I. ROLL CALL AND MEETING CALLED TO ORDER

a. **Industrial Development Authority (IDA)** – Talbert Bolling reconvened the IDA with a Moment of Silence.

Adoption of Agenda – Larry Yates made the motion and was seconded by Ginger Senter. All votes aye.

Conflict of Interest – None

Option Agreement of the Arlene Deel Property - Ginger Senter made the motion and was seconded. All votes aye.

b. **Board of Supervisors (BOS)** – Ron Peters called the Board of Supervisors to order.

Adoption of Agenda - David Perry made the motion and was seconded by Jason Compton. All votes aye.

c. **Dickenson County School Board** – Chairman Susan Mullins called the meeting to order noting for the record all members were present as well as Superintendent Haydee Robinson and Clerk Reba McCowan; followed with the Pledge of Allegiance.

Adoption of Agenda – Rocky Barton made the motion and was seconded by Dr. Lurton Lyle. All votes aye.

II. RESULTS ON THE SITE STUDY OF THREE LOCATIONS FOR THE NEW ELEMENTARY SCHOOL

d. Curtis Elswick presented and reviewed with the Board the follow PowerPoint Presentation:

Attachment #1: Dickenson County Public Schools New Elementary School Project

e. Greg Widener and Tim Mullins presented and reviewed with the Boards the follow PowerPoint Presentation:

Attachment #2: Site Selection Study for the New Dickenson County Elementary School

Summary of Costs:

Total Recommended Project Budgets

Upper Backbone (500 students – min. per ACOE Contract)	$27,195,000
Upper Backbone (569 students)	$28,712,000
Clinchco (500 students – min. per ACOE Contract)	$23,211,000
Clinchco (569 students)	$24,730,000
Ridgeview (500 students – min. per ACOE Contract)	$20,984,000
Ridgeview (569 students)	$22,502,000
Ridgeview (1,029 students – One School Model)	$37,925,000

*Further delays will result in additional impacts of escalation.

III. ADJOURNMENT: 6:10 p.m.

Following a motion by Rocky Barton and a second by Dr. Lurton Lyle the meeting was adjourned. All votes aye.

Susan Mullins

_____

Chairman, Susan Mullins

Approved: November 28, 2018

Reba McCowan

_____

Reba McCowan, Clerk

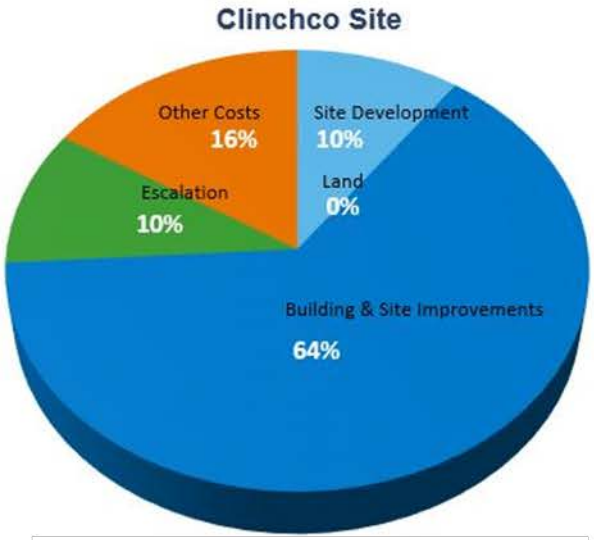
SKANSKA

Dickenson County Public Schools
New Elementary School Project
October 23, 2018

Overview

- ACOE Contract Requirements – Construct New Elementary School, minimum size of 61,279 SF, meets VA DOE standards (Contract Amendment March 6, 2013)
- Current Funding for New Elementary School = $24,561,867
- Directive: Study Potential Sites and Anticipated Costs for New Elementary School at Each Site
- This Evening's Agenda:
  - Components of Project Cost – Skanska
  - Site Selection Study – Thompson & Litton
  - Land Acquisition Considerations – Leman Kendrick
  - Current and Projected Construction Market Conditions – Skanska
  - Total Recommended Project Budgets for Each Site – Skanska
  - Discussion

Components of Project Cost



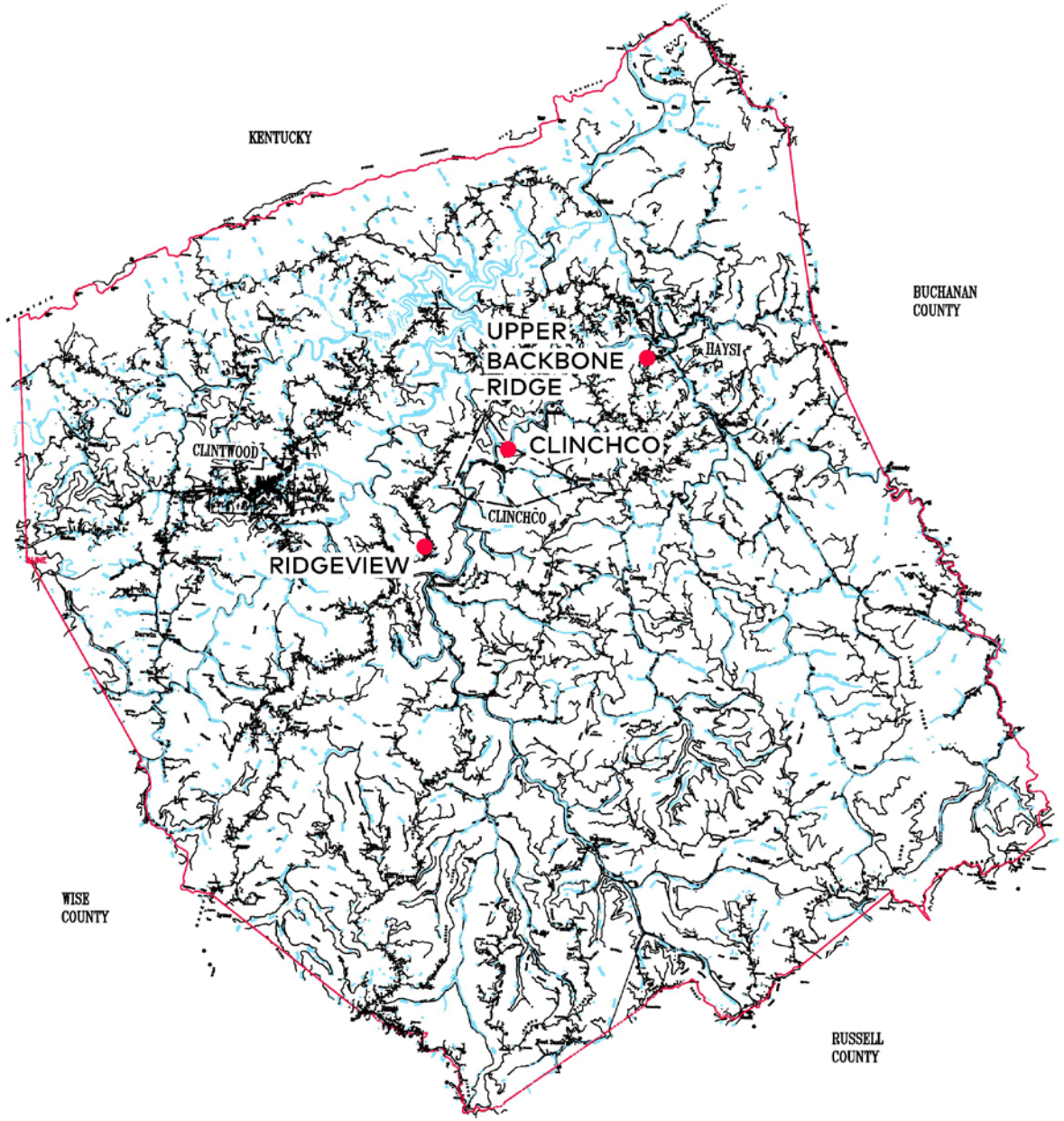
Dickenson County Public Schools

SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

THOMPSON & LITTON EST. 1956
ENGINEERS ARCHITECTS SURVEYORS

October 23, 2018

STUDY LOCATION MAP



STUDY CRITERIA

- **9-Acre Developed Pad for 500-student elementary school**
- **Earthwork**
- **Utilities (Electric, Fiber, Water, Sewer & Gas)**
- **On-site/Off-site Road Improvements**
- **Environmental Considerations**
- **Historical Resources Considerations**
- **Underground Mining Considerations**

UPPER BACKBONE RIDGE SITE

- **Site Development**
  - **9-Acre Contiguous Building Pad**
  - **2:1 Cut/Fill Slopes & 2 Percent Pad Slope**
  - **190,000 C.Y. Earthwork (Balanced)**

UPPER BACKBONE RIDGE SITE

- **Utilities**
  - **Electric – Power Company to Provide**
  - **Fiber – Fiber Line Required**
  - **Water – Water Line & Water Tank Required**
  - **Sewer – Gravity Sewer, Pump Station & Force Main Required**
  - **Gas – Gas Line & Drying & Metering Station Required**

UPPER BACKBONE RIDGE SITE

- **Site Access & Transportation Facilities**
  - **VDOT Recommendations**
  - **Turn Lane Analyses**
  - **Intersection Sight Distance**
  - **Route 652 Improvements**
  - **On-Site Access Road**

UPPER BACKBONE RIDGE SITE

- **Environmental, Historical & Mining Considerations**
  - **Minor Environmental Impacts**
  - **No Historical Resources Impacts**
  - **No Underground Mining**

CLINCHCO SITE

- **Site Development**
  - **9-Acre Contiguous Building Pad**
  - **2:1 Cut/Fill Slopes & 2 Percent Pad Slope**
  - **176,000 C.Y. Earthwork (Balanced)**

CLINCHCO SITE

- **Utilities**
  - **Electric – Power Company to Provide**
  - **Fiber – Available On-Site**
  - **Water – Water Tank Required**
  - **Sewer – Available On-Site**
  - **Gas – Gas Line & Drying & Metering Station Required**

CLINCHCO SITE

- **Site Access & Transportation Facilities**
  - **VDOT Recommendations**
  - **Turn Lane Analysis**
  - **Intersection Site Distance**
  - **Close Existing Entrances**

CLINCHCO SITE

- **Environmental, Historical & Mining Considerations**
  - **Minor Environmental Impacts**
  - **No Historical Reviews Conducted**
  - **No Underground Mining**

RIDGEVIEW SITE

- **Site Development**
  - **9-Acre Contiguous Building Pad**
  - **2:1 Cut/Fill Slopes & 2 Percent Pad Slope**
  - **26,000 C.Y. Earthwork (Off-Site Disposal Required)**

RIDGEVIEW SITE

- **Utilities**
  - **Electric – Available On-Site**
  - **Fiber – Available On-Site**
  - **Water – Available On-Site**
  - **Sewer – Available On-Site**
  - **Gas – Available On-Site**

RIDGEVIEW SITE

- **Site Access & Transportation Facilities**
  - **VDOT Recommendations**
  - **Turn Lane Analysis**
  - **Intersection Site Distance**
  - **Route 637 Improvements**
  - **On-Site Road Improvements**

RIDGEVIEW SITE

- **Environmental, Historical & Mining Considerations**
  - **No Environmental Impacts**
  - **No Historical Reviews Conducted**
  - **Previous Underground Mining**
    - **Building Location**

COMPARATIVE CONSTRUCTION COST SUMMARY

- **UPPER BACKBONE RIDGE SITE** **$5,152,470**
- **CLINCHCO SITE** **$2,626,000**
- **RIDGEVIEW SITE** **$962,825**

SUMMARY

- **All Sites are Considered Suitable for 500-student elementary school**

- **Ridgeview Site Has Lowest Site Development Cost followed by Clinchco Site and Upper Backbone Ridge Site**

- **Additional Factors to Consider**
  - **On-Site Development Costs**
  - **Property Acquisition Costs**
  - **Environmental Considerations**
  - **Student Population Center**
  - **Travel Times**
  - **Impact to the Community**

Land Acquisition Considerations

- Land acquisition required?
  - Clinchco = $0
  - Ridgeview = $0
  - Upper Backbone = Estimate of $350,000 to $1,040,000 (budget $600,000)

- NEPA Environmental Permitting
  - Clinchco = Approx. $20,000 and 9 month process
  - Ridgeview = Approx. $10,000 and 6 month process
  - Upper Backbone = Approx. $30,000 and 1 year process

Current Market Conditions

Cost Data from Virginia DOE (Construction Cost Only):

- Average cost/SF for a new ES 2016-2017: $210/SF
- Average cost/SF for a new ES 2017-2018: $255/SF (21% in one year)
- Average cost/SF for a new ES 2018-2019: $279/SF (9% in one year)

New Pulaski County Middle School (August 2018): $247/SF

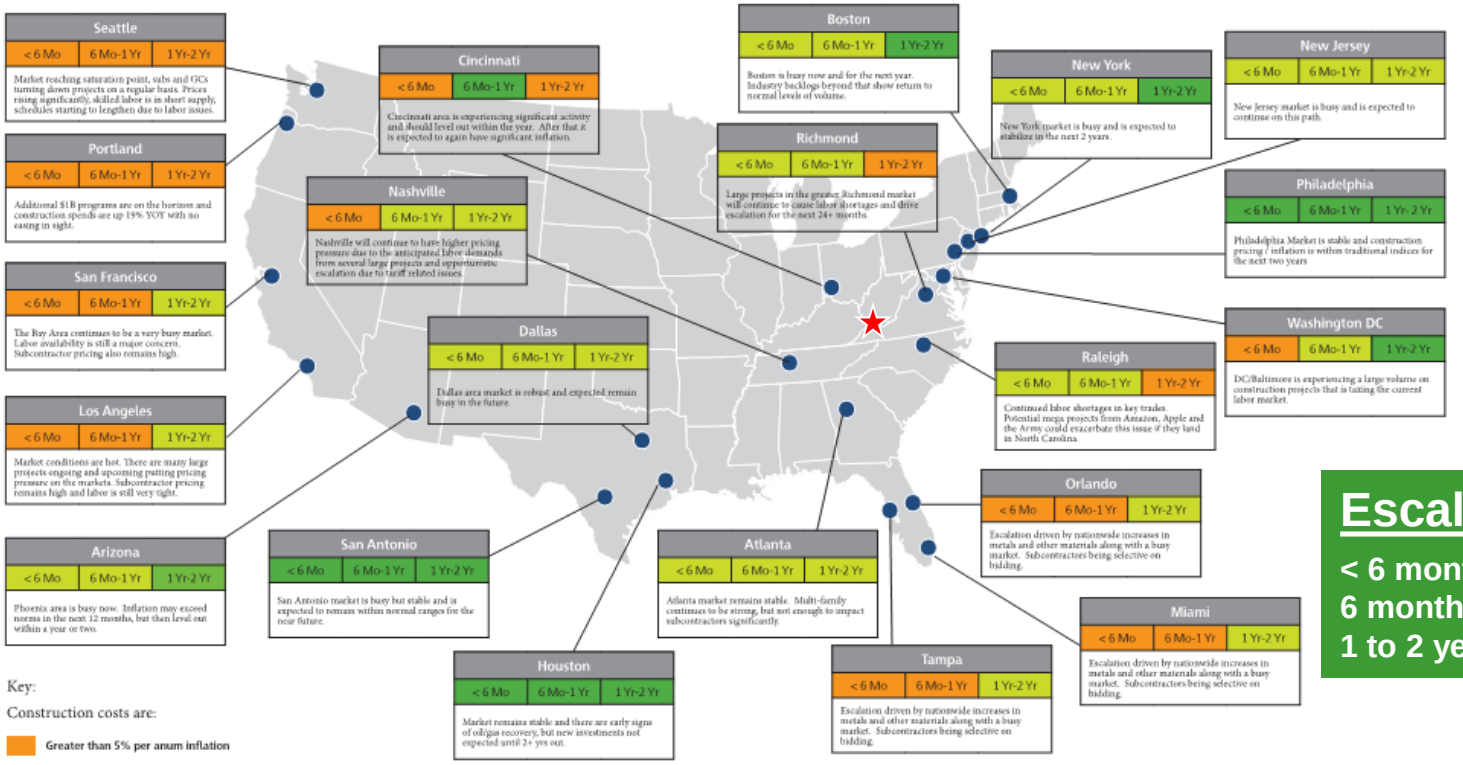
Recommended Budget Cost/SF (Construction Cost): $240/SF (*today's dollars)

** today's dollars = escalation not assumed*

Projected Market Conditions

SKANSKA

Market Forecast - Predicting Your Local Construction Costs | Q3 - 2018



This chart reflects local preconstruction team leaders' opinions of market volume and capacity and is not based on published analytics or third-party forecasts. To discuss market position with your local contact, requests can be made via David Formichella

Escalation Prediction:

< 6 months =	5%
6 months to 1 year =	5%
1 to 2 years =	>5%

Total Recommended Project Budgets

Upper Backbone (~500 students – min. per ACOE Contract)

Site Development:	$ 5,152,470	(per T&L Study)
Building and Site Improvements:	$14,706,960	(61,279 SF X $240/SF)
Construction Cost:	$19,859,430	
Escalation:	$ 2,582,967	(*to mid-point of construction)
Construction Cost with Escalation:	$22,442,397	
Land:	$ 600,000	
Other Project Costs**:	$ 4,152,603	
Recommended Project Budget:	**$27,195,000**	

$2,633,133 more than current funding from ACOE

** Further delays will result in additional impacts of escalation*

*** Other project costs include design fees, permitting, testing and inspections, furnishings and equipment, project management, etc.*

Total Recommended Project Budgets

Upper Backbone (569 students)

Site Development:	$ 5,152,470	(per T&L Study - may increase)
Building and Site Improvements:	$15,840,000	(66,000 SF X $240/SF)
Construction Cost:	$20,992,470	
Escalation:	$ 2,730,333	(*to mid-point of construction)
Construction Cost with Escalation:	$23,722,803	
Land:	$ 600,000	
Other Project Costs**:	$ 4,389,197	
Recommended Project Budget:	**$28,712,000**	

$4,150,133 more than current funding from ACOE

** Further delays will result in additional impacts of escalation*

*** Other project costs include design fees, permitting, testing and inspections, furnishings and equipment, project management, etc.*

Total Recommended Project Budgets

Clinchco (~500 students – min. per ACOE Contract)

Site Development:	$ 2,626,000	(per T&L Study)
Building and Site Improvements:	$14,706,960	(61,279 SF X $240/SF)
Construction Cost:	$17,332,960	
Escalation:	$ 2,254,368	(*to mid-point of construction)
Construction Cost with Escalation:	$19,587,328	
Land:	$ 0	
Other Project Costs**:	$ 3,623,672	
Recommended Project Budget:	**$23,211,000**	

$1,350,867 under current funding from ACOE

** Further delays will result in additional impacts of escalation*

*** Other project costs include design fees, permitting, testing and inspections, furnishings and equipment, project management, etc.*

Total Recommended Project Budgets

Clinchco (569 students)

Site Development:	$ 2,626,000	(per T&L Study - may increase)
Building and Site Improvements:	$15,840,000	(66,000 SF X $240/SF)
Construction Cost:	$18,466,000	
Escalation:	$ 2,401,734	(*to mid-point of construction)
Construction Cost with Escalation:	$20,867,734	
Land:	$ 0	
Other Project Costs**:	$ 3,862,266	
Recommended Project Budget:	**$24,730,000**	

$168,133 more than current funding from ACOE

** Further delays will result in additional impacts of escalation*

*** Other project costs include design fees, permitting, testing and inspections, furnishings and equipment, project management, etc.*

Total Recommended Project Budgets

Ridgeview (~500 students – min. per ACOE Contract)

Site Development:	$ 962,825	(per T&L Study)
Building and Site Improvements:	$14,706,960	(61,279 SF X $240/SF)
Construction Cost:	$15,669,785	
Escalation:	$ 2,038,051	(*to mid-point of construction)
Construction Cost with Escalation:	$17,707,836	
Land:	$ 0	
Other Project Costs**:	$ 3,276,164	
Recommended Project Budget:	**$20,984,000**	

$3,577,867 under current funding from ACOE

** Further delays will result in additional impacts of escalation*

*** Other project costs include design fees, permitting, testing and inspections, furnishings and equipment, project management, etc.*

Total Recommended Project Budgets

Ridgeview (569 students)

Site Development:	$ 962,825	(per T&L Study - may increase)
Building and Site Improvements:	$15,840,000	(66,000 SF X $240/SF)
Construction Cost:	$16,802,825	
Escalation:	$ 2,185,417	(*to mid-point of construction)
Construction Cost with Escalation:	$18,988,242	
Land:	$ 0	
Other Project Costs**:	$ 3,513,758	
Recommended Project Budget:	**$22,502,000**	

$2,059,867 under current funding from ACOE

** Further delays will result in additional impacts of escalation*

*** Other project costs include design fees, permitting, testing and inspections, furnishings and equipment, project management, etc.*

Total Recommended Project Budgets

Ridgeview (1,029 students – One School Model)

Site Development:	$ TBD	(Needs further evaluation)
Building and Site Improvements:	$28,320,000	(118,000 SF X $240/SF)
Construction Cost:	$28,320,000	
Escalation:	$ 3,683,370	(*to mid-point of construction)
Construction Cost with Escalation:	$32,003,370	
Land:	$ TBD	(Needs further evaluation)
Other Project Costs**:	$ 5,921,630	
Recommended Project Budget:	**$37,925,000**	**WITHOUT SITE AND LAND**

$13,363,133 more than current funding from ACOE

** Further delays will result in additional impacts of escalation*

*** Other project costs include design fees, permitting, testing and inspections, furnishings and equipment, project management, etc.*

Next Update:

November 7, 2018 at 5:00 PM

Topics:

- Follow Up Discussion from October 23, 2018
- Enrollment Projections
- Bus Travel Times
- Operations & Maintenance Budgets
- Capital Improvement Needs
- Funding
- Other Considerations

Discussion

Site Selection Study for the New Dickenson County Elementary School

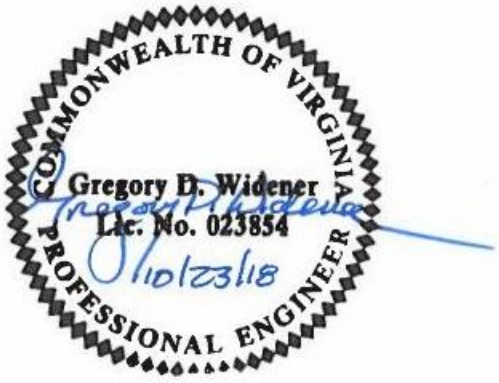
Prepared for
Dickenson County Industrial Development Authority

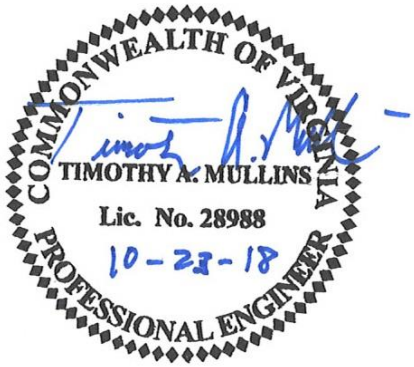
T&L Project No. 14244
October 2018

THOMPSON & LITTON EST. 1956

SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

Prepared For
Dickenson County Industrial Development Authority





THOMPSON & LITTON

103 East Main Street
P.O. Box 1307
Wise, Virginia 24293

T&L Project No. 14244

October 2018

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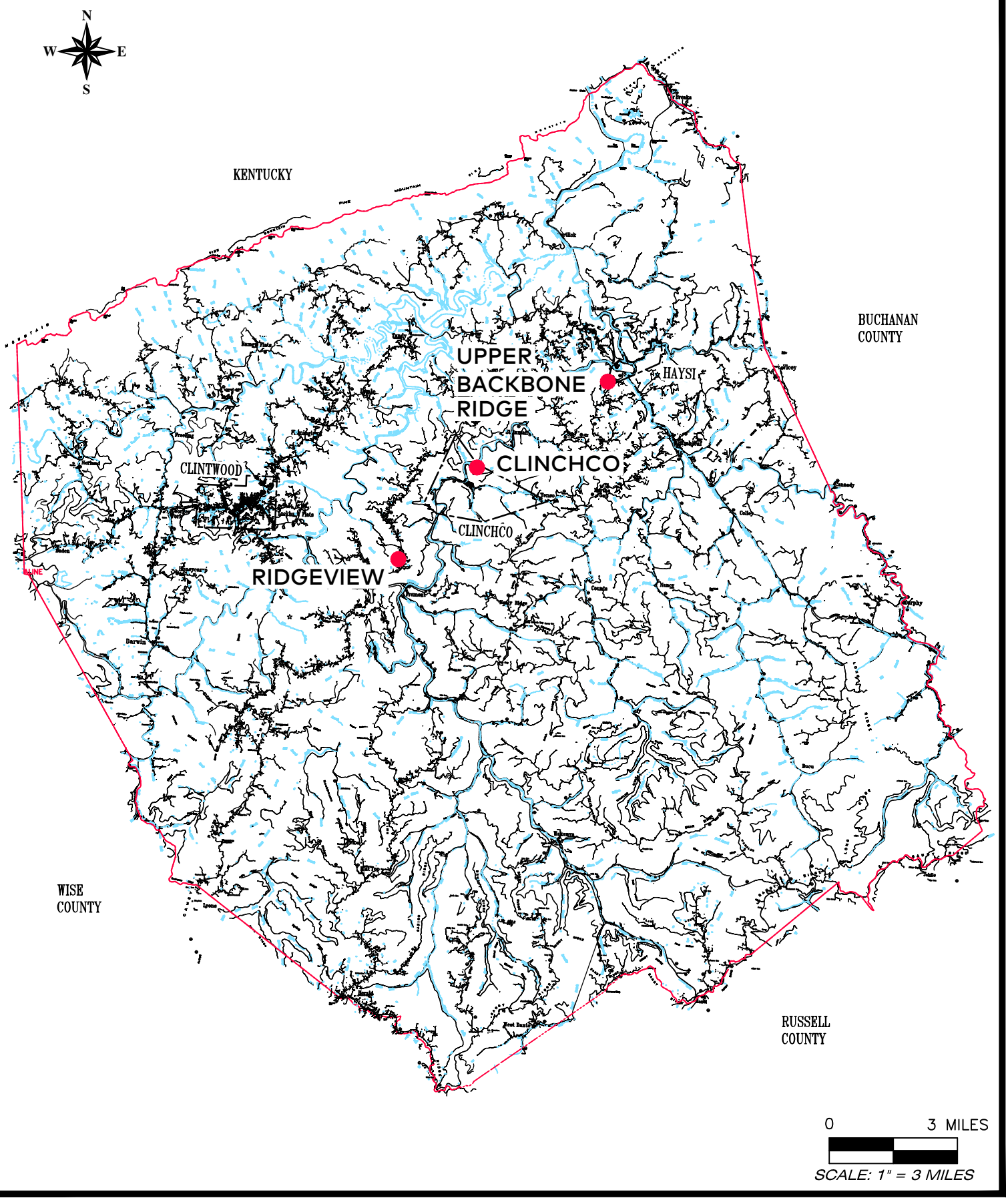
INTRODUCTION

The Dickenson County School Board, the Dickenson County Board of Supervisors, and the Dickenson County Industrial Development Authority are currently in the process of planning for a new elementary school in Dickenson County. A contract between the United States Army Corps of Engineers (ACOE) and the Dickenson County School Board, contract no. W91237-6-11-0022, requires that the new elementary school be a minimum of 61,279 square feet in size. Based upon an estimate of 125 square feet per student, the minimum required building size will accommodate approximately 500 students. In July 2018, the Dickenson County Industrial Development Authority, commissioned Thompson & Litton to prepare a site selection study to aid in the selection of a site for the new elementary school. Working with Dickenson County personnel, three (3) potential sites were identified in the County for evaluation in this study. These sites include the Upper Backbone Ridge site, the Clinchco site, and the Ridgeview site.

PURPOSE AND SCOPE

The purpose of this site selection study is to investigate and evaluate, from a preliminary viewpoint, the potential development of three (3) sites identified by Dickenson County for the development of a new elementary school. These sites include the Upper Backbone Ridge site, the Clinchco site, and the Ridgeview site. A Study Area Location Map, which depicts each of these three sites, is presented in Exhibit I. This site selection study will address what is considered necessary to develop a building pad and provide access and utilities to the building pad to accommodate an elementary school for 500 students on each of the respective sites. Based upon the study criteria established in this report, a site with the best development potential with respect to site development costs will be identified for further study.



PROJECT NO.	DATE
14244-00	JULY 2018
FILE NAME	
Study Location Map	

SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

STUDY AREA LOCATION MAP

THOMPSON & LITTON

EXHIBIT I

STUDY CRITERIA

Based upon the criteria set forth by the Virginia Department of Education (VDOE), it is recommended that the elementary school site consist of approximately 9 acres of usable building pad to accommodate a 500 student school. Therefore, a site pad with a total developable area of 9 acres was utilized in this study for the building, parking area, and associated recreational fields. Generally, each of the sites were configured to take advantage of the existing site topography in order to minimize the required grading needed to develop the site. All of the sites were graded based upon a contiguous single site pad. A copy of the VDOE is provided in Appendix A.

Each of the three (3) identified sites were evaluated to determine the development costs associated with grading the site, site access, off-site road improvements, water service, sewer service, electrical service, fiber service, gas service, and associated costs. The amount of earthwork involved in a development of a site is typically one of the most significant costs associated with the development of a project in the region. Each of the sites were primarily graded in an effort to minimize the amount of grading required while balancing the amount of cut and fill. A balanced condition is preferable, because of the additional costs incurred if material is being hauled to or from the site.

Each of the sites were evaluated based upon the development of a 9-acre graded pad and providing access and utilities to the pad. No site development within the boundaries of the graded pad, such as buildings, utilities, internal roadways, parking lots, and recreational fields were included in this study. It has been assumed that the costs associated with these items would be comparable for each of the sites. Because of the preliminary nature of this study, the evaluations contained herein for each of the potential sites are intended for relative comparison purposes only and the costs presented do not necessarily represent the total cost for developing a new elementary school on each site.

A meeting with Virginia Department of Transportation (VDOT) personnel was held in the field to identify off-site roadway improvements and evaluations that would be required for each site. This meeting was held on July 24, 2018, and the VDOT recommendations that were made as a result of this meeting were incorporated into this study. A copy of a memo from VDOT outlining their recommendations for each site based upon this site meeting is included in Appendix B.

DESCRIPTION OF ALTERNATIVES

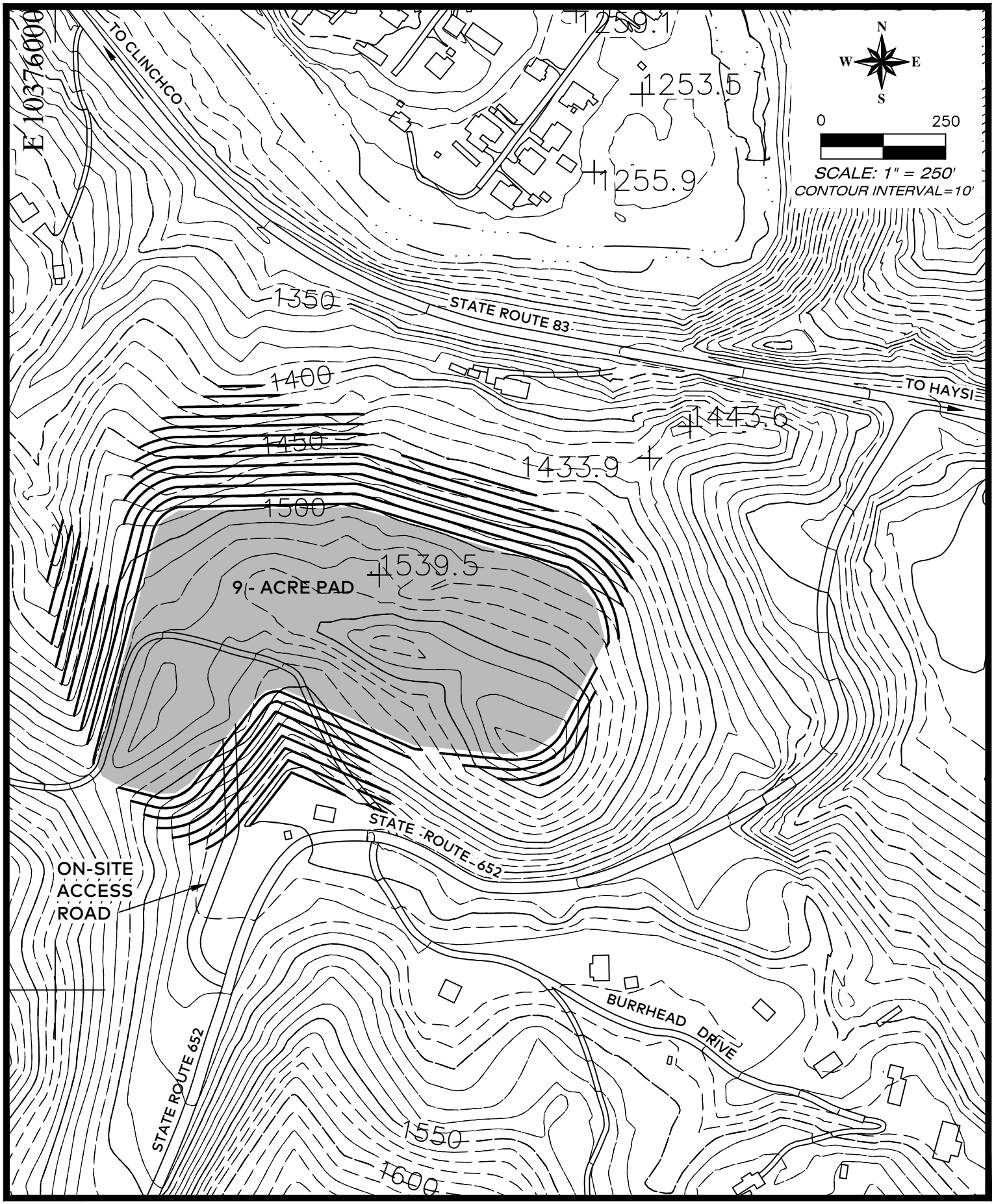
Three (3) alternative potential sites have been identified for investigation and evaluation in this site selection study. A brief description of each alternative is provided in this section. Preliminary cost estimates are provided in the Project Costs section of the study.

