Albemarle County Public Schools

Schematic Design for Scottsville Elementary Additions and Improvements

July 11, 2019

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History and Project Summary

Scottsville Elementary School was originally established in this rural area of southern Albemarle County in 1908 as both an elementary and secondary education site. In the decades since it has moved several times and seen changes in the grade levels served. In 1967 it was reduced to serve only elementary and junior high school grade levels, with high school students moving to Albemarle High School. In 1972 the building was destroyed by Hurricane Agnes. A new school was constructed and opened in 1974 to serve only elementary grade levels–one of three octagonal, open-planned County schools constructed in the early 1970s (along with Red Hill, 1972, and Mary Carr Greer, 1974). That octagonal structure remains today, though no longer in its original open plan arrangement.

In 1979 the size of the school more than tripled with the addition of eight classrooms, a gymnasium, cafeteria and a small library, an addition that still forms most of the school today. It was at that time the octagon was partitioned into five more classrooms. Two more additions in 2004 and 2017 provided a new media center, and a new main office and secure vestibule entrance.

In recent years enrollment at Scottsville has increased, necessitating installation of four mobile classrooms on site, and in 2018, Yancey Elementary School in the community of Esmont was closed and half of its enrollment brought to Scottsville. This required another four mobile classrooms to address the capacity shortfall. The eight mobile classrooms currently serve four grade level classes, art, music, the school's social worker suite, and a reading intervention program with book storage.

This proposed expansion and renovation of Scottsville Elementary will address the capacity issue in a more permanent manner enabling the removal of the eight mobile classrooms currently on site. Four grade level classrooms and an art room are proposed for the 16,000 s.f. addition, along with a new 4,600 s.f. gymnasium–twice the size of the existing Scottsville gym. The enlarged gym will be more in keeping with the size of other Albemarle County Elementary School gymnasiums. By relocating the physical education program to the new gym, space is gained in the existing gym to provide for a new music classroom and some flexible office and intervention spaces which can serve the social worker team and reading intervention program.

Other renovations in the existing school will include the upgrade of all toilet rooms to current ADA and ANSI accessibility standards, removal of some small, under-utilized or less flexible offices and storage spaces to create larger, more flexible collaboration zones at the center of each classroom cluster. The entire school will receive new finishes–flooring, wall treatments and ceilings–new visual display boards, some new casework and technology to bring the quality of the existing building environment up to par with the new addition. Paired classrooms in the addition and in the existing school will be provided with sections of operable partition to facilitate team teaching and combined classroom opportunities.

Grimm + Parker Architects has worked with the Design Committee selected by ACPS towards this goal, gathering community input throughout the process. Together the design team has developed 12 Guiding Principles to inform the development of the design, while also supporting the overall goals of Albemarle County Public Schools. This document represents the culmination of the Schematic Design process and will explain the project through site plans, floor plans, exterior renderings and a program summary. Also included is a Schematic Design Statement of Probable Cost.

The Process 1

Stakeholder Input

The community engagement process to date has consisted of a series of twelve meetings conducted over a four-month period with citizens, students, teachers, building-level and central-office administrators, community leadership, and other key stakeholders. Engagements included:

Design Committee Meetings	
March 20	Meeting 1 - Albemarle County Office Building
March 27	Meeting 2 - Albemarle County Office Building
April 15	Meeting 3 - Albemarle County Office Building
May 1	Meeting 4 - Albemarle County Office Building
May 15	Meeting 5 - Albemarle County Office Building
May 29	Meeting 6 - Scottsville Elementary School
June 12	Meeting 7 - Sutherland Middle School
June 26	Meeting 8 - Albemarle County Office Building

Community Presentations and Input Sessions	
April 16	Scottsville Elementary - School Concert
May 30	Scottsville Elementary - Staff Meeting
May 30	Scottsville Elementary - School Picnic
June 13	Albemarle County Office Building - School Board Progress Presentation

Overall Project Schedule	
2019 March	Schematic Design
August	Design Development
October	Construction Documents
2020 January	Bidding
Spring	Construction Begins
2021 Fall	First Day of School in Completed Building

Albemarle County Public Schools' Horizon 2020 Strategic Plan

Unleashing Each Student's Potential

Vision | All learners believe in their power to embrace learning, to excel, and to own their future.
Mission | The core purpose of Albemarle County Public Schools is to establish a community of learners and learning, through relationships, relevance and rigor, one student at a time.

Core Values

Excellence | We believe in meaningful learning that stretches people to the frontiers and boundaries of their abilities.
Young People | We believe young people deserve the best we have to offer. Each individual child is capable and has the right to safety, mutual respect, and learning.
Community | We believe in our collective responsibility to work together in a cooperative effort to achieve common goals by building communities of practice, establishing a high-quality learning community, and listening to the community.
Respect | We believe in treating all individuals with honor and dignity.
Student-Centered Goal | All Albemarle County Public Schools students will graduate having actively mastered the lifelong-learning skills they need to succeed as 21st century learners, workers and citizens.

Five Objectives

Engage Every Student | Implement Balanced Assessments | Improve Opportunity & Achievement | Create & Expand Partnerships | Optimize Resources

Strategic Priorities

The Division's Strategic Priorities provide the target toward which our collective effort and resources should be aimed in order to realize our goal. Strategic priorities are analyzed and revised every biennium in order to make any necessary adjustments to the work that is being done in the division to meet our objectives and our goal. The adopted strategic priorities for 2017-2019 are as follows:

Create a culture of high expectations for all.
Identify and remove practices that perpetuate the achievement gap.
Ensure that students identify and develop personal interests.

Guiding Principles

To ensure the future expansions and renovations to Scottsville Elementary School create a state-of-the-art Place of Learning that will provide for our children's growth and help them develop the foundations for a lifelong love for learning, the design team has set forth twelve Guiding Principles.

Safety and Security.

The school must be a place that provides protection from threats both internal and external, controlling access, maximizing visibility to improve passive supervision and teacher management and discourage bullying or other unsafe behaviors. The design should communicate security in subtle ways such that students perceive the environment of safety one associates with a home rather than a fortress.

Choice and Comfort.

The design must enhance our children's ability to learn by creating spaces that empower students to choose activities, settings, and furniture that match their learning styles and foster a special sense of "ownership" of their environment. The design should accommodate different learning styles with different spatial approaches—openness v. enclosure, collaborative v. individualized, stimulating v. focused, acoustically lively v quiet/contemplative.

Project-Based, Problem-Based, and Passion-Based Learning.

Recognizing that students retain more of what they learn by doing, the school must provide spaces, amenities, and furnishings that facilitate hands-on activities that promote higher-order critical thinking, problem-solving, and exploration based on students' own interests.

Making Everywhere.

The design should provide the tools learners need to become collaborative creators and sharers of knowledge content, rather than merely consumers of facts. There must be ample facilities for making both physical and digital projects.

Mobility/Interactivity.

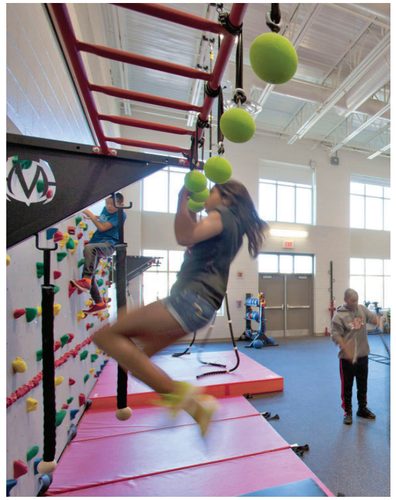
The design should build-in technological connectivity everywhere, so that learning and knowledge-sharing is not confined only to certain spaces, but can take place anywhere to maximize learning and teaching opportunities.

Transparency.

The school should provide environments of visual and spatial connectivity that fuel learning by sparking curiosity and engagement and fostering the free-flowing exchange of energy and creativity. When learners can see the work created by their peers, or those in older grades or special classes like art and music, they are inspired to learn more and do more.

Inside and Outside Learning Environments.

Some of our most effective learning is done when stimulated by natural light, fresh air, and exercise. The design must provide "seamless" connections between interior and exterior environments to maximize natural lighting and connection to nature, and to encourage opportunities for outdoor learning.



Flexibility and Adaptability.

The design can best accommodate multiple styles of learning by minimizing the fixed elements that "enforce" specific locations and approaches to teaching, opting instead for an agility of space that fosters change from hour to hour, week to week, year to year.

Universal Design for Learning/Individualization.

The school must provide environments that ensure every student will be afforded the same opportunities to develop lifelong learning competencies through universal accessibility to all the new school's amenities and spaces. The design should accommodate all students, regardless of ability.

Evident Sustainable Design.

The design must embrace eco-friendly, energy-conscious design that not only approaches resource consumption in a healthy, sustainable way, but makes learning opportunities of these choices, and encourages a life-long attitude of responsible earth stewardship.

Unified, Blended, and Inclusive.

