planning is to continue, commission the architect to prepare preliminary designs and estimated cost of construction based on the approved educational specifications and program of studies and agreed program space for collocators.
12. If land must be purchased or leased, care should be taken to see that necessary legal procedures are followed. If state construction aid is desired, a school district must have permanent unrestricted access to any leased land upon which a school is to be erected. Review utility services including electricity, water and sewage disposal conditions at the existing site and costs for bringing such services to any new site the board may be considering. For any site not served by municipal systems for both water and sewage the board must employ professional engineering services for this review.
13. Construction activities either at existing or new sites, may also trigger a variety of other permitting requirements involving Agency of Natural Resources, Act 250 or other local and state agencies. Due to the fact that some permitting processes can require several months to complete and that state agency approvals are necessary for funding, it is very important to initiate these processes as early as possible.
14. If the Commissioner has approved the enrollment projections, educational specifications, and the program of studies, the governing board once it is satisfied with a design, it may submit seven sets of preliminary architectural drawings and estimated cost to the Department of Education.

The Department of Education will arrange a preliminary review where all relevant state agencies can comment on the proposed plans and can provide information essential to the success completion of the project.

15. Once the Departments of Buildings and General Services and the Education have approved preliminary drawings and estimated cost estimate the State Board of Education may submit a request for funding to the legislature.

16. Once the legislature has approved the final project and appropriated funds the Department of Buildings and General Services will enter into a contract with the architect for final design and seek all building permits.

The information you need to go through these steps is provided in the parts of this planning section.

B. ESTABLISHING URGENT NEED

A Regional Technical Educational Center considering requesting School Construction Aid for the cost of constructing a new technical center, addition or alteration to an existing technical center must demonstrate to the Commissioner of Education that an urgent need exists that cannot be reasonably met by another means. Urgent need is established by conducting a facility analysis. The analysis entails an evaluation of the infrastructure of existing building(s), including the health and safety conditions and a history of maintenance on the school. It must also include demographic data, enrollment projects, and a space utilization schedule. It must also include evidence that alternative educational and physical solutions available to them have been evaluated. The analysis shall identify the areas of deficiency consistent with the following criteria:

- Facilities are inadequate to provide programs required by state or federal rule or regulation;
- There is deterioration of existing buildings;
- Conditions are unsafe or threaten the health of students or employees;
- There is maximum utilization or over utilization of the existing space requiring additional space to meet the needs for the total eligible pool in the center's assigned service region;
- The current facility does not meet the design criteria established by the legislature in Act 138:
 1. Accommodate larger number of students for longer periods of time;
 2. Provide maximum flexibility to modify programs
 3. Allow for program clusters around career areas; and
 4. Provide students opportunities to experience technologies found in the modern workplace.
- The center demonstrates that it needs additional space to provide adult and postsecondary technical education programming.
- The center can not address regional workforce development needs.

Space Utilization Schedule - The facility analysis should include a room utilization chart or schedule demonstrating how the existing facilities are inadequate to provide quality programs and services required by state or federal rule.

Enrollment Projections - When a construction aid project is primarily intended to accommodate enrollment growth, it must be shown that the existing facilities are overcrowded or otherwise inadequate to support programs required by state or federal rule. It must also be shown that these conditions are not likely to be relived by a decline in enrollment for the foreseeable future.

Generally speaking, projections for enrollment for construction aid purposes must follow the so-called persistence of experience method. This means that you must use the enrollment history of the schools together with the live birth history for the district or districts from which the school receives students to predict the enrollment that will occur in the years to come. This approach must be used in any school system with yearly live births and grade-by-grade enrollments of twenty or more with a record of growth or stability in its enrollments. If you have a different approach confer with the Department of Education to determine a more appropriate basis for predicting future enrollments. This method should be based on a ten-year history and limited to ten years ahead. Directions for preparing projects are found in Appendix_____.