ALTERNATIVE 1: UPPER BACKBONE RIDGE SITE

Site Development

The proposed Upper Backbone Ridge site is located at the intersection of State Route 83 and State Route 652 in the corporation limits of Haysi, Virginia. The Dickenson County School Board has previously purchased 5.247 acres of property on the site. The remaining property is currently owned by several private property owners. The site is bounded to the north by State Route 83, to the east and south by State Route 652, and to the west by undeveloped forest land. The site itself is undeveloped forest land and is situated on a ridgeline with relatively steep topography across most of the site. All surface runoff from the site discharges to the Russell Fork River to the east of the site.

Site preparation for the Upper Backbone Ridge site will require the grading of the site to a maximum of 2 horizontal to 1 vertical (2:1) for cut and fill slopes and a minimum of 2 percent slope for the 9-acre building pad area. Preliminary site grading indicates that approximately 190,000 cubic yards of excavation would be required for the development of an elementary school on the site. It is anticipated that the grading of the site will be balanced meaning that no significant amount of material will need to be hauled on-site or off-site. It should be noted that, based upon the topography of the site, the development of a pad larger than 9 acres is not considered to be cost effective. A preliminary site plan for the Upper Backbone Ridge site is presented as Exhibit II.



PROJECT NO.	DATE
14244-00	JULY 2018
FILE NAME	
Upper Backbone Exhibit	

SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

UPPER BACKBONE RIDGE SITE

THOMPSON & LITTON

EXHIBIT II

Utilities

All necessary utilities for the Upper Backbone site are within relatively close proximity to the site, with the exception of natural gas. Electric service for the Upper Backbone Ridge site can be provided by American Electric Power (AEP). Three-phase power is currently located to the east of the site and AEP has indicated that power can be extended to the site at little to no cost.

Fiber service for the Upper Backbone Ridge site can be provided by a connection to an existing fiber optic line owned by Sunset Digital Communications which is located within approximately 1,100 feet of the site near the intersection of State Route 83 and McClure Avenue. The proposed fiber service to the site will consist of the construction of approximately 1,100 linear feet of overhead fiber line and approximately 700 linear feet of underground fiber line which is anticipated to follow along the route of the overhead electric to the site.

Water service for the Upper Backbone Ridge site can be provided by a connection to an existing 6-inch water line located along State Route 652 to the west of the site. This water line is owned by the Dickenson County Public Service Authority. The proposed water service will consist of the construction of approximately 700 linear feet of 6-inch water line constructed along State Route 652 to the site. Additionally, the construction of an on-site water storage tank will be required to provide the required fire flow for the project.

Sanitary sewer service for the Upper Backbone Ridge site can be provided by connection to an existing 6-inch sewer force main which runs along State Route 83 to the north of the site. This force main is owned by the Dickenson County Public Service Authority (DCPSA). The proposed sanitary sewer system will consist of the construction of approximately 700 linear feet of 8-inch gravity sewer, a sewage pump station, and approximately 100 linear feet of 4-inch sanitary sewer force main. All sewage for the proposed site will be treated at the Haysi Wastewater Treatment Plant which is owned by the DCPSA. It should be noted that this plant is currently operating at approximately 85 percent of capacity and the DCPSA recommends that this capacity be re-

evaluated should the Upper Backbone Ridge site be chosen for development of the new elementary school. A copy of a letter from the DCPSA regarding the Haysi plant capacity is included in Appendix C of this report. Should the DCPSA not be able to treat the additional flow from a school on this site, an on-site wastewater treatment plant would be required at an estimated additional cost of $640,000.

There is an existing gas line owner by Enervest which runs across the site. However, this line has been abandoned and cannot be used to serve the Upper backbone site. Gas service can be provided to the Upper Backbone Ridge site by a connection to an existing Enervest gas line located at the Birchleaf compressor station along Larkspur Drive on Turner Ridge. The proposed gas line to serve the site will consist of the construction of approximately 6,900 linear feet of 4-inch gas line and gas drying and metering facilities. The majority of this gas line installation would be cross country on private property.

Site Access and Transportation Facilities

Access to the Upper Backbone Ridge site will be provided from State Route 652. The on-site access road will be approximately 700 linear feet of two-lane roadway with curb and gutter. The on-site access road will be designed in accordance with VDOT geometric design standards.

Based upon a field meeting with VDOT, it was determined that improvements and widening of State Route 652 from State Route 83 to the proposed school entrance intersection with State Route 652 would be required. At a minimum, these improvements should include roadway widening for the entire length, vertical considerations, and horizontal alignment improvements on some of the curves. Geometric improvements shall be made based on the design vehicle (school bus). Evaluate the warrants for right and left turn lanes on State Route 652 at the school entrance in accordance with VDOT Appendix F Access Management Design Standards. It was also determined that an evaluation of the warrants for right and left turn lanes on State Route 83 at the State

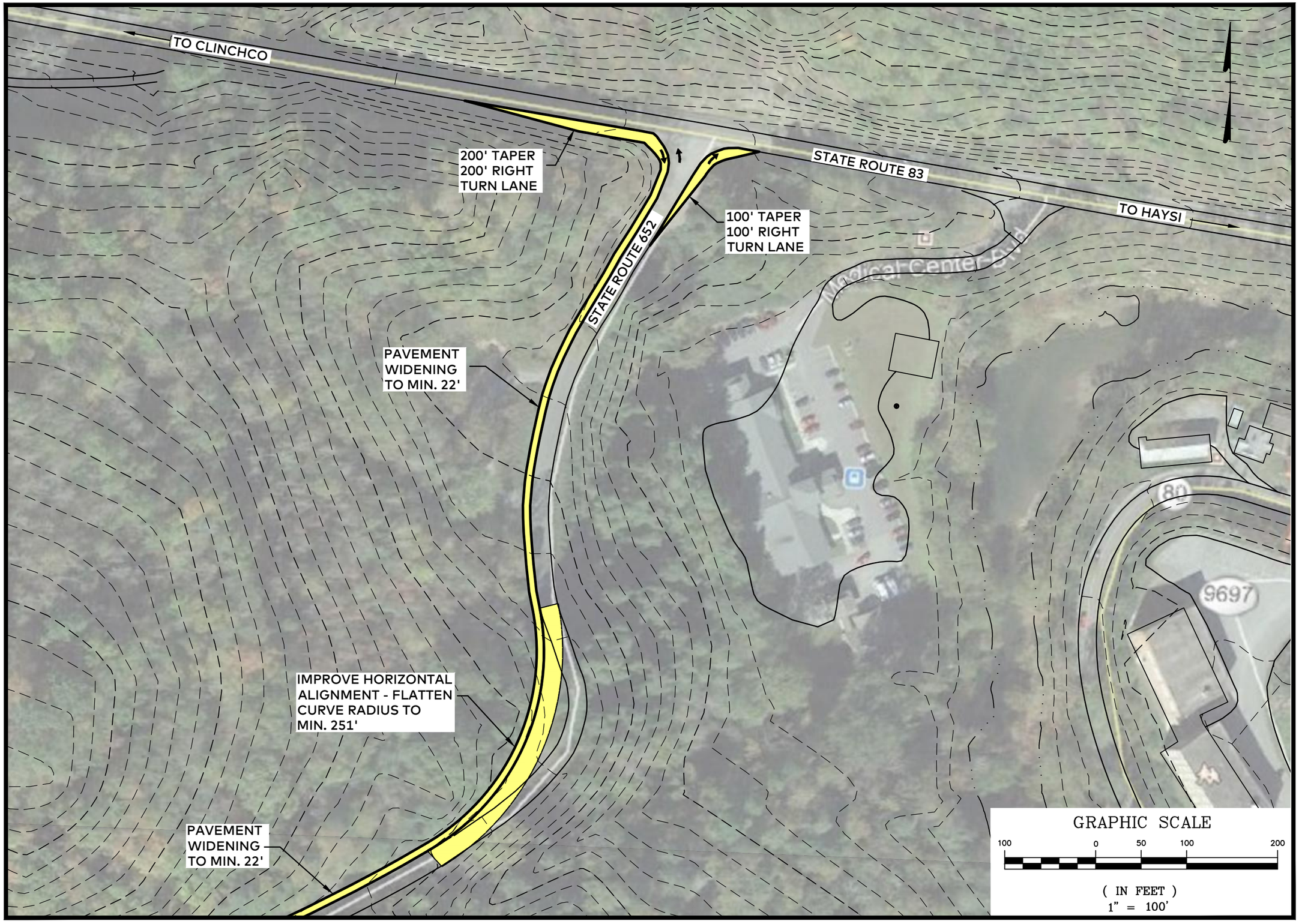
Route 652 intersection in accordance with VDOT Appendix F Access Management Design Standards would be required.

Per the 2017 VDOT Daily Traffic Volume Estimates Jurisdictional Report, the existing annual average daily traffic on State Route 652 is 270 vehicles per day. The projected Trip Generation for an elementary school with 500 students is 645 vehicles per day. The warrant evaluation for right and left turn lanes on State Route 652 at the school entrance indicate that no turn lanes are warranted.

The existing annual average daily traffic on State Route 83 is 2,600 vehicles per day. The warrant evaluation for right and left turn lanes on State Route 83 at the intersection with State Route 652 indicate that no turn lanes are warranted. However, at the intersection of Routes 83/652, the sight distance to the west (left when exiting 652) is limited due to the vertical alignment of State Route 83. Also noted, the speed limit on State Route 83 to the west of Route 652 is 55 mph and to the east of State Route 652, it is 35 mph. The speed limit reduction on State Route 83 is located at the State Route 652 intersection. Due to the high bus traffic, 55 mph speed limit, and the poor sight distance of the approach from the west, a 200-ft taper and 200-ft right turn storage lane are proposed at State Route 83. The sight distance to the east (right when exiting 652) exceeds the 390-ft intersection sight distance required.

The off-site access road improvements proposed on State Route 652 include a 100-ft taper and 100-ft right turn storage lane at State Route 83, pavement widening the 2,640-ft of roadway from State Route 83 to the proposed school entrance from 20-ft to 22-ft minimum, improving two horizontal curves to a minimum 251-ft radius, drainage improvements (ditches and culverts), shoulder widening, installation/replacement of guardrail, and installation of guardrail end terminals.

Traffic data and turn lane analyses for the Upper backbone Ridge site are provided in Appendix D. The proposed off-site road improvements for the Upper Backbone Ridge site are presented in Exhibit III and Exhibit IV.



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SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

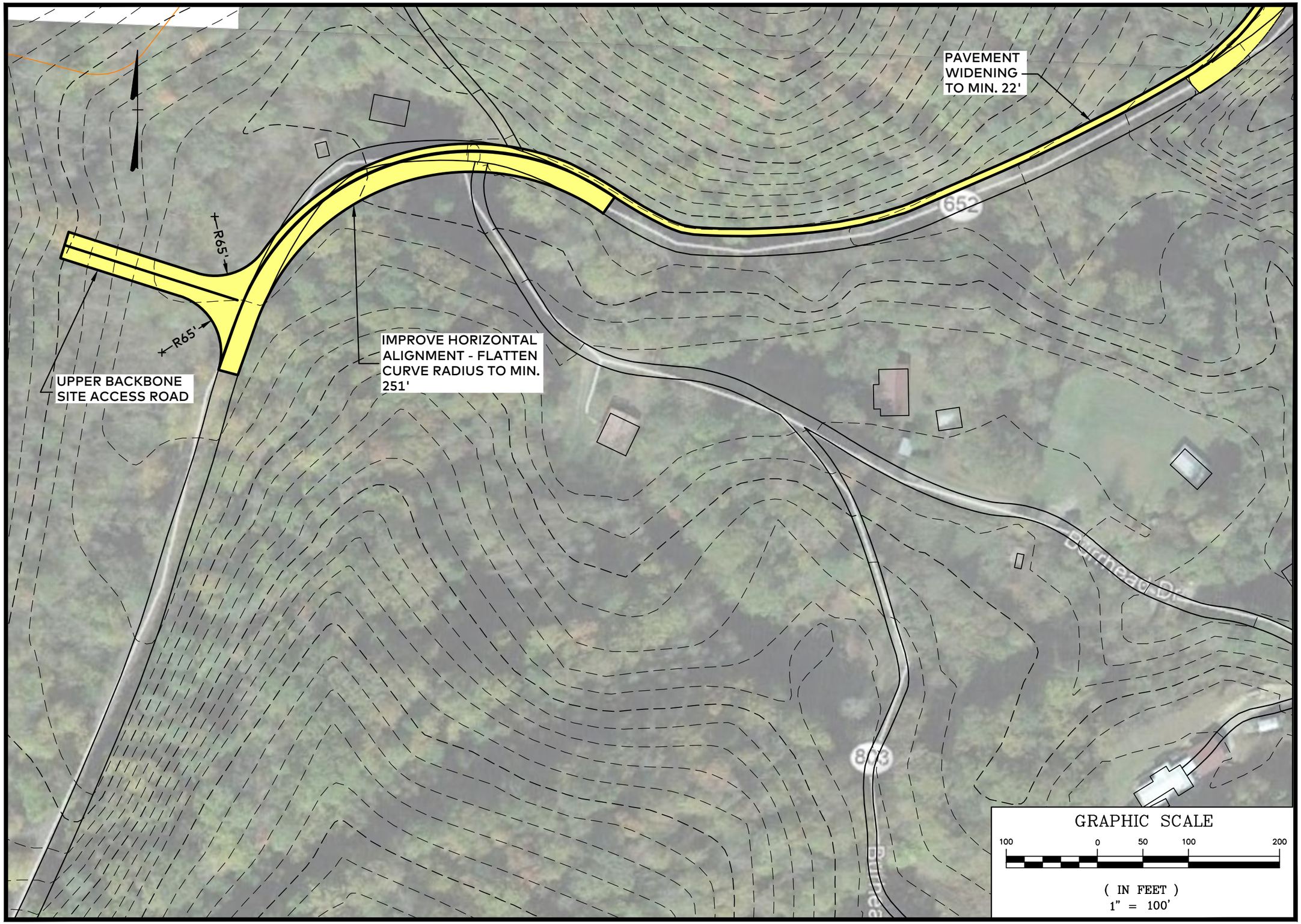
OFF-SITE ROAD IMPROVEMENTS - UPPER BACKBONE RIDGE SITE

Designed	TAM, GDW
Drawn	DJL
Checked	TAM, GDW
Date	SEPT. 2018

Project No.
14244

THOMPSON & LITTON

EXHIBIT III



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SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

OFF-SITE ROAD IMPROVEMENTS - UPPER BACKBONE RIDGE SITE

Designed	TAM, GDW
Drawn	DJL
Checked	TAM, GDW
Date	SEPT. 2018

Project No.
14244

THOMPSON & LITTON

EXHIBIT IV

Environmental, Historical and Mining Considerations

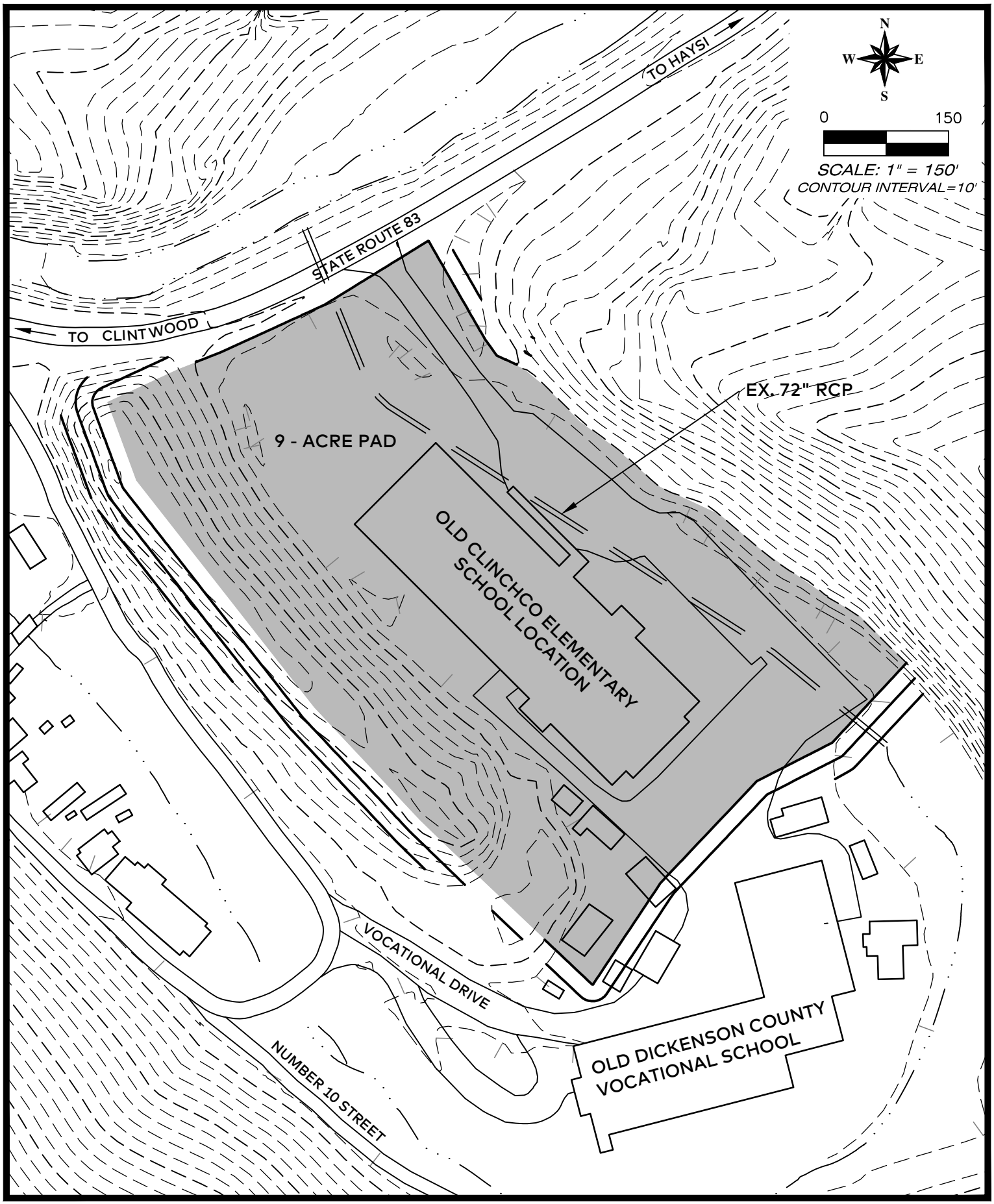
Preliminary field investigations, threatened and endangered species searches, and reviews of available databases for historic resources were performed for the Upper Backbone Ridge site by D.R. Allen & Associates in December 2013. Based upon a review of the databases for historical resources, it was determined that there were no known architectural or archaeological resources affected by the development of the Upper Backbone site. During a preliminary field investigation of the Upper Backbone Ridge site, impacts to streams or wetlands appear to be minimal. A threatened or endangered species search revealed two (2) endangered bat species, which will likely require time of year restrictions on site construction. It should be noted that the preparation of all necessary National Environmental Policy Act (NEPA) environmental documentation will be required prior to the development of the Upper Backbone Ridge site. A search of the Virginia Department of Mined Land Reclamation (DMLR) database showed no evidence of previous underground mine workings beneath the Upper Backbone Ridge site.

ALTERNATIVE II: CLINCHCO SITE

Site Development

The proposed Clinchco site is located off of State Route 83 in the Town of Clinchco, Virginia. The proposed site is the location of the previous Clinchco Elementary School which was demolished in recent years. The property is currently owned by the Dickenson County School Board. The site is bounded to the north by State Route 83, to the east by undeveloped forest land, to the south by the old Dickenson County Vocational School, and to the west by a residential area. The site itself is predominantly previously developed gently graded grassy areas with a relatively steep forested ridgeline along the southwest boundary. The majority of the site is currently located in the 100-year flood plain. All surface runoff from the site discharges to the McClure River to the north of the site.

Site preparation for the Clinchco site will require the grading of the site to a maximum of 2 horizontal to 1 vertical (2:1) for cut and fill slopes and a minimum of 2 percent slope for the 9-acre building pad area. The ridgeline along the southern boundary of the site will be excavated and the fill placed across the lower lying areas which contained the old Clinchco Elementary School. These filling operations will elevate the site out of the 100-year flood plain. Preliminary site grading indicates that approximately 176,000 cubic yards of excavation would be required for the development of an elementary school on the site. It is anticipated that the grading of the site will be balanced meaning that no significant amount of material will need to be hauled on-site or off-site. It should be noted that, based upon the topography and boundaries of the site, the maximum contiguous pad size on the site that would be considered to be cost effective would be approximately 10.5 acres. A preliminary site plan for the Clinchco site is presented as Exhibit V.



PROJECT NO.	DATE
14244-00	JULY 2018
FILE NAME	
Clinchco Exhibit	

SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

CLINCHCO SITE

THOMPSON & LITTON

EXHIBIT V

Utilities

All necessary utilities for the Clinchco site are within relatively close proximity to the site, with the exception of natural gas. Electric service for the Clinchco site can be provided by American Electric Power (AEP). Three-phase power is currently located along State Route 83 to the north of the site and AEP has indicated that power can be extended to the site at little to no cost.

Fiber service for the Clinchco site can be provided by a connection to an existing fiber optic line owned by Sunset Digital Communications which is located along State Route 83 to the north of the site. Since the fiber service is already immediately adjacent to the site, it has been assumed that there will no cost to provide service to the site.

Water service for the Clinchco site can be provided by a connection to an existing 6-inch water line located along State Route 83 to the north of the site. This water line is owned by the Dickenson County Public Service Authority. Since the water service is already immediately adjacent to the site, it has been assumed that there will no cost to provide service to the site. However, the construction of an on-site water storage tank will be required to provide the required fire flow for the project.

Sanitary sewer service for the Clinchco site can be provided by connection to an existing sewage pump station and force main located on the southern end of the site. This pump station and force main is owned by the Dickenson County Public Service Authority (DCPSA). Since the sanitary sewer service is already immediately adjacent to the site, it has been assumed that there will no cost to provide service to the site. All sewage for the proposed site will be treated at the Haysi Wastewater Treatment Plant which is owned by the DCPSA. It should be noted that this plant is currently operating at approximately 85 percent of capacity and the DCPSA recommends that this capacity be re-evaluated should the Upper Backbone Ridge site be chosen for development of the new elementary school. A copy of a letter from the DCPSA regarding the Haysi plant capacity is included in Appendix C of this report. Should the DCPSA not be able to treat the

additional flow from a school on this site, an on-site wastewater treatment plant would be required at an estimated additional cost of $570,000.

Gas service can be provided to the Clinchco site by a connection to an existing Enervest gas line at the North Big Ridge compressor station located south of the site just outside the Town of Clinchco corporate limits near the headwaters of House Fork. The proposed gas line to serve the site will consist of the construction of approximately 12,000 linear feet of 4-inch gas line and gas drying and metering facilities. The majority of this gas line installation would be along roadways on private land and public right-of-ways.

Site Access and Transportation Facilities

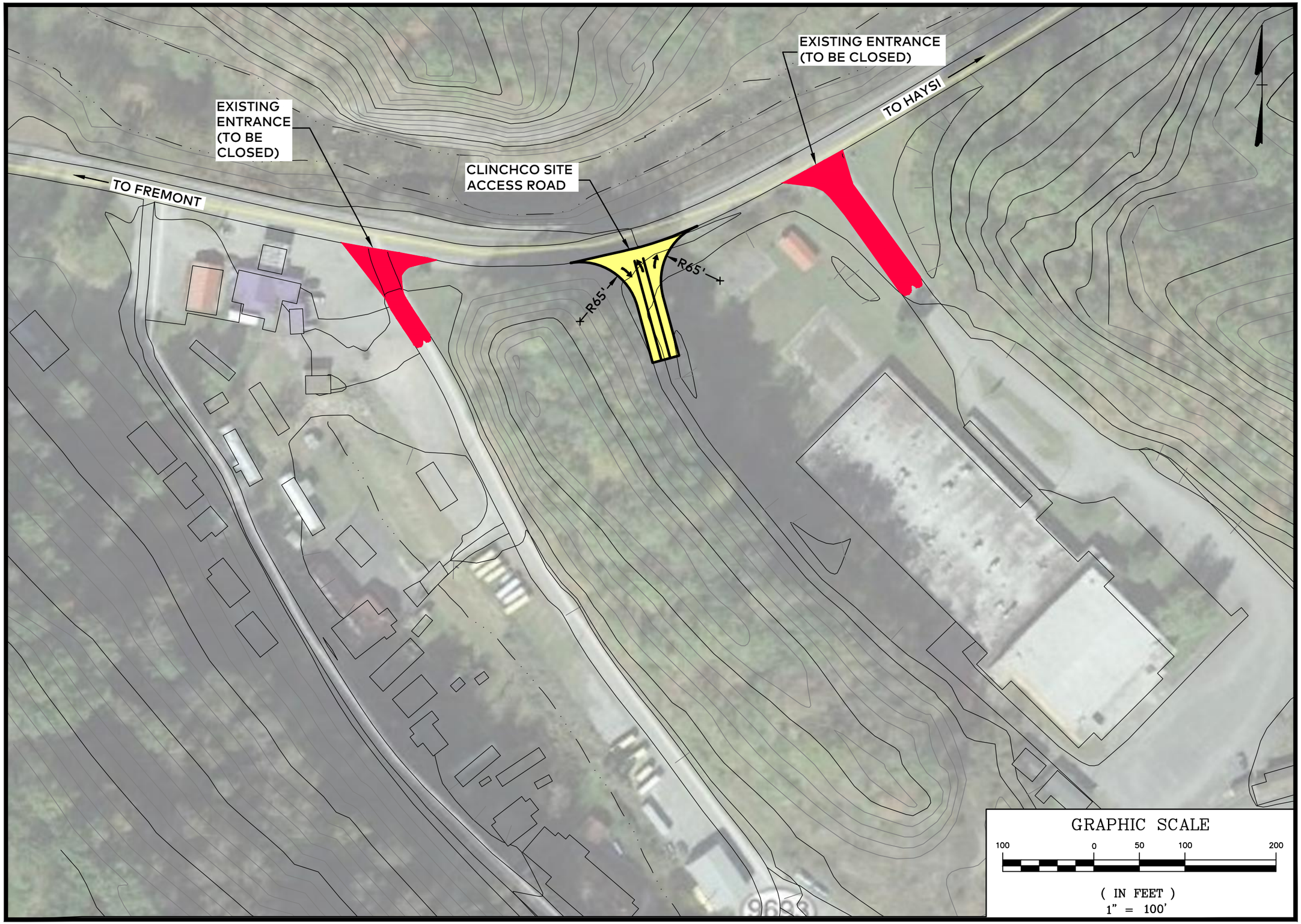
Access to the Clinchco site will be provided from State Route 83. Based upon a field meeting with VDOT, it was determined that the two existing entrances to the site be consolidated to provide one entrance to the facility from State Route 83. The location of this the new entrance will provide the required intersection sight distance along State Route 83. It was also determined that an evaluation of the warrants for right and left turn lanes on Route 83 at the school entrance in accordance with VDOT Appendix F Access Management Design Standards and possible impacts to the existing roadway network resulting from site grading also needed to be evaluated as part of the project development.

Per the 2017 VDOT Daily Traffic Volume Estimates Jurisdictional Report, the existing annual average daily traffic on State Route 83 is 2,800 vehicles per day. The projected Trip Generation for an elementary school with 500 students is 645 vehicles per day. The warrant evaluation for right and left turn lanes on State Route 83 at the school entrance indicate that no turn lanes are warranted.

The access road improvements proposed for the Clinchco site include closing the two existing entrances (Vocational Drive and Cardinal Street) and constructing a new three lane intersection with entrance from State Route 83, left turn lane, and right turn lane to State Route

83. The sight distance to the east and west exceed the 390-ft intersection sight distance required.

Traffic data and turn lane analyses for the Clinchco site are provided in Appendix D. The proposed intersection improvements for the Clinchco site are presented in the Exhibit VI.



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SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

OFF-SITE ROAD IMPROVEMENTS - CLINCHCO SITE

Designed	TAM, GDW
Drawn	DJL
Checked	TAM, GDW
Date	SEPT. 2018

Project No.
14244

THOMPSON & LITTON

EXHIBIT VI

Environmental, Historical and Mining Considerations

Based upon National Environmental Policy Act (NEPA) environmental work conducted on the Clinchco site in 2010 by the United States Army Corps of Engineers (ACOE), a concern was raised regarding soil contamination since a closed, capped landfill located upgradient of the site had contaminated the groundwater under the school site. However, it was determined that there were no traces of contamination in the top 11 feet of soil above the groundwater table. Further investigations by the ACOE determined that there was no conclusive contamination identified in the soil at the site and that no further action was recommended for the soil. Copies of all previous NEPA documentation can be found on the Dickenson County School Board website at www.dcps.k12.va.us/home.

Based upon the proposed grading of the site, additional fill material will be placed across the site of the old elementary school and no construction is anticipated to be required in the existing soils beneath the previous school location. The finished pod elevation for the site will be approximately 29 feet above the contaminated ground water and approximately 10 feet above the 100-year flood plain. It should be noted that, at a minimum, the previously prepared NEPA environmental documentation for the Clinchco site may need to be updated due to the time that has elapsed since it's preparation. No historical reviews have been conducted on this site. A search of the Virginia Department of Mined Land Reclamation (DMLR) database showed no evidence of previous underground mine workings beneath the Clinchco site.

ALTERNATIVE III: RIDGEVIEW SITE

Site Development

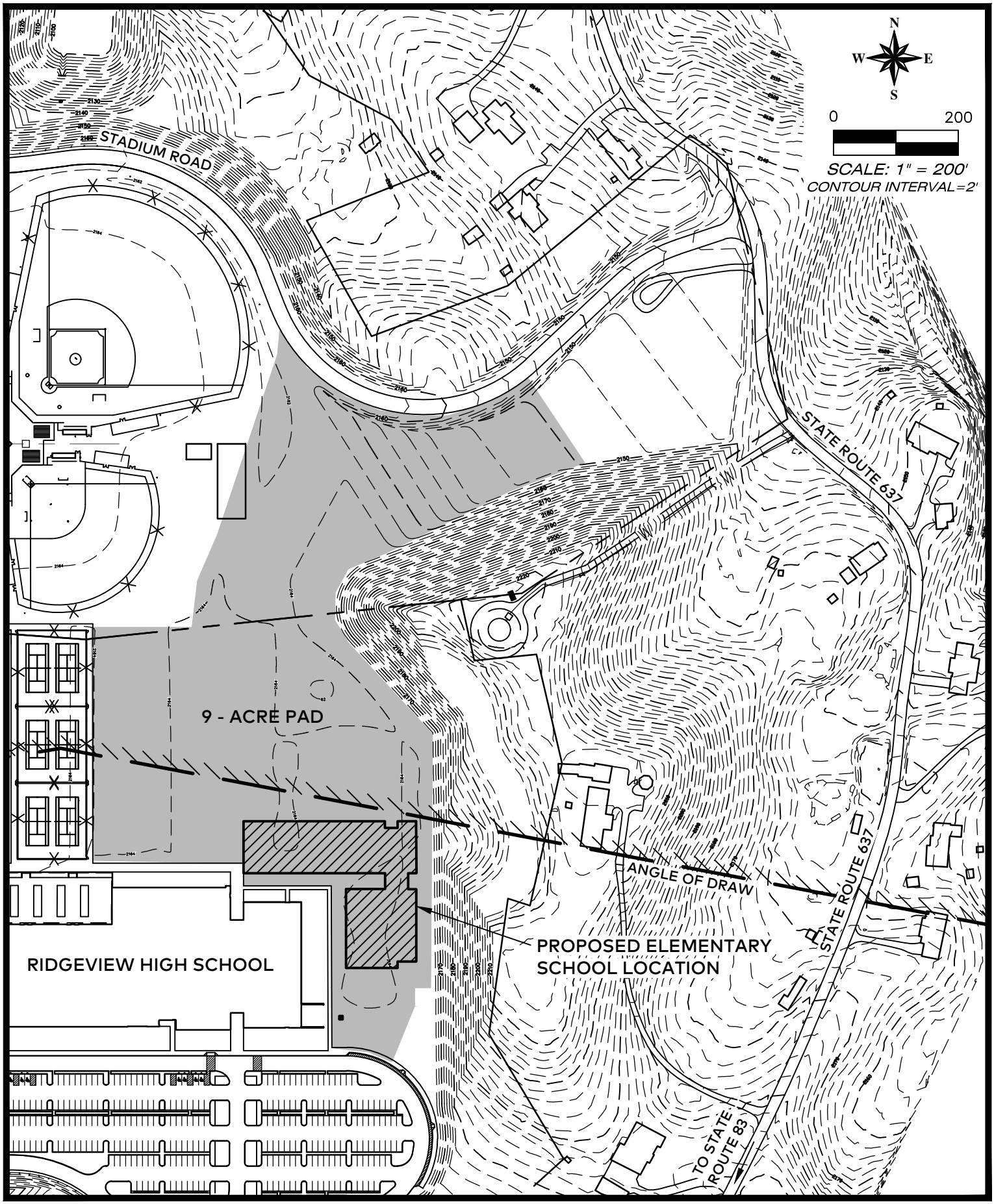
The proposed Ridgeview site is located off of State Route 637 on the campus of Ridgeview High School/Middle School. The property is currently owned by the Dickenson County School Board. The site is bounded to the east by a residential area and to the south, west and north by the Ridgeview High School/Middle School campus. The site itself is predominantly previously developed gently graded grassy areas. All surface runoff from the site discharges to the Cranes Nest River to the northeast of the site.