The new school must be an inclusive hub for the broader community in which students feel united in their learning and growth. It must attempt to blend the new addition with the renovated existing school such that all learning environments are equally prepared to meet the challenges of next generation learning. We recognize that students at Scottsville Elementary come from different communities with important and distinct historical and cultural traditions, and the design should reflect and embrace these many traditions, so that all feel a sense of belonging and are invested in our school's success.

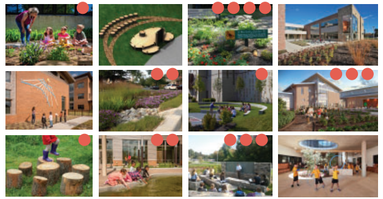
Fun!

The renovated and expanded school must be a fun place to be, an environment that communicates the joy of life and learning and provides the setting for the creation of wonderful childhood memories. Students should be glad to come to Scottsville Elementary each morning, and leave looking forward to the next day!

Community Input

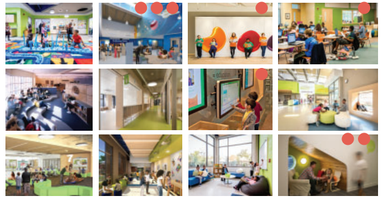
CLASSROOM / INSTRUCTIONAL SPACE

OUTDOOR LEARNING / CLASSROOM



GYMNASIUM / RECREATION

COLLABORATION ZONE / COMMONS



SCOTTSVILLE ELEMENTARY SCHOOL ADDITIONS AND RENOVATIONS
GUIDING PRINCIPLES FOR THE DESIGN

To ensure the future expansions and renovations to Scottsville Elementary School create a state-of-the-art Place of Learning that will provide for our children's growth and help them develop the foundations for a lifelong love for learning, the design team has set forth twelve Guiding Principles.

Please use dots provided to identify the Principles you feel are most important to your child's growth, and feel free to use the cards provided to suggest your own Guiding Principles if you feel there is something the Design Team has missed.
Thank you for your participation!

1. Safety and Security
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Participants in the first community meeting were asked to place dots on the images and principles that resonated with them.

A selection of ideas that emerged from engaging with parents, students, teachers, community members, and school system staff:

"...a new school should set the example that all others schools should want to be like..."
– design committee

"...new school should feel totally unified for all school populations, blend together into a cohesive school..."
– design committee

Image from Community Meeting #2

"...direct access from gym and direct passage from the front to the back of the school would be ideal for parents picking up from the after school program as well as after school events..."
–parent

"...all guiding principles should promote a great learning environment..."
– design committee

"...we like a variety of spaces - campfires, watering holes, and caves..."
– design committee

"...keep site paving minimal..."
– parent

"...new school should be flexible and modern, able to be reconfigured for all types of learning..."
– design committee

"...we like the teacher to have the flexibility of open learning, the choice of being able to open up their classroom..."
– parent

"...kids need great outdoor spaces to run around and a connection to the outdoors..."
– Mayor of Scottsville

"...students should be able to own their own learning through bounded choice..."
– design committee

"...we need to try and make the entire school as clean, new, and cohesive as possible..."
– design committee

"...so this addition means the school is here to stay..."
– community member

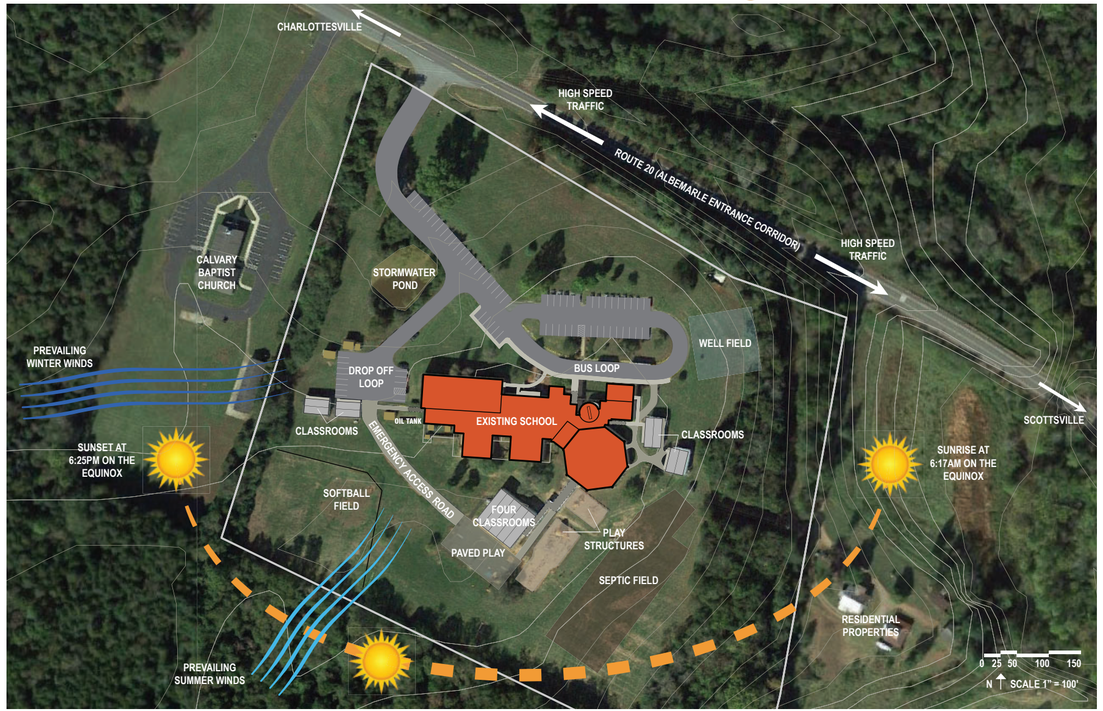
"...the existing cafeteria is too small to hold full assemblies, can we utilize the new gym for this?"
– design committee

"...let's create an environment for students to thrive in..."
– design committee

The town of Scottsville, founded on the iconic Horseshoe Bend of the James River, is surrounded by natural stone and timber resources.

Site Analysis | 2

Existing Site Conditions



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Scottsville Elementary School sits in the middle of a pastoral 14.7 acre site on a small hill overlooking Scottsville Road, Route 20, to the north. The property to the south is wooded. The property to the east is a mix of woods and meadows and the property to the west is a church surrounded by an open lawn. The existing site has a large amount of open site area surrounding the school with a variety of trees around parking areas and walks and dense rows of trees bordering the southeast and west sides.

Existing Site Issues and Constraints

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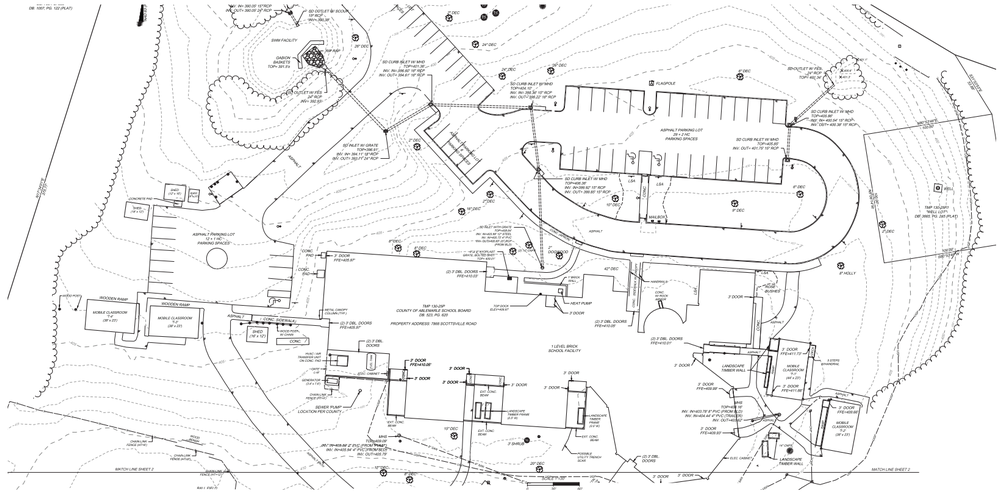


Issues and Constraints

- Buses and cars mix on site in the current parking layout.
- The existing well field on site is to remain unimpacted by the new design, or by construction activities.
- The existing septic field on site is to remain and must be upgraded.
- Site topography drops steeply to the east and to the north of school.
- Increased impervious site area resulting from additional paving and roof surfaces will require an increase in stormwater retention facilities on site.
- Increased impervious area will require on site treatment of storm water run off.
- Existing play structures and fields must remain.
- The southern and eastern mobile classrooms are to remain occupied during construction.
- Emergency access to southern mobile classrooms must be maintained during construction.