Once you have your ten-year projects, take 50% of the enrollment of the total 11th and 12th grade students enrolled in the service region and multiply the result by 40%. This calculation will identify the needed capacity for secondary technical education programming for the technical center.

Projections should also be developed for the need of adult and postsecondary technical education in the region. The regional Workforce Investment Board should provide a projection of the type and quantity of such programming needed to meet the workforce development needs of the region.

Collocators - If there are to be collocators to address these needs as part of the proposed construction project, enrollment and/or service projections for collocators shall be included.

C. PROPOSED PROGRAMMING

Once urgent need has been established and the number of students to be served has been identified, you need to develop a set of programs/services that will meet the needs of current and future students. You must document that the proposed programming meets the following criteria:

1. Each proposed program prepares students to pursue high-skill, high-wage careers.
2. There are employment opportunities in the region/state in the career area of each program.
3. There is evidence that there is and will be sufficient student interest to generate an enrollment that would justify offering each program.

The Department of Employment and Training has regional data on wage levels and employment opportunities and will be glad to provide and orient you to this information. Your task is to analyze this information and identify programming that will prepare students for career areas in which they will have opportunities for employment and will be able to earn adequate wages.

Possible program enrollments can be established in several ways. Past enrollments can be analyzed if the program has already been offered. Possible enrollments for new programs can be projected through instruments such as student surveys and enrollment histories of that program area in other parts of the state.

If the project is to include postsecondary programs, these also must be identified and justified using the same criteria.

D. EDUCATIONAL SPECIFICATIONS

Once agreement has been reached on the programming that the construction project is to accommodate, you can begin the process of developing educational specifications for those programs. Educational specifications are a set of performance requirements for a school construction or renovation project. They describe the indoor and outdoor facilities the school needs for every area of its curriculum and services provided, as well as the anticipated community use or partnerships for its buildings and grounds.

If the school needs new or renovated facilities to provide appropriate space for existing programs or to accommodate new instructional techniques, the educational specifications should articulate the physical space needs necessary for students to have the appropriate learning opportunities.

Preparing educational specifications should be a collaborative effort of the faculty, school housekeeping, support staff, administration and partners. Students, parents and other community members can and should be asked to help. When collocators are part of the project, they need to develop specifications for their space that reflect the input from their customers and those to whom they report. The end product will be a document, which describes the school's future and all elements of the community, which have interest.

Educational specifications should begin with an opening statement that clearly describes the vision for the school. In the years ahead, how will instruction be organized? How will students and partners work with each other and their teachers? What new programs will be introduced? Then based on the enrollment projections, each indoor and outdoor area need should be described in **non-architectural** terms:

- Who will use the space (age or grade level of students for instructional spaces) and what will they be doing there?
- What will the maximum number of uses at any one time be?

- How much space will be needed for the teaching strategies?
- What is the frequency of the room's use during the school week?
- What are the special requirements as to:
 1. Heating, lighting, or ventilation
 2. Acoustics
 3. Relative location within the building to other programs or the site
 4. Other environmental or aesthetic considerations
- What fixed equipment or furnishings are necessary?
- What storage provisions are necessary?
- What state or federal regulations apply to the space?
- What parts of the school are to be used by partners or the community and what are the desirable design provisions in anticipation of such use?

The architect will design the facility based on the approved educational specifications. The Department of Education and the Department of Buildings and General Services will evaluate design proposals for the project based on the approved educational specifications.

E. PRELIMINARY DESIGN

The finalization of educational specifications defines what the construction project must provide. Now begins the phase of developing a preliminary design of a facility that will do that. There are multiple things for you to consider as you enter this phase. You will definitely want to start working with an architect to walk you through the process of creating a preliminary design. Issues you will need to address in the creation of this design are:

- how the project relates to **existing space**
- How current **design elements for technical centers** are incorporated
- What design options are there to meet the **educational specifications**
- Whether proposed designs meet **state standards for minimum square footage** in different program areas
- The extent to which **Site considerations** will influence how the components of the project come together and impact the effectiveness and cost of the project.