Site preparation for the Ridgeview site will require the grading of the site to a maximum of 2 horizontal to 1 vertical (2:1) for cut and fill slopes and a minimum of 2 percent slope for the building pad area. The new elementary school building location is anticipated to be immediately to the northeast of the existing Ridgeview High School/Middle School. Preliminary site grading indicates that approximately 26,000 cubic yards of excavation would be required for the development of an elementary school on the site. It is anticipated that the grading of the site will result in excess material which will need to be hauled off-site for disposal. It should be noted that, based upon the topography and boundaries of the site, the maximum contiguous pad size on the site that would be considered to be cost effective would be approximately 11 acres. A preliminary site plan for the Ridgeview site is presented as Exhibit VII.

Utilities

All necessary utilities are within relatively close proximity to the site. Electric service for the Ridgeview site can be provided by American Electric Power (AEP). Three-phase power is currently located on-site to serve the existing high school/middle school. Since the electric service is already available on-site, it has been assumed that there will no cost to provide service to the site. However, there may be existing underground electric line on the site that may need to be relocated depending

upon the layout of a new school on the site. The relocation of this underground electric line will result in additional cost to the development.



PROJECT NO.	DATE
14244-00	JULY 2018
FILE NAME	
Ridgeview Exhibit	

SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

RIDGEVIEW SITE

THOMPSON & LITTON

EXHIBIT VII

Fiber service for the Ridgeview site can be provided by a connection to an existing fiber optic line owned by Sunset Digital Communications which is located on-site to serve the existing high school/middle school. Since the fiber service is already available on-site, it has been assumed that there will no cost to provide service to the site.

Water service for the Ridgeview site can be provided by a connection to an existing on-site 6-inch water line owned by the Dickenson County School Board which serves the existing high school/middle school. Since the water service is already available on-site, it has been assumed that there will no cost to provide service to the site.

Sanitary sewer service for the Ridgeview site can be provided by connection to an existing on-site 8-inch gravity sewer owned by the Dickenson County School Board which serves the existing high school/middle school. Since the sanitary sewer service is already available on-site, it has been assumed that there will no cost to provide service to the site. All sewage for the proposed site will be treated at the on-site wastewater treatment plant which is owned by the Dickenson County School Board. Based upon usage records, it appears that this treatment plant has adequate capacity to serve the new elementary school. However, it is recommended that this capacity be re-evaluated should the Ridgeview site be chosen for development of the new elementary school.

Gas service can be provided to the Ridgeview site by a connection to an existing on-site 4-inch gas line owned by Appalachian Natural Gas Distribution Company. Since the gas service is already on-site, it has been assumed that there will no cost to provide service to the site.

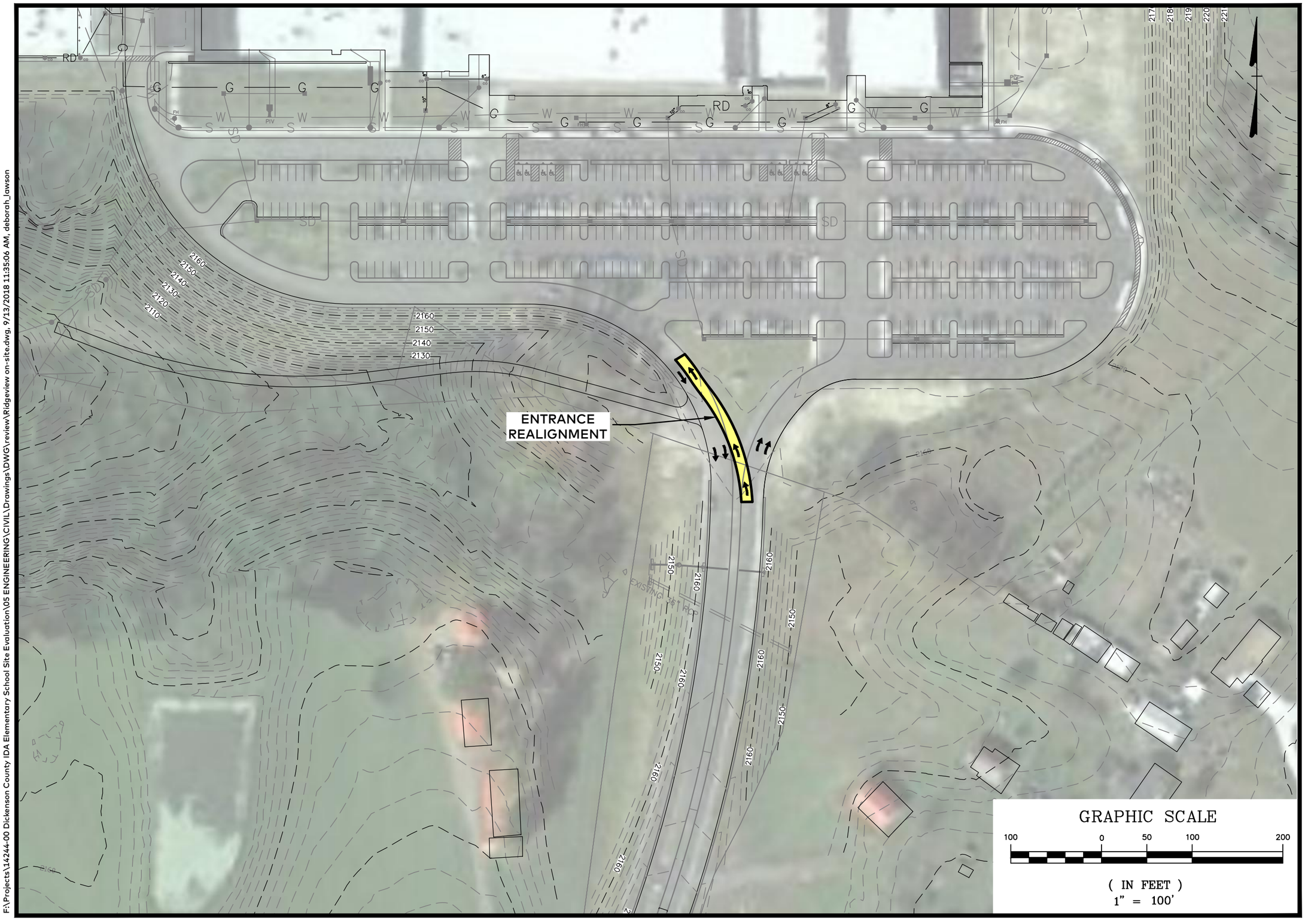
Site Access and Transportation Facilities

Access to the Ridgeview site will be provided via Wolfpack Way from State Route 637. On-site access road improvements to Wolfpack Way will be required to accommodate the increased traffic for the new elementary school. These improvements consist of connecting the entrance road to the western side of the access road (currently a two lane exit only) to provide an alternative route for traffic into the school. The proposed on-site road improvements are presented in Exhibit VIII.

A roadway improvements project along State Route 637 from State Route 83 to Wolfpack Way was completed in July 2016. The Route 637 roadway improvements were designed for a future average daily projected traffic of 2,500 vehicles per day. The projected average daily traffic with the addition of the elementary school at the Ridgeview site is 1,585 vehicles per day; therefore, no off-site roadway improvements are proposed for State Route 637 from State Route 83 to Wolfpack Way.

As noted previously in this report, VDOT requested that the intersection of State Route 637 and the back entrance into the Ridgeview campus be evaluated if there is an increase in traffic at this location due to the construction of the new elementary school. Per the 2017 VDOT Daily Traffic Volume Estimates Jurisdictional Report, the existing annual average daily traffic on State Route 637 is 940 vehicles per day. The projected Trip Generation for an elementary school with 500 students is 645 vehicles per day. The warrant evaluation for right and left turn lanes on State Route 637 at the back entrance to the Ridgeview campus indicate that no turn lanes are warranted.

The off-site access road improvements proposed for State Route 637 from the roundabout to the back entrance include pavement widening the 3,400-ft of roadway from 20-ft to 22-ft minimum, improving one horizontal curve to a minimum 251-ft radius, drainage improvements (ditches and culverts), shoulder widening, tree clearing, installation/replacement of guardrail, and installation of guardrail end terminals.



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SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

ON-SITE ROAD IMPROVEMENTS - RIDGEVIEW SITE

Designed	TAM, GDW
Drawn	DJL
Checked	TAM, GDW
Date	SEPT. 2018

Project No.
14244

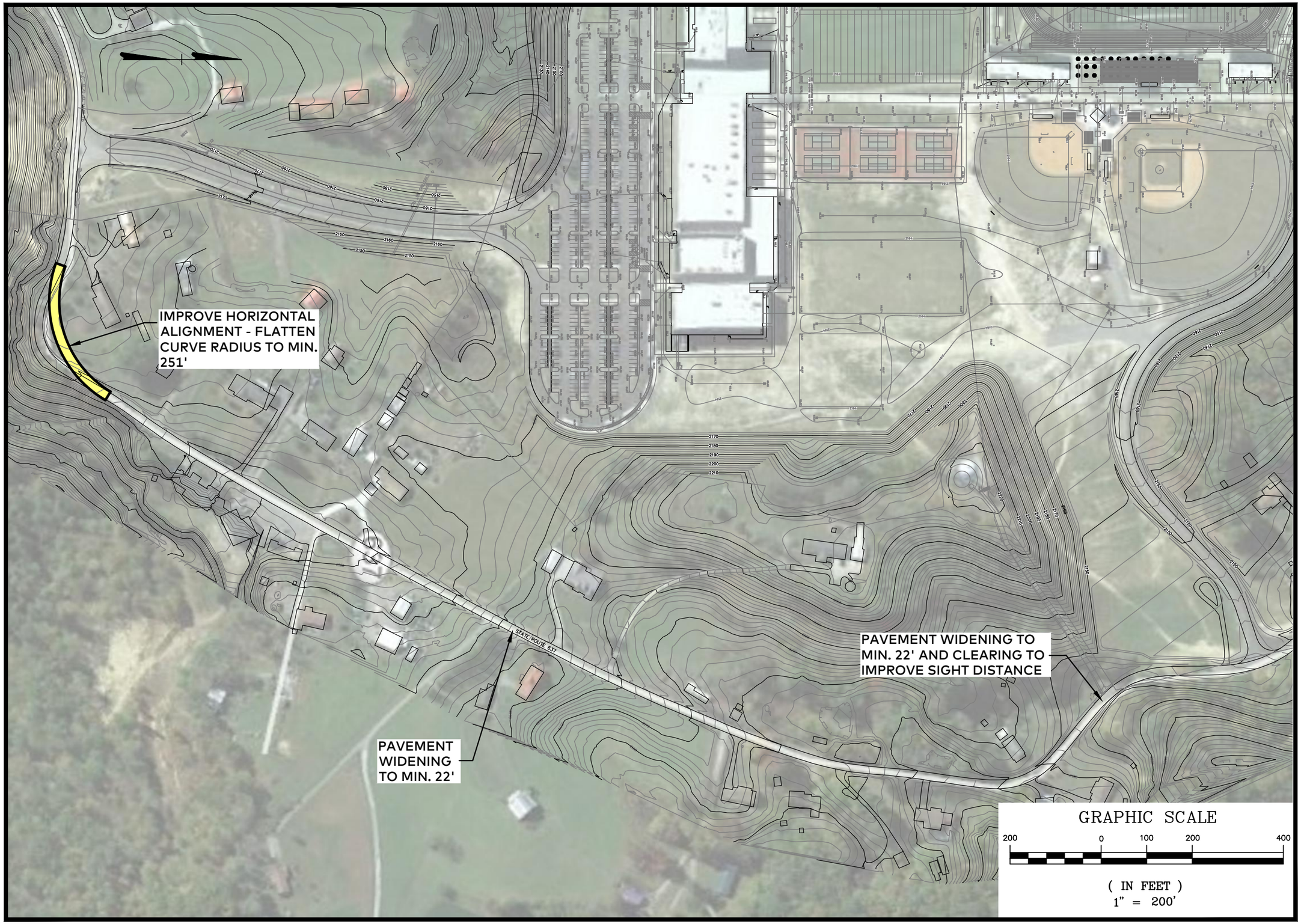
THOMPSON & LITTON

EXHIBIT VIII

Traffic data and turn lane analyses for the Ridgeview site are provided in Appendix B. The proposed off-site road improvements for the Ridgeview site are presented in Exhibit IX.

The additional traffic for the elementary school will enter the complex through the existing Route 637 roundabout and Wolfpack Way; therefore, allowances will need to be made to alter the existing flow of traffic on Wolfpack Way in and around the Ridgeview High/Middle School to accommodate the elementary school traffic. An assumption will need to be made that a portion of the elementary school traffic may use the rear entrance to Ridgeview High/Middle School; therefore, warrants for right and left turn lanes on State Route 637 at the rear entrance in accordance with VDOT Appendix F Access Management Design Standards, making conservative assumptions on trip generation. If the existing flow of traffic on Wolfpack Way within the limits of the Ridgeview High/Middle School cannot be sufficiently altered to accommodate the elementary school traffic, the portion of State Route 637 from the existing roundabout entrance to the rear entrance will need to be reviewed for potential geometric improvements.

VDOT also noted that the County has submitted a roundabout project at the intersection of State Route 637 and State Route 83 for funding through Smart Scale. Assuming this project is funded, preliminary engineering would not be initiated until September of 2023 (at the earliest). If existing capacity and/or safety issues currently exist at this intersection or are anticipated to occur due to increased traffic generated from an elementary school addition, it is recommended mitigation measures be proposed, because the roundabout funding is not a guarantee.



SITE SELECTION STUDY
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL

OFF-SITE ROAD IMPROVEMENTS - RIDGEVIEW SITE

Designed	TAM, GDW
Drawn	DJL
Checked	TAM, GDW
Date	SEPT. 2018

Project No.
14244

THOMPSON & LITTON

EXHIBIT IX

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Environmental, Historical and Mining Considerations

Based upon National Environmental Policy Act (NEPA) environmental work conducted on the Ridgeview site in 2010 by the United States Army Corps of Engineers (ACOE), there were no significant environmental concerns raised that would affect the development of a new elementary school on the existing campus. Additionally, the entire area which would be utilized for the development of the new elementary school was previously disturbed as part of the development of Ridgeview High School/Middle School. It should be noted that, at a minimum, the previously prepared NEPA environmental documentation for the Ridgeview site may need to be updated due to the time that has elapsed since it's preparation. No historical reviews have been conducted on this site. A search of the Virginia Department of Mined Land Reclamation (DMLR) database showed evidence of previous underground mine workings beneath the northern portion of the existing Ridgeview High School/Middle School campus. However, if the new elementary school is located near the northeast corner of the existing Ridgeview High School/Middle School, it would not be located over any of the previously mined areas and would be outside the angle of draw, or zone of influence, of the previous underground mining. This location for the new elementary school would minimize the potential for any adverse effects of the previous underground mining on the new school.

PROJECT COSTS

The project costs associated with the development of the Upper Backbone Ridge, Clinchco, and the Ridgeview sites are summarized in this section. These project costs, which are provided in Tables I, II, and III, respectively, are based upon estimates of site grading, as well as access and utilities to each site. Additionally, a comparative construction cost summary is provided in Table IV which compares the construction costs for each site. The costs associated with the development of the sites are based on the preliminary site considerations discussed in this site selection study, and, therefore, represent conceptual cost estimates.

It should be noted that no site development within the boundaries of the graded pad, such as buildings, utilities, internal roadways, parking lots, and recreational fields were included in this study. It has been assumed that the costs associated with these items would be comparable for each of the sites. Because of the preliminary nature of this study, the evaluations contained herein for each of the potential sites are intended for relative comparison purposes only and the costs presented do not represent the total cost for developing a school on each site. Additionally, related costs such as Architectural/Engineering fees, administration fees, environmental costs, etc. are not included in this study. These costs will be incorporated into the overall project cost by others.

It is important to stress that these cost estimates are conceptual in nature and have been developed without the benefit of a detailed preliminary engineering reports, survey information, geotechnical information, or final design information and details. Therefore, these costs are subject to further revision as field surveys/studies are completed and detailed plans are developed for the project. Experience on similar projects and actual unit cost bids received on similar projects were utilized during the calculation of all construction costs.

TABLE I

PRELIMINARY STATEMENT OF PROBABLE CONSTRUCTION COST

FOR THE

NEW DICKENSON COUNTY ELEMENTARY SCHOOL

UPPER BACKBONE RIDGE SITE

CONSTRUCTION COST:

Site Pad		
20 ACRES Clearing and Grubbing @ $5,000/ACRE	$100,000	
190,000 C.Y. Earthwork @$8/C.Y.	$1,520,000	
10 ACRES Seeding @ $2,000/ACRE	$20,000	
		$1,640,000
On-Site Access Road		
46,000 C.Y. Earthwork @$8/C.Y.	$368,000	
700 L.F. Paved Roadway @ $120/L.F.	$84,000	
1,400 L.F. Curb & Gutter @ $30/L.F.	$42,000	
700 Guardrail @ $28/L.F.	$19,600	
2 ACRES Seeding @ $2,000/ACRE	$4,000	
		$517,600
Off-Site Road Improvements Route 83 and Route 652		
118,000 C.Y. Earthwork @$8/C.Y.	$944,000	
395 TON Asphalt Surface Material SM-12.5A @$120/TON	$47,400	
395 TON Asphalt Intermediate Material IM-19A @$95/TON	$37,525	
785 TON Asphalt Base Material BM-25.0 @$85/TON	$66,725	
1,500 TON Coarse Aggregate Base Material No. 21B @$30/TON	$45,000	
2,640 L.F. Guardrail GR-2 @$28/L.F.	$73,920	
6 EA. Guardrail End Treatment @$3,500/EA.	$21,000	
5,900 S.Y. Milling 2-Inch Depth @$10/S.Y.	$59,000	
675 TON Asphalt Surface Material SM-12.5A Overlay @$120/TON	$81,000	
1 ACRES Seeding @$2,000/ACRE	$2,000	
2 ACRES Clearing and Grubbing @$25,000/ACRE	$50,000	
Work Area Protection/Maintenance Of Traffic, L.S.	$125,500	
Drainage Structures, L.S.	$75,000	
Erosion and Sediment Control, L.S.	$35,000	
Pavement Marking, L.S.	$19,000	
Permanent Signs, L.S.	$15,000	
		$1,697,070

TABLE I (CONTINUED)
PRELIMINARY STATEMENT OF PROBABLE CONSTRUCTION COST
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL
UPPER BACKBONE SITE

CONSTRUCTION COST (CONTINUED):

Water System		
1,400 L.F. 8-inch Water Line @ $25/L.F.	$35,000	
1 EA. 100,000 Gallon Water Storage Tank for Fire Protection Purposes @ $250,000/EA.	$250,000	
3 EA. 8-inch Gate Valve @ $1,800/EA.	$5,400	
1 EA. Air Release Valve @ $1,700/EA.	$1,700	
1 EA. Blow-Off Valve @ $1,700/EA.	$1,700	
		$293,800
Sanitary Sewer System		
700 L.F. 8-inch Sanitary Sewer @ $70/L.F.	$49,000	
4 EA. Sanitary Sewer Manhole @ $3,500/EA.	$14,000	
Sewage Pump Station, L.S.	$150,000	
100 L.F. 4-inch Sanitary Sewer Force Main @ $55/L.F.	$5,500	
		$218,500
Natural Gas Service		
6,900 L.F. 4-inch Natural Gas Line @ $35/L.F.	$241,500	
Drying and Metering Facilities, L.S.	$50,000	
		$291,500
Fiber Service		
Fiber Service, L.S.	$25,000	
		$25,000
	Construction Subtotal	$4,683,470
	Construction Contingency (10%)	$469,000
	TOTAL CONSTRUCTION COST	**$5,152,470**

Please be advised that since Thompson & Litton has no control over the cost of labor, materials, equipment, or services furnished by others, or over Contractor(s') methods of determining prices, or over competitive bidding or market conditions, our opinions of probable project cost and construction cost provided herein are made on the basis of our experience and qualifications and represent our best judgment as experienced and qualified Professional Engineers familiar with the construction industry. Thompson & Litton cannot and does not guarantee that proposals, bids, or actual project construction cost will not vary from those opinions of probable costs prepared by Thompson & Litton. If, prior to the Bidding or Negotiating Phase, the DCIDA wishes greater assurance as to project or construction costs, the DCIDA should employ an independent cost estimator.

TABLE II
PRELIMINARY STATEMENT OF PROBABLE CONSTRUCTION COST
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL
CLINCHCO SITE

CONSTRUCTION COST:

Site Pad		
12 ACRES Clearing and Grubbing @ $3,500/ACRE	$42,000	
176,000 C.Y. Earthwork @$8/C.Y.	$1,408,000	
6 ACRES Seeding @ $2,000/ACRE	$12,000	
		$1,462,000
Off-Site Road Improvements Route 83		
Roadway Intersection Improvements, L.S.	$75,000	
		$75,000
Water System		
1 EA. 100,000 Gallon Water Storage Tank for Fire Protection Purposes@ $250,000/EA.	$250,000	
		$250,000
Natural Gas Service		
12,000 L.F. 4-inch Natural Gas Line @ $25/L.F.	$300,000	
Drying and Metering Facilities, L.S.	$50,000	
		$350,000
Building Demolition/Replacement		
Building Demolition, L.S.	$250,000	
		$250,000
Construction Subtotal		$2,387,000
Construction Contingency (10%)		$239,000
TOTAL CONSTRUCTION COST		**$2,626,000**

Please be advised that since Thompson & Litton has no control over the cost of labor, materials, equipment, or services furnished by others, or over Contractor(s') methods of determining prices, or over competitive bidding or market conditions, our opinions of probable project cost and construction cost provided herein are made on the basis of our experience and qualifications and represent our best judgment as experienced and qualified Professional Engineers familiar with the construction industry. Thompson & Litton cannot and does not guarantee that proposals, bids, or actual project construction cost will not vary from those opinions of probable costs prepared by Thompson & Litton. If, prior to the Bidding or Negotiating Phase, the DCIDA wishes greater assurance as to project or construction costs, the DCIDA should employ an independent cost estimator.

TABLE III
PRELIMINARY STATEMENT OF PROBABLE CONSTRUCTION COST
FOR THE
NEW DICKENSON COUNTY ELEMENTARY SCHOOL
RIDGEVIEW SITE

CONSTRUCTION COST:

Site Pad		
9 ACRES Clearing and Grubbing @ $2,500/ACRE	$22,500	
26,000 C.Y. Earthwork @$5/C.Y.	$130,000	
5 ACRES Seeding @ $2,000/ACRE	$10,000	
		$162,500
On-Site Road Improvements		
High School Entrance Improvements, L.S.	$45,000	
		$45,000
Off-Site Road Improvements Route 637		
5,000 C.Y. Earthwork @ $8/C.Y.	$40,000	
225 TON Asphalt Surface Material SM-12.5A @ $120/TON	$27,000	
225 TONS Asphalt Intermediate Material IM-19A @ $95/TON	$21,375	
450 TONS Asphalt Base Material BM-25.0 @ $85/TON	$38,250	
820 TONS Coarse Aggregate Base Material No. 21B @ $30/TON	$24,600	
1,700 L.F. Guardrail GR-2 @ $28/L.F.	$47,600	
4 EA. Guardrail End Treatment @ $3,500/EA.	$14,000	
7,600 S.Y. Milling 2-Inch Depth @ $10/S.Y.	$76,000	
875 TON Asphalt Surface Material SM-12.5A Overlay @ $120/TON	$105,000	
1 ACRE Seeding @ $2,000/ACRE	$2,000	
1 ACRE Clearing and Grubbing @ $25,000/ACRE	$25,000	
Work Area Protection/Maintenance of Traffic, L.S.	$125,500	
Drainage Structures, L.S.	$37,500	
Erosion and Sediment Control, L.S.	$45,000	
Pavement Marking, L.S.	$23,500	
Permanent Signs, L.S.	$15,000	
		$667,325
Construction Subtotal		$874,825
Construction Contingency (10%)		$88,000
TOTAL CONSTRUCTION COST		**$962,825**

Please be advised that since Thompson & Litton has no control over the cost of labor, materials, equipment, or services furnished by others, or over Contractor(s') methods of determining prices, or over competitive bidding or market conditions, our opinions of probable project cost and construction cost provided herein are made on the basis of our experience and qualifications and represent our best judgment as experienced and qualified Professional Engineers familiar with the construction industry. Thompson & Litton cannot and does not guarantee that proposals, bids, or actual project construction cost will not vary from those opinions of probable costs prepared by Thompson & Litton. If, prior to the Bidding or Negotiating Phase, the DCIDA wishes greater assurance as to project or construction costs, the DCIDA should employ an independent cost estimator.

TABLE IV

COMPARATIVE CONSTRUCTION COST SUMMARY

FOR THE

NEW DICKENSON COUNTY ELEMENTARY SCHOOL

ALTERNATIVE	TOTAL CONSTRUCTION COST
UPPER BACKBONE RIDGE SITE	$5,152,470
CLINCHCO SITE	$2,626,000
RIDGEVIEW SITE	$962,825

SUMMARY

Based upon the evaluations provided in this site selection study, it can be concluded that all of the sites evaluated in this study are considered suitable for the development of a new elementary school. It can be concluded further that the Ridgeview site presents the lowest site development construction costs followed by the Clinchco site and the Upper Backbone Ridge site.

Although site development costs are a very important consideration, there are additional factors which are recommended for consideration in evaluating the best location for the new elementary school. These factors would include the following:

- On-site Development Costs (Building, roads, parking, recreation fields, etc.)
- Property Acquisition Costs
- Mineral Rights Costs
- Environmental Considerations
- Student Population Center
- Travel Times
- Impact to the Community

Unlike development costs, many of these factors do not lend themselves to an engineering analysis and therefore, are beyond the scope of this site selection study. This study is intended only to provide a relative comparison of site development construction cost associated with each of the sites considered in this study.

APPENDICES

APPENDIX A

VDOE GUIDELINES

Guidelines for School Facilities In Virginia's Public Schools

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Prepared by the Virginia Department of Education,
Office of Support Services
June 2010
Revised February 2013
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APPENDICES

FOREWORD

VIRGINIA PUBLIC SCHOOL FACILITIES GUIDELINES

The Virginia Uniform Statewide Building Code regulates the general health, safety, and welfare of building occupants of public educational facilities in Virginia. Also, public school sites and buildings, new or renovated, as well as all educational programs, activities, or services offered at school facilities must meet the federal Americans with Disabilities Act (ADA). While the building code addresses life safety design issues, it does not offer any design guidance to school planners and educators as to how to meet their educational program needs. Various requirements contained in the *Regulations Establishing Standards for Accrediting Public Schools in Virginia* and in the *Standards of Quality*, such as required program offerings, pupil-teacher ratios/maximum class sizes, and administrative staffing, guide school facilities design in the context of minimum standards. The *Virginia Public School Facilities Guidelines* are intended to provide more detailed guidance for the planning and design of local public school facilities.

The issues involved in planning and providing adequate and safe school facilities for Virginia's public school students are complex and merit careful study and thoughtful consideration. To plan and construct school buildings that meet today's educational needs - and that are safe, economical to build and maintain, that will last, and flexible in their program uses - is an extremely difficult task. It is the responsibility of the local school board to develop a specific educational program and from this to determine school facility needs in the form of an architectural program. The choices of school design, materials and types and number of spaces required to carry out the educational program rests with the local school board.

The *Virginia Public School Facilities Guidelines* were developed in a cooperative effort between the Virginia Department of Education, school architects and school division facilities directors from across Virginia. The goal was to provide recommendations that will help local school divisions ensure that their school sites and facilities support the principles of good teaching and learning and promote sound educational programs. The recommendations contained in these optional guidelines should be considered as a useful tool when planning school facilities projects. School facilities planners and local school boards are encouraged to exceed them whenever possible.

Finally, the Virginia Department of Education wishes to thank and acknowledge those individuals who served on the committee that developed the Facility Guidelines: Hunter Barnes, David Boddy AIA, William Bridgeforth, William Brown AIA, Paul Carper, June Eanes, Donald Large, James McCalla AID, A.K. (ViJay) Ramnarain, Clifton Ross AIA, and Russell Wilson.

PART I
DEFINITIONS

1.0 Definitions.

The following words and terms, when used in these guidelines, shall have the following meaning unless the context clearly indicates otherwise:

"Final plans and specifications" means the complete set of contract documents including bidding requirements, contract requirements, technical specifications, plans, and addenda which depict the scope of the project. The documents shall bear the Virginia seal and signature of the licensed design professional. Incomplete plans and specifications shall not be considered "final" as referenced in §22.1-140 of the *Code of Virginia.*

"Net floor area or square footage" means the area derived by multiplying the inside dimensions of the classroom space, including all features of the self-contained classroom such as garment storage, teacher's storage, shelving, work counters, vestibule, and incidental partitions but excluding walls, toilet rooms, general storage, space for special equipment, stage, or auxiliary rooms.

"Recommendations" means suggested best practices that may be used in the planning and construction of public school buildings.

"Regulations" means any mandatory requirements adopted by the Virginia Board of Education for the planning and construction of public educational facilities as authorized by §22.1-138 of the *Code of Virginia*.

"School" means an educational facility that has the following program levels:

- "primary school" – pre-kindergarten through third grade, but may not include all grades or have all grades represented.
- "elementary school" – pre-kindergarten through seventh grade, but may not include all grades or have all grades represented.
- "middle school" – fifth through ninth grade, but may not include all grades or have all grades represented.
- "high school" – eighth through twelfth grade, but may not include all grades or have all grades represented.
- "combined school" – a single facility that includes two or more of the elementary, middle or high school program levels.

"School site number" means the number assigned by the Virginia Department of Education (VDOE) to a given parcel of land to be occupied for educational purposes by a given school division which may or may not contain school buildings.

"School project number" means the number derived from the school site number and assigned by VDOE to new construction work or alterations to school buildings owned or leased by the school board.

"Supplemental classroom" means facilities to temporarily house students because of a special need. The use of such facilities is scheduled to terminate when the special need is eliminated.

"Usable site" means that portion of the site that can be developed without excessive cost for school use and may be used for future additions, outdoor instruction, physical education, outdoor circulation, parking, bus loading, and where necessary, sewage disposal or treatment plants.

PART II
GENERAL PLANNING

2.1 Professional Services

A. All plans for permanent new school plants, alterations, renovations, or additions to existing plant are to be prepared by licensed architects, except where work is essentially engineering, plans may be prepared by licensed professional engineers. The license issued by the Department of Professional and Occupational Regulation as required under §54.1 of the *Code of Virginia* should be current.

2.2 Project Start-Up

A. All school divisions are required to give notice prior to contracting to the Superintendent of Public Instruction of any proposed construction expenditures for new construction or alterations of existing facilities pursuant to §22.1-139 of the *Code of Virginia*. The Department of Education will assign a site and school project number to the project upon notification.

2.3 Future Expansion

A. While planning a new school, it is recommended that consideration be given to provide for future expansion and modifications.

B. When general classrooms are added and the student capacity is increased, consider programming the following support facilities to meet the recommendations for the increased population:

1. library media center
2. cafeteria
3. administrative spaces

2.4 Additional Planning Strategies

A. High Performance School Buildings

1. In the design of High Performance schools, consider best practices in the following components of a facility:
    a. Site selection and development
        1. Use natural trees and shrubs
        2. Minimize disturbance to natural habitats
    b. Water efficiency
        1. Natural rain water collection system for nonpotable use
    c. Energy efficiency
        1. Maximize use of natural light, building orientation
        2. Select energy efficient building systems and fixtures
    d. Building materials and resource selection and use
    e. Indoor environmental quality
    f. Recycling of construction waste and building materials
    g. Consideration of the life cycle cost of materials and systems

2. Establish a vision that the building should be a teaching tool. The building and site can be used as a type of classroom and teachers can develop an educational program to use the "building as a teaching tool" to illustrate a wide spectrum of environmental, scientific, mathematical, and social issues. Too often classrooms just house the activity and are not part of the learning activity.

3. The High Performance elements of the school can distinguish it from other buildings in the community. Through the use of signage and educational programs, these High Performance elements can demonstrate to the school community that the building is a responsible site in the environment and the community.

2.5 Classroom Program Accessibility

A. Where new classrooms are provided by new construction or alteration of existing space, these classrooms must be accessible as set forth in the Americans with Disabilities Act and construction or alterations commenced on or after September 15, 2010 must be in compliance with either the 1991, or the 2010 ADA Standards. School facilities or elements that are constructed or altered after March 15, 2012, shall be made in accordance with the *2010 ADA Standards for Accessible Design*, dated September 15, 2010.

Comments

High Performance school buildings can support a school's mission by contributing to the following key benefits: better student performance, increased average daily attendance, increased teacher satisfaction and retention, reduced operating costs, reduced exposure to environment related sicknesses, a positive influence on the environment, and opportunities for using the facility as a teaching tool. A focus on student achievement coupled with concern for the environment and cost effectiveness will help ensure that any school, no matter its budget, achieves the highest performance possible. The quality of the school building has a profound effect on student performance, and on the well-being of all occupants. Consideration should be given to the energy efficiencies of building systems and setting environmental design goals for achieving verifiable High Performance efficiencies to increase energy efficiency and reduce energy costs prior to design and construction.