Existing Building - Exterior Character

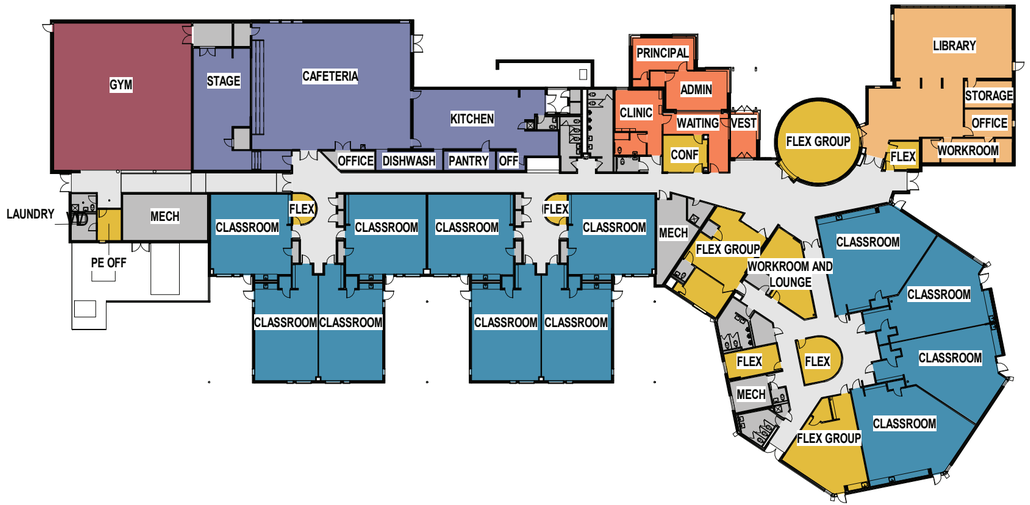
The existing building is a red-orange brick structure with dark brown brick details–soldier course banding, soldier course window heads, and rowlock brick window sills. Edge trim metal, canopy posts and window framing are dark bronze in color. The two most recent additions have honored this color and material tradition, choosing to closely match brick and mortar colors. The media center addition from the early 2000s (top left) has a dark bronze standing seam metal roof finish.

The original 1979 canopy of wood roofs and red steel posts (shown top left) was removed as part of the last addition project. Similar red steel posts and precast concrete beams still remain on the south (rear) side of the school.

The recent Main Administrative Office and Security Vestibule Addition (bottom right) maintained all existing finish color and material choices, but incorporated a higher glass to masonry ratio in an effort to bring more daylight into the front offices.

At the main entrance, a bright red glazed tile “silo” structure with a steeply angled white roof which served as the original library from the 1979 addition is a well-known landmark form in the Scottsville community.

Existing Building - Interior Planning Issues



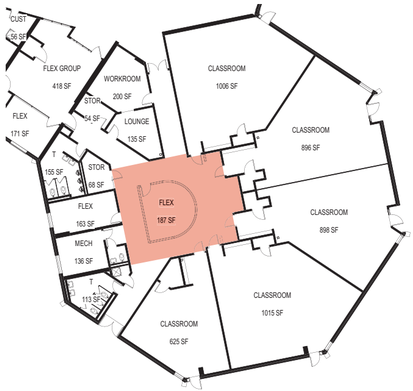
Apart from the capacity issue, the existing building has several shortcomings the addition and renovations seek to correct.

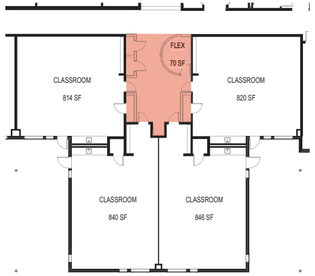
At 2,300 square feet, the existing gymnasium is far smaller than the gyms of other elementary schools in Albemarle County. It will be replaced by a gym approximately twice its size, making it consistent with the average ACPS elementary gym.

Music and Art are currently taught in mobile classrooms, so permanent homes for these two important programs are a must.

Current restroom facilities do not conform with ADA and ANSI standards. All facilities will be upgraded as part of this project to provide accessibility for all.

Each of the existing classroom clusters is grouped around a central space that could be effectively used as a Collaboration Zone, but are currently constricted by the presence of semi-circular offices that are small and difficult to furnish, and small storage closets that could be arranged more effectively or flexibly if replaced by mobile storage units.





Concept Design | 3

Building Capacity Requirements

The new, completed Scottsville Elementary school shall accommodate an enrollment of 303 students.
A detailed Program Summary is provided later in this document. In summary the expanded school will include:

18 **classrooms** - 15 K-5, 1 Pre-K, 1 Art, and 1 Music

15 **flex spaces** - Resource Offices, Intervention Spaces, Special Education

4 **collaboration zones** - each classroom grouping shall have a central breakout space

1 **new gymnasium** - 4,600 SF

The four new classrooms of the addition will bring the total number of grade-level instructional spaces (not including Art or Music) up to **sixteen**, grouped in four neighborhoods of four. Each of these neighborhoods will have a Collaboration Zone at its center for group work, breakout space, or team-teaching exercises.

Scottsville's anticipated grade level distribution for the coming year yields **fourteen** classes:
(5) K/First Combined **(2) Second** **(2) Third** **(2) Fourth** **(3) Fifth**

This leaves two additional classrooms that can be used for Special Education, or, depending on class sizes, Special Education can be taught in the larger Flexible Learning Spaces. One of the two large Flexible Learning Spaces has a self-contained toilet room which may make it more appropriate for Special Education use. The larger Flexible Learning Spaces will be furnished and equipped similar to the grade level classrooms, to provide this flexibility of room assignments.

The art program will be moving from a mobile classroom to a new 1,200 square foot home in the front of the addition to greet people with colorful works. The new Art room will include rooms for storage and a kiln. Flex spaces will be undergoing extensive reconfiguration in the existing school with the completed school having fifteen office, resource, intervention and group meeting spaces of all sizes. These flexible spaces can be used for small group breakout or conference rooms, as well as providing homes for the school Psychologist, Speech Instruction, Guidance, Bright Stars Coordinator, Therapeutic Day Treatment, and Response to Intervention. Two of these spaces are located in the new Gymnasium for use by the Physical Education program and Extended Day Enrichment Program.

The larger gymnasium will bring Scottsville Elementary to par with other elementary schools of similar size in Albemarle County. Not only will the students have much more space for interior recreation but a stage in this space will enable large assemblies and community use during non-school hours.

Program Summary

Space Code	Space Name	Existing School	Proposed School	Comments
Administration and Clinic		**1,548**	**1,548**	
	Secure Vestibule	130	130	
	Reception	278	278	
	Waiting	528	528	
	Principal's Office	264	264	
	Clinic	267	267	
	Toilet - Clinic	81	81	
Auxiliary and Flexible Spaces		**3,049**	**5,520**	Small < 200SF, Medium 200-400SF, Large > 400SF
	Small	70	-	
	Small	72	-	
	Small	106	106	
	Small	163	163	
	Small	187	-	
	Large	589	589	
	Large	625	625	
	Large	630	630	
	PE Office	85	100	Relocated to Addition
	Teacher Workroom and Lounge	338	619	Relocated to Existing Gym
	Conference Room	184	184	
	EDEP Office	-	100	Addition
	Small	-	143	
	Small	-	188	
	Medium	-	260	
	Large	-	422	
	Large	-	541	
	Large	-	850	Existing Stage

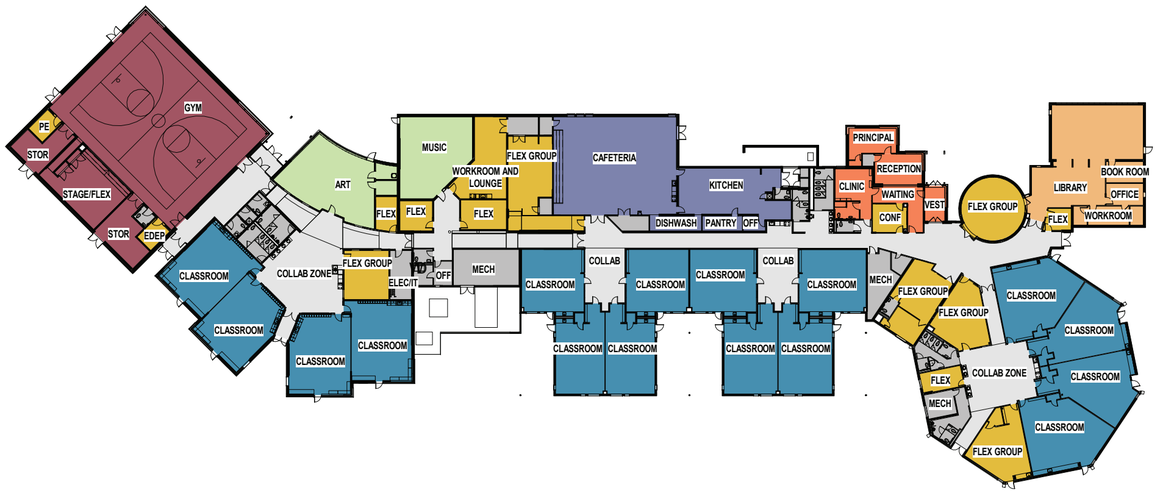
Space Code	Space Name	Existing School	Proposed School	Comments
Media Center		**2,201**	**2,201**	
	Library	1,650	1,650	
	Storage	150	150	
	Office	155	155	
	Storage	47	47	
	Storage	50	50	
	Workroom	149	149	
Instructional Space		**10,209**	**16,699**	
	Classroom #1	761	761	Classroom Core
	Classroom #2	774	774	Classroom Core - with operable wall
	Classroom #3	779	779	Classroom Core - with operable wall
	Classroom #4	760	760	Classroom Core
	Classroom #5	814	814	Classroom Core
	Classroom #6	840	840	Classroom Core - with operable wall
	Classroom #7	846	846	Classroom Core - with operable wall
	Classroom #8	820	820	Classroom Core
	Classroom #9	1,015	1,015	Octagon Pod
	Classroom #10	896	896	Octagon Pod - with operable wall
	Classroom #11	898	898	Octagon Pod - with operable wall
	Classroom #12	1,006	1,006	Octagon Pod
	Classroom #13	-	959	Addition
	Classroom #14	-	928	Addition
	Classroom #15	-	928	Addition
	Classroom #16	-	959	Addition
	Collaboration Zone	-	1,024	Addition
	Collaboration Zone	-	432	Classroom Core
	Collaboration Zone	-	435	Classroom Core
	Collaboration Zone	-	825	Octagon Pod