Disposition of Technical Center Space

The technical center board is required to account for, and, to the extent practical, make use of, all of the technical education spaces previously provided by the State of Vermont.

If a decision is made to vacate the current space and to build new on a different site, the technical center board must demonstrate to the State Board of Education why the existing space and site are inadequate for the proposed programs and services. In addition the board must make recommendations for disposition of the existing technical center facility to the State Board of Education.

Design Elements for Technical Centers

Regional technical centers and comprehensive high schools must provide reasonable access to all secondary students throughout their regions strengthen connections to out-lying communities. While the primary mission of these centers will continue to be the provision of secondary technical education programs, their after-school capacity for adult or postsecondary technical education should be maximized to support regional and state workforce development. Renovation and expansion of these centers should:

- Accommodate larger number of students for longer periods of time to allow for the acquisition of broader and higher skills
- Provide maximum flexibility to modify programming to stay current with the rapidly changing workplace
- Allow for clustering of programs around career areas to promote efficient instruction of foundation skills underlying multiple programs within those areas
- Significantly increase the capacity to provide adult and postsecondary programs
- Provide experience with technologies current in the workplace to youth and adults.

A technical center can additionally request an expanded construction project that would include space for collocation of providers and/or spaces dedicated to postsecondary programming. In addition to the above design elements, such centers should be built to:

- Collocate workforce development providers of programs and services.
- Offer the full range of adult and postsecondary programs and services needed by the region and the state.
- Be operated by a regional board that is representative of and responsive to collocation partners and major stakeholders.

To request additional space for collocation partners, the center must solicit and obtain support from the Department of Education, the Human Resource Investment Council, and, if postsecondary programming is involved, the Vermont State Colleges that it is strategically located to serve an area of the state that needs significantly expanded access to adult and postsecondary technical education and training or to specific services that support the workforce development needs of the region. Once this support is obtained, the center needs to develop a draft host-tenant agreement for all collocators addressing all necessary subjects.

Preliminary Design of Program Spaces

Preliminary design of program and service spaces should be the most exciting and creative part of the planning process. Working off of the design elements, invite your staff to research what are best practices in their program areas, visit other centers to see their design approaches, involve advisory board members in the design process, or pursue other strategies to develop plans that will optimally serve students.

This creative aspect of design will be counter-balanced by certain constraints. Once a vision has started to emerge for the center, you will want to begin to consider the

state's guidelines, standards, and levels of participation in construction. These can be found in section of this guide. The evolution of an efficient and effective design require both the exploration of possibilities and the application of constraints.

Site Considerations

If there is a choice between an existing school site and a new one, cost of land is an obvious factor, and must be weighed against the disposition of technical center space previously provided by the state. In any case there are constant factors, which should enter into the decision making a school site, these are outlined below:

- Convenient location for school activities and non school functions the facility may serve;
- Convenient location for regional areas the technical center supports;
- Safe highway access; and safe traffic pattern around the school;
- Aesthetic appeal;
- Access to municipal services for water supply and sewage disposal or suitable conditions for developing on-site services;
- Sufficient usable land for all the programs the school would project;
- Conditions for economical construction and site development;
- Enough space for the necessary service delivery are3as for the school;
- Noise levels in the surrounding areas; and
- Space to accommodate the growth potential of the service region.

Land owned by another legal entity might be counted if the school has permanent unrestricted use of it. However, state school construction aid can only apply to construction or site development costs on land owned outright by the district or land for which the district has a clear title in fee simple or permanent deeded easement or right-of-way.

Preliminary Plan Review

During the creation of a preliminary plan, you will want to get feedback from the Departments of Education and Buildings and General Services in order to make final approval easier. Once a preliminary plan has been completed, a meeting with the Departments of Education and Buildings and General Services of school officials, architect, governing board and state agency representatives to review preliminary architectural plans for school addition, renovations and new buildings is required.