Life Cycle Cost Analysis to assess the total cost of facility ownership over time should be conducted during the design development of a school construction project. Costs should include initial design and construction costs; operating costs for energy, water, other utilities and personnel; and maintenance, repair and replacement costs. Life Cycle Analysis impacts virtually every system in a school and when used properly can optimize the integrated performance of all systems and thereby reduce a school's total cost to the community. This will allow evaluation of "first cost" to "life cycle cost" when implementing a high performance design strategy as a long-term investment in the best interest of the community.

Additional information can be obtained from the US Green Building Council "LEED" Leadership in Energy and Environment Design Web site at http://www.usgbc.org/LEED, the Green Building Initiative Web site http://www.thegbi.org and the Virginia Collaborative for High Performance Schools "VA-CHPS" Web site: http://www.chps.net/virginia .

PART III
SCHOOL SITES

3.1 Site Ownership/Control

A. It is recommended that the local governing body or the local school board hold title to an adequate site, or should be in the process of acquiring sufficient land to meet the recommendations on school sites; or should have a legal written agreement with the owner to use the site for educational purposes and development. This total usable acreage should be in reasonable compliance with the recommendations for new school sites.

3.2 Size of New School Site

A. The following minimum usable site sizes are recommended:

School Type	Basic Acreage	Additional Acreage Per 100 Pupils in Ultimate Enrollment
Primary or Elementary (grades pk-7)	4	1
Middle School, Intermediate, Jr. High	10	1
Senior High or Combined School	10	1

B. Other considerations recommended to evaluate existing or potential school sites are:

1. Adequate site acreage to separate pedestrian, bus, and car traffic
2. Adequate site acreage to meet the needs of the outdoor physical education program
3. Adequate road frontage and ease of access
4. Availability of utilities
5. Proximity to noise and other pollution sources (airport, traffic, industrial)
6. Additional considerations would be the shape of the site, topography, and soil conditions
7. Adequate perimeter road circulation for emergency response vehicles.
8. Where possible, locate new schools in attendance areas that will promote students to walk or ride bicycles safely to school. When developing a new school site or altering an existing site the design should include features that encourage pedestrian or bicycle access to and from the school site.

C. The total area of the site and total usable area should be indicated on final plans.

3.3 Size of Existing School Sites

A. When permanent additions are made to an existing school facility, it is recommended that the minimum usable area of the site be in reasonable compliance with the recommendations for new school sites.

3.4 Driveways

A. It is recommended that driveways and service drives do not encircle the school, nor serve as pedestrian walks unless provided with traffic controls such as fences, barriers, signs or lights.

3.5 Bus Loading Areas

A. Consider including provisions for the bus loading areas to be separated from other vehicular traffic in all new or revised school site plans.

3.6 Unobstructed View

A. It is recommended that driveways and adjacent improvements be arranged so as to provide a safe driving view on the site and on the approach and exit from the site.

3.7 Development for Physical Education

A. It is recommended that the site have areas that can be developed to provide the minimum number of play areas required for physical education as indicated.

MINIMUM OUTSIDE PLAY AREAS

	ELEMENTARY SCHOOL	NUMBER OF STUDENTS		
		up to 399	400-599	600-above
100'X120'	Multiuse (Hard Surface)	1	2	2
100'X120'	Fitness Development Fenced Equipment Area (PK-1)	1	1	1
100'X120'	Fitness Development Equipment Area (2-5)	1	1	1
180'X140'	Multiuse Field Play Area	1	1	2

Note: A gymnasium may substitute for one multiuse (hard surface) play area

	MIDDLE SCHOOL	NUMBER OF STUDENTS		
		up to 599	600-899	900-above
100'X120'	Hard Surface	1	2	2
100'X150'	Fitness Development Equipment Area	1	1	1
200'X400'	Field Game Areas	2	2	3

	HIGH SCHOOL	NUMBER OF STUDENTS		
		up to 899	900-1199	1200-above
100'X120'	Hard Surface	1	1	2
100'X180'	Fitness Development Equipment Area	1	1	1
200'X590'	Track (standard size)	1	1	1
200'X400'	Field Game Areas	2	3	3
7200 sq.ft.	Tennis Courts (60 X 120 ea.)	6	6	6

3.8 Playgrounds

A. It is recommended that both nonstructured play areas and play equipment areas be provided on primary school and elementary school playgrounds. All play equipment should meet the guidelines of the United States Consumer Product Safety Commission's "Handbook for Public Playground Safety." Consideration should also be given to designing the outdoor learning environment to support the classroom learning.

B. Age Groups

It is recommended that playgrounds for different age groups be separated and play equipment sized accordingly. Consider providing play areas for nonstructured play by means of landscaping.

C. Surfacing

Surfacing materials should be of organic type such as wood mulch, bark mulch, or wood chips; inorganic type such as sand or gravel; or synthetic type such as rubber mats or foam mats.

D. Depth of Surfacing Materials

The depth of surfacing materials under and around play equipment should be determined by the height of the play equipment, as established in the following table:

Maximum Height of Play Equipment
Above Surfacing Materials

	Uncompressed Depth			Compressed Depth
Material	6 inch	9 inch	12 inch	9 inch
Wood Mulch	7 ft	10 ft	11 ft.	10 ft.
Double-Shredded Bark Mulch	6 ft.	10 ft.	11 ft.	7 ft.
Uniform Wood Chips	6 ft.	7 ft.	12 ft.	6 ft.
Fine Sand	5 ft.	5 ft.	9 ft.	5 ft.
Coarse Sand	5 ft.	5 ft.	6 ft.	4 ft.
Fine Gravel	6 ft.	7 ft.	10 ft.	6 ft.
Medium Gravel	5 ft.	5 ft.	6 ft.	5 ft.

Rubber and Foam Mats as per manufacturer's recommendations

3.9 Site and Playground Accessibility

A. Walkways and pathways to and from the school building to playgrounds and other areas of after-school activities on the school grounds must be accessible as set forth in the Americans with Disabilities Act and construction or alterations commenced on or after September 15, 2010 must be in compliance with either the 1991, or the 2010 ADA Standards.

Comments

Adequate acreage will allow the physical education program to have a variety of outdoor activities and also provide adequate parking.

The acreage recommended refers to the minimum usable land that can be built upon. In order to provide for adequate outdoor activity space, adequate parking, and to allow for future growth and flexibility, consideration should be given to obtaining additional acreage where possible.
To support physical activity and play, paved outdoor areas are essential at all elementary grade levels; the types and number of outside fields depend on the size and grade structure of the school as well as the physical education program of the school.

In elementary schools, it is age-appropriate for pre-kindergarten and kindergarten grades to share play areas that keep children within a gated area for safety purposes. It is desirable to have a fence surrounding play areas. If the security fence height exceeds 32" consider providing a latch type gate and not a locking type.

On-site parking needs have increased over the years. Adequate parking for the staff and an additional 10 percent to 20 percent parking space for visitors should be provided. Student parking to accommodate one-third of the student enrollment should also be provided.

PART IV
CLASSROOMS

4.1 Number and Priority of Classrooms

A. The number of classrooms required in any school project is determined by projected enrollment and pupil/teacher ratios of the facility by the local school board. When providing classrooms by new construction or alteration, each grade level, beginning with pre-kindergarten, should be provided with sufficient rooms designed for its use before rooms are provided for the next higher grade level.

4.2 General Classroom Floor Areas

A. The minimum net floor areas for classrooms, including all features of self-contained classrooms such as garment storage, teacher's storage shelving, work counters, vestibules, and incidental partitions, but excluding classroom toilet and general storage rooms, should be as indicated below:

Pre-Kindergarten, Kindergarten, Grade 1	975 square feet
Grades 2-5	800 square feet
Grades 6-12	700 square feet

4.3 Classroom Geometry

A. The length of classrooms should be no more than 1.5 times the width, unless program functions indicate otherwise. The minimum ceiling height for any classroom should be nine feet.

4.4 Classroom Floor Area for Self-Contained Special Education Rooms

A. The minimum net floor areas for special education classrooms including all features of the self-contained classrooms such as garment storage, teacher's storage shelving, work counters, vestibules and incidental partitions, but excluding classroom toilet rooms, should be as indicated below:

1. Resource, consultation, evaluation and/or itinerant rooms with six students maximum should be 400 square feet (i.e., speech-language therapy, small group specialized intervention services). Add 50 square feet for each additional student.

2. Rooms used for consultation and/or evaluation for physical and/or occupational therapy services will need additional space for specialized equipment and should be 800 square feet.

3. Pre-kindergarten special education classrooms should be 975 square feet. Pre-kindergarten classrooms should be adjoining, or in close proximity to, accessible toilet rooms with hot water for children between the ages of two through five years.

4. Self-contained classrooms with 10 students maximum should be 750 square feet.

4.5 Location of Elementary Classrooms

A. Classrooms for pre-kindergarten, kindergarten, grade 1 and self-contained special education rooms in elementary schools should be located on the floor of exit discharge.

4.6 Garment Storage

A. In pre-kindergarten, kindergarten, and grade 1, hanging and shelf storage facilities for each pupil's clothing and books should be provided in the classroom.

B. In grades 2-5, hanging and shelf storage facilities for each pupil's clothing and books should be provided in or adjacent to the classrooms.

4.7 Display and Marker Boards

A. The minimum length of display and marker boards or white boards in general classroom areas should be as follows:

Display	Marker	Mounting Heights-Floor to Marker/Chalkrail
PreK-K grades 20 ft.	8 ft.	24”
1st – 2nd grades 20 ft.	8 ft.	24”
3rd – 5th grades 16 ft.	16 ft.	28”
6th – 8th grades 12 ft.	16 ft.	36”
9th – 12th grades 12 ft.	16 ft.	36”

C. Display and marker boards should be a minimum of 42” in height.

D. Other screens mounted for audio-visual devices shall be positioned as needed in the room.

Comments

Classrooms should be equipped with a two-way communication system for both informational and emergency use.

Classrooms should be equipped with computers, or conduits and data ports, for future installation.

Cabinets in classrooms should have both open and lockable storage. Wall units should have open shelving for books and door cabinets should also be provided.

For special education classrooms where students are using a wheelchair and/or adaptive equipment, additional square footage should be considered to avoid obstruction while navigating the classroom as independently as possible.

Recommended practices for classrooms for students who are deaf or hard of hearing are available in the Virginia Department of Education’s *Guidelines for Working with Students who are Deaf or Hard of Hearing in Virginia Public Schools* at Web site: http://www.doe.virginia.gov/special_ed/disabilities/sensory_disabilities/hearing_impairment/guidelines_working_with_deaf.pdf

Recommended practices for classrooms for students with blindness, visual impairment, or who are deaf-blind are available from the Virginia Department for Blind and Vision Impaired by contacting the education program specialist at the Web site: http://www.vdbvi.org/.

Licensed pre-kindergarten before- and after-school programs have their own requirements due to the fact they are classified and operated as "Licensed Child Day Centers." The Virginia Department of Social Services administers the minimum standards for licensed child day centers. These requirements can be located on their Web site at http://www.dss.virginia.gov under the tab Children-"Child Care Facilities."

PART V
ADMINISTRATIVE AND HEALTH CLINIC

5.1 Administrative Unit

A. In new schools and schools where the administrative unit is being altered, the following minimum spaces should be provided where required:

1. General Office with clerical workstations
2. Finance Office
3. Waiting Room
4. Principal's Office
5. Assistant Principal's Office(s) (number as per Standards of Quality)
6. Guidance Office(s) (number as per Standards of Quality)
7. General Storage for supplies and books
8. Workroom
9. Coat Closet
10. Staff Toilet(s)
11. Fire Resistive Record Storage
12. Conference Room
13. Other Administrative Offices as applicable
14. Secure Storage Area

5.2 Health Unit

A. In new schools and schools where the health unit is being altered, health service facilities should be provided.

1. An examining room, with private access to an accessible toilet for persons with disabilities.
2. Cot area should be adjacent and directly accessible from the examining room, and shall have access to an accessible toilet for person(s) with disabilities. Cots should be adjacent to nurse's desk with curtains for privacy.
3. Middle and high schools should provide separate cot areas for boys and girls.
4. Nurse work area for desk, chair, file, phone, and other equipment should be provided.

5. Enough space to accommodate eye screening, twenty-two feet in length, should be provided. Clinic corridors may be used for this purpose.
6. Locked cabinet and locked refrigeration for medicines.
7. Nonabsorbent, nonslip floor in all clinic areas.
8. A lavatory with gooseneck faucet with aerator, wrist handles, and grid drain. Place sink in a separate area from toilet, accessories to include liquid soap and paper towel dispensers.

B. An accessible shower should be provided in the Health Unit area.

5.3 Record Storage

A. If provided, fire resistive student record storage should meet one of the following standards:

1. A portable record protection cabinet shall be an Underwriter's labeled Class C, one hour rating.

2. A built-in records file room should be constructed in accordance with the provisions of NFPA (National Fire Protection Agency) 232-2007 "Standard for the Protection of Records." Walls, floor and ceiling construction must protect records for two hours, except the door shall be a fire door with a Class B label , 1 ½ hour fire resistance rating.

Comments

Other administrative spaces typically being provided in schools are office and storage rooms for PTA, Community Recreation, and Safety Security Officers.

Other office spaces may be designated for other student services such as Psychologist, Social Worker, Speech Therapist, and other health professionals. Student offices may be needed for student publications, student government and clubs.

Having a shower in the Administrative and Health Clinic area is recommended for students with disabilities.

Doors to all administrative offices should have a view panel for security.

PART VI
SCIENCE

6.1 Preparation/Storage Room

A. If provided, a preparation room with the following floor areas should be provided for each laboratory.

A single laboratory	200 square feet
Two laboratories	300 square feet

6.2 Science Laboratory/Rooms

A. Middle school science labs should provide a minimum of 1,000 net square feet.

B. High school science labs should provide a minimum of 1,100 net square feet.

6.3 Demonstration Desk

A. Each laboratory and each science classroom should be provided with an instructor's or demonstration desk with acid resistant top, sink, and utility connections; however, when a science classroom is provided and laboratory work only is planned for the laboratory, the instructor's or demonstration desk may be omitted from the science classroom.

6.4 Safety

A. Fume hoods should be installed in all laboratories where flammable or toxic vapors or airborne particulates are generated.

B. Eye wash facilities, fire blanket, and safety deluge shower, portable ABC rated fire extinguishers, and master shutoff controls for gas and electricity should be provided in all laboratories.

6.5 Gas Outlets

A. Gas outlets should be placed in science rooms where required by the program. Middle and high science rooms should provide gas only to the demonstration table.

6.6 Accessible Workstation

A. Each science laboratory should have at least one fixed or portable workstation that provides access to students in wheelchairs.

6.7 Exhaust Ventilation

A. All areas should be adequately ventilated so that exposure to hazardous or toxic materials is eliminated.

B. Hoods shall exhaust directly to the outside and should be located away from building air-intake or other openings.

Comments

For a complete list of science safety equipment and specific storage requirements for chemicals as well as other safety recommendations for science labs, the "Safety in Science Teaching" December 2000 manual from the Virginia Department of Education should be referenced. The Web address for the manual is: http://www.doe.virginia.gov/instruction/science/middle/safety_science_teaching.pdf

All science labs should provide a safety goggle cabinet since eye protection is required by both the *Code of Virginia* and Occupational Safety and Health Administration (OSHA).

Physical science and chemistry labs should be equipped with fume hoods. For most labs a low-volume exhaust fan that is controlled by the teacher is recommended.

Fire extinguishers should be located in each laboratory classroom or the adjacent preparation room.

Science laboratory classrooms should provide 24 student workstations. Also, science teachers should have their own workspace apart from classroom preparation space.

For more detailed information regarding science facilities, see the National Clearinghouse for Educational Facilities Web site: http://www.ncef.org/ and the National Science Teachers Association Web site: http://www.nsta.org/

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PART VII
MUSIC, VISUAL ART, DRAMA, AND DANCE

7.1 General

A. In new schools and in schools where music, art and drama facilities are being altered, music, art and theater spaces should be provided in accordance with the following recommendations.

7.2 Band/Orchestra Room

A. The band room should provide a minimum of 20 square feet per member in the largest band group. The minimum ceiling height should be 12.5 feet. A secure storage space of 200 square feet should be provided for elementary and middle schools, and 400 square feet for high schools.

7.3 Choral Room

A. The choral room should be at least 15 square feet per member in the largest choral group. The minimum ceiling height should be 10 feet. A secure storage space of 200 square feet should be provided.

7.4 Band/Orchestra, Choral Room Geometry

A. The design of music rooms should consider acoustics requirements by using space separation, special surfaces, shapes, or treatments to improve sound in the room and limit sound outside the room.

7.5 Art Room

A. The art room should provide at least 45 square feet per student, not including storage and kiln rooms. A secure storage space of 350 square feet should be provided for elementary art rooms, and 400 square feet for middle and high schools.

B. The art room should provide adequate storage space for supplies, equipment, and student projects. This storage space should include space that can be locked for supplies and equipment.

C. When kilns are provided, in a separate room, exhaust ventilation directly to the outside should be provided.

7.6 Photography Room

A. Photography rooms should provide a total of 340 square feet, with functions broken down as follows: 100 square feet for film developing and chemical mixing, 180 square feet for darkroom printing, and 60 square feet for finishing.

7.7 Drama and Theater Arts

A. For K-12 Theater Arts, the instructional area should provide a minimum of 1,800 square feet with a minimum ceiling height of 10'. For middle and high schools this space should be provided if a black box theater area or performance hall facility is not available in the school facility.

B. The drama room should provide adequate storage space for tapes, CDs, videos, books, audio and video equipment. For middle and high schools, a separate costume storage space should be considered.

C. Should an auditorium be provided, the following guidelines are recommended:

Grades	Seating Capacity	Square Footage
K-5	Fixed seating not recommended; locate stage in cafeteria or gym	1,200 sf stage
6-8	Fixed seat auditorium optional 1/4-1/3 Average Daily Membership (ADM) (or use gym or cafeteria)	1,200 – 3,000 sf. stage
9-12	1/3 to 1/2 ADM (8 square feet per seat)	3,000 – 5,000 sf. stage

7.8 Dance Arts

A. For elementary grades K-5 dance rooms, the instructional area should provide a minimum of 1,700 square feet with a minimum ceiling height of 10' and 100 square feet of secure storage space.

B. For middle school grades 6 – 8 dance rooms, the instructional area should provide a minimum of 1,700 square feet with a minimum ceiling height of 10' and 100 square feet of secure storage space.

C. For high school grades 9 -12 dance rooms, the instructional area should provide a minimum of 1,800 to 2,000 square feet with a minimum ceiling height of 10', an enclosed office, and 100 square feet of secure storage space.

Comments

Provide an oversized door or pair of doors into the music classroom and instrument storage room. Risers if used should be portable for use on the stage or other space as well. Music teachers may prefer a flat floor for flexibility.

It is recommended that art classrooms have windows and direct access to an outdoor art patio. Adequate art storage for art supplies and equipment should be provided. Lockable storage space should be provided at all grade levels. Art rooms should be provided with display boards for two-dimensional art and shelving for display of ceramics and sculpture. Art rooms need at least one acid resistant sink with heavy duty drain with clay or plaster traps to prevent clogging.

The K-6 theater arts room should be an open space which is carpeted and acoustically treated. A small raised platform with simple, individually controlled directional lighting should be considered. The middle and high school theater arts room can be similar if no other performing facility is provided.

If a high school auditorium is to be provided, it should be located adjacent to band, chorus, and drama classrooms. This will allow these spaces to serve as staging, green rooms, dressing and set-up areas for performances. For a high school auditorium, consideration should be given to seating one grade level (class ADM x 8 sq. ft.) plus 4,000 square feet for the stage, storage, and small lobby. Generous side stage areas are encouraged for props and scene storage. Fly lofts and orchestra pits are strongly discouraged for safety reasons. As an alternative for orchestra pits, provide several rows of removable seats at the front of the auditorium. Overhead or oversized doors from a loading area to the stage and scene storage areas should be provided. In lieu of a separate control booth for sound and lights, provisions can be made to set up control boards in the middle of the seating area. Stage lighting is costly and needs will vary upon performances; therefore, consider minimal lighting, with circuits and grid for installation of retail units.

The dance classroom should be an unobstructed space with a sprung wood or resilient wood floor. Concrete, tile, wood-over-concrete, and wood-over-tile floors are not recommended due to the potential for injury from falls or repetitive jumping. Shatter-proof mirrors should be mounted on at least one wall. The classroom should be soundproofed and located so that classroom noise can be isolated from the rest of the school.

More information can be obtained from the Music Educators National Convention Design Standards for School Facilities and best practices, the National Art Education

Association Design Standards for School Art Facilities and best practices, and the National Dance Education Organization Design Standards for Art Facilities and best practices.

PART VIII
HEALTH AND PHYSICAL EDUCATION

8.1 General

A. In new schools and in schools where physical education facilities are being altered, physical education facilities should meet the following minimum recommendations.

8.2 Gyms

A. Gymnasiums should have the following minimum clear dimensions:

Elementary gym (where provided) 45’ X 70’ X 20’ (clear height)
Middle school gym 54’ X 90’ X 22’ (clear height)
Middle school auxiliary gym (where provided) 54’ X 45’ X 22’ (clear height)
High school gym 62’ X 100’ X 22’ (clear height)
High school auxiliary gym (where provided) 62’ X 50’ X 22’ (clear height)

B. Minimum floor dimensions do not include space for bleachers or retractable bleachers.

8.3 Locker and Shower Rooms in Middle and High Schools

A. Locker rooms should be provided with the following:

1. One locker for each student scheduled for physical education.
2. Fifteen square feet per pupil, based on the largest scheduled class.
3. Complete privacy against visibility from the outside.
4. Provide convenient access from lockers to the gymnasium teaching station it serves.
5. Nonabsorbent, nonslip floors in all areas.
6. A janitor’s closet in or convenient to all locker rooms.

B. Shower rooms should be provided with the following:

1. Private shower stalls as follows:
   Middle School – 4 per gender
   High school – 6 per gender
2. Shower room finishes should be provided as follows:

Nonskid floors, moisture resistant surfaces.

C. Laundry rooms should be provided for washer and dryer space.

8.4 Team Rooms at High Schools

A. Team rooms for high schools should be provided with the following:

1. Complete privacy against visibility from the outside.
2. Nonabsorbent, nonslip floor in all areas.
3. A janitor's closet in or convenient to the team room.
4. A team room office for coaches.
5. A lockable coat storage closet.

8.5 Physical Education Staff Offices for Middle and High Schools

A. Staff offices should be provided with the following:

1. A separate office for both the male and female staffs.
2. A view window from the male office to the male dressing room and a view window from the female office to the female dressing area. The design of the room should be configured to restrict line of sight when office door is open.
3. A toilet and shower in each office.
4. Nonabsorbent, nonslip floors in office areas.
5. A lockable coat storage closet in each office.

8.6 Storage for Physical Education Equipment

A. Interior storage for equipment should be provided as follows:

1. Elementary School – minimum 300 square feet.
2. Middle School – minimum 600 square feet.
3. High School – minimum 800 square feet adjacent to the gymnasium.

B. Outside storage of field equipment

1. Middle School – minimum 250 square feet.
2. High School – minimum 250 square feet.

Comments

Gym floors need a clear safety space of 6' on each side and 8' on each end of a basketball court free of bleachers or intrusions to prevent accidents or injury.

Community use of gymnasiums and outdoor fields are not uncommon in elementary, middle and high schools. If this is a planned consideration, a small office should be considered for use by the partnering local parks and recreation office.

While the use of in-school showers has declined in recent years, some showers should be provided for both physical education and athletics. To encourage use, private showers with enclosed dressing rooms, small bench and clothes hooks should be provided for both boys and girls. Lockers and dressing rooms are high security risk and should be visible from staff offices to reduce vandalism and misbehavior.

A resilient floor finish such as a high density carpet is recommended for elementary school multipurpose rooms, wrestling rooms, and resistive exercise rooms.

PART IX
LIBRARY MEDIA CENTER

9.1 Library Media Center

A. In new schools and existing schools where the library media centers are to be renovated, the following library facilities should be provided.

9.2 Reading Rooms

A. Reading Rooms should be provided based upon enrollment and grade structure, in accordance with the following requirements:

1. Elementary reading rooms should have a gross floor area of at least 750 square feet, plus 2 square feet times the total enrollment.
2. Middle and high school reading rooms should have a gross floor area of at least 1,000 square feet, plus 3 square feet times the total enrollment.

9.3 Book Shelving

A. Book shelving capacity in elementary schools should be sufficient for a minimum collection of 10 books per pupil at not more than 9 books per lineal foot of shelf, plus shelving for periodicals. Middle and high schools with enrollments in excess of 1,500 students should provide at least 15,000 books, at not more than eight books per linear foot of shelf, plus shelving for periodicals.

B. Books available in electronic format may be counted for up to 25 percent of the number of books required for the school. In determining the number of books available in electronic format, the same title should be counted only once.

C. Provide shelving arrangement for ease of supervision and clear line of sight from circulation desk.

D. All library book shelving should be provided with backs, regardless of location.

9.4 Seating Capacity

A. Seating should be provided for minimum of 30 students to a maximum of 60 students.

9.5 Librarian Workroom

A. Workroom of at least 150 square feet should be provided adjacent to the reading room, and should have a work counter and sink, storage cabinet, shelving, and view window into the reading room.

9.6 Staff Workroom

A. In elementary and high school libraries, a room of at least 200 square feet with work counter and sink should be provided for producing teaching materials. This may be combined with the librarian workroom without reduction in total area.

9.7 Other Rooms

A. Where required by the program, additional rooms should be provided for the following functions:

1. Conference room 120 sq. ft.
2. Distant learning 120 sq. ft.
3. Computer network server 100 sq. ft.
4. Communicating room 48 sq. ft.
5. Librarian office 120 sq. ft.
6. Electronic/software storage room 150 sq. ft.
7. Periodical storage room 120 sq. ft.

9.8 Professional Staff Library

A. In elementary and secondary schools, a separate room or space for professional materials off the main reading room should be provided for a staff library.

Comments

Elementary schools should have a group storytelling area. Storytelling pits are discouraged due to inflexibility, safety and ADA concerns.

It is best if a school's media center is located on the ground floor and is convenient to all learning areas of the school. Space in the media center should be provided for a copier.

Many schools no longer include a computer room as part of the media program. The trend is for the media center to house media retrieval head-in equipment to serve computers located in classrooms or lab spaces. An equipment storage space for this purpose should be provided.

For more detailed information regarding library media centers go the American Library Association Web site: http://www.ala.org

PART X
SCHOOL CAFETERIA

10.1 General

A. In new schools and schools where the school cafeteria is being altered, the following recommendations are provided.

10.2 Dining Room Size

A. In determining dining room floor area, first determine the number of seats needed based on total enrollment. Typically three seatings make the best use of cafeteria facilities. For a continuous serving program use a factor of 2.5 seatings. The dining room size formula is determined by dividing total enrollment by the number of lunch seatings times the square footage per pupil indicated in the table below.

Dining Room Square Footage Guide by Table Type

Grades	Rectangular Tables with Attached Seats	Rectangular Tables with Stacking Chairs	Round Tables with Stacking Chairs
K-5	8-10 square feet per student	10-11 square feet per student	11-14 square feet per student
6-8	9-11 square feet per student	11-14 square feet per student	11-14 square feet per student
9-12	11 square feet per	11-14 square feet per	11-14 square feet per

	student	student	student

Table based upon the Design Handbook - National Food Service Management Institute – The University of Mississippi

B. Dining Room Ceiling Height

For dining rooms under 3,000 square feet, the ceiling height should be 12' and for dining rooms over 3,000 square feet, 14'.

10.3 Serving Areas

A. Cafeteria serving areas should be provided at 20 percent to 25 percent of the dining room floor area.

10.4 Kitchen Layout Design

A. The general kitchen layout design should include the loading dock, receiving area, area for storage of recycling, space for food preparation, serving lines, areas for food and nonfood storage, employees' locker, and toilet facilities and all other proposed equipment indicated.

B. The minimum total area of the general kitchen should be provided in accordance with the following formula: 1,000 square feet, plus one square foot times the total enrollment.

Kitchen Square Footage (SF) Requirement for all Spaces

Area	Meals Served Per Day				
	200-400	400-600	600-800	800-1200	1200-1500
Receiving	50-60 SF	60-75 SF	75-85 SF	85-100 SF	100-125 SF
Can Wash/Dry	50-75	75-100	100-125	125-150	150-160
Toilets/Lockers	200	200	200	225	250
Janitor & Chemical / Soap Storage	50-60	60-75	75-85	85-100	100-125
Offices	50-80	80-100	100-120	120-150	150-160
Dry Storage	200-300	300-400	400-500	500-600	600-700
Refrigerated / Storage	130-200	200-300	300-400	400-600	600-750
Preparation / Cooking	500-600	600-700	700-800	800-1000	1000-1250
Pot & Pan Washing	75-85	85-100	100-110	110-125	125-150
Holding & Serving	250-400	400-800	800-1200	1200-1400	1400-1800
Dining	800-1600	1600-2400	2400-3200	3200-3600	3600-4500

Dish/Tray Washing	100-150	150-200	200-250	250-350	350-400

Table based upon the Design Handbook – National Food Service Management Institute – The University of Mississippi

10.5 Kitchen Office

A. The office should have view window(s) to exit(s) and preparation area.

10.6 Service Entrance

A. A separate service entrance should be provided for kitchens that prepare 100 or more meals per day.

10.7 Refrigerator/Freezer

A. The door of all walk-in refrigerators or freezers should not have locking devices that prevent opening the door from the inside.

10.8 Can Washing Provisions

A. Consider making provisions for a hose bib near the kitchen trash removal area.

10.9 Trash and Recycled Material Storage

A. A secure trash and recycled material storage space should be provided unless a dumpster is provided. Size shall be based on the amount of trash generated during lunch.

10.10 Mop Closet

A. A mop closet with service sink or receptor, convenient to the kitchen, should be provided.

Comments

When a dumpster is provided, provisions must be provided for washing. A dumpster pad of adequate size and facilities for cleaning should be provided or an approved contracting service that has cleaning facilities may be accepted. When a dumpster is to be cleaned on-site, waste water should be discharged to the sanitary sewer system.

Floor trenches are recommended in front of cooler and freezer doors to prevent spillage of liquids or to prevent liquids from clinging to floor on the traffic areas.

Food service equipment not readily movable (on casters or rollers) should have a minimum space of six inches below to allow access for cleaning. When the equipment is eight feet or more in length a space of 18 inches from walls and other equipment should be provided.

More information can be obtained from The New Design Handbook for School Food Service, National Food Service Management Institute (NFSMI) University of Mississippi Web site: http://www.nfsmi.org .

PART XI
COMMON EQUIPMENT

11.1 Bookshelving

A. Bookshelving should be provided in each classroom as follows:

1. Pre-kindergarten, through third-grade classrooms; 20 linear feet.
2. All other classrooms and teaching stations: 12 linear feet.

11.2 Room Darkening Equipment

A. Consideration should be given in all major instructional spaces and window or ceiling construction that adequate room darkening equipment can be installed without additional structural supports.

11.3 Locked Teacher Storage

A. Locked storage with space for garments and space for shelving should be provided for each teacher in the classroom or teacher's office.

11.4 General Storage

A. All self-contained classrooms should have access to 12 square feet of storage area for general equipment storage. This space is to be included in the total classroom area requirements and may be open or closed.

11.5 Commons Display Area

A. Enclosed display cases should be provided in common area.

B. Surface display hardware should be provided in corridors and common area as allowed by the local fire marshal.

PART XII
TECHNOLOGY

12.1 General

A. In new schools, additions, renovations and supplemental classrooms, provisions that promote the transmission of voice, video, and data to all spaces should be provided and consideration should be given for future flexibility and evolving technology. Provisions should be made to provide voice, video, and data cables to all equipment in accessible cable paths that do not interfere with circulation of the occupants.

Comments

Computers in school facilities have had a major impact upon classrooms and business labs in particular in terms of the instruction space, additional electrical requirements and higher air conditioning loads.

Typically the main head-end room contains the main connections to the outside, as well as the network hubs, wireless devices, routers and file servers that make up the network. Racks for VCRs, laser disc, and CD Rom towers are typically located near or in a support room of the media center. Rack and tower equipment may not be required if this technology is being supported by "in classrooms" systems.

Space for smaller wiring closets that require fewer connections may require nothing more than a mounting board on a wall for punch down blocks and hubs. Closets requiring more connections will require floor-mounted racks, for front and rear access, as well as servers and cross connections to telephone service.

The extent and requirements of integrated communication systems that combine clock/bell, intercom, television, video, and telephone will vary widely between manufacturers.

For more detailed information regarding technology guidelines go to the Virginia Department of Education's *SOL Technology Initiative, Architectural Guidelines for High School Readiness:* http://www.doe.virginia.gov/support/technology/edtech_plan/guidelines_resources/edtech_guidelines.pdf.

PART XIII
TOILET AND PLUMBING FIXTURES

13.1 General

A. Toilet rooms and custodial facilities should comply with the following recommendations where applicable.

13.2 Classroom Toilets for Pre-Kindergarten, Kindergarten, and First Grade

A. Except as provided in 13.3, each classroom designed for any pre-kindergarten, kindergarten, or first-grade pupils should have at least one toilet room, connected to the classroom, containing a water closet.