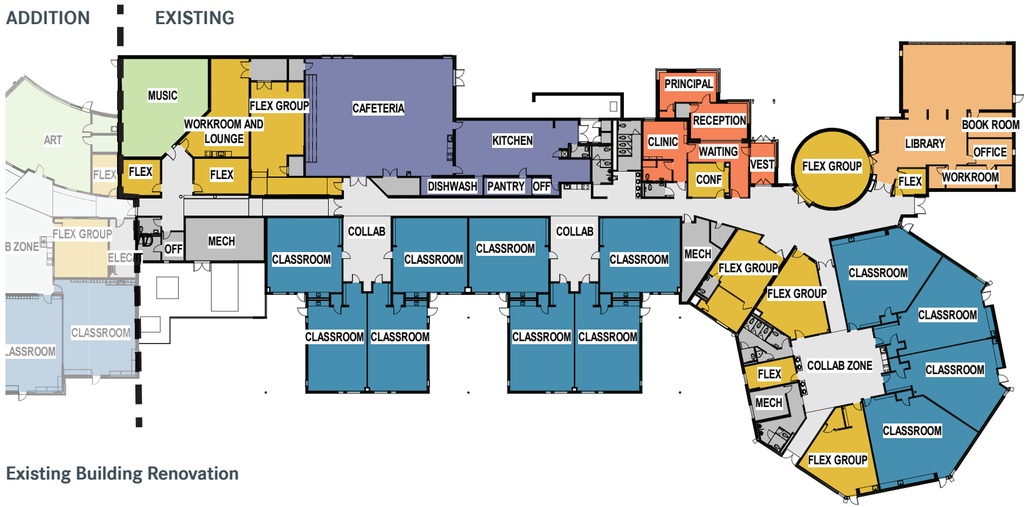
Space Code	Space Name	Existing School	Proposed School	Comments
Gym		**2,457**	**5,969**	
	Gymnasium Space	2,351	4,576	Relocated to Addition
	Stage/Flex	-	731	Addition
	Storage	106	283	Existing and Addition
	Storage	-	379	Addition
Special Programs		**-**	**2,218**	
	Art	-	1,218	Relocated from Mobile Classroom to Addition
	Music	-	1,000	Relocated from Mobile Classroom to Addition
Food Service		**3,497**	**2,647**	
	Kitchen	930	930	
	Office	55	55	
	Pantry	113	113	
	Dishwashing	150	150	
	Cafeteria	2,329	2,329	
	Stage	850	-	Converted to Flexible Space

Space Code	Space Name	Existing School	Proposed School	Comments
Building Support Spaces		**2,353**	**3,048**	These spaces do not contribute to the Net Programmed Square Footage
	Staff Toilet	38	38	Near Admin Wing
	Elec/PA Closet	45	26	Existing - Resource Room, Moved to Admin Closet
	Toilet	30	30	Resource Room - Flex Group
	Staff Toilet	22	41	
	Student Toilets	113	168	Octagon Pod
	Student Toilets	155	188	Octagon Pod
	Storage	67	-	Octagon Pod
	Storage	54	-	Octagon Pod
	Mech	136	136	Octagon Pod
	Custodial Closet	17	16	Octagon Pod
	Custodial Closet	56	56	Entry
	Mech	269	269	Entry
	Student Toilets	220	154	Classroom Core
	Student Toilets	120	97	Classroom Core
	Facilities Office	-	85	Converted from Existing Gym Office
	Laundry	75	75	Gym Office - Facilities Office
	Toilet	51	51	Gym
	Custodial Closet	7	7	Cafeteria
	Toilet	29	29	Cafeteria
	Storage	108	-	Classroom Core
	Storage	96	96	Cafeteria
	Storage	40	40	Stage
	Storage	44	44	Cafeteria
	Storage	106	106	Gym/Stage
	Mechanical	455	455	Opens to Mech Yard
	Elec/IDF	-	205	Addition
	Toilet Core	-	444	Addition
	Custodial Closet	-	31	Addition
	Toilet	-	54	Addition
	Toilet	-	54	Addition
	Toilet	-	53	Addition

	TOTALS	Existing School	Completed School	
		22,961	36,802	**Net programmed area (does not include Building Support Spaces)**
	Efficiency Factor	0.69	0.75	Net to gross ratio (net programmed s.f as a fraction of gross s.f.)
		33,277	49,286	**Gross Building Area**

Overall Floorplan





Existing Building Renovation

Each of the three existing classroom clusters are grouped around a central space, but each of these central spaces are cluttered with small inflexible offices and small storage rooms that make it difficult to use these spaces as true collaboration zones. The plan for renovation is to remove each of these small offices and small closets, open these spaces up, and replace storage with mobile storage units on casters so that the spaces become more flexible and usable for a range of inter-class activities, group tasks, and display of student work.

Additionally, a grouping of three small rooms in the octagon—a storage room, the teachers lounge, and the teacher work room—are being combined into one larger Flexible Group Space. Another larger resource room will remain a Flexible Group Space, this one with its own existing self-contained toilet room which may make this space a good site for a Self-Contained Special Education Room.

The existing gymnasium is being converted into the new Music Room—a great location because of the possibility of high ceilings—a new Teachers' Work Room and Lounge—well located with proximity to the cafeteria—and two smaller flexible resource or intervention spaces.

All existing toilets will be brought to current ADA and ANSI standards for accessibility.

All spaces within the existing school (excluding the brand new Main Office addition) will have new flooring, wall, and ceiling finishes, new visual display boards, some new casework, and new technology as is required to make the existing school look and feel as fresh, contemporary, and functional as the new addition. If the project budget permits, additional windows can be designed for classroom spaces.

Floor Plans

The Addition

After analyzing the many site constraints and considering several options to locate the new addition or additions, it was determined a single addition at the western end of the school was the right strategy.

Considerations in this decision were:

- It was decided the best arrangement for the layout was a cluster of four classrooms on the south side, adjacent to outdoor play areas and similar to the other classroom clusters. The new gymnasium should be located on the north side adjacent to parking and drop off for ease of evening and weekend community access, and use by the Extended Day Enrichment Program. The west end provided the most available site area and the simplest way to accomplish this.
- Access to a new entrance at the western end of the building by vehicle could be achieved more easily than to the eastern end owing to available site area and the configuration of the existing parking and traffic flow.
- The western end of the site is relatively flat in the area of the existing parent drop-off, where the eastern end extends level for a short distance and then drops off steeply. Accommodating this steep drop would have resulted in too much of the project budget spent on earthwork.
- A single addition has economies of scale, and economies of exterior-envelope-to-enclosed-area that make better use of the project budget than multiple additions.
- A single addition is easier to stage, phase, and maintain safe egress for a school that must remain occupied throughout construction.
- The existing building is not outfitted with an automatic fire suppression (sprinkler) system, and as the school is not connected to a municipal water source (it draws its water from an underground well field), sprinklering the building would have been far too costly. New addition(s) would have to be separated from the existing building by a rated fire wall(s). A single addition would be easier to separate than multiple smaller additions, and the western end of the building with its existing relatively straight and flat masonry walls was the most advantageous location.
- Maintaining all eight mobile classrooms throughout construction placed too great a limitation on available site area for the addition. Relocating or moving the mobile classrooms at the west end was easier than relocating those at the east end due to their utility connections.

With the location of the new addition determined, the Committee began its work developing the floor plan for the addition. Locating the four new classrooms on the southern side provided southern light for daylighting and equal access to the outdoors and the play spaces as the existing classrooms. The four classrooms are grouped in two pairs, each pair separated by an operable partition. The four classrooms are grouped around a central open collaboration zone for small group break-out space, inter-class activities or large group presentations.