The purpose of the meeting is to expedite the final state review of the completed working drawings for the project. At the meeting the state agencies will advise of any problems they see with the plans with respect to their agency rules and regulations and the approved educational specifications and program of studies. Also, the estimated level of state financial assistance for the project will be determined.

The Department of Education will coordinate this meeting.

III. Technical Education Construction

A. Steps in the Construction Process

After the legislature has approved your technical education construction project and appropriated all or part of the necessary funds, the construction process can begin in earnest. Up to this point your main point of contact on the state level has been the Department of Education. As the construction process begins, you will work primarily with the Department of Buildings and General Services to whom the funds are appropriated and who is charged with overseeing the final design and construction project. The steps in the construction process are as follows:

1. Once the legislature has approved the final project and appropriated funds the Department of Buildings and General Services will enter into a contract with the architect for final design and seek all building permits.
2. The Department of Buildings and General Services will publicly bid the construction project.
3. The Department of Buildings and General Services will enter into a contract for construction with the General Contractor.
4. The Department of Buildings and General Services will process payments in accordance with the contract.
5. The Department of Buildings and General Services must approve all change orders. When this involves the reallocation of educational space, it will consult with the Department of Education.
6. When the governing board and the Department of Buildings and General Services are satisfied that the construction has been completed according to the approved specifications, a joint inspection will be schedule. The inspection will determine that the work meets all state agency requirements necessary for occupancy of the building. Any discrepancies found in the project during this inspection must be corrected to the satisfactory of the governing board and the state agencies before final payment is made.
7. Upon completion of the project, the contractor will provide the governing board with the “as built” drawings. It is the responsibility of the board to ensure these are safely and securely stored.
8. Once the construction project has been completed and ownership of the project has passed from the Department of Buildings and General Services to the governance board for the technical education facility, the governing board is required, as a condition of ownership, to assure the State Board of Education that all of the spaces provided in the proposed center will be utilized for the purposes for which they were constructed and that technical

education programs and services will be available for both secondary and adult students for the total service region assigned by the State Board. When parts of technical education facilities are not needed, with the permission of the Commissioner of Education, others may utilize those facilities for other educational purposes.

Communication During Construction

It is necessary to maintain communication throughout the project among the governing board, clerk-of-the works, architect, Department of Buildings and General Services representative and the contractor. To ensure the best possible communication among all parties concerned, the board must designate one person to speak for the board throughout the project to a building committee. The Department of Buildings and General Services will have oversight of the building committee meetings. Failure to designate such a spokesperson will lead to contradictory signals among the parties, lost time and energy, as well as possible added costs.

B. State Standards for Technical Education Construction Projects

In order to insure that technical education construction projects result in a safe environment, are built efficiently, and are responsive to all federal and state requirements, the state sets parameters for these construction projects. Those that impact the design and construction phases are identified in the following sections:

1. Minimum Square Feet per Student for Programs and Services
2. Maximum Space & Cost for State Participation
3. Standards for Construction
4. State Agencies' Rules and Regulations

1. Minimum Square Feet per Student for Programs and Services

If one or more of the following are included in the proposed construction project, the following guidelines indicate the minimum amount of space that should normally be planned the program and service areas. Your project may have special circumstances that require more space. You should be prepared to identify those circumstances when you present your preliminary design.