13.3 Shared Classroom Toilets for Pre-Kindergarten, Kindergarten, and First Grade

A. When toilets for pre-kindergarten, kindergarten, and first grade are grouped together so that adequate supervision can be provided without leaving the instructional area, individual classroom toilets may be omitted.

13.4 General Use Instructional Toilets

A. General toilet rooms for each gender should be provided on each floor of every building where toilets are not provided in classrooms as listed in 13.2 or 13.3 and should be located within 200’ of the most remotely located instructional space.

13.5 Physical Education Dressing Room Toilets

A. A toilet with lavatory should be provided for pupils in each dressing or locker room of the physical education department. It should not be directly connected to the shower area.

13.6 Staff/Public Toilets

A. At least one accessible toilet for each gender should be provided to the staff and/or public.

13.7 Health Unit

A. The health suite should be directly accessible to a toilet and lavatory.

13.8 Privacy in Toilet Rooms

A. Toilet rooms with two or more toilets should have the doors, windows, mirrors, and fixtures arranged to ensure privacy.

13.9 Toilet Room Finishes and Accessories

A. All general toilets for pupils, staff, or public use should have impervious floors, stalls, and walls up to a minimum of five feet above the finished floor.

B. Toilet room accessories should include:

1. A soap dispenser convenient to each lavatory;
2. A toilet paper dispenser for each water closet;
3. Consider mounting mirrors other than over the lavatories (except in private toilet);
4. A shelf in secondary school toilets, for books and other articles; and
5. Paper towel dispenser or electric hand driers convenient to lavatories.

13.10 Domestic Hot Water Temperature

A. All hot water supply systems should be equipped with automatic temperature controls capable of adjustments to deliver domestic hot water between 85^0 and 110^0 F to all fixtures.

13.11 Fixtures

A. Lavatories or wash fountains should be provided in the following locations:
   1. In or adjacent to general toilet rooms;
   2. In or adjacent to any classroom toilets;
   3. In or adjacent to toilets in physical education locker rooms, kitchens, and clinics; and
   4. In shops with one washing position per 10 students.

B. Work sinks should be provided, where applicable, in the following locations:

   1. Pre-kindergarten through first grade classrooms;
   2. Special education classrooms;
   3. Science classrooms/labs;
   4. Art/photo labs (provide plaster traps);
   5. Vocational labs;
   6. Media center staff workrooms;
   7. Kitchen; and
   8. Band rooms.

13.12 Drinking Fountains/Coolers

A. Drinking Fountain/Cooler Locations

1. Drinking fountains/coolers should be provided in high traffic areas such as public corridors, lobbies, gymnasiums, multipurpose rooms, music rooms, dining rooms and adjacent to auditoriums.
2. Consider water resistant/slip resistant floors

B. Mounting Heights. Drinking fountains/coolers should be mounted so the height from the floor is approximately as follows:

1.	For pre-kindergarten through grade 3	27 inches
2.	For upper elementary grades; multipurpose rooms, cafeterias in elementary schools	30 inches
3.	For intermediate and high schools	40 inches
4.	Physically disabled maximum spout height	36 inches

13.13 Shower Temperature

A. Hot water to showers should be provided at 85^0 to 110^0 F. Controls should be provided to ensure that water temperature does not exceed 110^0 F.

Comments

When considering group or gang type toilet rooms for girls and boys, five is the recommended number of flushing fixtures per toilet room. It is preferable that the number of toilet rooms in a school be increased rather than the number of fixtures, the rationale being that larger toilet rooms are more susceptible to crime and violence. Also, it is always prudent to locate toilet facilities near cafeterias, gymnasiums, and auditoriums. These toilet rooms should be sized to accommodate the larger of the spaces to be served.

Hot water should be provided to the following spaces: art rooms, photographic darkrooms, and classrooms for self-contained special education children. A small, 10-20 gallon electric hot water heater is sufficient for single room applications. Hot water temperature should be set at a maximum of 110^o F to prevent scalding.

Modesty for girls and boys should be considered when designing shower rooms. Also, lavatories with countertops are subject to damage from students sitting on them. They can also be a maintenance problem by collecting spilled soap and water spills, therefore, individual wall hung lavatories are recommended in all school toilet rooms.

Provide accessible cut-off valves to each major wing of the building when designing water supply systems for schools. The rationale being that this will facilitate repairs without having to cut off water to the entire facility.

Consider that site and construction record drawings are up-to-date with the exact locations of all underground water and sewer lines indicated. When water is supplied to

buildings such as concession stands, stadium toilets, and field houses, water supply piping should be sloped to a cut-off or waste valve drainage point to simplify winterization.

Plumbing specifications should require testing of all water and gas systems by a qualified commissioning agent to ensure the good working order of plumbing systems.

PART XIV
ACOUSTICS

14.1 Noise Reduction

A. In new construction and in remodeling or renovations of existing media center, cafeterias, corridors, and space for large groups, including gymnasiums, one of the following should be in place:

1. The entire ceiling should be treated with acoustical material having a noise reduction coefficient, NRC (average sound absorption coefficient) of not less that 0.70.
2. Reduce background noise contribution from mechanical equipment to levels less than 45 decibels.
3. Design walls and floors to have a sound transmittance coefficient (STC) as recommended by ANSI Standard S12.60-2002.
4. Equivalent sound reduction achieved by other means.

14.2 Sound Enhancement

A. Consider sound enhancement (voice amplification) in all instructional areas which would include wireless microphones and speakers.

14.3 Rehearsal Rooms

A. Sound insulation of music rehearsal rooms should be provided so that normal rehearsal room sound will not produce a noise level of more than 35db in adjacent classrooms, libraries, other music rehearsal rooms, and auditoriums.

14.4 Special Education

A. At least one room for speech training and hearing testing should be isolated from outside sound and have an ambient noise level of less than 25db.

Comments

When designing the school layout, care should be taken to isolate the cafeteria, auditorium, music rooms and shop areas from classroom spaces and the library from unwanted noise that could impact learning.

When planning band, choral and other music rooms, consider splaying or angling walls. This will help to provide better acoustics. Also, all music room walls should go to the roof deck or floor deck above; this will help prevent sound traveling from music spaces to adjacent spaces.

PART XV
VENTILATION

15.1 Occupancy Load

A. For the purpose of providing ventilation and outside air to educational spaces, the occupancy for each space should be determined, based on a maximum occupant load of 25 students, plus one teacher, or 26 occupants total. This should be confirmed with local building official.

B. The occupant load for assembly or educational areas with permanent fixed seating should be determined by the actual number of seats.

C. Two levels of ventilation should be provided for periods of low occupancy and high occupancy in the following school areas; gyms, multipurpose rooms, auditoriums, libraries, and cafeterias.

15.2 Relief Ventilation

A. Relief ventilation equal to a minimum 90 percent of the outside air requirements should be provided in each space of air handling system.

15.3 Minimum Ventilation

A. A minimum of two cfm per square foot of ventilation air should be provided to janitors' closets.

B. A minimum of six air changes per hour for band/choral uniform storage areas should be provided.

15.4 Direct Exhaust Fume Hoods

A. Direct exhaust fume hoods to the outdoors should be provided with hood face velocity and minimum transport velocity as indicated in the following areas:

Space	Face Velocity	Transport Velocity

science labs	100 fpm	-----
kitchen range	100 fpm (or less if UL tested)	1500 fpm
paint booths	150 fpm	1500 fpm
ventilated welding booth	100 fpm	2000 fpm
woodworking dust exhaust	------	3500 fpm

Comments

The table below lists options and alternatives to the major types of heating, ventilating and air conditioning (HVAC) mechanical systems listed below:

Alternative Component/System	Advantages	Disadvantages
2 Pipe Circulation System in lieu of 4-Pipe	• Lower initial cost	• Must shut down system for a day or two to switch between heating and cooling mode • System not applicable to some building designs which require simultaneous heating/cooling
Same system except each AHU serves 2-5 classrooms	• Slightly lower first cost	• Having more than one classroom on a single thermostat is a compromise in comfort
Fan Coil Units or unit ventilators mounted above ceiling in each classroom or corridor with ductwork and diffusers	• Individual room control • Moderately lower cost than AHUs • Don't occupy floor space	• Noisy • Difficult to service. (ladder) • Poor air distribution • Routing of condensate drain line can be difficult • Moderate life of unit • Not easy to include fresh air
Unit ventilators, console or exposed below/at ceiling	• Individual room control • Slightly lower cost than AHUs. (No ductwork required)	• Noisy • Fresh air is difficult for interior spaces • Take up space under windows (console units) • Care must be taken to avoid coil freeze-up in console units

		• Unsightly if piping is not concealed • Better filtration not possible
Water-cooled Chiller (in lieu of air-cooled)	• Good performance and reliability • Energy efficient	• High first cost • Maintenance/treatment of cooling tower not practical for most school systems.
VAV system with separate zone for each classroom. Typically one large AHU per wing	• Excellent individual room control • Can use reheat for humidity control	• More difficult to maintain requirements for fresh air. • High maintenance cost. Can be noisy if units are above classroom ceilings. • Requires reheat.
Hydronic Heat Pumps	• Relatively low first cost • Only one uninsulated pipe loop required • Energy savings during simultaneous heating/cooling	• Multiple compressors to maintain - Cooling tower maintenance • Noisy if mounted in or above classroom
Geothermal (ground-coupled) Hydronic Heat Pumps	• Individual room control • Good reliability - Very low operating cost • No above-ground outdoor equipment required. Renewable energy source (environmentally friendly)	• Drilling of wells and ground loop piping is very costly • Requires a lot of land for wells and even more for horizontal loops

Footnotes: As you approach smaller zone/individual room control, both initial and maintenance costs increase. As you approach larger zone/whole building with one control, reliability increases and initial and maintenance costs decrease, but potential problem from temperature variation in room increases.

Table and footnotes taken from the 2003 Facilities Guidelines, North Carolina Department of Public Instruction.

A school's heating, ventilation, and air condition (HVAC) system is the most important internal system in a school facility. This system is the major energy user in a school and is a major source of problems and complaints. No other system impacts learning or comfort of the building occupants as much as a ventilation system. For these reasons thoughtful planning must go into the selection of the HVAC system. A design professional should always be consulted as to the type of system selected and its eventual design. First cost, operating cost, ease of operation, quietness of operation, as well as

system maintenance are all major factors to be considered in the selection of any system. There are many HVAC systems available. Sorting through the types of systems available and making a wise choice is difficult for even the most competent design professional. Major systems likely to be considered are as follows:

Oil or natural gas-fired boiler systems
Four (4) pipe chilled water/hot water systems
Air cooled chillers systems
Air handling units (AHUs) separate zone systems

Spaces where separate systems should be considered would be the library and administration office areas that typically operate during the summer when other areas of the school building are closed. Main head-end rooms for computer equipment often generate so much heat that these spaces must be cooled year round, and should also have a separate system.

Whenever possible, equipment should be floor mounted and in a separate mechanical room. Boiler rooms should be located at or above grade level and the placement of air handling equipment should be avoided in boiler rooms whenever possible. Other considerations would be to specify high-efficiency air filters to enhance indoor air quality. The use of a certified air balancing contractor should always be specified to balance system air and water flow rates.

Types of equipment that are not recommended are rooftop units which are difficult to maintain, and frequently cause roof leaks, window air conditioners and wall-hung heat pumps which are noisy. Any equipment that blocks windows should not be used in schools.

Construction specifications should always require a building commissioning program that would help ensure both good indoor air quality and good energy-efficiency from a building HVAC system.

PART XVI
LIGHTING

16.1 Illumination Levels

A. Minimum illumination levels, as indicated below, should be provided and maintained at task level. Illumination levels are given in footcandles (FC). Task level is to be defined as thirty (30) inches above the finish floor. All illumination levels should be an average maintained footcandle level.

Illumination Levels
(Additional footcandle levels for other spaces can be found
in the 9th Edition of IES-NA)

TASK	FOOTCANDLES	TASK	FOOTCANDLES
Classrooms	55 - 60	Gym	30 - 50
Media Center	55 - 60	Lockers	10 - 20
AV Distribution Room	50	Lobbies	10 - 15
Offices	30 - 50	Toilets	5 - 10
Business	55 - 60	Corridors	10 - 15
Studio	55 - 60	Kitchen	60 - 70
Science Labs	60 - 70	Dining	20 - 40
Electrical rooms	30	Auditoriums	10 - 30
Mechanical Room	30 - 40	Storerooms	20 - 30
Computer Labs	30		

B. If the dining room or gym spaces are to be used for SAT testing, then 40 to 50 footcandles is recommended.

16.2 Illumination Standards

A. All new public school construction should be designed to meet the current ICC International Energy Code and shall meet the minimum footcandle levels as recommended by Illumination Engineering Society of North America, IES-NA, 9th Edition.

1. Motion detectors required for all classrooms and restrooms as required by IECC International Energy Conservation Code, ICC reference Table 805.5.2 for required watts per sq. ft.

16.3 Indirect Luminaries

A. Indirect luminaries in classrooms or libraries are permitted, provided that indirect systems meet the following requirements for ceiling brightness: ceiling luminance should not exceed 750 foot lamberts and the ceiling luminance uniformity ratio, maximum to minimum, should not exceed 15. Vertical or wall illumination in footcandles should be at fifty percent of the horizontal illuminance measured thirty inches above the floor. The uniformity lighting ratio is to be in the 1.0 to 2.5 range.

16.4 Lighting Controls

A. Dual switching required by the IECC International Energy Code.

Comments

Fluorescent lighting should be installed wherever incandescent fixtures have been used in the past to illuminate a school building. Generally, fluorescent lamps of the T-8 and T-5 variety and electronic ballast should be used in classroom and lab spaces. However, in drama classrooms and auditoriums where color rendition and brightness control are a critical issue, incandescent lighting should be used. Light-emitting (LED) exit light fixtures are recommended due to low operational cost and long lamp life.

Lighting systems in a school building should be placed on the building energy management system whenever possible. Motion detectors and lighting level controls should be considered and used to turn off lights, or lower lighting levels in storage and building maintenance areas.

PART XVII
MAINTENANCE AND CUSTODIAL FACILITIES

17.1 Storage for Maintenance Manual and Building Plans

A. Consider providing facilities for secure storage of building plans, specifications, and operation and maintenance manuals. These should be easily accessible in cases of emergency.

17.2 Custodians' Closets

A. Sufficient custodians' closets should be provided to conveniently serve all areas on every floor of each building for new schools and for additions where no existing custodians' closet is convenient.

B. Each custodian's closet should contain a mop sink, hot and cold water faucet, mop hangers, hose and hose bracket.

C. Consider consumable products storage areas conveniently located to serve all areas on every floor.

17.3 Roof Access

A. Each low pitch or flat roof surface having mechanical equipment mounted on it or which is 12 feet or more above adjacent grade, should be accessible from within the building by means of a permanent roof hatch

and ships ladder or stairs. Changes in roof levels should also be accessible by steps or ladder if the level change exceeds 36".

Comments

Typically, maintenance and custodian closets need to be well ventilated. Louvers on interior doors and the undercutting of doors should be considered.

The storage space for lawn maintenance equipment and combustible materials must be well ventilated. A separate building from the main building is strongly recommended when the storage of combustibles is required on school grounds.

PART XVIII
CIRCULATION

18.1 Interior Stairways

A. Consider circulation efficiency in the planning of interior stair locations, in addition to the Building Code requirements.

B. Stairs should not be less than 48" wide (handrail to handrail).

18.2 Handrails

A. Elementary schools should have double handrails where handrails are required by the building code. These handrails shall be mounted, as measured vertically, above the tread, at 26" and 34".

18.3 Corridors

A. Major circulation in corridors should not be less than 8'clear when measured wall-to-wall.

B. Where lockers occur in corridors, the clear width should be measured from the edge of open locker doors.

C. Corridors providing circulation to administrative areas or serving less than 100 students should not be less than 5' clear when measured wall-to-wall.

18.4 School Doors

A. All exterior doorways for student use should be protected by a canopy or a recess of not less than three feet in depth.

B. All multiple exterior doors, except service and storage doors, should be separated by mullions. Consider removable mullions to facilitate movement of oversized equipment.

C. Consider providing vision panels on all doors into instructional and related office spaces.

18.5 Door Hardware

A. Consider door hardware that will be in line with school safety policies.

Comments

Here are the corridor guidelines to be used when designing a school facility.

Corridor type	Widths (Minimum) *
Elementary Schools major corridors	8’
Middle School major corridors	10’
High School major corridors	10’

* Note: Minimum width should be increased by an additional 2’ when lockers are along one wall, and 3’ when lockers are located along two walls.

Corridors that are both wide and provide good sightlines for visual supervision will significantly enhance school safety and security. The use of locker commons areas is another design feature that can improve the overall security of middle and high schools. Locker commons areas should be designed as a student social center. The placement of these commons areas is more important than the size. Typically locker common areas are located at major corridor intersections. They will generally be half-high lockers and have countertops for book bags. Two tier lockers should not be considered since they are too small for books, coats, etc., and can cause conflicts when students have to get to both levels at the same time.

PART XIX
SUPPLEMENTAL CLASSROOMS

19.1 Supplemental Classrooms – Industrialized Buildings Regulations

A. The Board of Housing and Community Development has been granted the authority to promulgate rules and regulations under § 36-73 of the *Code of Virginia* that governs the purchase and use of industrialized buildings or manufactured modular units as supplemental classrooms on school sites. The state regulations that establish the standards for construction and installation of industrialized buildings are called Industrialized Building Safety Regulations (IBSE) (13 VAC 5-63); these are part of the Virginia Uniform Statewide Building Code.

19.2 Virginia Registration

A. All supplemental classrooms to be used by a school division shall be labeled and registered as defined in the Virginia Industrialized Building and Manufactured Home Safety Regulations of the Virginia Uniform Statewide Building Code and shall display the following:

1. A label identifying the compliance assurance agency;
2. A permanent manufacturer's data plate; and
3. A Virginia registration seal with serial number.

19.3 General Recommendations

A. Only stand-alone factory built modular units are to be considered as supplemental classrooms.

B. When one or more supplemental units are connected by enclosed corridors, lobbies, or vestibules, such structures shall no longer be considered supplemental classrooms.

19.4 Certificate of Occupancy

A. All supplemental classrooms shall obtain a certificate of occupancy from the local building inspector who has jurisdiction. Support details and tie-down anchorage shall be in accordance with the Virginia Industrialized Building and Manufactured Home Safety Regulations.

19.5 Bidding Requirements

A. The bid package to procure supplemental units should include design criteria as indicated below and the purchase is to be made in accordance with the Virginia Public Procurement Act.

19.6 Design Criteria

A. The dimensions of the unit should meet the following minimums: outside width of 24 feet for classrooms greater than 400 square feet and 12 feet for classrooms equal or less than 400 square feet, clear ceiling height eight feet with no columns in the classroom space.

B. Net classroom floor areas should be as follows:

Pre-kindergarten, kindergarten, grade 1	975 square feet (excluding toilet)
Grades 2-5	800 square feet
Grades 6-12	700 square feet

Self-contained classrooms ten (10) students maximum	750 square feet (excluding toilet)

C. Supplemental classrooms that are used for the following programs should have a self-contained toilet which is accessible to persons with disabilities.

1. Pre-kindergarten
2. Kindergarten
3. Grade 1
4. Self-contained special education

D. Supplemental classroom equipment should be provided in the manufacturer's contract or by the school division as follows:

1. Bookshelving: Pre-kindergarten through first grade, 20 linear feet; all other classrooms, 12 linear feet.
2. General shelf storage and hanging space for pupils' clothing for grades pre-kindergarten through 5th grade.
3. Locked teacher storage at all grades.
4. Room darkening equipment is required on windows.

E. The minimum lengths of display and marker boards or white boards in relocatable classroom areas should be as follows:

	Display	Marker	Mounting Heights-Floor to Marker/Chalkrail
PreK-K grades	20 ft.	8 ft.	24"
1st & 2nd grades	20 ft.	8 ft.	24"
3RD – 5TH grades	16 ft.	16 ft.	28'
6th – 8th grades	12 ft.	16 ft.	36"
9th – 12th grades	12 ft.	16 ft.	36"

F. Display and marker boards should be a minimum of 42" in height.

G. Fifty-five to sixty footcandles of lighting should be provided at task level, desk height.

H. Provide dedicated pathways for voice, video and data transmission to all supplemental classrooms as indicated in the division technology plan.

I. Provide cabling to all equipment in accessible cable paths that do not interfere with circulation of the occupants.

19.7 Asbestos Statement

A. The supplemental unit manufacturer is required to submit to the school division a signed statement that no asbestos-containing building material (ACBM) was used in the manufacture of the unit.

19.8 Toilets

A. Toilets for supplemental classrooms are not required, although recommended for the grade levels/programs listed in 19.6C.

19.9 Travel Distance to Toilets

A. The travel distance from the most remote point of the supplemental classroom to the nearest general toilet should not exceed 300 feet.

19.10 Accessibility

A. Where new supplemental classrooms are provided or existing units relocated, these units are required to meet the minimum accessibility standards for new construction as set forth in the Americans with Disabilities Act Accessibility Guidelines, (ADAAG).

Comments

To obtain more information and a copy of the Industrialized Building Safety Regulations "IBSR" (2009 Edition), go to the Virginia Building and Code Officials Association Web site: http://www.vbcoa.org from the home page, under the tab "Codes", click on Current Codes-"2009 Virginia Industrialized Building Safety Regulations."

Although not required by the state's building code, it is recommended that a two-way intercom system or a telephone be provided for safety. Computer and other electronic systems will also be required between units and the school building. Along with meeting the current requirements of the Virginia Uniform Statewide Building Code, wind, snow load and other locale specific code provisions must be met.

When submitting plans to the local building official for approval, a site plan may be required to show the location of the unit(s) with setback dimensions from the existing building indicated. Proposed location of electric lines, plumbing, telephone and other electronic systems should be shown. The ADA accessible pathway and ADA ramp should be indicated on the site plan. A foundation plan showing footing, piers, and the location of the tie-downs for wind anchorage should be provided to the local building inspector. The use of fossil fuel devices should not be used to heat supplemental classroom units.

Reminder: The following items should be included in any request for proposals when advertising to bid for supplemental classroom units:

- All supplemental classroom units shall be labeled and registered as defined in the Virginia Industrialized Building Safety Regulations "IBSR" (2003 Edition - Virginia Uniform Statewide Building Code)
- All such units shall display a Virginia Registration seal with serial number on the manufacturer's data plate.
- The manufacturer's data plate should be located in the vicinity of the electrical distribution panel or another area with good access.
- The manufacturer shall provide specifications for the support and anchorage of each industrialized building in accordance with IBSR – 13 VAC 5-91-270.
- Provide minimum ventilation (International Mechanical Code – 2003) 15 cfm of outside air per occupant.
- Provide light levels of 55 to 60 footcandles at task level, evenly distributed with a Visual Comfort Probability (VCP) of 70 percent.
- Provide convenient electrical duplex outlets spaced a minimum of 12' along all outside walls.
- The ceiling height should be 8' with no columns in the classroom space. The outside width of the unit should be 24'.

PART XX
FINAL DRAWINGS AND SPECIFICATIONS

20.1 Final Submittal

A. Prior to advertising school construction projects for bid, the following items shall be submitted to the Virginia Department of Education, Office of Support Services, as required by §22.1-140 of the *Code of Virginia*:

1. One copy of the final plans and specifications.

2. Written approval of plans and specifications by the division superintendent.

3. Statement from architect or engineer which states that plans and specifications are, in his professional opinion and belief, in compliance with the regulations of the Board of Education and the Uniform Statewide Building Code.

4. Two "pdf" electronic versions of the plans only on a standard compact disc or CD. Each CD should be submitted in its own jewel case.

20.2 Final Drawings

A. For the final drawings and specifications to be considered 100 percent complete, all the following items should be included:

1. Identification (on each sheet);

   a. Name of Project;
   b. Department of Education assigned project number;
   c. Date of initial drawings and each revision;
   d. Signed seal of the architect or engineer; and
   e. Minimum height hand lettering on all project drawings shall be 1/8 inch, typed or CADD height shall be 1/10 inch.

2. Site plan to scale, showing:

   a. Entire site, property lines, ownership and easements;
   b. Acreage;
   c. North arrow reference;
   d. Vicinity map showing project location in county or city;
   e. Complete topography, existing and finished;
   f. Streets or highways (names or numbers) and sidewalks adjacent to property;
   g. Proposed drives, walks, and parking areas on-site including parking and access for the physically disabled;
   h. Location of all existing buildings on the site and on adjacent property within 40 feet of the property line;
   i. Location of proposed buildings, and possible future additions, with dimensions to establish location;
   j. Water, electricity, and underground gas and or fuel oil service lines;
   k. Sewage disposal system or sanitary sewer;
   l. Storm drainage;
   m. Landscaping;
   n. Athletic fields, playground improvements;
   o. Flagpoles;
   p. One-hundred year flood line;
   q. Wetlands with acreage;
   r. Satellite dishes; and
   s. Fire hydrants or other fire connections.

3. Architectural Plans showing:

   a. Code analysis and life safety information plan showing the total school plan, including existing buildings, at a convenient but legible scale;
   b. All floor plans to scale of 1/8 inches or larger, fully dimensioned;

c. Foundation plan;
d. Roof plan showing mechanical equipment, roof access and other items such as antennas, satellite dishes and skylights;
e. Designation of the use of each space, new and existing;
f. Elevations above datum of all finished floor;
g. Door swings;
h. All openings, whether glazed or otherwise;
i. Legend of standard symbols of construction materials;
j. Location of all equipment and indication if included in contract or not;
k. Location and size of all display and marker boards and indication if included in contract or not;
l. Small key plan for all elements of work (architectural, structural, mechanical, plumbing, electrical) when a floor plan is not complete on one sheet;
m. Plan markings to local sections and details; and
n. Scope and extent of alternates.

4. Elevations showing:

a. All exterior elevations, to scale of 1/16 inch or larger;
b. Grades, steps, areaways, footings, and foundation walls;
c. Vertical dimension and datum reference for all floor levels; and
d. Notes indicating types of materials and exterior features, including doors, windows, ventilators, HVAC units, ladders, screens, and other equipment on roof.

5. Interior elevations showing:

a. Important wall features;
b. Heights of equipment, ceiling, grills;
c. Changes in floor and ceiling levels, slopes;
d. Typical classroom wall features; and
e. Toilet rooms showing partitions, fixtures, and accessories.

6. Schedules showing:

a. Door types, sizes, and hardware sets;
b. Window types and sizes;
c. Finish materials with ceiling heights; and
d. Toilet accessories with mounting heights.

7. Wall sections showing:

a. Typical construction; and

b. Wall sections, including vertical dimensions and datum for all floors, ceilings, and structural bearing levels.

8. Details showing construction, dimensions, materials, and types as necessary of:

   a. Footings, walls, partitions, expansion joints, insulation, flashing;
   b. Openings, windows, doors, door frame;
   c. Floors, ceiling, roofs;
   d. Flashing, skylights, overhangs, parapets, canopies; and
   e. Stair details including risers, treads, handrails, guardrails, ramps.

9. Structural drawing showing structural members, details, schedules, and the following design data:

   a. Reference to use of design standards;
   b. Schedule of live loads;
   c. Schedule of working stresses where they differ from standards;
   d. Schedule or diagram of truss stresses or loading;
   e. Gross loads on vertical structural members in multistory construction;
   f. Soil-bearing design pressure.

10. HVAC plans showing, by layout or schedule, the following as applicable:

   a. Rating and specification of the boilers and firing equipment or other heat generating units; connections, pumps, valves, supply and return piping for hot water storage and boilers, with sizes, slopes, and other data;
   b. Chiller size or other air conditioning refrigeration equipment and arrangement of connections, pumps, valves, supply and return piping and condensate with sizing, slopes, and other data;
   c. Total capacity, outside air, exhaust air, description of features;
   d. Ventilation fans and motors with all necessary design air quantities;
   e. Fan coils, convectors, panels, unit ventilators, variable air volume boxes or other elements;
   f. Layout of piping, size, flow, direction, details of expansion, and anchoring;

g. Existing Facilities – Any connections or alterations to existing facilities;
h. Fuel storage tanks with size, anchoring, and connections (above or below ground);
i. Thermostats – Location of all controlling thermostats;
j. A plan showing the areas included in each heating or cooling zone, if any, and the location of controls for each zone;
k. The total heating and cooling demand load for the entire building, or each central system if more than one;
l. The outside air requirement and total ventilation requirement, to meet the code occupancy levels, including ventilation requirements of each space in cubic feet per minute (cfm); and
m. Gravity/power roof ventilators with capacities in cfm.

11. Plumbing plans showing:

a. Water supply and sewage disposal facilities;
b. Complete storm drainage facilities, including roof drains, footing drainage and site drainage;
c. Complete water distribution system showing hot and cold piping connections to all fixtures, storage tanks, and pumps;
d. Locations of all fixtures, hose bibs, hose cabinets;
e. Schedule of fixtures mounting heights, hot water temperature;
f. Provisions for extension of water lines, fixtures;
g. Gas piping location, sizes, connections, valves; and
h. Fire protection systems.

12. Electrical plans showing:

a. Service: characteristics of current, detailed routing (overhead or underground) from public utility distribution line to transformer pad and building distribution panel;
b. Riser and circuit diagrams;
c. Location and details of main and secondary switches, panels, fuses, and breakers;
d. A schedule for each branch panel identifying all facilities on each breaker;
e. Location and circuiting of all outlets and switches noting insulated ground fault equipment;
f. Location and connection for all signal and communications outlets, computer networks, telephones, fire alarms and pull stations, TV, clocks, and intercoms;

g. Light fixture locations, types, wattage, mounting heights;
h. Identification of exit and emergency lighting circuits and outlets; and
i. Minimum calculated maintained electric light level in footcandles for each major space.

20.3 Final Specifications

A. Specifications should be on 8½ X 11 inches sheets. The table of contents page should have the architects seal and be signed. Specifications shall include:

1. Advertisement and Invitation to bid with reference to Section 2.2-4301 of the *Code of Virginia*:
2. Instruction to Bidders;
3. Form of Proposal;
4. General Conditions;
5. Supplemental General Conditions;
6. Form of Agreement;
7. Standard Bid Bond;
8. Standard Performance and Payment Bond;
9. Requirements of the Virginia Public Procurement Act with reference to Sections 2.2-4311, Employment discrimination and 2.2-4333, Retainage on progress payments;
10. Certification that the contractor or his employees have not been convicted of crimes of moral turpitude with reference to Section 22.1-296.1 C;
11. List of drawings; and
12. All divisions of the specifications for materials to be included in the contract.

B. HVAC, Plumbing, and Electrical specifications should include:

1. Mechanical System Description – A brief, clear nontechnical description of the complete heating and ventilating systems;
2. Energy system description or energy management system or other means of controlling energy cost;
3. Communication and voice, video, data transmission system description;
4. Balancing – information as necessary to balance the ventilating system, and permissible tolerance;
5. Manuals – the specifications should require the contractor to furnish two copies of detailed service and maintenance manuals for all equipment furnished, such as boilers, oil burners, unit ventilators and ventilating equipment or component mechanical

and electrical equipment controls, and energy management systems;

6. Operating instructions – the specifications should require the contractor to provide approved operating instructions, wiring diagrams and control diagrams of the heating and ventilating systems. The specifications should also require the mechanical trade contractors or their representatives to instruct the representative of the owner in the operation of the equipment for at least one hour per season for winter and summer operations. Instructions should be given at the time of completion and before acceptance of the school building by the owner.
7. Performance and Balance Test – The applicable test listed below should be described in the specifications, and conducted by a qualified testing organization upon completion of the installation of the systems.
    a. Heating/Cooling System – operating test of the entire system during cold/hot weather, with findings adjusted to outdoor design conditions:
    b. Ventilating Systems – performance test after proper balancing showing air flow measurement through each supply, return, and exhaust grill;
    c. Fans – measurement of capacity and static head of all individual exhaust and supply fans;
    d. Unit Ventilators – tabulation of measurement of minimum and maximum air flow with recorded inlet and outlet temperatures;
    e. Other Power Air Handling Equipment – tabulation of air flow giving minimum and maximum for variable quantity features and listings inlet and outlet temperature;
    f. Other equipment – test of equipment such as air conditioning, refrigeration, heat pumps, and others; and
    g. Exhaust hoods – test verification for supply and exhaust air handling and capabilities of all exhaust hoods.
8. Test Provisions – the performance test should include the complete heating/cooling and ventilating systems and all their parts including thermostatic and electrical controls, in order to determine that the systems are in compliance with the contract.
    a. The specifications should state that the test shall show the heating/cooling and ventilating systems to be acceptable and certified by a testing engineer before the installation is approved for acceptance by the owner; and
    b. A provision should be included that will require the testing engineer to furnish the owner three copies of the findings of the approved test, including tabulation of all readings and computations.

Comments

The following table provides some additional design information to be considered when designing public school facilities. This information has been taken from the Fairfax County Public Schools, Applicable FCPS Standards.

RECOMMENDED EQUIPMENT MOUNTING HEIGHTS

LAVARATORIES: (Measured from floor to top of rim)

a.	Grades PK (Preschool), K, 1, 2, 3, 4, 5, 6	=	27”
	Accessible	=	30”
	(24” clear knee space)		
b.	Grades 7, 8, 9, 10, 11, 12 and Adults	=	31”
	Accessible	=	34”
	max (29” clear knee space at rim by 8” deep,		
	minimum, 27” clear to bottom of bowl		

URINALS: (Measured from floor to top of rim)

a.	Grades PK, K, 1, 2, 3, 4, 5, 6	=	17”
	(centerline of flush valve 11.5” from top of urinal)		
	Accessible	=	
b.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	24”
	(centerline of flush valve 11.5” from top of urinal)		
	Accessible	=	17”
	(rim height A.F.F.)		