The gymnasium was located with a convenient entrance directly from the parking and parent drop off on the north side, for improved access for after-school, evening and weekend use. Large amounts of glazing can be provided to a gymnasium on the north face, without introducing the glare that comes from direct sunlight.

A broad corridor between the gym and the classroom cluster runs through the addition from the main north entrance to the outdoor play areas on the south. This makes it easy to partition off public assemblies from the rest of the school for evening and weekend use. Two public toilets are provided on this corridor.

The new Art Room is also located on the north side to get diffuse northern light, and with access to an exterior space for outdoor art activities.

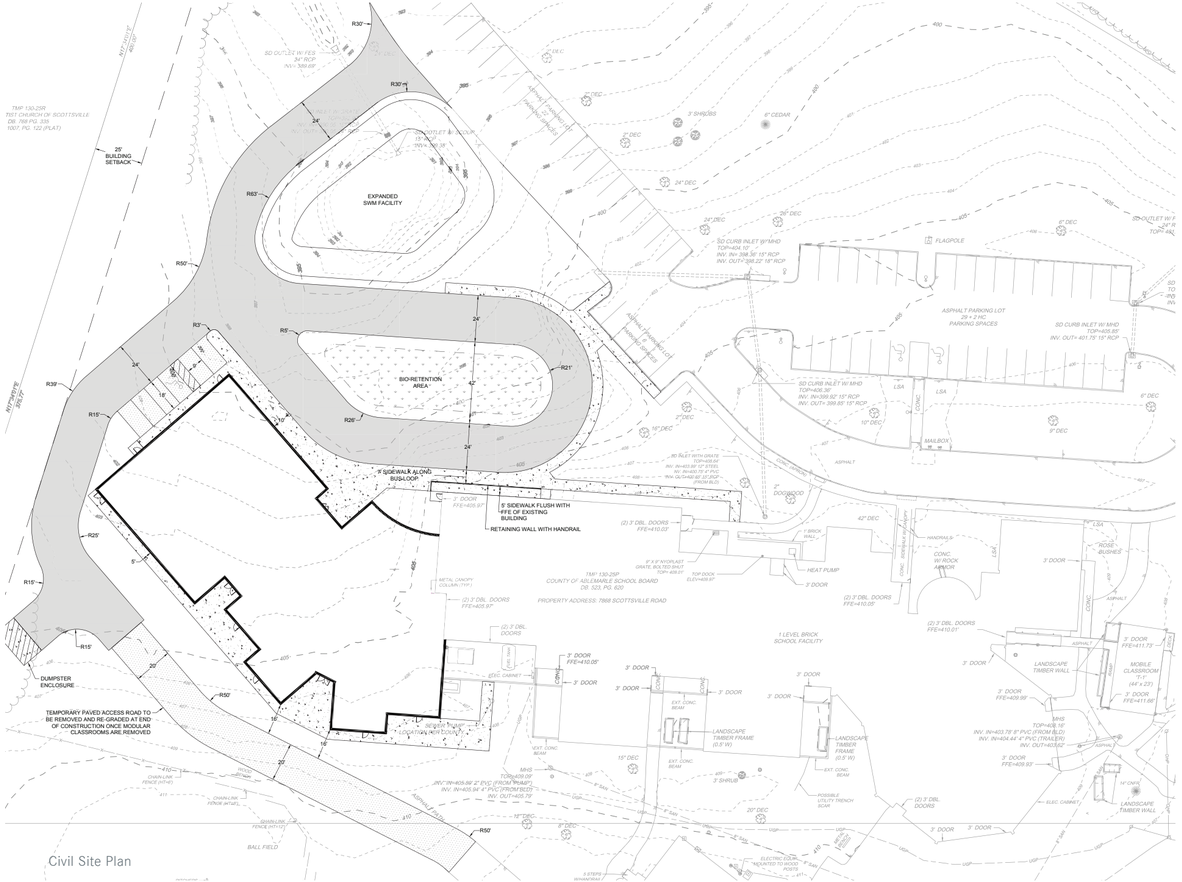
Site Design Concept

The new addition with classrooms, collaborative spaces, and a gym will expand the building to the west in the location of the existing small parent drop off loop and two mobile classrooms. The existing grade slopes from the existing building to a stormwater management dry pond to the northwest. The finished floor elevation of the proposed addition will step down in elevation to conform to the existing grade and minimize the need to import fill material. This will also enable drainage from the small hill south of the building to run to the east around the addition in a gentle swale.

The new bus loop will be added allowing for 7 buses to line up in order around the outer edge of the loop for loading or unloading. The students riding the buses will enter and exit the school through the main entrance of the new addition. The bus loop will be connected to the entrance road through a new access drive to the southeast of the existing stormwater pond. The current loop at the front of the school will be used for the parent drop off and pick up. This will separate the cars and bus traffic and allow for cars to line up for drop off and pick up along the existing sidewalk in the front of the school. The bus loop will also provide additional parking around the edge for after hour events at the school.

Stormwater runoff from the increased impervious area of building and site hardscape will be filtered through a bio-retention area in the center of the new bus loop. The water will then flow into the expanded stormwater management facility sized to detain and gradually release any increased volume of runoff. This will allow students to learn about stormwater runoff best management practices through observation.

The project will include expanding and enhancing the outdoor learning and play areas to the south and east of the school building. As part of this project, the eight mobile classrooms around the site will be removed opening up spaces for the outdoor learning and play. The area to the east will become the tricycle trails. This will consist of filling in the gaps of asphalt sidewalk where the mobile classrooms stood to create a continuous loop for younger students to ride tricycles. The main features to the south are the building ground and the stormwater swale. The building ground is a relatively flat circular paved area with decomposed granite located where the quad mobile classroom currently sits. This feature will be a flexible space to allow students to build large projects. Between this element and the existing school building is the learning swale. In addition to the stormwater conveyance function, the swale feature is an opportunity to create a water play element and bridging opportunity for the students. These elements build on the existing play equipment to create a well rounded school yard that provides play and learning opportunities for all students.



Civil Site Plan

SWALE PLAY OPPORTUNITY

SWALE AND POND FORMS

SWALE CROSSINGS

THE BUILDING GROUND PILES OF RAW MATERIAL

REVEALING THE ROOF RUNOFF

PATRICK DOUGHERTY - CONCEPT INSPIRATION

WOODS EDGE TRAIL - OUTDOOR SCIENCE EXPERIENTIAL EDUCATION

FORT BUILDING PROJECTS WITH NATURAL MATERIALS

Outdoor Learning Concept

MAY 14, 2019

Exterior Character

Overall Massing Birdseye View

Exterior Character

The new addition uses the existing form and material palette of rectilinear massing skinned in red and brown brick and dark bronze metallic elements. The most recent security vestibule and main office addition set a new precedent for greater amounts of glazing set at the corners, and this addition continues that strategy, placing large areas of dark bronze aluminum framed windows at the corners of the gymnasium. Three smaller, rectangular windows reference the pattern of small rectangular windows at the existing cafeteria and gymnasium.

The new art room is designed with a curved façade that mediates between the orthogonal geometry of the existing school and the 45 degree turn of the new gym. This curving façade also relates back to the curving form of the bright red “silo” adjacent to the building’s main entrance. Providing the art room with tall segmented storefront glazing brings openness and transparency to the entrance approach, provides great daylight to the art space within, and creates a more welcoming façade adjacent the entrance. It also enhances the opportunity to display student art works in a highly visible location.

A new canopy shades the secondary entrance to the building. The red soffit and white framing pay homage to the silo form at the main entry, and the four-post form relates to the new canopy at the recently completed security vestibule.

The corner glazing motif moves throughout the new addition from the art room, to the gym, and the classrooms of the south side. The red brick of the classrooms is wrapped with ribbons of the dark brown brick like the existing school while kid-sized windows punch through the mass create fun opportunities for seating niches in each classroom.

Entry Perspective View

Classroom Views from South

Sustainability Narrative

Civil

Considerable thought was given to the layout and site access, minimizing impervious surface, while providing separation of buses, cars, and pedestrians. Stormwater Best Management Practices including Bioretention and detention in a dry pond will be used to treat water quality and quantity from existing and proposed impervious areas. This will improve the quality of the stormwater flowing off the site by removing pollutants to improve the health of the ecosystem of downstream waterways and reduce the peak flow to protect against erosion of downstream waterways.

Natural Materials

Outdoor play areas will be designed to foster natural learning through engagement with the surrounding environment. Spaces will be created to allow students to discover how the natural area around them can come to life with a focus on imaginative play and learning. The site's layout will continue to be developed to encourage students to harvest and build with the natural resources around them, while also offering opportunities to interact with stormwater, plants, and other objects in nature. The natural elements of crushed stone, wood balance beams, and logs have long lifespans and should not require much maintenance.