A. HORTICULTURAL/NATURAL RESOURCES

1. Horticultural

Laboratory	160 square feet per student capacity
Classroom	30 square feet per student capacity
Greenhouse	225 square feet per student capacity
Headhouse	125 square feet per student capacity
Storage	500 square meet

2. Natural Resources

Laboratory	160 square feet per student capacity
Mechanics	225 square feet per student capacity
Classroom	30 square feet per student capacity
Hydroponics	125 square feet per student capacity
Storage	500 square feet

3. Agricultural Mechanics

Laboratory	160 square feet per student capacity
Classroom	30 square feet per student capacity
Storage	500 square feet

B. CONSTRUCTION/INDUSTRIAL

1. Construction Trades

Laboratory	225 square feet per student capacity
Classroom	30 square feet per student capacity
Storage	500 square feet

2. Welding/Metal Fabrication

Laboratory	160 square feet per student capacity
Classroom	30 square feet per student capacity
Storage	250 square feet

3. Manufacturing/Industrial Technology

Laboratory	160 square feet per student capacity
Classroom	30 square feet per student capacity
Storage	250 square feet per student capacity

- 4. Electricity/Electronics
 - Laboratory 80 square feet per student
 - Classroom 30 square feet per student
 - Storage 400 square feet

C. AUTOMOTIVE TECHNOLOGY

- 1. Automotive
 - Laboratory 180 square feet per student
 - Classroom 30 square feet per student
 - Storage 600 square feet

- 2. Auto Body Repair
 - Laboratory 180 square feet per student
 - Classroom 30 square feet per student
 - Storage 600 square feet

D. CULINARY ARTS

- 1. Culinary Arts Program
 - Kitchen 120 square feet per student
 - Dining Room 125 square feet per student
 - Classroom 30 square feet per student
 - Storage/Freezers 600 square feet

E. HEALTH AND HUMAN SERVICES

- 1. Human Services Program
 - Classroom 30 square feet per student
 - Laboratory 225 square feet per student
Not including infants/toddlers
 - Storage 200 square feet
- 2. Health Occupations
 - Classroom 30 square feet per student
 - Laboratory 225 square feet per student
 - Storage 200 square feet

F. GRAPHIC ARTS/CADD ENGINEERING DESIGN

- Laboratory 75 square feet per student
- Classroom 30 square feet per student
- Storage 400 square feet per student

G. COMPUTER TECHNOLOGY/FINANCIAL SERVICES/OFFICE OCC.

- (Also, networking, medical records, video production, design and illustration)
- Laboratory 60 square feet per student
 - Classroom 30 square feet per student
 - Storage 200 square feet

H. MARKETING, HOSPITALITY TRAVEL & TOURISM

Laboratory	Store – 1,500 square feet
Classroom	30 square feet per student
Storage	400 square feet per student

I. ADMINISTRATION

1. Student Support Services

The same as the school construction minimum standards for high schools

2. Adult Education

Reception (storage)	250 square feet
Conference	300 square feet
Offices (adult coordinator, secretary)	400 square feet

J. PROGRAM AND SERVICES FOR HIGH SCHOOL CURRICLUM

If any programs and services proposed for construction represent duplication of high school services, they must be designed to the minimum and maximum standards developed under State Board of Education Rules Series 6000.

2. Maximum Space & Cost for State Participation

Construction aid for a new technical center or an addition to an existing school is subject to limits established by the Department of Buildings and General Services and the Department of Education. The departments will establish maximum square footage allowances for programs and services and the maximum cost for the total construction. This does not limit what a center may choose to build. If a project exceeds the allowances established, the governing board must assume the additional cost.

A. Maximum Space for State Participation

The Maximum Gross square Footage Per Student Capacity for State Participation on portions of the secondary portion of a project eligible for construction aid is 260 square feet.

In cases of renovations and additions the Commissioners of Buildings and General Services and Education will determine the gross square footage useable for educational purposes of an existing building establishing the maximum square footage allowable for construction aid.

The square footage allowed for any type of collocation - including postsecondary space, space for another state agency, etc. - will be decided on a case by case basis.