WATER CLOSETS: (Measured from floor to top of rim)

a.	Grades PK, K, 1, 2, 3, 4, 5, 6	=	15”
	(centerline of flush valve 26” A.F.F.)		
	Accessible	=	15”
b.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	15”
	(centerline of flush valve 29” A.F.F.)		
	Accessible	=	18”

DRINKING FOUNTAINS, EWC’s: (Measured from floor to spout)

a.	Grades PK, K, 1, 2, 3, 4, 5, 6	=	28”
	Accessible	=	30”
	(24” clear knee space)		
b.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	42”
	Accessible	=	36”
	(27” clear knee space)		

SHOWER HEADS: (Measured from floor to head)

a.	All Grades – Boys	=	72”
b.	All Grades – Girls	=	66”
c.	Adults	=	72”

COMPUTER COUNTERS: (Measured from floor to top)

a.	Grades PK, K, 1, 2, 3	=	24”
b.	Grades 4, 5, 6	=	27”
c.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	30”

COUNTERTOPS: (Base cabinets with or without sinks measured from floor to top)

a.	Grades PK, K, 1, 2, 3	=	24”
b.	Grades 4, 5, 6	=	27”
c.	Accessible sink tops (Grades PS, K, 1, 2, 3) serving classroom toilets (24” clear knee space)	=	30”
d.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	36”
	Accessible	=	34”

ACCESSIBLE GRAB BARS: (Measured from floor to center line of bar)

a.	Grades PK, K, 1, 2, 3, 4, 5, 6	=	27”
b.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	36”

HANDRAILS: (Measured from ramp or stair nosing to top of gripping surface)

a.	All grades and adults (including adult accessible)	=	34”
b.	Grades PK, 1, 2, 3, 4, 5, 6 (child accessible)	=	25”

PAPER TOWEL DISPENSERS: (Measured from floor to towel slot)

a.	All grades and Adults	=	40”

TOILET PAPER HOLDERS: (Measured from floor to centerline of roll)

a.	All grades and Adults	=	20”

WARM AIR HAIR DRYERS: (Measured from floor to centerline of push button switch)

a.	All grades and Adults	=	40”

SOAP DISPENSERS: (Measured from floor to bottom of dispenser)

a.	Grades PK, K, 1, 2, 3, 4, 5, 6	=	36”
b.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	40”

FEMININE NAPKIN DISPENSERS: (Measured from floor to coin slot)

a.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	40”

FEMININE NAPKIN DISPOSAL: (Measured from floor to top of unit)

a.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	34”

MIRRORS: (Measured from floor to bottom of mirror)

a.	Grades PK, K, 1, 2, 3, 4, 5, 6	=	30”
b.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	40”

FIRE EXTINGUISHERS: (Measured from floor to top of cabinet)

a.	All grades and Adults	=	56”

PENCIL SHARPENER BLOCKS: (Measured from floor to top of 8” x 8” wood block)

a.	Grades PK, K, 1, 2, 3	=	32”
b.	Grades 4, 5, 6	=	38”
c.	Grades 7, 8, 9, 10, 11, 12	=	42”

CORRIDOR TACK STRIPS:

(2) strips – 6’ 8” A.F.F. and 4’ 8” A.F.F.
Stop strips 36” from door/window frames
Maximum strip length 25’. Provide 10’ break between strips.

CHALKBOARDS & TACKBOARDS: (Measured from floor to bottom of board)

a.	Grades PK, K, 1, 2, 3	=	24”
b.	Grades 4, 5, 6	=	28”
c.	Grades 7, 8, 9, 10, 11, 12, and Adults	=	36”

TV/VCR YOKE ASSEMBLIES: (Measured from floor to bottom of VCR shelf)

a.	Elementary and Middle Schools A.F.F.; 24” from face of front wall, 24” from face of side wall from center line of yoke support pipe	=	72”
b.	High Schools A.F.F.; 24” from face of front wall, 30” from face of side wall from center line of yoke support pipe	=	72”

MAP SUPPORT BLOCKS: (Measured from floor to top of block)

a.	All grades and Adults	=	8’ 4”

DOOR HARDWARE: (Measured from floor to centerline of hardware)

Grades PK, K, 1, 2, 3, 4, 5, 6

(1)	Push Plates	=	42”
(2)	Pull Handles	=	42”
(3)	Levers	=	36”
(4)	Panic Exit centerline of push bar	=	36”
(5)	Deadlocks maximum	=	48”

Grades 7, 8, 9, 10, 11, 12, and Adults

(1)	Push Plates	=	50”
(2)	Pull Handles	=	42”
(3)	Levers	=	36”
(4)	Panic Exit centerline of push bar	=	40”
(5)	Deadlocks maximum	=	48”

CCMS SENSORS: (Measured from floor to centerline of box)

a.	All Occupied Spaces	=	5’ 6” .

THERMOSTATS: (Measured from floor to centerline of box)

a.	All Occupied Spaces	=	4’ 0” .

CONV. RECEPTACLES: (Measured from floor to bottom of box)

a.	General Areas	=	1’ 4” .
b.	Special Areas as required/check with Owner		

CLOCK OUTLETS

a.	General Areas from ceiling to top of box	=	6”
b.	Special Areasas required/check with Owner		

LIGHT SWITCHES: (Measured from floor to top of box)

a.	All Areas	=	4’ 0” .

FIRE ALARM PULL SWITCHES: (Measured from floor to top of box)

a.	All Areas	=	4’ 0” .

FIRE ALARM BELLS/HORNS: (Measured from floor to top of box)

a.	All Areas A.F.F. (or 6” below ceiling, whichever is lower)	=	6’ 8”

INTERCOM SPEAKERS:

a.	General Areas with ceiling	=	Flush
b.	Special Areas required/check with Owner	=	As

TV OUTLETS: (Measured from floor to bottom of box)

a.	General Areas	=	1’ 4”
.			
b.	TV/VCR Fixed Below ceiling	=	1’ 0”
c.	TV/VCR on cart	=	5’ 0”
.			
d.	Special Areas as required/check with Owner		

TELECOMMUNICATIONS: (Measured from floor to bottom of box) = 1’ 4” .

SOUND SYSTEM CALL SWITCHES: (Measured from floor to top of box)= 4’ 0” .

SMOKE/HEAT DETECTOR:

a.	General Areas	=	Ceiling
b.	Special Areas as required/check with Owner		

LIBRARY SHELVING: (Measured from floor to top)

a. Grades PK, K, 1, 2, 3, 4, 5, 6

(1)	Check-out desk	=	32” H
(2)	Easy books 14” deep	=	42” H
(3)	Reference 12” deep	=	36” H
(4)	Free standing 12” deep wall shelving 12” deep, 72” H	=	48” H

b. Grades 7, 8, 9, 10, 11, 12, and Adults

(1)	Check-out desk	=	39” H
(2)	Easy books 14” deep	=	42” H
(3)	Reference 12” deep	=	84” H
(4)	Free standing 12” deep	=	84” H

KITCHEN SERVING LINES

a.	Level Floor (Measured from floor to top of unit)	=	34”
b.	Stepped Floor (Measured from lowest floor to top of unit)	=	36”

PART XXI
CONSTRUCTION SUPERVISION

21.1 Construction

A. Adequate observation monitoring of building construction by a qualified construction representative should be provided to protect the owner's interest during construction.

B. The construction representative should monitor all construction activities, notify architect or owner if work does not conform to contract documents, attend meetings, observe tests and inspections, maintain job site records, provide documentation on behalf of the owner. The construction representative is prohibited from interpreting plans and specifications or issuing any orders which alter the contract amount.

C. The standard form of agreement between owner and architect/engineer of record should not be considered as providing full-time, continuous monitoring of the project.

PART XXII
SCHOOL CONTRACT DATA

22.1 School Contract Data

A. Upon execution of the Owner-Contractor Agreement, the architect's construction cost data shall be filed promptly with Office of Support Services, Virginia Department of Education.

B. The school division should submit to the Office of Support Services, Virginia Department of Education, upon completion of the project, a final cost summation.

APPENDICES

Appendix A

GUIDELINES FOR DEVELOPING A SCHOOL BUILDING PROJECT

2 -4 Months

A. Preliminary Planning:

1. Recognize and define present and long-term needs
2. Analyze existing buildings, site requirements, transportation needs, finances and budget, grade structure, joint use of facilities, etc.

§ 22.1-138

3. Review School Building Guidelines

§ 22.1-139

4. **Notify VDOE Support Services of planned project. Discuss objectives, funding, educational trends, time schedule, and receive project number.**
5. Select architect
6. Prepare timetable for planning and construction
7. Select site

1 – 2 Months

B. Develop Educational Program/Translate to Building Project

1. Update philosophy and goals, prepare educational program
2. Establish measurable environmental goals for the project
3. Translate to architectural program
4. Define quality of construction and level of maintenance
5. Estimate cost/budget
6. Review and approval by School Board

2 – 4 Months

C. Development of Preliminary Drawings

1. Prepare preliminary plans and specifications based on approved architectural program
2. Estimate cost
3. Review and approval by School Board

6 – 8 Months

D. Development of Contract Documents

1. Set timetable
2. Complete financial arrangements
3. Develop approved preliminary plans into final working drawings and specifications
4. Estimate cost
5. Review and approval by School Board

§22.1-140	6.	**Submit one copy of final drawings and Specifications (bid documents) along with Approval letter from Division Superintendent and statement from architect to VDOE Support Services.**
2 -3 Months	E.	Contract Administration 1. Review State procurement requirements 2. Receive and analyze bids 3. Execute contract and bonds 4. File contract and bid data with Support Services 5. Provide for adequate supervision of construction
18 – 24 Months	F.	Execution of Contract 1. File completion statement and cost data with Support Services at completion of project
TOTAL TIME 31 – 45 Months	Note: *Code of Virginia* Requirements indicated in bold.	

Appendix B

Prototype Elementary School Capacity Total Core Classrooms (includes self-contained sp-ed)				A 494 23			B 606 28			C 768 35			D 938 43			E 1,050 48		
PTR	Classroom		Sq. Ft	Rooms	Pupils	Sq. Ft.	Rooms	Pupils	Sq. Ft.	Rooms	Pupils	Sq. Ft.	Rooms	Pupils	Sq. Ft.	Rooms	Pupils	Sq. Ft.
8/1	PKH*	@	975	1	8	975	1	8	975	1	8	975	1	8	975	1	8	975
15/1	PK*	@	975	2	32	1,950	3	48	2,925	4	64	3,900	5	80	4,875	6	96	5,850
24/1	K*	@	975	3	72	2,925	4	96	3,900	5	120	4,875	6	144	5,850	7	168	6,825
24/1	1st*	@	975	3	72	2,925	4	96	3,900	5	120	4,875	6	144	5,850	7	168	6,825
24/1	2nd	@	800	3	72	2,400	4	96	3,200	5	120	4,000	6	144	4,800	7	168	5,600
24/1	3rd	@	800	3	72	2,400	4	96	3,200	5	120	4,000	6	144	4,800	7	168	5,600
25/1	4th	@	800	3	75	2,400	3	75	2,400	4	100	3,200	5	125	4,000	5	125	4,000
25/1	5th	@	800	3	75	2,400	3	75	2,400	4	100	3,200	5	125	4,000	5	125	4,000
8/1	Sped self-contained	@	800	2	16	1,600	2	16	1,600	2	16	1,600	3	24	2,400	3	24	2,400
Subtotal				23	494	19,975	28	606	24,500	35	768	30,625	43	938	37,550	48	1,050	42,075
Administrative core facilities						Sq. Ft.			Sq. Ft.			Sq. Ft.			Sq. Ft.			Sq. Ft.
Principal's office						200			200			200			200			200
Assistant principal's office												150			150			150
Secretary's office						100			100			100			100			100
Guidance office(s)				1		100	1		100	2		200	2		200	2		200
Waiting area						200			250			300			300			300
Books, Supplies, Storage						300			400			500			600			700
Student record storage						200			200			200			200			200
Health Unit						250			250			300			300			300
General office toilet, closet						100			100			100			100			100
Teacher's workroom						200			250			300			350			400
Teacher's lounge						150			200			250			300			350
General conference room						200			200			200			200			200
Itinerant office(s)				1		100	1		100	2		200	2		200	2		200
Technology Resource				1		100	1		100	1		100	2		200	2		200
Finance Office				1		100	1		100	1		100	2		200	2		200
Records Vault				1		100	1		100	1		100	1		100	1		100
Subtotal						2,400			2,650			3,300			3,700			3,900
Auxiliary Support Facilities **						Sq. Ft.			Sq. Ft.			Sq. Ft.			Sq. Ft.			Sq. Ft.
Librarian's office						100			100			150			200			200
Reading room (750 + 2 sq. ft x total enrollment)						1,594			1870			2046			2438			2514
Staff, library workroom						200			200			200			200			200
Multiuse library room, AV Tech						120			120			150			150			150
Audio-visual storage						150			150			200			200			200
Dining room, three settings (1/3 enrollment x 12 sq. ft.)						1,688			2040			2592			3176			3528
Table chair storage						400			500			600			700			800
Stage						1,700			1700			1700			1700			1700
Kitchen, service area (1000 + 1 sq. ft. x total enrollment + 80 sq. ft. office)						1,502			1590			1728			1874			1962
Technology support room						100			100			200			200			200
Computer classroom(s)				1		800	1		800	1		800	2		1600	2		1600
Subtotal						8,354			9,170			10,366			12,438			13,054
Resource Rooms						Sq. Ft.			Sq. Ft.			Sq. Ft.			Sq. Ft.			Sq. Ft.
Gymnasium (45' x 70')						3,150			3,150			3,150			3,150			3,150
PE Toilet						300			300			300			300			300
PE office w/toilet						250			250			250			250			250
Sped Resource		@	400	2		800	3		1,200	4		1,600	5		2,000	6		2,400
Art classrooms		@	1200	1		1,200	1		1,200	1		1,200	2		2,400	2		2,400
Music classrooms		@	1000	1		1,000	1		1,000	1		1,000	2		2,000	2		2,000
Team planning rooms		@	300	3		900	4		1,200									
Team planning rooms		@	400							5		2,000	6		2,400	7		2,800
Resource rooms		@	500	2		1,000	3		1,500	3		1,500	3		1,500	5		2,500
Subtotal						8,600			9,800			11,000			14,000			15,800
All Subtotals						**39,329**			**46,120**			**55,291**			**67,688**			**74,829**
Halls, toilets, HVAC @ 35%						**13,765**			**16,142**			**19,352**			**23,691**			**26,190**
GRAND TOTAL						**53,094**			**62,262**			**74,643**			**91,379**			**101,019**
Square Feet per student						**107**			**103**			**97**			**97**			**96**

Footnotes: * PKH, PK, K & lst grade classrooms, spec. ed self-contained would need to include a toilet (50 sq. ft.)

** Other spaces to be considered are individual grade meeting rooms @ 1800 sq. ft. each; parent resource/PTA room @ 2100 sq. ft; parks & recreation office w/toilet @ 250 sq. ft; remedial resource room @ 400 sq. ft.

Appendix C

Recommended Prototypical Space program for
Virginia Middle Schools
(Note: Smaller pupil teacher ratios may require more rooms)

Max. Students per grade		100		150		200		300		400	
School Size		300		450		600		900		1,200	
Teaching Stations (Core Subjects)		12		21		24		39		51	
	Sq. Ft.		Sq. Ft.		Sq. Ft.		Sq. Ft.		Sq. Ft.		Sq. Ft.
Classrooms											
6th Grade Rooms	700	(3)	2,100	(5)	3,500	(6)	4,200	(10)	7,000	(13)	9,100
7th Grade Rooms	700	(3)	2,100	(5)	3,500	(6)	4,200	(10)	7,000	(13)	9,100
8th Grade Rooms	700	(3)	2,100	(5)	3,500	(6)	4,200	(10)	7,000	(13)	9,100
Science Rooms	1,200	(3)	3,600	(5)	7,200	(6)	7,200	(9)	10,800	(12)	14,400
Subtotal			9,900		17,700		19,800		31,800		41,700
Additional Instructional Spaces											
Health Classrooms	800		800		800	(2)	1,600	(2)	1,600	(3)	2,400
Art Lab	1,200		1,200		1,200		1,200		1,200		1,200
Darkroom			--		--		--		800		800
Vocal Music Classroom			1,000		1,000		1,000		1,200		1,200
isntrumental Band Classroom			--		--		1,200		1,200		1,200
Exploratory Lab	1,600		1,600		1,600		1,600		1,600		1,600
Business/computer	800	(3)	2,400	(3)	2,400	(3)	2,400	(3)	2,400	(3)	2,400
Self-contained Special Ed	750		750	(2)	1,500	(2)	1,500	(3)	2,250	(4)	3,000
Resource Classroom (ESL Reading, Testing)	500	(3)	1,500	(4)	2,000	(6)	3,000	(6)	3,000	(9)	4,500
Life Management	600		1,600		1,600		1,600		1,600		1,600
Subtotal			10,850		12,100		15,100		16,850		19,900
Administrative Core Facilities											
Principal's Office			200		200		200		200		200
Assistant Principal's Office(s)	150						150	(1)	150	(2)	300
Secretary's Office(s)	100		100		100		100	(2)	200	(2)	200
Guidance office(s)	100		100	(2)	200	(2)	200	(2)	200	(3)	300
Waiting Area			200		250		300		400		400
Books, Supplies, Storage			500		600		700		800		900
Student Record Storage			200		200		200		200		200
Health Unit			300		300		300		300		300
General Office Toilet, Closet			100		100		100		100		100
Teacher Workroom			200		250		300		350		400
Teacher Team Planning Rooms			600		800		1,000		1,200		1400
Teacher Lounge			250		300		350		400		450
General Conference Room			200		200		200		250		250
Technology Resource	100	(1)	100		100	(2)	200	(2)	200	(2)	200
Finance office	100	(1)	100		100	(2)	200	(2)	200	(2)	200
Records Vault	100	(1)	100		100	(1)	100	(1)	100	(1)	150
Subtotal			3,250		3,800		4,600		5,250		5,900
Auxiliary Support Facilities											
Dining Room (3) Seating			1,200		1,800		2,400		3,600		4,800
Kitchen Serving Areas			1300		1,500		1,700		2,100		2,300
Table/Chair Storage			400		600		800		1,000		1,200
Librarian's Office(s)	150	(1)	150	(1)	150	(1)	150	(2)	300	(2)	300
Staff, Library Workroom			200		200		300		300		300
Library Reading Room (1000 x 3 sq. ft. x enrollment)			1,900		2,350		2,800		3,200		4,600
Library Multiuse/Electronic Classroom			120		120		150		150		200
Audio-Visual Stoarge			150		200		300		400		500
Gymtorium			8,000		10,000		10,000		10,000		12,000
Stage			1,200		1,200		1,200		1,200		1,200
Auxiliary Gymnasium			---		--		--		5,000		5,000
Locker/Shower/Dressing	1,500	(2)	3,000	(2)	3,000	(2)	3,000	(2)	3,000	(2)	3,000
Physical Education Offices	100	(1)	100	(2)	200	(2)	200	(4)	400	(4)	400
Physical Education Storage (Interior)			600		600		600		600		600
Physical Education Storage (Outside)			250		250		250		250		250
Subtotal			18,570		22,170		23,850		31,500		36,650
TOTAL			42,570		55,770		63,350		85,400		104,150
Halls, Toilets, HVAC @ 38%			16,177		21,193		24,073		32,452		39,577
Grand Total			58,747		76,963		87,423		117,852		143,727
Sq. Ft.			196		171		146		131		120

Appendix D

Recommended Prototypical Space Program for
Virginia High Schools

Average 25 students per classroom												
Max. Students Per Grade		150		225		300		375		450		525
School Size		600		900		1,200		1,500		1,800		2,100
Teaching Stations		17		23		33		38		44		52
(Core subjects based on seven periods)												
	Sq. Ft.	Sq. Ft.		Sq. Ft.		Sq. Ft.		Sq. Ft.		Sq. Ft.		Sq. Ft.
Classrooms												
English Classrooms	700	(4)	2,800	(6)	4,200	(8)	5,600	(9)	6,300	(11)	7,700	(13)	9,100
Math Classrooms	700	(3)	2,100	(4)	2,800	(6)	4,200	(7)	4,900	(8)	5,600	(9)	6,300
Social S. Classrooms	700	(3)	2,100	(4)	2,800	(6)	4,200	(7)	4,900	(8)	5,600	(9)	6,300
Foreign Language Classrooms	700	(2)	1,400	(3)	2,100	(4)	2,800	(5)	3,500	(5)	3,500	(6)	4,200
Science Rooms	1,400	(3)	4,200	(4)	5,600	(6)	8,400	(6)	8,400	(8)	11,200	(10)	14,000
Resource Classrooms (ESL, Reading, Testing)	700	(2)	1,400	(2)	1,400	(3)	2,100	(3)	2,100	(4)	2,800	(5)	3,500
Subtotal			14,000		18,900		27,300		30,100		36,400		43,400
Additional Instructional Spaces													
Health Classrooms	800	(1)	800	(1)	800	(2)	1,600	(2)	1,600	(3)	2,400	(4)	3,200
2D-Art Lab	1,400	(1)	1,400	(1)	1,400	(1)	1,400	(1)	1,400	(1)	1,400	(1)	1,400
3D-Art Lab	1,400		0		0	(1)	1,400	(1)	1,400	(1)	1,400	(1)	1,400
Art Storage and Kiln Room	400	(1)	400	(1)	400	(1)	400	(1)	400	(1)	400	(1)	400
Art Classroom	700		0		0		0		700		700		700
Darkroom	750		0		0		0		750		750		750
Vocal Music Classroom			1,000		1,000		1,000		1,200		1,200		1,400
Vocal Music Storage			150		150		200		200		250		300
Drama Classroom	1,000		0		0	(1)	1,000	(1)	1,000	(1)	1,000	(1)	1,000
Instrumental Band Classroom			1,600		1,600		1,800		1,800		1,800		2,000
Band Storage			400		450		450		450		500		500
Business Classroom	900	(1)	900	(2)	1,800	(2)	1,800	(2)	1,800	(3)	2,700	(4)	3,600
Business Office & Storage	250	(1)	250	(1)	250	(1)	250		250		250		250
Keyboarding	1,200	(1)	1,200	(1)	1,200	(2)	2,400	(2)	2,400	(3)	3,600	(3)	3,600
Distributive Ed. Classroom	750	(1)	750	(1)	750	(1)	750	(2)	1,500	(2)	1,500	(2)	1,500
Home Economics Classroom/lab			1,500		1,500		1,500		2,500		2,500		2,500
Home Ecnomics Office	150	(1)	150	(1)	150	(1)	150	(1)	150	(1)	150	(1)	150
Health occupations	1,500		0		0	(1)	1,500	(1)	1,500	(1)	1,500	(1)	1,500
Marketing Education			0		0		1,000		1,200		1,200		1,200
Communication Labs (drf/photo)			1,500		2,000		2,000		2,500		3,000		3,000
Production Shop			2,000		2,500		3,000		3,000		3,500		3,500
Power and Energy			0		2,000		2,500		2,500		2,500		2,500
Vocational Lab/Classroom			2,000		2,500		3,000		3,000		3,500		3,500
Exploratory Lab	1,600	(2)	3,200	(2)	3,200	(2)	3,200	(3)	4,800	(4)	6,400	(4)	6,400
Computer Lab	800	(1)	800	(1)	800	(1)	800	(2)	1,600	(2)	1,600	(3)	2,400
Self-Contained Special Ed.	750	(1)	750	(2)	1,500	(2)	1,500	(3)	2,250	(4)	3,000	(5)	3,750
Resource Classrooms (ESL, Reading, Testing)	450	(2)	900	(2)	900	(3)	1,350	(3)	1,350	(4)	1,800	(5)	2,250
Speech Classroom	200	(1)	200	(1)	200		200		200		200		200
Math Lab	600	(1)	600	(1)	600		600		600		600		600
Reading Lab/ESL Lab	600	(1)	600	(2)	1,200	(2)	1,200	(3)	1,800	(3)	1,800	(4)	2,400
In-School Suspension Classroom	600	(1)	600	(1)	600	(1)	600		600		600		600
Subtotal (General Classrooms)			23,650		29,450		38,550		46,400		53,700		58,450

Appendix D

Recommended Prototypical Space Program for
Virginia High Schools (Continued)

Average 25 students per classroom												
Max. Students Per Grade		150		225		300		375		450		525
School Size		600		900		1,200		1,500		1,800		2,100
Teaching Stations		17		23		33		38		44		52
(Core subjects based on seven periods)	Sq. Ft.	Sq. Ft.		Sq. Ft.		Sq. Ft.		Sq. Ft.		Sq. Ft.		Sq. Ft.
Administrative Core Facilities												
Principal's Office	200	200	(1)	200	(1)	200	(1)	200	(1)	200	(1)	200
Principal's Secretary	100	100	(1)	100	(1)	100	(1)	100	(1)	100	(1)	100
Assistant Principal's Office(s)	150	150	(1)	150	(1)	150	(2)	300	(3)	450	(3)	450
Secretaries Office(s)	60	60	(1)	120	(2)	120	(3)	180	(3)	180	(4)	240
Guidance Offices(s)	100	200	(2)	300	(3)	400	(4)	500	(5)	600	(6)	600
General Waiting Reception		200		300		400		500		600		700
Career Center		200		300		400		400		400		500
Guidance Reception		100		150		200		250		250		250
Technology Resource	100	100	(1)	200	(2)	200	(2)	300	(3)	300	(3)	300
Mailroom		200		250		250		250		250		300
Books, Supplies, Storage		500		600		700		800		900		1,000
Vault Record Storage	200	200	(1)	200	(1)	200	(1)	200	(1)	200	(1)	200
Health Suite		500		500		500		550		550		600
General Office Toilet(s)/closet		100		100	(2)	150	(2)	150	(2)	150	(2)	150
Workroom		200		250		300		300		300		350
Teacher Team Planning Rooms	400	1,200	(3)	1,200	(3)	1,200	(3)	1,200	(3)	1,200	(3)	1,200
Teacher Lounge		150		200		250		300		350		400
General Conference Room		200		200		200		250		250		250
Student Commons		1,500		1,500		2,000		2,000		2,000		2,000
Subtotal (Administrative Core)		6,060		6,820		7,920		8,730		9,230		9,790
Exceptional Education												
Exception Classrooms	750	1,500	(2)	2,250	(3)	3,000	(4)	3,750	(5)	4,500	(6)	4,500
Resource Classrooms	400	400	(1)	400	(1)	400	(1)	800	(2)	800	(2)	800
Testing room (Special Ed Only)	100	100	(1)	100	(1)	100	(1)	100	(1)	100	(1)	100
Psychologist Office	100	100	(1)	100	(1)	100	(1)	100	(1)	100	(1)	100
Itinerant Offices	100	200	(2)	200	(3)	300	(4)	400	(5)	500	(6)	600
Conference Room	150	150	(1)	150	(1)	150	(1)	150	(1)	150	(1)	150
Subtotal (Exceptional Education)		2,450		3,200		4,050		5,300		6,150		6,250
Auxiliary Support Facilities												
Technology Support Room		300		300		300		400		400		400
Dining Room (3) Seatings		2,400		3,600		4,800		6,000		7,200		8,400
Kitchen Serving Areas		1,700		2,100		2,300		2,500		2,700		2,900
Librarians' Office(s)	150	150	(1)	150	(2)	300	(2)	300	(2)	300	(2)	300
Staff, Library Workroom		200		200		300		300		300		300
Reading Room (1,000 x 3 sq. ft. x enrollment)		2,800		3,700		4,600		5,500		6,400		7,300
Library Multiuse/electronic Classroom		120		120		150		150		200		200
Audiovisual Storage		150		200		300		400		500		600
Gymnasium		10,000		10,000		10,000		10,000		10,000		16,000
Auxiliary Gymnasiun		0		0		0		5,000		5,000		5,000
Locker/Shower/Dressing	2,500	5,000	(2)	5,000	(2)	5,000	(2)	5,000	(2)	5,000	(2)	5,000
Physcial Education Offices	100	200	(2)	200	(4)	400	(4)	400	(4)	400	(4)	400
Physical Education Storage (Interior)		800		800		800		800		800		800
Physical Education Storage (Outside)		250		250		250		250		250		250
* Auditorium		5,200		5,800		6,400		7,000		7,600		8,200
Stage		2,000		2,000		2,000		2,000		2,000		2,000
Subtotal		31,270		34,570		37,900		46,000		49,050		58,050
Total Page 1 & 2		77,430		92,940		115,720		136,530		154,530		175,940
Halls, Toilets, HVAC @ 38%		29,423		35,317		43,974		51,881		58,721		66,857
Grand Total		106,853		128,257		159,694		188,411		213,251		242,797
Sq. Ft. Per Student		178		143		133		126		118		116

Footnotes:

* Size of auditorium equals students in one grade level times eight sq. ft. per student plus 4,000 sq. ft. for dressing rooms, storage & lobby.

Project Requirements
A Checklist for Virginia School Divisions

To ensure that your final project submission will comply with the *Code of Virginia* and the Virginia Uniform Statewide Building Code, a checklist of the project administrative items is being provided for your information.

Project Start-Up

_____ Notice to the Division Superintendent and the Virginia Department of Education of the proposed public school construction expenditures. (Section 22.1-139, *Code of Virginia*)

Completion of Final Contract Documents

_____ Letter of Approval from division superintendent. (Section 22.1-140, *Code of Virginia*)

_____ Accompanying design statement letter from the architect or engineer of record. (Section 22.1-140, Code of Virginia)

_____ One set of complete final bid plans and specifications (Section 22.1-140, *Code of Virginia*). The complete final plans and specifications submission shall include the following information:

1. The seal(s) of the design professional on every plan sheet.
2. Virginia Department of Education project number on each plan sheet.
3. All bidding requirements, contract requirements, technical specifications, plans and addenda.
4. Two pdf electronic versions of the plans only on a standard compact disc or CD.

Construction Cost Forms

_____ Contract Construction Cost Data Form
_____ Total Capital Outlay Summation Form

VIRGINIA ELEMENTARY SCHOOL CAPACITY WORKSHEET

Division:
School:
Site Size:

Plan Control No.:
School Project No.:

Permanent Spaces	No. of Teaching Stations	SOQ Maximum Capacity: Per Teaching Station	SOQ Maximum Capacity: Capacity	Division Operating Capacity: Per Teaching Station	Division Operating Capacity: Capacity
Pre-Kindergarten Classrooms:		x 18	0	x	0
Kindergarten Classrooms:		x 24	0	x	0
First - Third Grade Classrooms:		x 24	0	x	0
Fourth - Fifth Grade Classrooms:		x 25	0	x	0
Self-Contained Exceptional Children Classrooms:		x 8	0	x	0
Other (specify) _____		x	0	x	0
Non Capacity Spaces					
Art Classrooms:					
Music Classrooms:					
Resource (Pull-Out Program) Classrooms:					
Gym - Multipurpose Rooms:					
Science/Computer rooms:					
Other (Specify) _____					
			Maximum Capacity: 0		Maximum Capacity: 0
TOTAL	0				
			Additional Capacity: 0		Additional Capacity: 0
Relocatable Classrooms:		x 25		x	

Appendix G

VIRGINIA MIDDLE SCHOOL CAPACITY WORKSHEET

Division:
School:
Site Size:

Plan Control No.:
School Project No.:

Permanent Spaces	No. of Teaching Stations	SOQ Maximum Capacity: Per Teaching Station	SOQ Maximum Capacity: Capacity	Division Operating Capacity: Per Teaching Station	Division Operating Capacity: Capacity
Language Arts:		x 24	0	x	0
Homeroom Classrooms: (Social Studies, Math, or Science)		x 25	0	x	0
Self-Contained Exceptional Children Classrooms:		x 8	0	x	0
Other (specify) _____		x	0	x	0
Non Capacity Spaces					
Art Classrooms:					
Chorus/Band/Music Classrooms:					
Resource (Pull-Out Program) Classrooms:					
PE/Gym/Health/Multipurpose Rooms:					
Exploratory Career Classrooms/Labs:					
Computer Rooms:					
			Maximum Capacity		Maximum Capacity
TOTAL	0		0		0
			Additional Capacity		Additional Capacity
Relocatable Classrooms:		x 25	0	x	0

VIRGINIA HIGH SCHOOL CAPACITY WORKSHEET

Division:
School:
Site Size:

Plan Control No.:
School Project No.:

Permanent Spaces	No. of Teaching Stations	SOQ Maximum Capacity: Per Teaching Station	SOQ Maximum Capacity: Capacity	Division Operating Capacity: Per Teaching Station	Division Operating Capacity: Capacity
Academic Classrooms: (Foreign Language, Social Studies, Math, Science)		x 25	0	x	0
English Classrooms:		x 24	0	x	0
Arts Education Classrooms: (Visual Arts, Drama)		x 24	0	x	0
Business/Office Education Classrooms: (Typing/Keyboard, Computer App., Business, etc)		x 25	0	x	0
Music Classrooms: (Band, Chorus, Music)		x 30	0	x	0
Health Classrooms:		x 30	0	x	0
Main Gym: (Counts as 2 Teaching Stations)		x 30	0	x	0
Auxiliary Gym: (Counts as 1 Teaching Station)		x 25	0	x	0
Service/Marketing Classrooms/Labs: (Consumer/Health Occup., Teen Living, Marketing)		x 20	0	x	0
Vocational Education Lab: (Do not count associated classrooms)		x 20	0	x	0
Self-Contained Exceptional Student Classrooms:		x 8	0	x	0
Other (specify) _____		x	0	x	0

Non Capacity Spaces					
			Maximum Capacity		
Resource (Pull-Out Programs) Classrooms:					
In-school Susp., Extra-Curric. Rooms:			0		
Weight, Wrestling Rooms:			Maximum Operating Capacity		Operating Capacity
Classrooms use with a Vocational Lab:					
		x 90%	0		0
TOTAL	0				
			Additional Capacity		Additional Capacity
Relocatable Classrooms:		x 25	0	x	0

Appendix I

VIRGINIA DEPARTMENT OF EDUCATION
OFFICE OF SUPPORT SERVICES
CONSTRUCTION COST DATA FORM

School Name: _____ School Division: _____
School Project No. _____

Architect: _____

Address: _____
_____

GENERAL CONTRACT INFORMATION

General Contractor: _____ Contract Award Date: _____

Project Deliver Method (Check One) ____Design/Bid/Build _____ PPEA/Design Build _____ CM not at Risk _____ CM at Risk

Project will be LEED certified _____ Yes _____ No If, yes, level of LEED certification _____

1. Building Cost Award amount less site development cost) $ _____
2. Site Development cost (Excluding any special water or sewer treatment plants, or off-site and road systems) $ _____
3. Special Site development costs (Including those excluded in 2 above.) $ _____
4. Cost items not included above but awarded under separate contract. (Fixed equipment, technology, etc.) $ _____
5. TOTAL SCHOOL CONSTRUCTION COST (Does not include fees, land cost, or loose equipment/furniture.) $ _____
6. Gross Building Square Foot Area: _____ s.f.
7. Building Square Foot Cost: (1 divided by 6) $ _____ s.f.
8. Building and Site Development Cost: (5 divided by 6) $ _____ s.f.
9. List alternatives accepted by number & brief description, use back if necessary.