Architectural

The mechanical systems will be aided in achieving maximum energy efficiency by highly insulating the walls and roofs as well as detailing tight envelope systems with special attention to air and moisture barriers. Increased glazing in instructional spaces and in the gym will increase natural lighting levels and reduce dependency on artificial lighting sources. Insulated, low-e glazing with high shading coefficients will reduce direct solar gain in these spaces. Shading devices for will be modeled and studied to maximize reduction in solar gain based on the orientation of each window grouping. Materials like sealants, adhesives, paints and coatings will be chosen for their low-VOC content, meaning they will have minimal to no negative impact on indoor air quality. Low -flow plumbing fixtures will be specified to minimize use of potable water for toilet flushing and eliminate inefficiencies in water use. Priority in material selection will be given to building materials that maximize recycled content and are themselves recyclable at the end of their useful lives. Plans will be developed to minimize construction waste. Lighting fixtures will be high efficiency LED type and will utilize occupancy sensors and lighting zones to minimize energy consumption for lighting.

Sustainability Narrative

Solar-Ready Roof

The school will be equipped with solar-ready roof areas to allow for solar photovoltaic panels (PV). The future PV panels shall be located on designated roof areas in an efficient manner to maximize power production. A ballasted system shall be used to secure the PV system to the roof areas. Groups of PVs will have a remote, three-phase inverter located on the roofs. A PV panel can produce an approximate peak output wattage of 360 watts AC in optimum conditions. The PV system will be integrated into distribution breakers in panelboards. That breaker panel will be tied to the building power distribution to provide an addition source of power. The PV system's three phase inverters will be synced with the power company's AC 60 Hz sine wave. If the AC 60 Hz sine wave is lost due to a power company outage, the inverters will shut down and isolate the PVs from the building's power distribution system. The PV system will be monitored for power production via metering.

Mechanical

The high-efficiency Variable Refrigerant Flow (VRF) classroom system with energy-recovery via simultaneous heating/cooling can greatly reduce electricity usage and operating costs, particularly on shoulder months in the spring and fall. The VRF system inverter compressors can operate in heat pump mode well below design winter conditions, saving on heating costs versus fuel-fired or electric resistive heating options. The Dedicated Outdoor Air System (DOAS) provides preconditioned, dehumidified fresh air directly to each classroom for improved ventilation design. Air handling equipment utilizes inverter compressors, total-enthalpy energy recovery wheels, and variable speed ECM fan motors. Quality double-wall unit construction, low-sound condenser fans, enclosed inverter compressors, and reduced equipment cycling all contribute to a low-ambient noise for an undisrupted classroom setting.

Structural Narrative

Building Codes and Specifications

The structure will conform to the 2015 Virginia Construction Code, Part 1 of the Virginia Statewide Building Code (VUSBC).
Structural steel will conform to AISC 360-10 Specification for Structural Steel Buildings.
Masonry work will conform to the requirements of TMS 402-13 Building Code Requirements for Masonry Structures and TMS 602-13 Specification for Masonry Structures.
Concrete work will conform to all requirements of ACI 318-14 Building Code Requirements for Structural Concrete.

Material Types and Strengths

Wide Flange Beams and Columns	ASTM A992, Fy = 50 Ksi
Square and Rectangular HSS Shapes A	STM A500 Grade C, Fy = 50 ksi
Round HSS Shapes	ASTM A500 Grade C, Fy = 50 ksi
Concrete Slab-On-Grade	f'c = 3500 psi
Concrete Footings	f'c = 3000 psi
Concrete Walls	f'c = 3000 psi
Concrete Reinforcing	
Welded Wire Fabric	ASTM A185
Reinforcing Steel	ASTM A615, Grade 60
Concrete Masonry	f'm = 1900 psi

Structural Systems

The main structural roof system will consist of open web steel joists. Design loading will include an allowance for addition of a rooftop photovoltaic array. K-series joists will be spaced 5'-0" on center maximum. Long-span joists at the gym will be LH-series joists spaced at 10'-0" oc. The roof deck will primarily be galvanized 1 1/2", 22 gage steel roof deck. Roof deck at long-span joists will be galvanized 3", 20 gage steel roof deck. Acoustic deck will be used where required. Joists over typical classrooms will be supported primarily by masonry walls or structural steel where required.

Foundations are assumed to consist of spread footings under columns and strip footings under load-bearing masonry walls. This will be confirmed with the final Geotechnical Report. The slab-on-grade floor system will be a 4" reinforced concrete slab, over a vapor barrier, over 6" of porous fill.

Building lateral force resisting system will consist of intermediate reinforced masonry shear walls.

Structural Narrative

Design Loads and Parameters

Building Risk Category	3	
Live Loads		
Roof	20 psf	
Rooftop PV Array	7 psf	
Snow Loads		
Ground snow, P_g	30 psf	
Exposure factor, C_e	1.0	
Thermal Factor, C_t	1.0	
Importance Factor, I_s	1.1	
Flat roof snow load, P_f	23.1 psf (use 30 psf)	
Wind Loads (ASCE 7-10)		
Vult	120 mph	
Exposure	C	
Seismic Loads (ASCE 7-10)		
Importance Factor, I_e	1.25	
S_s = 0.231 g	S_{ms} = 0.369 g	
S_1 = 0.072 g	S_{m1} = 0.174 g	
F_a = 1.60	S_{ds} = 0.246 g	
F_v = 2.40	S_{d1} = 0.116 g	
Seismic Design Category	B	
Basic Structural System	Bearing Wall	
Seismic Force Resisting System	Intermediate Reinforced Masonry Shear Walls	
Response Modification Factor, R	3.5	
System Overstrength Factor, ω_0	2.5	
Deflection Amplification Factor, C_d	2.25	

Plumbing Narrative

PLUMBING SYSTEMS

Design Basis: Plumbing Systems including sanitary drain waste and vent (DWV), primary and secondary storm drainage, and domestic water systems will be installed based on the requirements set forth in the Virginia Uniform Statewide Building Code 2015, International Plumbing Code, 2015, and ICC/ANSI A117.1 - 2009, "Accessible and Usable Buildings and Facilities".

Sanitary DWV: Sanitary DWV system will serve all added plumbing fixtures, drains and equipment as required. Underground sanitary waste piping will be Schedule 40 solid core PVC pipe with drainage pattern fittings or hub and spigot cast iron in where equipment discharge temperatures exceed 140°F. Above-ground sanitary waste and vent piping will be "no-hub" cast iron. Floor drains will be provided in custodial areas, toilets and as needed according to facility program. Cleanouts will be provided for ease of maintenance and as required. Sanitary building drain piping will be extended to a point five (5) feet beyond the building addition exterior wall where the Site Utilities Contractor will connect the piping to the on-site septic system.

Storm Drainage System: Primary and secondary (overflow) storm drainage systems will be provided to serve all flat or low slope roof areas. Architectural parapet scuppers may be provided as secondary roof drainage where appropriate and/or preferred. Cast iron downspout boots will be provided at grade to receive discharge from exterior gutter downspouts. Storm drainage piping will be no-hub cast iron piping above floor, and schedule 40 solid core PVC piping with drainage pattern fittings below slab on grade. Roof drains and above-ground interior storm drainage piping will be insulated to prevent condensation accumulation. Primary storm drainage piping will be extended below grade to points five (5) feet beyond the addition exterior wall where the Site Utilities Contractor will connect the piping to the exterior storm sewer system.

Domestic Water Systems: Domestic water for the building addition will be provided from the existing private well pump equipment located in the mechanical room, as an extension of the existing system. The above slab-on-grade, domestic water distribution system will be type "L" copper with soldered joints. Below slab-on-grade domestic water distribution branches will be type "K" soft copper, single point to point loops without fittings below floor. Below floor domestic water distribution branches will be wrapped for isolation from concrete and under slab fill. The existing domestic hot water system, in the mechanical room, will be extended to the new addition and anywhere in the existing building that requires a change. Hot water will be distributed to the addition, at 120°F, to the fixtures with a return loop back to the existing main mechanical room. Loose key hose bibbs will be provided in all custodial closets, toilets, main mechanical rooms, on the exterior building wall and on the roof in the vicinity of mechanical equipment. Building zones will be valved such that small portions can be isolated for maintenance. All domestic cold water piping mains above ground will be insulated with 1" fiberglass insulation,and 1 ½" insulation on domestic hot water mains.

Plumbing Narrative

Plumbing Fixtures: Commercial grade vitreous china floor mounted, 1.28 gpf, manual flush valve water closets; vitreous china wall hung, 0.125 gpf, manual flush valve urinals; vitreous china countertop, drop-in, lavatories with manual faucets; countertop, drop in, stainless steel sinks with drinking fountain bubblers and two handle manual gooseneck faucets in the classrooms. Art Room sinks will be equipped with a solids interceptor for capturing solids prior to entering the sanitary sewer system. Electric water coolers will be bi-level with bottle fillers. Water closets (1.28 gpf), Urinals (0.125 gpf) and Lavatories (0.5 gpm) will be water saving fixtures. Tempered water will be delivered to all lavatories and sinks used for hand washing through an approved water temperature limiting device that conforms to ASSE 1070. Custodial rooms will include a floor mounted mop sink and a hose bibb. Fixtures will be as required for the physically handicapped in accordance with ICC/ANSI A117.1-2003, "Accessible and Usable Buildings and Facilities".