B. Maximum Cost for State Participation

Pursuant to Title 29 V.S.A. 161, The Commissioners of Buildings and General Services and Education shall determine the maximum eligible cost. The maximum cost for state participation shall in no way limit the amount of construction cost that the governing board may authorize or expend on a project. If the governing board wishes to authorize construction costs in excess of this figure, it may, but the state construction aid will be calculated on the basis of the maximum eligible cost. Any costs in excess of this will be borne by the governing board.

The maximum cost for state participation shall be determined by multiplying the \$170 by the total allowable square footage. This unit cost reflects all costs associated with the construction. The total cost will not exceed \$170 per square foot for new construction except as noted below.

1. For remodeling of existing educational spaces, the maximum eligible building cost is to be 65% of the building cost figure. For site or and waste treatment when applicable the building cost does not apply.
2. In the event of unusually difficult and unavoidable site conditions engaging more than normally expensive site work or waste treatment facilities and renovations to existing buildings, the Commissioner of Buildings and General Services may increase the cost increments for these areas.

3. The unit cost for construction may be subject to annual readjustment by the Department of Buildings and General Services. The readjustment will be based on the past years cost of construction.

C. Determining Costs for New Construction, Alterations, and Additions

For new construction, determine the total space allowance for the project by multiplying the approved capacity by the Maximum Gross Square Footage Allowance.

To determine space allowance for an addition, deduct from the total space allowance the area of the existing building approved for educational programs, adjusted for its current age status by multiplying the area by the applicable use factors listed below:

Basement Areas:	25%
Above grade facilities constructed sine 1945	80%

To determine the maximum cost for state participation purposes, multiply the new space allowance by the approved cost for new construction and multiply the area in the existing building that is identified for remodeling by the approved unit cost at 50%.

- The following example determines the Maximum Cost for State Participation for a new technical center with an approved design capacity of 350 students.

Total Space Allowance:	350 x 260=	91,0000
M.C.S.P.:	\$170 x 91,000 =	\$15,470,000

- The following example demonstrated the Maximum Cost for State Participation for an addition and renovation project.

Total Space Allowance:	350 x 260=	91,000
Existing Building:	50,000 x 80%=	<u>40,000</u>
Space Allowance for New:		51,000
M.C.S.P:		
New:	51,000 x \$170=	8,670,000
Renovations:	50,000 x \$110.50 =	5,525,000
Total		14,195,000

3. Standards for Construction

All designs for technical center construction shall comply with the following Standards for Construction. The Department of Buildings and General Services will review and approve all plans based on the following design standards.

Design Goal: Within the constraints of reasonable space guidelines and prevailing economic criteria; Plan and develop Career Centers which are safe, efficient, environmentally friendly, accessible to a reasonable degree and educationally appropriate places for the instruction, training and education of secondary, and post secondary vocational students.

Construction Goal: To provide management and oversight during the construction or renovation of State supported space to ensure the delivery of quality projects in a timely and cost effective manner and to encourage the participation of qualified contractors.

Maintenance Goal: To maintain a safe and productive educational environment in which employees and students may accomplish their objectives. To perform preventive maintenance efficiently and effectively in order to enhance the ability of the physical space to perform at optimal levels for the anticipated life of the facility and to avoid the requirement for expensive emergency repairs and the loss or premature depreciation of the State's Capital Investments.

Construction Standards

I. Design

A). Site Features

1. Parking - 1 space / 4 students and 1 space / employee or per local code
2. Circulation - separate bus from vehicular traffic
3. Landscaping
4. Exterior Lighting - to meet IES standards and Act 250 requirements
5. Layout and Orientation of Building - consider solar orientation
6. Security

B). Envelope and Space Parameters and Design

1. Maximize daylight potential
2. Use of environmentally friendly material - see BGS purchasing requirements
3. Use of durable exterior and interior finishes
4. Use of locally produced material; i.e. wood and stone.
5. Consider future reuse, recycling opportunities - required recycling/reuse plan
6. Appropriate space for functions, future growth and flexibility.