PROJECT COMMENTS (brief description or other special design features or conditions to be noted)

OTHER PROJECT INFORMATION

Architects/engineer design fee: _____ % OR $ _____

Site cost if available: $ _____ Total number of acres: _____

Cost Form Prepared by: _____

Date: _____

Phone Number: _____

PLEASE RETURN TWO COPIES TO:
Hunter.Barnes@doe.virginia.gov

Virginia Department of Education
P. O. Box 2120
Richmond, VA 23218-2120
Phone: 804-225-2035
Fax: 804-530-4519

TOTAL CAPITAL OUTLAY SUMMATION

1. Construction Contract Summary

Bid Award Date:
Alternates Accepted: (No's _____, _____, _____, _____)
Architect/Engineer of Record: _____

Building Cost	$_____	
Change Orders	$ _____	
Built-in Equipment	$ _____	
Utilities	$ _____	
Site Work	$ _____	
Total Construction contract		$ _____

2. Other Project cost

Site Cost	$ _____	
A/E Fees	$ _____	
Owner test fees, permits, insurance	$ _____	
Loose Furniture	$ _____	
Special Equipment	$ _____	
Inspection & Clerk of Work Fees	$ _____	
Construction Management Fees	$ _____	
Other	$ _____	
Total Other Project Costs		$ _____
Total cost of project (Total Items 1 & 2)		$ _____

Return 1 copy to:
Hunter L. Barnes, Architectural Consultant
Office of Support Services
Department of Education
P. O. Box 2120
Richmond, VA 23218-2120

Do not write below this line – for Support Services only

Literary Loan No.	_____	Computer Entry	_____
Literary Loan Amt.	_____	Cost Data Status	_____
School Plant No.	_____	Micro Film Status	_____
Plan Control No.	_____		

_____new construction _____ new addition _____ renovation work

Total Cost	$_____	Cost per square foot	$_____
Total No. of Students	_____	Cost per student	$ _____
Total gross square feet	_____		

Public Private Education Act of 2002 (PPEA)

PPEA Project Delivery Process

A. The Public Private Education Act of 2002 (PPEA) is state legislation that allows school divisions an alternative school construction delivery process. In this process, a developer, contractor and an architect team through a design-build process, can design, build, and finance public school facilities. Public school divisions must adopt Implementation Guidelines in order to accept Unsolicited proposals or to advertise for Solicited Proposals. For more detailed information regarding the PPEA process, go to the following Web address: http://dls.state.va.us/PPEA.htm.

B. These school design guidelines, project notice and final plan submittal requirements for PPEA school construction projects are identical to project design under the traditional design, bid-build delivery method process. Typically under the PPEA, projects are often fast-tracked, with site construction and building foundation construction proceeding prior to completion of the finished construction documents. For fast-tracked PPEA projects, it is recommended that architects submit plans and building programs to the Office of Support Services at the Virginia Department of Education at the design develop stage for a preliminary review.

Design-Build/Construction Management Contracts

§ 2.2-4308. Design-build or construction management contracts for public bodies other than the Commonwealth; eligibility requirements; award of contract; records to be kept.

A. While the competitive sealed bid process remains the preferred method of construction procurement for public bodies in the Commonwealth, any public body other than the Commonwealth may enter into a contract for construction on a fixed price or not-to-exceed price design-build or construction management basis provided the public body complies with the requirements of this section and has implemented procedures consistent with the procedures adopted by the Secretary of Administration for utilizing design-build or construction management contracts.

Prior to making a determination as to the use of design-build or construction management for a specific construction project, the public body shall have in its employ or under contract a licensed architect or engineer with professional competence appropriate to the project who shall advise the public body regarding the use of design-build or construction management for that project and who shall assist the public body with the preparation of the Request for Proposal and the evaluation of such proposals.

Prior to issuing a Request for Proposal for any design-build or construction management contract for a specific construction project, the public body shall:

1. Have adopted, by ordinance or resolution, written procedures governing the selection, evaluation and award of design-build and construction management contracts. Such procedures shall be consistent with those described in this chapter for the procurement of nonprofessional services through competitive negotiation. Such procedures shall also require Requests for Proposals to include and define the criteria of such construction project in areas such as site plans; floor plans; exterior elevations; basic building envelope materials; fire protection information plans; structural, mechanical (HVAC), and electrical systems; and special telecommunications; and may define such other requirements as the public body determines appropriate for that particular construction project. Such procedures for:

a. Design-build construction projects shall include a two-step competitive negotiation process consistent with the standards established by the Division of Engineering and Buildings of the Department of General Services for state agencies.

b. Construction management projects shall include selection procedures and required construction management contract terms consistent with the procedures as adopted by the Secretary of Administration.

2. Have documented in writing that for a specific construction project (i) a design-build or construction management contract is more advantageous than a competitive sealed bid construction contract; (ii) there is a benefit to the public body by using a design-build or

construction management contract; and (iii) competitive sealed bidding is not practical or fiscally advantageous.

B. The contract shall be awarded to the fully qualified offeror who submits an acceptable proposal determined to be the best value in response to the Request for Proposal.

(1996, c. 962, § 11-41.2:2; 2000, c. 29; 2001, c. 844; 2004, c. 706; 2006, c. 510; 2011, cc. 594, 681.)

WEB LINKS

Americans with Disabilities Act	http://www.access-board.gov
Americans with Disabilities Act	http://www.ada.gov/
Art	http://www.arteducators.org/
Asbestos Management	http://www.epa.gov/asbestos/pubs/asbestos_in_schools.html
Building Code	http://www.dhcd.virginia.gov/StateBuildingCodesandRegulations/PDFs/2009/Code%20-%20VCC.pdf
Code of Virginia	http://leg1.state.va.us/000/src.htm
Dance	http://www.ndeo.org/
Green Building Initiative	http://www.thegbi.org
Illuminating Engineering Society	http://www.iesna.org
Industrialized Building	http://www.dhcd.virginia.gov/StateBuildingCodesandRegulations/PDFs/2009/Code%20-%20IBSR.pdf
Library	http://www.ala.org/
Music	http://musiced.nafme.org/
National Facilities Clearinghouse	http://www.ncef.org/
National Science Teachers Association	http://www.nsta.org
Public Private Education Act	http://dls.state.va.us/PPEA.htm
School Food	http://www.nfsmi.org
Technology	http://www.doe.virginia.gov/support/technology/edtech_plan/guidelines_resources/edtech_guidelines.pdf
US Green Building Council LEED	http://www.usgbc.org/LEED
Child Care Facilities	http://www.dss.virginia.gov

Appendix M

Virginia Public Procurement Act http://www.eva.state.va.us/dps/Manuals/docs/vppa.htm

Virginia Collaborative for High Performance Schools http://www.chps.net/virginia

APPENDIX B

VDOT MEMO

VDOT BRISTOL DIST.
LOCATION & DESIGN

Memo

To : Tim Mullins, P.E.

From : Tamara D. Pritchard, P.E.

Date : August 16, 2018

Re : Proposed Dickenson County Elementary School Site Reviews

---

Tim,

Please note the following recommendations and understanding of requirements for the below proposed sites:

Upper Backbone Site

Improve and widen Rt. 652 from Rt. 83 to the proposed school entrance intersection with Rt. 652. At a minimum, these improvements would include roadway widening for the entire length, vertical considerations, and horizontal alignment improvements on some of the curves. Geometric improvements to be made based on the design vehicle (school bus). Evaluate the warrants for right and left turn lanes on Rt. 652 at the school entrance in accordance with VDOT Appendix F Access Management Design Standards. Evaluate the warrants for right and left turn lanes on Rt. 83 at the Rt. 652 intersection in accordance with VDOT Appendix F Access Management Design Standards.

At the intersection of Rt. 83 and Rt. 652, the sight distance to the west (left when exiting 652) is limited due to the vertical alignment of Rt. 83. Also noted, the speed limit on Rt. 83 to the west of Rt. 652 is 55 mph and to the east of Rt. 652, it is 35 mph. The speed limit reduction on Rt. 83 is located at the Rt. 652 intersection. This is a safety concern that will need to be considered. Sight distance challenges will need to be addressed with appropriate mitigation strategies.

Clinchco Site

It is recommended the two existing entrances to the site be consolidated to provide one entrance to the facility from Rt. 83. Locate the new entrance to provide the required intersection sight distance. Evaluate the warrants for right and left turn lanes on Rt. 83 at the school entrance in accordance with VDOT Appendix F Access Management Design Standards. Construction of the facility will need to account for

flood plain concerns. Possible impacts to the existing roadway network as a result of grading would need to be evaluated as well.

Verify the speed limit on Rt. 83 is 35 mph at this location.

Ridgeview Site

Improvements to Rt. 637 from Rt. 83 to the existing school site have been made via a recent project. In speaking with the County Engineer, should the additional traffic for the elementary school enter the complex through the existing roundabout, allowances would need to be made to alter the existing flow of traffic in and around the school complex as the existing flow would not be conducive for the elementary school addition. An assumption will need to be made that a portion of the elementary school traffic may use the rear entrance to the school and as such, a right/left turn analysis be performed at the rear entrance, making some conservative assumptions on trip generation. Evaluate the warrants for right and left turn lanes on Rt. 637 at the rear entrance in accordance with VDOT Appendix F Access Management Design Standards. If the existing flow of traffic within the limits of the school complex cannot be sufficiently altered to accommodate the elementary school traffic, the portion of Rt. 637 from the existing entrance to the rear entrance will need to be reviewed for potential geometric improvements.

The County has submitted a roundabout project at the intersection of Rt. 637 and Rt. 83 for funding through Smart Scale. Assuming this project is funded, preliminary engineering would not be initiated until September of 2023 (at the earliest). If existing capacity and/or safety issues currently exist at this intersection, or are anticipated to occur due to increased traffic generated from an elementary school addition, it is recommended mitigation measures be proposed, as the roundabout funding is not a guarantee.

Thank you for the opportunity to review these sites in the field and to provide comments and/or recommendations. If the Department can provide any readily available information to you that would aid in the analysis of these properties, don't hesitate to request said information at your convenience.

If you have any questions, please contact either Joey or myself at your earliest opportunity.

Thanks,

Tamara D. Pritchard, P.E.
District Location and Design Engineer

cc: Mr. Joey Mullins, P.E.
Mr. Dennis Harris, P.E.
File

APPENDIX C

DCPSA LETTER

Dickenson County Public Service Authority

GLYN R. PHILLIPS
Executive Director

P. O. BOX 619
CLINTWOOD, VIRGINIA 24228

Phone: (276) 835-1580
Fax: (276) 835-1583

August 14, 2018

Mr. Greg Widener
Thompson & Litton
P.O. Box 1307
Wise, VA 24293

RE: Haysi Waste Water Treatment Plant

Mr. Widener,

This letter is to advise that the Haysi Waste Water Treatment Plant was upgraded and substantial complete in September 2009 to a capacity flow of 200,000 GPD. At this time, we are currently operating this system at 85% capacity.

While the Dickenson County Public Service Authority will work diligently to provide and or accommodate any request within reason that could stimulate or enhance the quality of life for all of Dickenson County, our capacity to provide service for a new elementary school would need to be re-evaluated closer to time of construction of the new school.

Should you have any questions or need additional information, please let me know.

Sincerely yours,

Ron Phillips,
Executive Director

APPENDIX D

TRAFFIC DATA AND TURN LANE ANALYSES

Instructions:
Enter Numbers into the "Expected Units" in the Corresponding Yellow Column

Trip Generation Rates from the 8th Edition ITE Trip Generation Report

NA: *Not Available*
DU: *Dwelling Unit*
Occ.Room: *Occupied Room*
KSF[2]: *Units of 1,000 square feet*
Fuel Position: *# of vehicles that could be fueled simultaneously*

Description / ITE Code	Units	Rate Weekday Daily Traffic	PM Peak Period Rate	% PM In	% PM Out	Expected Units (independent variable)	Calculated Daily Trips	PM Peak Trips - Total	PM In	PM Out	Notes
Ice Rink 465	Seats	1.26	0.12	NA	NA		0	0	NA	NA	Caution- Only 1 Study.
Casino/Video Lottery Establishment 473	KSF^2	NA	13.43	56%	44%		0	0	NA	NA	
Amusement Park 480	Employees	8.33	0.50	61%	39%		0	0	NA	NA	
Zoo 481	Acres	114.88	NA	50%	50%		0	NA	NA	NA	
Zoo 481	Employees	23.93	NA	50%	50%		0	NA	NA	NA	
Tennis Courts 490	Courts	31.04	3.88	NA	NA		0	0	NA	NA	
Tennis Courts 490	Employees	66.67	5.67	NA	NA		0	0	NA	NA	
Racquet Club 491	Courts	38.70	3.35	NA	NA		0	0	NA	NA	
Racquet Club 491	KSF^2	14.03	1.06	NA	NA		0	0	NA	NA	
Racquet Club 491	Employees	45.71	4.95	NA	NA		0	0	NA	NA	
Health Club 492	KSF^2	32.93	3.53	57%	43%		0	0	NA	NA	Caution- Only 1 Study
Bowling Alley 494	KSF^2	33.33	3.54	35%	65%		0	0	NA	NA	Caution- Only 1 Study.
Recreational Com. Center 495	KSF^2	22.88	1.45	37%	63%		0	0	NA	NA	Caution- 1 study.
Recreational Com. Center 495	Employees	27.25	3.16	44%	56%		0	0	NA	NA	
Military Base 501	Employees	1.78	0.39	NA	NA		0	0	NA	NA	
Elementary School 520	Students	1.29	0.15	49%	51%	500.0	645	75	37	38	Peak Hour is PM Peak Hour.
Elementary School 520	KSF^2	15.43	1.21	45%	55%		0	0	NA	NA	
Elementary School 520	Employees	15.71	1.81	49%	51%		0	0	NA	NA	
Private School (K-12) 536	Students	2.48	0.17	43%	57%		0	0	NA	NA	Caution- Only 2 studies.
Middle/ JR. High School 522	Students	1.62	0.16	49%	51%		0	0	NA	NA	
Middle/ JR. High School 522	KSF^2	13.78	1.19	52%	48%		0	0	NA	NA	
High School 530	Students	1.71	0.13	47%	53%		0	0	NA	NA	
High School 530	KSF^2	12.89	0.97	54%	46%		0	0	NA	NA	

2017
Virginia Department of Transportation
Daily Traffic Volume Estimates
Including Vehicle Classification Estimates

where available

Jurisdiction Report
25

Dickenson County
Town of Clintwood
Town of Haysi
Town of Clinchco

Prepared By
Virginia Department of Transportation
Traffic Engineering Division

In Cooperation With
U.S. Department of Transportation
Federal Highway Administration

Virginia Department of Transportation
Traffic Engineering Division
2017
Annual Average Daily Traffic Volume Estimates By Section of Route
Dickenson Maintenance Area

Route	Jurisdiction	Length	AADT	QA	4Tire	Bus	Truck 2Axle	Truck 3+Axle	Truck 1Trail	Truck 2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW
		From: Wise County Line														
83 Dickenson Hwy	Dickenson County	3.91	5800	G	92%	0%	1%	1%	5%	0%	C	0.096		0.591	6100	G
		To: SR 72 Georges Fork														
83 W Main St	Dickenson County	0.69	7600	G	96%	0%	1%	1%	2%	0%	C	0.093		0.511	8000	G
		To: WCL Clintwood														
83	Town of Clintwood (Maint: 25)	1.78	7600	N	96%	0%	1%	1%	2%	0%	N	0.093		0.511	8000	N
		To: ECL Clintwood														
83 Dickenson Hwy	Dickenson County	5.57	5600	G	96%	0%	1%	1%	2%	0%	F	0.095		0.538	5900	G
		To: SR 63 Fremont														
83 63 Dickenson Hwy	Dickenson County	4.94	3000	G	90%	0%	2%	1%	6%	0%	C	0.095		0.619	3100	G
		To: SR 63 North of Clinchco														
		From: SR 63 North of Clinchco Beg Ridge Rd														
83 Dickenson Hwy	Dickenson County	2.44	2800	G	89%	1%	2%	1%	7%	0%	F	0.093		0.581	3000	G
		To: 25-607 Road Branch														
83 Dickenson Hwy	Dickenson County	3.23	2600	G	89%	1%	2%	1%	7%	0%	C	0.098		0.523	2700	G
		To: WCL Haysi														
83	Town of Haysi (Maint: 25)	0.56	2600	N	89%	1%	2%	1%	7%	0%	N	0.098		0.523	2700	N
		To: SR 80 Haysi														
83 80 Dickenson Hwy	Town of Haysi (Maint: 25)	0.34	4000	G	93%	0%	2%	1%	3%	0%	F	0.105		0.59	4200	G
		To: E SR 63														
83 80 Dickenson Hwy	Town of Haysi (Maint: 25)	1.08	2900	G	93%	0%	2%	1%	3%	0%	F	0.11		0.578	3000	G
		To: NCL Haysi														
83 80	Dickenson County	0.01	2900	N	93%	0%	2%	1%	3%	0%	N	0.11		0.578	3000	N
		To: SR 80 Breaks Park Rd														
83 Dickenson Hwy	Dickenson County	0.04	1900	G	93%	0%	2%	1%	3%	0%	C	0.108		0.651	2000	G
		To: WCL Haysi														
83	Town of Haysi (Maint: 25)	0.04	1900	N	93%	0%	2%	1%	3%	0%	N	0.108		0.651	2000	N
		To: ECL Haysi														
83	Dickenson County	3.38	1900	N	93%	0%	2%	1%	3%	0%	N	0.108		0.651	2000	N
		To: Buchanan County Line														

Virginia Department of Transportation
Traffic Engineering Division
2017
Annual Average Daily Traffic Volume Estimates By Section of Route
Dickenson Maintenance Area

Route	Length	AADT	QA	4Tire	Bus	Truck 2Axle	Truck 3+Axle	Truck 1Trail	Truck 2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Dickenson County																
(632)	0.62	400	R								NA			NA		06/16/2016
(633) Stroth Rd	1.40	210	R								NA			NA		06/22/2016
(633)	1.30	260	R								NA			NA		06/22/2016
(633)	1.10	170	R								NA			NA		06/22/2016
(633) Stroth Rd	0.53	20	R								NA			NA		06/22/2016
(634)	0.50	110	R								NA			NA		01/25/2016
(635)	0.95	100	R								NA			NA		06/22/2016
(636)	2.60	110	R								NA			NA		06/22/2016
(637)	0.06	640	R								NA			NA		06/22/2016
(637)	3.33	420	R								NA			NA		06/07/2016
(637) DC Caney Ridge Rd	4.19	460	G	98%	0%	1%	1%	0%	0%	F	0.093		0.702	480	G	2017
(637) DC Caney Ridge Rd	1.10	1100	G	98%	0%	1%	1%	0%	0%	C	0.093		0.661	1200	G	2017
(637)	0.69	1200	R								NA			NA		07/12/2016
(637)	4.96	940	R								NA			NA		07/12/2016
(638)	1.40	270	R								NA			NA		07/12/2016
(639)	1.80	230	R								NA			NA		06/07/2016
(640)	0.20	140	R								NA			NA		06/22/2016
(640)	0.30	120	R								NA			NA		06/22/2016
(640)	1.10	70	R								NA			NA		06/22/2016
(641)	0.40	90	R								NA			NA		01/25/2016
(642)	1.30	160	R								NA			NA		06/03/2016

From: 25-751 Old Vanover Farm Rd
To: SR 83 Dickenson Hwy

From: Dead End
To: SR 72 S. Cranes Nest Rd

From: SR 72 N. Cranes Nest Rd
To: 25-636

From: 25-784 Deer Lick Hollow
To: Dead End

From: Dead End
To: SR 72 Coeburn Rd

From: Dead End
To: SR 72 Cranes Nest Rd

From: 25-637
To: 25-633

From: SR 72 Cranes Nest Rd
To: 25-636

From: 25-649 W. DC Caney Ridge Rd
To: 25-731 Bise Ridge

From: SR 83 Dickenson Hwy
To: 25-638

From: SR 63 Big Ridge Rd
To: Dead End

From: 25-637
To: Dead End

From: 25-637 DC Caney Ridge Rd
To: SR 72 Cranes Nest Rd

From: Wise County Line
To: 0.30 ME of CL

From: Dead End
To: Dead End

From: 25-648
To: 25-652 Dr Ralph Stanley Hwy

From: Dead End
To:

Virginia Department of Transportation
Traffic Engineering Division
2017
Annual Average Daily Traffic Volume Estimates By Section of Route
Dickenson Maintenance Area

Route	Length	AADT	QA	4Tire	Bus	Truck 2Axle	Truck 3+Axle	Truck 1Trail	Truck 2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Dickenson County																
							25-697									
(651)	0.48	150	R								NA			NA		05/26/2016
							25-855 Highland Rd									
(651)	4.37	170	R								NA			NA		05/26/2016
							25-652 Dr Ralph Stanley Hwy									
							Wise County Line									
(652) Dr Ralph Stanley Hwy	1.03	1200	G	79%	0%	2%	1%	18%	0%	F	0.099		0.574	1300	G	2017
							25-642 Carico Ridge									
(652) Dr Ralph Stanley Hwy	3.18	1000	G	79%	0%	2%	1%	18%	0%	F	0.107		0.607	1100	G	2017
							25-645 Bad Ridge									
(652) Dr Ralph Stanley Hwy	0.71	1100	G	79%	0%	2%	1%	18%	0%	F	0.123		0.643	1100	G	2017
							25-643 Carter Stanley Rd									
(652) Dr Ralph Stanley Hwy	4.41	660	G	79%	0%	2%	1%	18%	0%	C	0.099		0.690	700	G	2017
							SR 63 S, Dante Mountain Rd									
							SR 63 N, Dante Mountain Rd									
(652)	1.46	110	R								NA			NA		06/01/2016
							25-662 Sutherland Ridge									
(652) Dyers Chapel Rd	1.00	180	R								NA			NA		06/01/2016
							1.00 MS 25-662									
(652) Dyers Chapel Rd	0.24	110	R								NA			NA		06/01/2016
							1.24 MS 25-662									
(652) Dyers Chapel Rd	0.07	140	R								NA			NA		06/01/2016
							25-661 W, Dog Branch Gap									
(652) Dog Branch Gap Rd	0.41	410	G	94%	0%	1%	5%	1%	0%	C	0.114		0.551	430	G	2017
							25-661 E, 25-676 Dog Branch Rd									
							25-661 E; 25-676 Dog Branch Rd									
(652) Nealy Ridge	1.12	110	G	94%	0%	1%	5%	1%	0%	F	0.174		0.676	120	G	2017
							25-663 Hale Mountain Rd									
(652) Nealy Ridge	1.84	120	G	94%	0%	1%	5%	1%	0%	F	0.131		0.563	120	G	2017
							25-778 Deel Lane									
(652) Nealy Ridge	2.04	110	G	94%	0%	1%	5%	1%	0%	F	0.137		0.636	120	G	2017
							25-664 W, Mill Creek Rd									
(652) Turkey Branch Rd	0.23	300	G	94%	0%	1%	5%	1%	0%	F	0.114		0.5	310	G	2017
							25-664 E, Edwards Ridge Rd									
							25-664 E, Turkey Branch Rd									
(652)	0.53	230	R								NA			NA		06/28/2016
							25-669									
(652)	3.19	100	R								NA			NA		06/28/2016
							25-722 Lazarus									
(652)	0.53	370	R								NA			NA		07/08/2016
							WCL Haysi									
Town of Haysi																
							WCL Haysi									
(652) Backbone Ridge	0.48	270	R								NA			NA		07/08/2016
							SR 83									
Dickenson County																
							25-611									
(653)	0.41	60	R								NA			NA		06/24/2016
							Dead End									
							25-643 SOUTH									
(654)	1.47	50	R								NA			NA		06/03/2016
							1.47 MN 25-643									
(654)	1.82	100	R								NA			NA		06/03/2016
							3.29 MN 25-643									

Dickenson County Elementary School
Turn Lane Analysis - Route 83 At Route 652 (Backbone Ridge) Intersection
Date:
Date Revised:
Developed By: TAM
Project No. 14244

TURN LANE WARRANT ANALYSIS

K =	9.80%	VDOT Traffic Engineering Division
D (West to East) =	52.30%	VDOT Traffic Engineering Division
D (East to West) =	47.70%	
VPH =	Vehicles Per Hour	
VPD =	Vehicles Per Day	
ADT =	Average Daily Traffic	

Route 83	2600	VPD VDOT Traffic Engineering Division
Elementary School ADT (500 Students)	645	VPD Per Trip Generation Calculation
Total ADT	**3245**	VPD
Directional Peak Hour (West to East)	166	VPH
Directional Peak Hour (East to West)	152	VPH
School Peak Hour Total	75	VPH
School Peak Hour In	37	VPH
School Peak Hour Out	38	VPH

LEFT-TURN STORAGE LANES WARRANT ANALYSIS

Va - Advancing Volume =		152	VPH
Vo - Opposing Volume =		166	VPH
PHV Left Turns =		37	VPH (Conservative - Assumes All Entrances Turning Left)
Percentage Left Turns in Va	L =	24	% Use Figure 3-21

Per Figure 3-21 attached, a Left-Turn Lane is not required for the Route 83/Route 652 Intersection.

RIGHT TURN TREATMENT WARRANT ANALYSIS

PHV Approach Total =	166	VPH
PHV Right Turns =	37	VPH (Conservative - Assumes All Entrances Turning Right)

Per Figure 3-26 attached, a right turn lane or taper is not warranted for the Route 83 entrance at Route 652 (Backbone Ridge) intersection. However, an exclusive right turn lane should be included due to the high bus traffic, 55 mph speed limit, and the poor sight distance of the approach.

WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAY

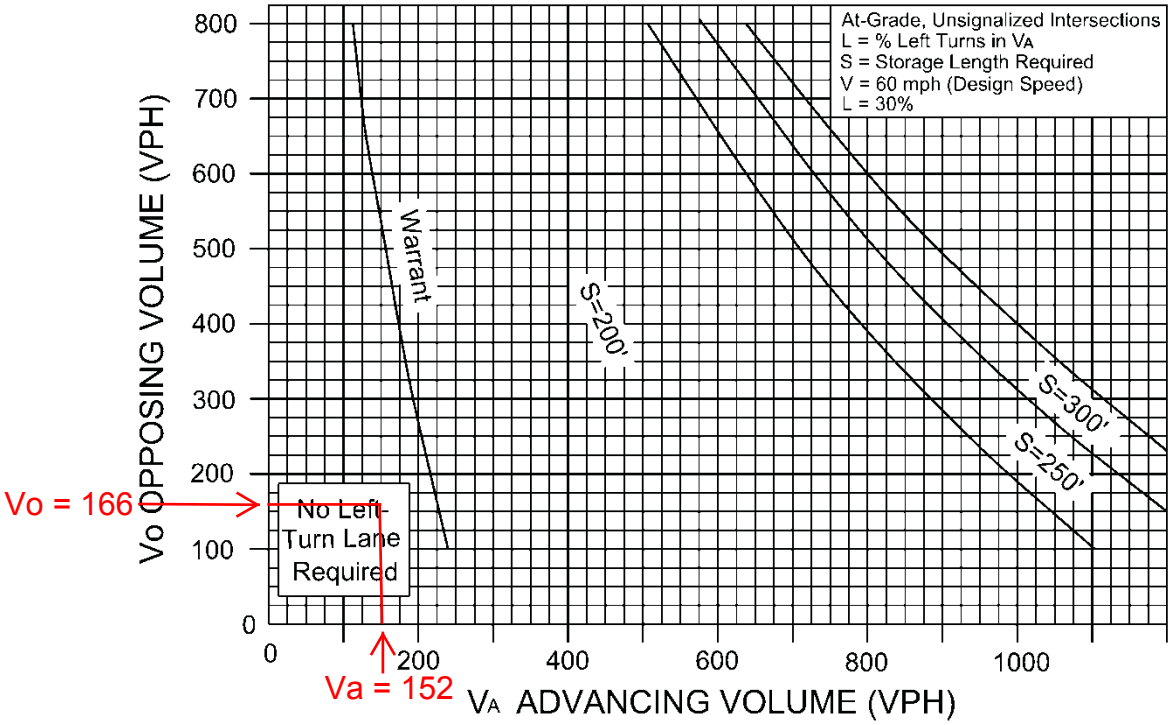


FIGURE 3-21

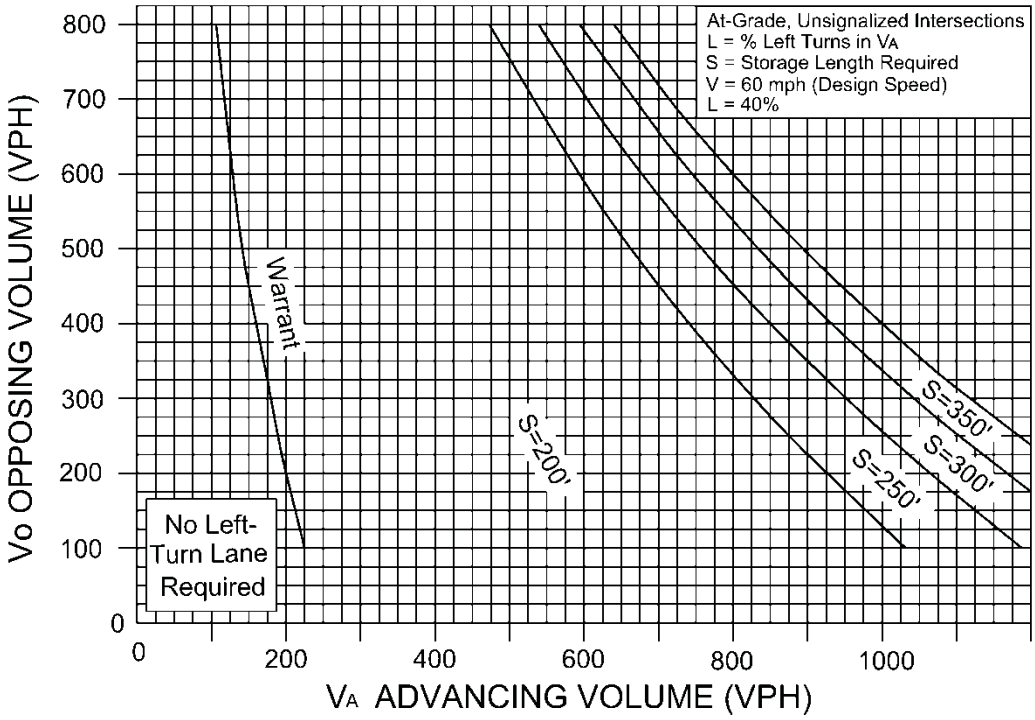
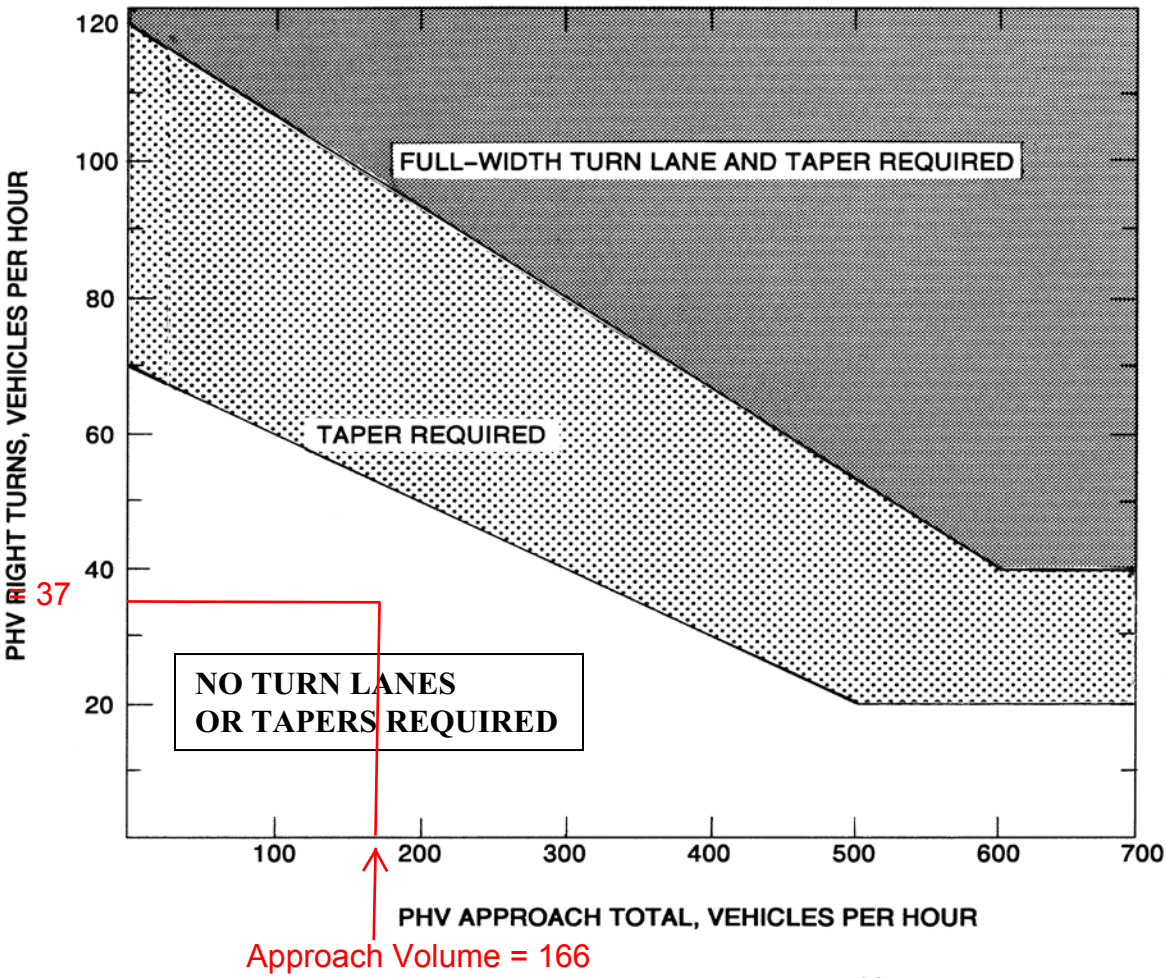


FIGURE 3-22



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15

Dickenson County Elementary School
Turn Lane Analysis - Route 652 (Backbone Ridge) At School Intersection
Date:
Date Revised:
Developed By: TAM
Project No. 14244

TURN LANE WARRANT ANALYSIS

K x D	11.00%	Appendix F
VPH =		Vehicles Per Hour
VPD =		Vehicles Per Day
ADT =		Average Daily Traffic

Route 652	270	VPD VDOT Traffic Engineering Division
Elementary School ADT (500 Students)	645	VPD Per Trip Generation Calculation
Total ADT	**915**	VPD
Directional Peak Hour (North to South)	101	VPH
Directional Peak Hour (South to North)	101	VPH
School Peak Hour Total	75	VPH
School Peak Hour In	37	VPH
School Peak Hour Out	38	VPH

LEFT-TURN STORAGE LANES WARRANT ANALYSIS

Va - Advancing Volume =		101	VPH
Vo - Opposing Volume =		101	VPH
PHV Left Turns =		37	VPH (Conservative - Assumes All Entrances Turning Left)
Percentage Left Turns in Va	L =	37	% Use Figure 3-10

Per Figure 3-10 attached, a Left-Turn Lane is not required for the Route 652/School Intersection.