Plumbing Fixture Counts: Plumbing fixture counts shall be based on the requirements set forth in the Virginia Uniform Statewide Building Code 2015, International Plumbing Code, 2015, ICC/ANSI A117.1 - 2009,"Accessible and Usable Buildings and Facilities" and ACPS Standards and Requirements.

Mechanical Narrative

MECHANICAL SYSTEMS

Design Basis:
The Scottsville Elementary School - New Addition & Renovations shall incorporate an HVAC system designed to meet the requirements of the following:

- Virginia Building Code (2015)
- Virginia Mechanical Code (2015)
- Virginia Energy Conservation Code (2015)
- Accessible and Usable Buildings and Facilities (ICC/ANSI A117.1 - 2009)
- ASHRAE Guidelines (as referenced in applicable code)

Cooling Ambient Design: 93.0 DB / 73.5 WB (0.4%)
Heating Ambient Design: 16.4 DB (99.6%)
(2017 ASHRAE Handbook, CHARLOTTESVILLE, VA)

Indoor Design Conditions: 75 DB / 50% RH (cooling)
70 DB (heating)

Building Addition HVAC Overview:
The proposed classroom and gymnasium addition to the Scottsville ES will be served by new HVAC equipment, completely separate from the existing 2-pipe changeover heating/cooling central plant systems serving most of the existing school building, which shall be considered existing-to-remain in this project.

Space conditioning for the added classrooms, collaborative spaces, and similarly occupied zones will be served by a variable-refrigerant flow (VRF) system, with a single dedicated outside air ventilation system (DOAS) to meet the ventilation needs for these spaces. The gymnasium will be served by a packaged direct-expansion (DX) rooftop unit providing heating, cooling, and ventilation air as required to meet space usage requirements.

Alternative mechanical systems having been considered for the classrooms / collaborative spaces include packaged DX vertical classroom units, individual split-HP (heat pump) units, and individual packaged HP rooftop units. All are viable options within certain limitations, however VRF units paired with the DOAS unit offer the best energy performance and system reliability on a competitive first-cost basis.

Mechanical Narrative

Classroom VRF System:
New classrooms and large support rooms will be provided with their own cassette or ceiling-concealed ducted indoor air handling unit, each paired with an individual temperature sensor/controller for optimal thermal comfort. All indoor units will be connected via a network of refrigerant piping and control wiring to outside VRF condensing units. These outdoor units may be installed either on an accessible flat roof or on an equipment pad located at grade level, whichever is more suitable to the project design and owner preference.

VRF condensing units will be selected to provide energy recovery operation during times of simultaneous heating/cooling, allowing improved system efficiency at times when some zones are in heating mode while other zones are in cooling operation (spring/fall shoulder months, early morning operation, etc.) Additionally, the VRF system can operate in heat pump mode well below winter design conditions for the Scottsville project location, allowing for efficient heating without the need for supplemental electric-resistive heating coils at the indoor equipment or in the system ductwork.

Initial HVAC tonnage estimates for the approximately 10,000 SF classroom and support spaces with a VRF system would be in the range of 25-30 tons of cooling capacity. ASHRAE Std-15 & 34 refrigerant calculations shall be performed to determine if a single large unit could be used, or if the load is required be split between two (2) nominal 14-ton units. Indoor units for classrooms will typically be 2x2 cassette type recessed in dropped ceilings.

Classroom DOAS Unit:
A single DOAS unit will be paired operationally to the VRF system, providing ventilation air for all classrooms, collaborative areas, support spaces, and corridors (i.e. all zones except the gymnasium). This rooftop mounted DOAS unit will be ducted above the corridor ceilings and into each occupied space, providing preconditioned room-neutral ventilation air to all associated zones. A fully ducted return system pulling air from each of these zones will be provided, returning air to the DOAS unit for recirculation at night and for exhaust-airstream energy recovery during normal operation.

The DOAS unit will be sized and selected as a packaged cataloged unit, keeping first-cost and operational costs low with standardized cataloged components. The DOAS unit will be outfitted with a total-enthalpy energy recovery wheel and a factory-configured DX cooling / DX heat pump heating / hot-gas reheat coil arrangement (to be confirmed), with supplemental SCR-modulating electric heat for low ambient operation. This arrangement allows for year-round ventilation air preconditioning that addresses both temperature and humidity setpoints. An internal return air damper will be provided to allow for recirculating air during nighttime setback operation. Unit-mounted powered exhaust will be provided to keep the building slightly positively pressurized.

Mechanical Narrative

Gymnasium Unit:
The gymnasium will be provided with a dedicated packaged direct-expansion (DX) rooftop electric heating unit. It will be designed to handle approximately 30-40% outside air to satisfy ventilation for maximum occupancy, but will be provided with CO2-based demand control ventilation (DCV) to reduce this percentage during periods of disuse or when lightly-occupied. The unit shall be operated as a single-zone variable air volume (SZVAV) system, adjusting both air temperature and air volume delivered to the space in an effort to reduce energy usage costs and equipment cycling during low loads.

This gym unit will be equipped with a total enthalpy energy recovery wheel, DX cooling, and a 60 kW SCR-modulating electric heater. Manufacturers offering optional heat pump operation as a first-stage of heat will be explored as an option to save on operating costs. This unit will utilize an inverter-driven or digital scroll compressor, which offers greater capacity control and superior part-load energy performance when compared to fixed-speed/staged compressor arrangements. Compressor cycling can be greatly reduced as well with the inverter option, minimizing wear over the life of the equipment.

Boiler Replacement:
Due to the proposed location of the project building addition, the existing underground fuel oil storage tank will have to be removed from the project site. In lieu of installing a new fuel oil storage tank, the oil-fired equipment in the existing boiler room in service to the existing 2-pipe system will be replaced with electric heating equipment.

In place of the two (2) fully-redundant Burnham boiler at 1198 MBH / 959 MBH (input/ output, each), two (2) new electric boilers will be installed at the same location within the existing mechanical room. Heating capacity will be determined during the heating load analysis procedure, but equipment capacities are estimated to be two (2) boiler at 614 MBH output (180 kW, each) estimated to handle approximately 60% of the design building load for partial system redundancy. Basis of design equipment shall be Lochinvar BWX2-180C. The existing pumping arrangement will need to be further investigated for operations compatibility. Additional isolation control valves and/or boiler pumps may be required.

Existing Gymnasium Conversion:
The existing gymnasium will be partitioned and converted into multiple spaces, including a music room and flexible office areas. This area is served by exposed supply ductwork high in the space, routed back to an indoor Daikin McQuay air handling unit located within the main mechanical room. This relatively new unit utilizes the 2-pipe heating/cooling changeover system. The current approach is to derate the unit airflow and coil capacity and reutilize this unit to serve only the new music room, with the new offices spaces being served as an extension to the VRF and DOAS system proposed for the classroom area. An estimated additional 8-tons of VRF cooling and 300 cfm ventilation air shall be added to the DOAS beyond what is estimated above for the classroom portion.

Mechanical Narrative

An alternative approach for this room conversion would be to modify this single-zone indoor AHU to serve as a multi-zone VAV, adding downstream electric reheat zone terminal boxes to serve each zone. This option will be explored for feasibility, but current designer-preference is to derate the AHU (option above), as this is expected to be the most suitable, cost effective approach.

Ancillary Spaces:
Internal space conversions within the octagonal classroom area will require minimal mechanical changes. An additional 600 cfm shut-off style VAV terminal unit with electric SCR reheat shall be added to serve the new Guidance Office. Minor branch ductwork modifications and diffuser relocations are expected for this area as well, but existing HW reheat terminal units and large duct mains are expected to remain in place.

Data and telecom rooms housing equipment with a high heat output (in excess of 6000 BTU/hr. cooling) will be served by single-zone ductless split-DX cooling only equipment. This equipment will be allowed to operate year-round during occupied and unoccupied periods to meet the space cooling needs. Outdoor condensing units will be selected to provide continual cooling even during low-ambient conditions, since telecom loads are unrelated to building seasonal ambient conditions.

Building restroom and custodial closet exhaust will be designed for minimal airflow as required by current building codes, operated continuously during scheduled occupied hours. Occupancy sensors or interconnection with room lighting control shall not be used for restroom exhaust.

Enclosed entrance vestibules will receive electric-resistive heating equipment, either wall-mounted heaters or ceiling-recessed heaters. Supply air from the DOAS unit will be provided in each of these spaces for building pressurization purposes, but will also serve to temper the air in warm ambient conditions. These spaces shall not be considered actively-cooled, however.

HVAC Controls:
The new VRF system, DOAS unit, and Gymnasium packaged rooftop unit will be configured with stand-alone web-enabled DDC controls, but some manufacturers may not interface with the existing Siemens BAS. Care will be paid to specifying a VRF system capable of fully integrating into the web-enabled building automation system (BAS) designed to control, schedule, and monitor all building HVAC systems.