7. Comply with energy standard

C). Plumbing Systems

1. Efficient, plumbing fixtures and water conservation devices per L&I code
2. Insulation of hot water supply systems - ADA requirements
3. Elimination of grease and oil from sanitary system
4. Separation of storm water from sanitary system
5. Eliminate disposal of heavy metals and other contaminants
6. Investigate use of solar collectors for heating and electrical purposes

D). HVAC Systems

1. Eliminate mechanical system sources of Indoor Air Quality (IAQ)
2. Isolate and exhaust point source of indoor air pollutants.
3. Separate indoor air intake from air pollutant sources.
4. Provide appropriate fresh air supply quantities - 20 CFM / student
5. Provide efficient ventilation distribution
6. Select high efficient heating and cooking equipment

E). Control Systems

1. Use DDC control system
2. Incorporate occupancy controls in zones with intermittent use
3. Use variable speed controllers for fans and pumps with modulating flows.

F). Electrical Systems

1. Select electrical and lighting equipment for reduced energy demands
2. Integrate daylight and electric lighting in spaces appropriately
3. Provide appropriate lighting levels for specific uses
4. Avoid electric resistance heaters
5. Comply with energy standard.

II. Construction

1. Prepare demolition and site protection plan
2. Prepare waste recycle, reuse and disposal plan
3. Use material conservation construction practices
4. Use of appropriate isolation practices to separate construction spaces from occupied spaces
5. Commission new facilities
6. Thoroughly clean new interiors
7. Comply with all State and Federal statues pertaining to school construction.

III. Maintenance

1. Prepare a detailed Operating and Maintenance manual
2. Conducts appropriate training
3. Conduct commission with maintenance personal.
4. Provide all related materials and equipment's to properly maintain the facility
5. Use environmentally friendly custodial cleaning products - see BGS purchasing guidelines

4. Standards & Roles of State Agencies

The standards that have been identified are those that apply to technical education construction projects specifically. However, for the construction project to be eligible for state participation, it must also meet any standards of state agencies that apply to school construction. The jurisdiction of each such agency is summarized in this section.

Department of Buildings and General Services

The Department of Buildings and General Services is responsible for the design, construction, and/or purchase of any new building or extensive additions or alterations to any existing buildings, for use as a technical education center, funded by state monies, regardless of any other source of funding.

The department will assist the planning committee and the department of education in the project development, and will coordinate with the architect the necessary involvement of each agency to ensure that the project complies with all state rules governing construction.

Department of Education

The Department of Education is responsible for determining urgent need; approval of projected enrollment; and programs to be offered supporting the regional career and workforce needs. It is also responsible for coordinating the preliminary review process.

The department will provide technical assistance to school officials on the process of planning for projects in coordination with the Department of Buildings and General Services.

Department of Labor and Industry

The Fire Prevention Division administers the standards for Fire Prevention and Building code; Life Safety Code; Recommended Practices for Fire Protection in Historic Buildings; the Americans with Disabilities Act; the Plumbing Code; the National Electrical Code; Mechanical Code and the ASME Standards for boilers and pressure vessel. Before construction can begin, the Department of Labor and industry must review the plans for compliance with these standards and issue a construction permit. The Department of Buildings and General Services in coordination with the architect will ensure compliance with these standards.

Department of Environmental Conservation – Agency of Natural Resources

The Department of Environmental Conservation is responsible for the overall goal of conserving and enhancing Vermont's natural resources and protecting human health. This is achieved through very specific regulatory programs which include dealing

with wastewater disposal, water supply, waste management (hazardous waste and solid waste management), contaminated sites, impacts on both ground and surface water quality, erosion control, wetlands wildlife and air quality.

Department of Environmental Conservation staff are available to assist in understanding water and sewage needs and systems criteria and design. They will make site visits and consult early in the school planning process.

Permit specialists located in each regional office will assist applicants in identifying all potential state permits or approvals (including ACT 250) for any given project as well as providing preliminary information on DEC jurisdictions.