RIGHT TURN TREATMENT WARRANT ANALYSIS

PHV Approach Total =	101	VPH
PHV Right Turns =	37	VPH (Conservative - Assumes All Entrances Turning Right)

Per Figure 3-26 attached, a right turn lane or taper is not warranted for the Route 652 entrance at the School intersection.

WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAY

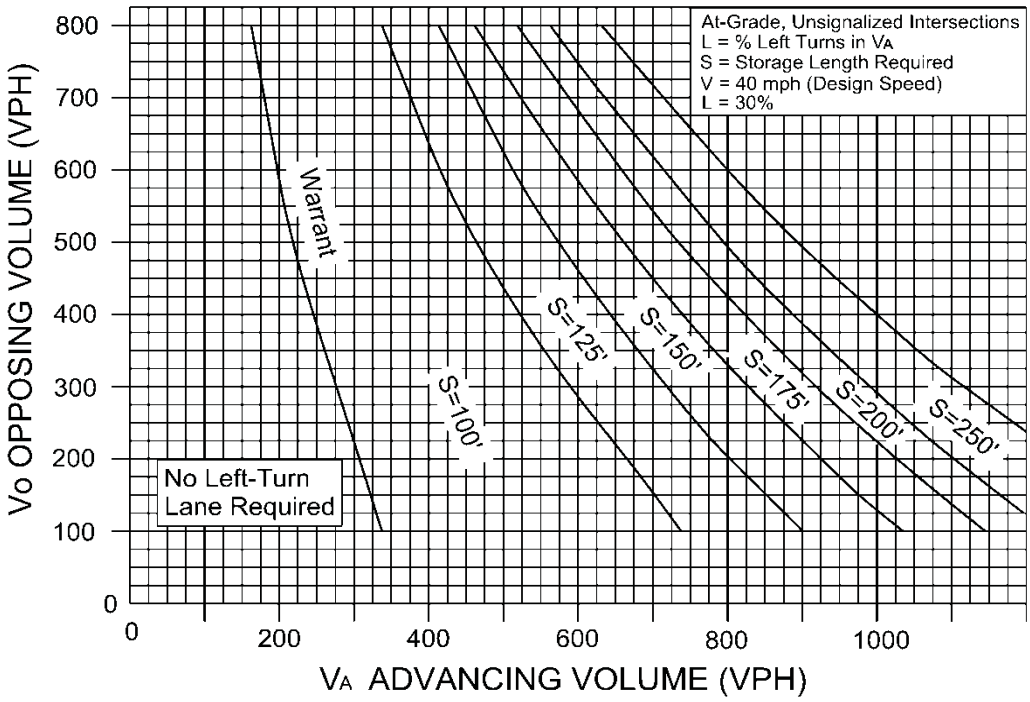


FIGURE 3-9

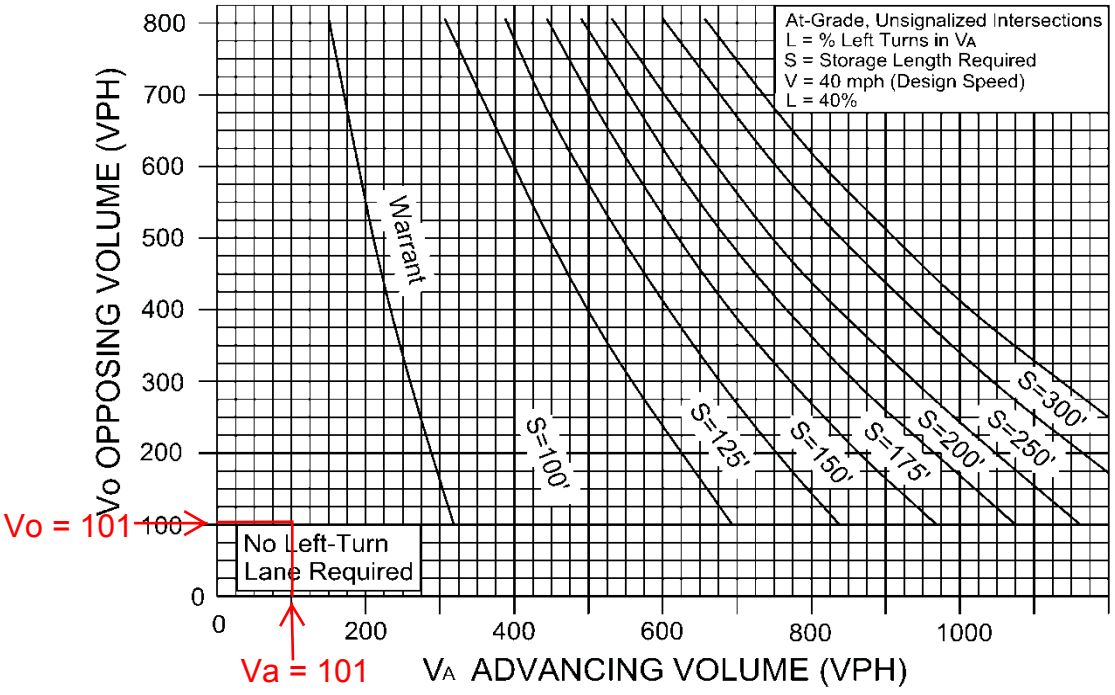
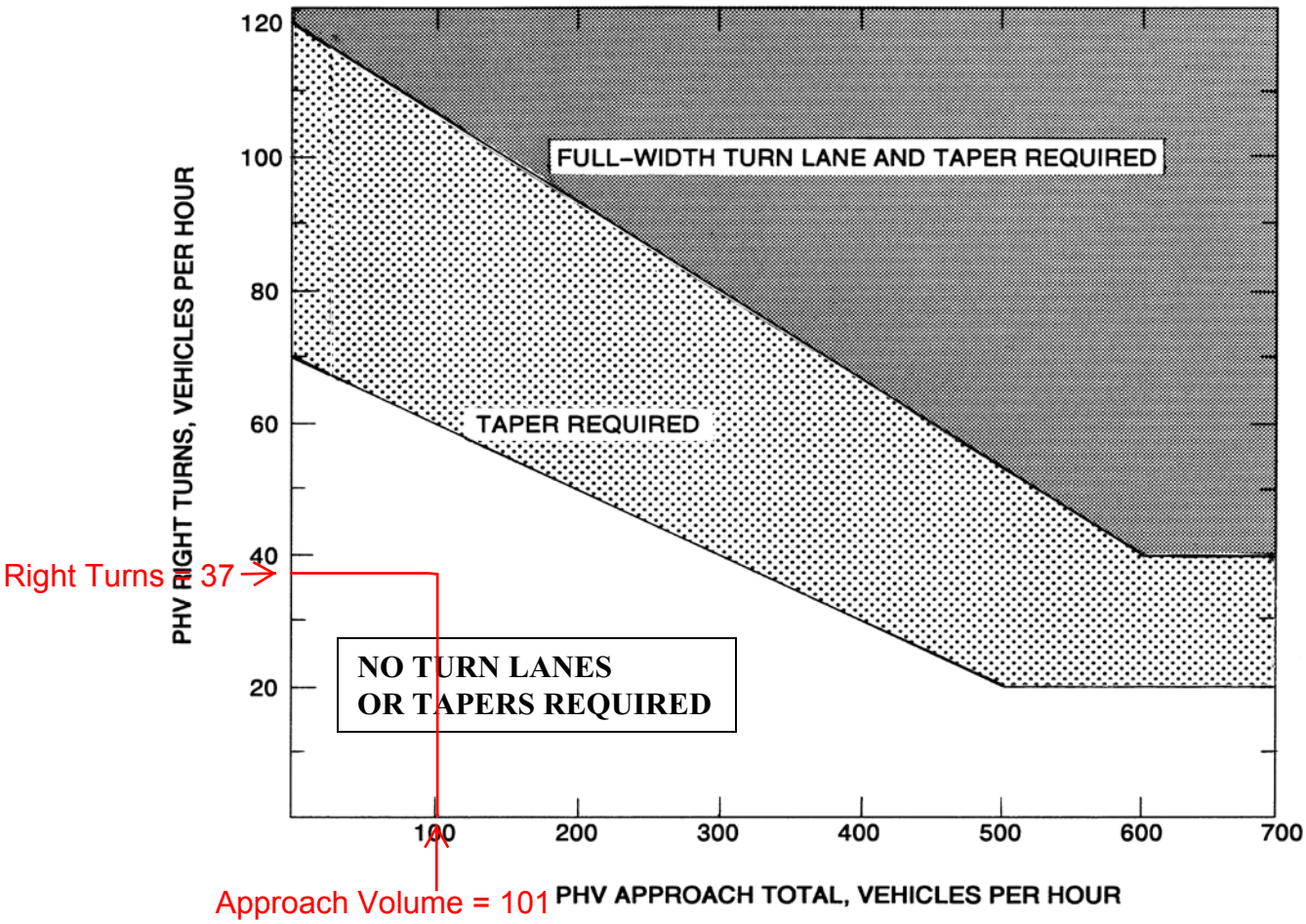


FIGURE 3-10



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15

Dickenson County Elementary School
Turn Lane Analysis - Route 83 At Clincho School Entrance Intersection
Date:
Date Revised:
Developed By: TAM
Project No. 14244

TURN LANE WARRANT ANALYSIS

K =	9.30%	VDOT Traffic Engineering Division
D (West to East) =	58.10%	VDOT Traffic Engineering Division
D (East to West) =	41.90%	
VPH =	Vehicles Per Hour	
VPD =	Vehicles Per Day	
ADT =	Average Daily Traffic	

Route 83	2800	VPD VDOT Traffic Engineering Division
Elementary School ADT (500 Students)	645	VPD Per Trip Generation Calculation
Total ADT	**3445**	VPD
Directional Peak Hour (West to East)	186	VPH
Directional Peak Hour (East to West)	134	VPH
School Peak Hour Total	75	VPH
School Peak Hour In	37	VPH
School Peak Hour Out	38	VPH

LEFT-TURN STORAGE LANES WARRANT ANALYSIS

Va - Advancing Volume =		134	VPH
Vo - Opposing Volume =		186	VPH
PHV Left Turns =		37	VPH (Conservative - Assumes All Entrances Turning Left)
Percentage Left Turns in Va	L =	28	% Use Figure 3-9

Per Figure 3-9 attached, a Left-Turn Lane is not required for the Route 83/School Intersection at Clinchco.

RIGHT TURN TREATMENT WARRANT ANALYSIS

PHV Approach Total =	186	VPH
PHV Right Turns =	37	VPH (Conservative - Assumes All Entrances Turning Right)

Per Figure 3-26 attached, a right turn lane or taper is not warranted for the Route 83/School Intersection at Clinchco

WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAY

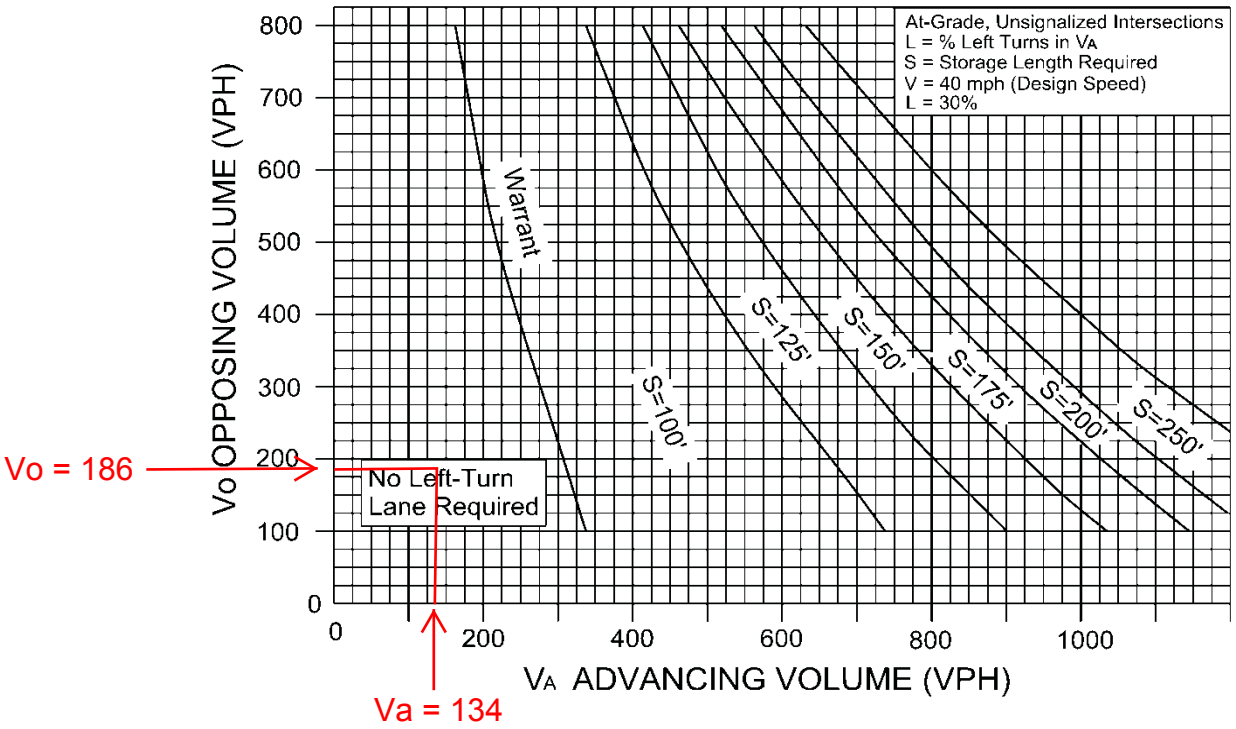


FIGURE 3-9

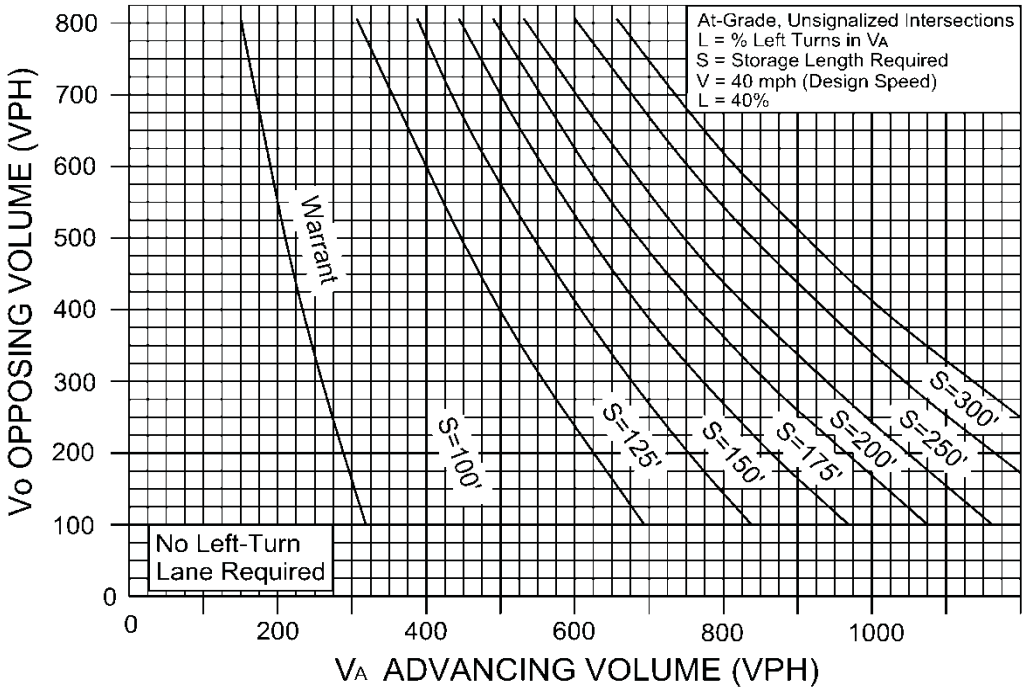
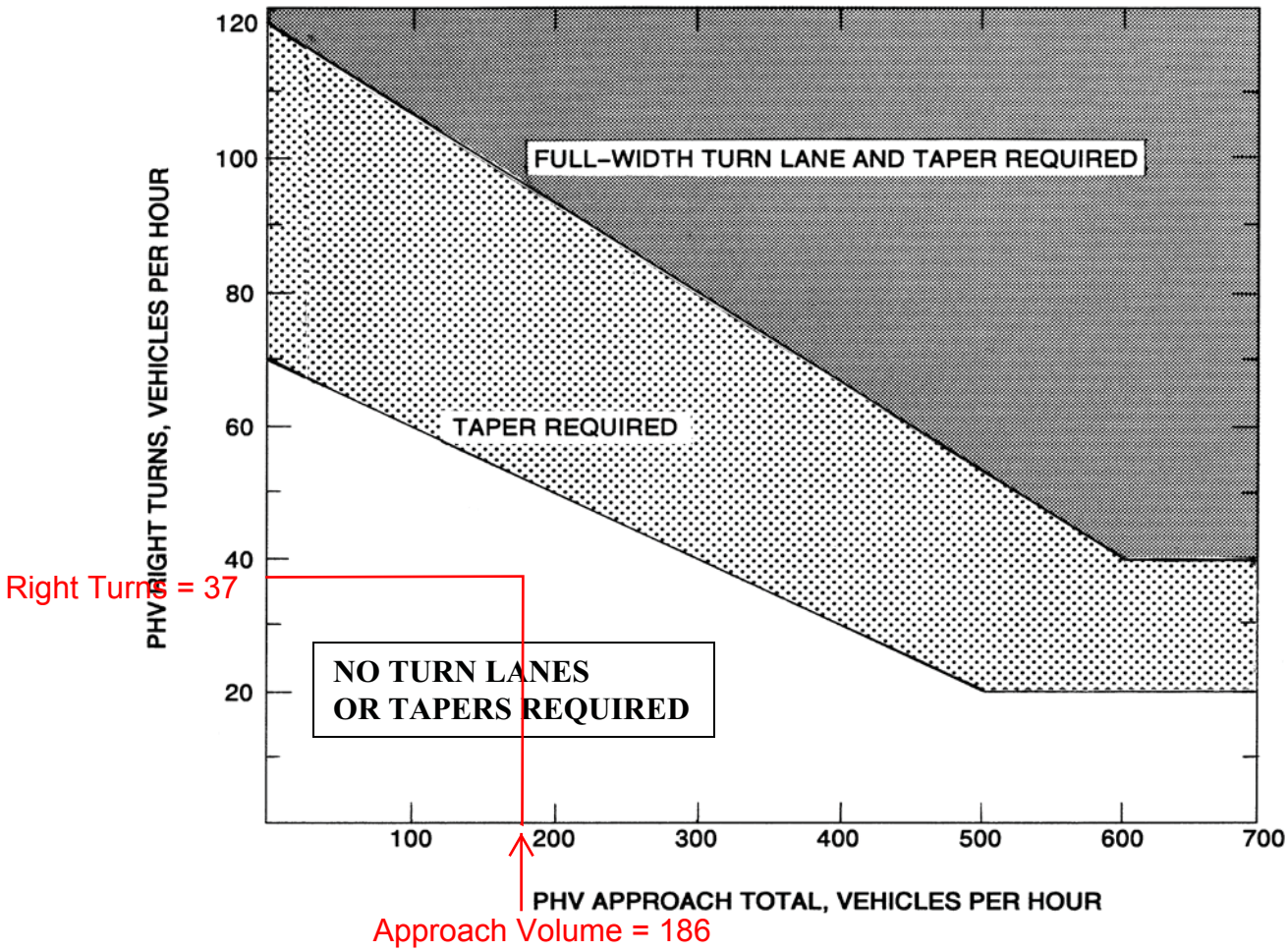


FIGURE 3-10



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15

Dickenson County Elementary School
Turn Lane Analysis - Route 637 At Ridgeview Back Entrance Intersection
Date:
Date Revised:
Developed By: TAM
Project No. 14244

TURN LANE WARRANT ANALYSIS

K =	11.00%	VDOT Traffic Engineering Division
VPH =		Vehicles Per Hour
VPD =		Vehicles Per Day
ADT =		Average Daily Traffic

Route 637	940	VPD VDOT Traffic Engineering Division
Elementary School ADT (500 Students)	645	VPD Per Trip Generation Calculation
Total ADT	**1585**	VPD
Directional Peak Hour (North to South)	174	VPH
Directional Peak Hour (South to North)	174	VPH
School Peak Hour Total	75	VPH
School Peak Hour In	37	VPH
School Peak Hour Out	38	VPH

LEFT-TURN STORAGE LANES WARRANT ANALYSIS

Va - Advancing Volume =		174	VPH
Vo - Opposing Volume =		174	VPH
PHV Left Turns =		37	VPH (Conservative - Assumes All Entrances Turning Left)
Percentage Left Turns in Va	L =	21	% Use Figure 3-9

Per Figure 3-9 attached, a Left-Turn Lane is not required for the Route 637/Ridgeview Back Entrance Intersection.

RIGHT TURN TREATMENT WARRANT ANALYSIS

PHV Approach Total =	174	VPH
PHV Right Turns =	37	VPH (Conservative - Assumes All Entrances Turning Right)

Per Figure 3-26 attached, a right turn lane or taper is not warranted for the Route 637 at Ridgeview Back Entrance intersection.

WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAY

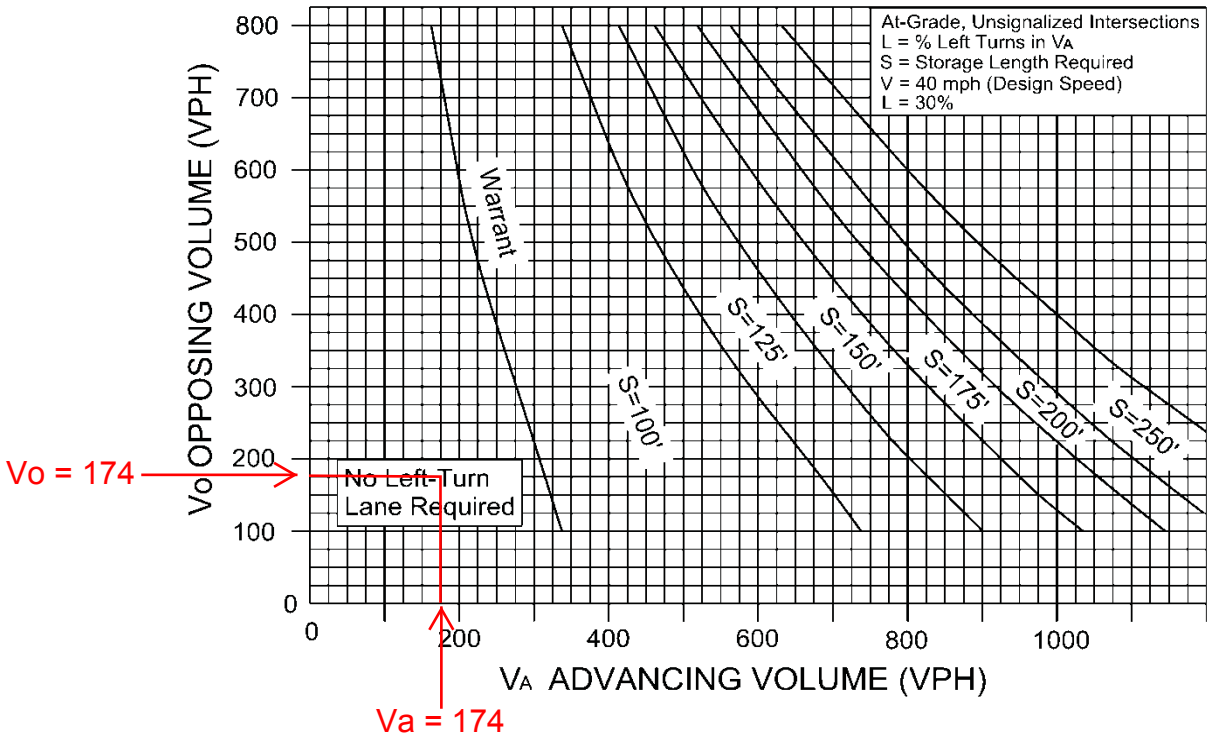


FIGURE 3-9

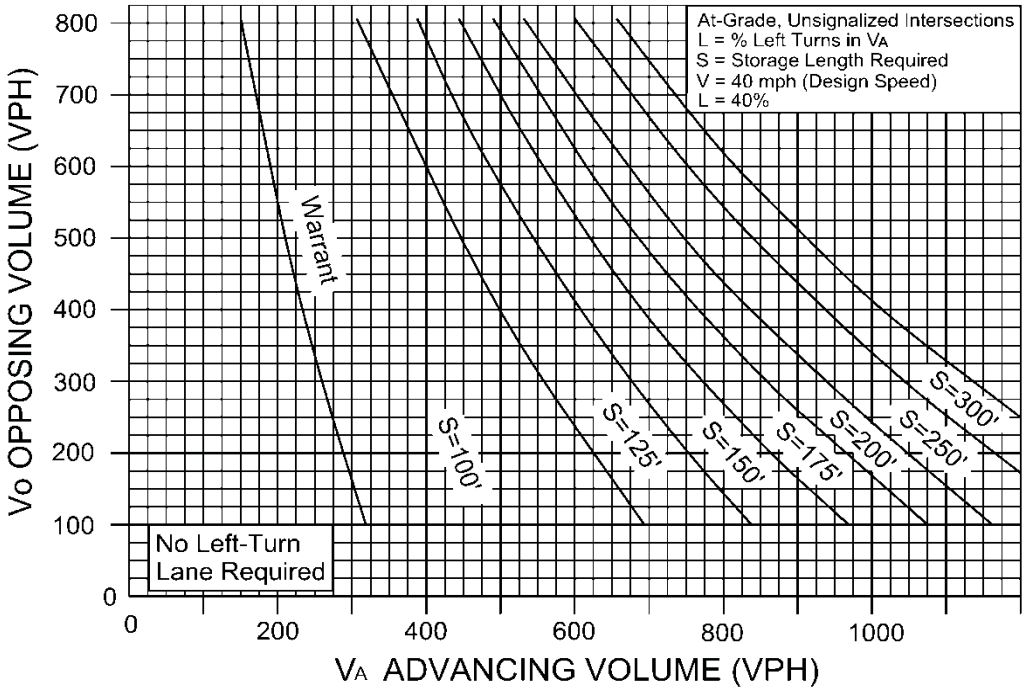
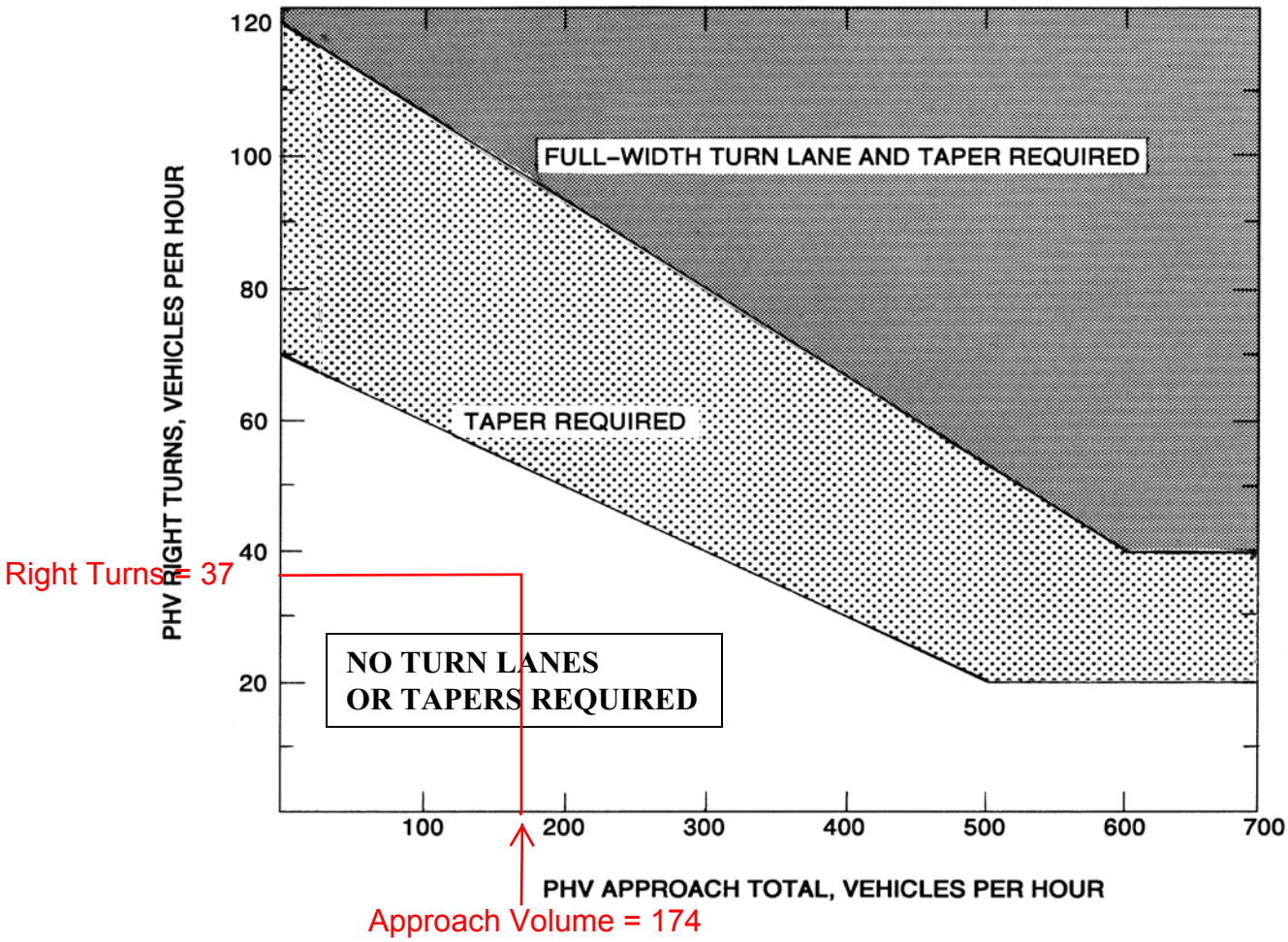


FIGURE 3-10



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15