The Department of Buildings and General Services in, coordination with the architect and engineer will ensure compliance with these rules and regulations.

Act 250 Review

Officials involved with the design of a new school or an addition other improvements to an existing school need to obtain a jurisdictional opinion from the District Environmental Coordinator for their area regarding the Act 250 process. The Department of Buildings and General Services in coordination with the architect and engineer will ensure compliance with these rules and regulations.

Department of Health

The Department of Health is responsible for assuring that schools abide by the Federal Asbestos Hazard Emergency Response Act. Federal law requires that prior to a renovation the school checks its Asbestos Management Plan to determine if the area being disturbed contains asbestos-containing materials. If so, those asbestos materials must be removed or properly encapsulated by certified abatement contractors prior to the renovation.

Prior to occupancy of a newly renovated or new school building, the Asbestos Management Plan must be updated or developed by an accredited Management Planner. The plan must include documents that include a signed statement that asbestos-containing materials were not used in the renovation or new construction. The architect or project engineer can sign this statement. Once this has been obtained, a certified asbestos inspector must then sign off on that statement. The Department of Buildings and General Services in coordination with the architect and engineer will ensure compliance with these rules and regulations.

The Department of Health is responsible for food service sanitation standards. All food service and food preparation in schools must comply with these standards. Copies of these regulations are available from the Department of Health.

This agency can also provide information on radon and assist with the collection of air samples to test for the presence of this natural occurring gas. In addition, they can provide information regarding testing for carbon dioxide levels.

Division for Historic Preservation – Advisory Council on Historic Preservation

The Division is part of the Department of Housing and Community Affairs, in the Agency of Commerce's and Community Development and is the state office concerned with preserving historic and archeological resources, including individual structures, groups of historic buildings, historic landscapes, and prehistoric and historic archeological sites. The Council is a governor-appointed citizen board that under state law (22 V.S.A. 14) reviews state-funded projects that may adversely affect historic and archeological resources. The Department of Buildings and Services, in consultation with the architect, engineer, and other consultants, will ensure compliance with this division's rules and regulations.

Agency of Transportation

The Agency of Transportation reviews school sites selection when entrance to the site is made from a state highway or state aided highway. They will assist the planning committee in determining where the entrance to the site should be located to best ensure the safest conditions for highway traffic flow.

When a driveway is to be development or changed accessing the state highway, a highway access permit is required. A permit is also required to work within the highway right-of-way. The Traffic and Safety Division looks at several other issues regarding traffic at a school site, including;

- roadway alignment to ensure adequate sight distances;
- traffic volumes that occur along that portion of the state highway and the impact of the increased volumes;
- highway signs required to be relocated or revised;
- accident history along the stretch of highway involved; and
- school bus issues.

New school locations may require some additional studies to determine adequacy of school bus routes and the associated stopping locations. This should be addressed as part of the traffic study associated with the site selection process.

The Department of Buildings and General Services in coordination with the architect and engineer will ensure compliance with these rules and regulations.

Department of Agriculture

This department will work with the planning committee in selecting new school sites to ensure that site selection and design minimize potential adverse impacts on agricultural soils, and agricultural operations on nearby lands. In addition the

department monitors agricultural operations to ensure that they are in compliance with Vermont's Accepted Agricultural Practice regulations.

DEPARTMENT OF PUBLIC SERVICE

The Department of Public Service and its Energy Efficiency Division employ staff with expertise in the design, construction and operation of energy efficient buildings. The Department has published a guide "Putting Energy into School Construction" for anyone involved with a school construction project. The guide explains how to incorporate energy efficiency in a school project to gain the benefit of lower, long-term operating costs. Copies are available by contacting the Energy Action line, 1-800-642-3281. Information about how schools can take advantage of low-cost wood chip heating systems is also available from the Department of Public Service. Contact the biomass staff at (802) 828-4056.