Further discussions are needed with the district and facilities staff as to what extent the new system will integrate with the existing DDC equipment.

Electrical Narrative

ELECTRICAL SYSTEMS

Design Basis: The Electrical Systems will be designed based on the criteria set forth in the 2015 Virginia Uniform Statewide Building Code (VUSBC), the 2014 National Electric Code, and the ICC International Energy Conservation Code 2015.

Electric Service: The existing electric service to the building will be removed and a new electric service provided that is sufficiently sized for the additions and renovations. The electric service is anticipated to be 480 volts, 3-phase, 2,000 amps and will terminate in a main switchboard. The switchboard will be complete with a main breaker and a distribution section with feeder breakers. The switchboard will serve lighting and mechanical loads, including the electric boilers that are anticipated. The switchboard will also serve step-down, dry-type transformers that will serve 120/208 volt, 3-phase distribution panelboards. These distribution boards will serve branch circuit panelboards that will provide power to receptacles, small mechanical loads, and miscellaneous loads throughout. Additionally, existing gear serving areas of the building not being renovated will be back-fed from the gear being installed. Feeders and circuits will be extended for connection to gear being provided, as necessary. Replacement of all electrical gear in the building is not in the scope of this project. Branch panels will be provided to serve the addition and renovated areas and to also provide for future spare capacity.

Emergency Generator: The existing emergency generator system will be replaced. The existing emergency loads will be served by the emergency gear being installed. However, life safety loads will be separated from optional/standby loads per the NEC. The system to be provided will include a diesel emergency generator, automatic transfer switches (quantity 2) and associated distribution gear, including panelboards and transformers. Emergency lighting in the addition and renovated areas will be powered from the generation system as well. The size of the generator is anticipated to be 75kW.

Receptacles: Receptacles will be provided throughout the renovated and addition areas to serve each associated space type, as appropriate. Dedicated receptacles will be provided where required for dedicated use by equipment, as coordinated with the Architect and the Owner. Receptacles will be heavy-duty type. Receptacles within 6' of any water outlet will be ground fault circuit interrupter type, with outdoor receptacles being provided with a cast-metal while-in-use cover plate.

Lighting: Lighting will be provided throughout the addition and renovated areas and will consist of a complete LED source solution. Fixtures in offices, classrooms, workrooms, and similar spaces will consist of recess mounted 2'x4' volumetric-type LED fixtures. Fixtures in the gymnasium will be high-bay LED type, with other spaces with exposed structure being provided with industrial-style LED fixtures. Building mounted lighting will be provided around all points of egress on the addition. These fixtures will be LED, full-cutoff type. Additionally, existing lighting will be assessed throughout the existing facility (areas not being renovated) to see if light fixtures can be eliminated from select spaces while still providing the required illumination. Fixtures will not be replaced in these areas of the building. However, revised lighting layouts may be proposed that would reuse existing circuits and control. Egress lighting in the addition and renovation areas will be powered by the emergency generation system being installed. Egress lighting will be provided per code requirements to provide the needed illumination along the path of egress, including building

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mounted lighting at building entrances and exits (being added). Exit signs will be LED type and will be provided to meet code requirements. Illumination will be provided in all spaces in accordance with Virginia Department of Education Guidelines as well as IESNA recommended levels. In general, illumination levels will be:

Space Type	Illuminance (fc)
Classrooms	55
Corridors	25
Utility Spaces	35
Gymnasium	55
Exit Access	5
Building Surroundings	1

Lighting control will be low-voltage type and will be complete with occupancy sensing devices, daylight harvesting devices, and wall controllers. Lighting in utilitarian spaces will be provided with on/off control, but no dimming, such as storage rooms, mechanical and electrical rooms, corridors, and similar. Offices, classrooms, workrooms, the gymnasium, and similar spaces will be provided with dimmable controls to allow lighting levels to be adjusted as desired for instructional purposes. Occupancy sensing devices, occupancy and vacancy type, will be installed in each space as required per the IECC. Additionally, spaces with windows to the outside will be provided with photocell devices to automatically dim the light fixtures in the defined daylighting zone per the IECC.

Wiring Systems:

A. All wiring systems will be installed in rigid or flexible metal raceways and terminated in boxes or cabinets, unless otherwise specified herein as partial conduit or non-conduit installation.
B. No rigid raceway for line voltage wiring will be smaller than ¾" except for flexible conduit.
C. Flexible Metal Conduit:
    a. Flexible metal conduit will be limited to lighting fixture whips of 6' maximum length and liquid-tight flexible metal conduit for motor and transformer connections. All other conduit utilized shall be rigid type (RMC, IMC, EMT, PVC, etc.)

D. Electrical Metallic Tubing (EMT) will not be used underground, cast in concrete, exposed on exterior of buildings, or exposed interior locations below 8'-0" (above finished floor). E.M.T. will be routed down exposed interior walls to top of panelboards, motor starters, disconnect switches, telephone cabinets, light switches, etc.

E. Schedule 40 PVC conduit will be limited to:
    a. Underground secondary service entrance conduits, concrete-encased, outside the perimeter of the building and routed under the concrete floor slab-on-grade to the service entrance equipment.
    b. Underground branch circuit and feeders (under 600 volts), telephone, fire alarm, data system, control conduits in specified concrete encasement outside the perimeter of the building, and without concrete encasement in or under the concrete floor slab-on-grade. Only exposed rigid metal conduit stubs will be permitted.

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F. Conductors:

a. Conductor Color Coding will be per codes and standards.
b. 208 Volt will be Phase A - Black, Phase B - Red, Phase C - Blue, Neutral - White, Ground - Green.
c. All control and instrumentation wiring will be number coded at all points of access.
d. Conductors will be soft annealed copper unless otherwise indicated.
e. All conductors #8 AWG or larger will be stranded.
f. All conductors will be derated for voltage drop.
g. All power wiring will be #12 AWG minimum unless otherwise indicated.
h. All control wiring will be #14 AWG minimum for NEC Class I and #16 AWG minimum for NEC Class II, extra fine stranding.
i. Building Wiring: Conductors will be type THWN or THHN unless otherwise indicated.
j. Underground wiring for exterior feeders and branch circuits will be #12 AWG through #6 AWG type UF copper cable with insulated equipment grounding conductor and #6 AWG through 500 kcmil (MCM) AWG type RHH/USE/RHW stranded copper with cross-linked polyethylene, thermosetting XLPE.
k. Underground electric service entrance wiring will be #6 AWG through 500 kcmil (MCM) AWG type XHHW-2 stranded copper cable with cross-linked polyethylene, thermosetting XLPE.

G. Flexible Metal Conduit (Liquidtight) Connections and Motor Starter Enclosures will contain control wiring Type MTW stranded copper for all motor connections, HVAC equipment, transformers, all other equipment subject to movement and vibration, and motor starter enclosures.

H. Power limited twisted pair cable: For Remote Control, Signaling and Power Limited Circuits as per NEC 725 for Class 2 and 3 circuits, the cable will be UL classified, Subject 13, non conduit application in accordance with NEC.

a. Control and Instrumentation (24 volt) will be the minimum of two (2) #16 twisted pair configuration, type CL2 and CL3 insulated stranded tinned copper conductors with 1 1/2 minimum lay, flame retardant, low smoke insulation as required by Class, insulated jacket, color coded, 100% aluminum polyester tape shield, #18 AWG tinned copper drain wire or as indicated otherwise herein.
b. Control and Instrumentation: Thermocouple extension wire will be compatible with the specific thermocouple material and will have the same features as above, except the wire will meet ANSI standard MC96.1 (Temperature Measurement Thermocouples).
c. Direct Digital Control System: Wiring between pilot relays, sensors, DDC's and control processing unit will have proper amount of pairs and be the type as required by Digital Control System installed by temperature control system trade, and will have similar features as above.
d. For Fire Protective Signaling System Circuits, the cable will be UL Classified, Subject 13, conduit application in accordance with NEC 760 or plenum rated open wiring system, will be twisted pair configuration, type FPL, color coded, solid tinned copper conductor, flame retardant, low smoke insulation, 100% aluminum polyester tape shield complete with tinned copper drain wire and shielded if required.

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I. Control and instrumentation wiring specified under Mechanical will be furnished and installed as follows:

a. All line voltage control wiring, 101 volts, 60 Hertz or higher voltage will be provided by the Electrical Trade. All low voltage control wiring, 100 volts and lower voltages and thermocouple extension wiring will be provided under the Mechanical Division.
b. Power Limited (Shielded) Twisted Pair Cable will be installed in accordance with NEC Article 725, 760 or 800 on the load side of the applicable system.
c. All power limited cables installed in ceiling voids will be attached to, or supported from, a vertical surface, a structural member or electrical conduit with a Caddy flexible cable support, bridle ring or cable clamp (or specified conductor tie). Such cabling will absolutely not be supported from ceiling system or fixture support wires except where accessing a ceiling mounted device. The cable(s) will not block lay-in lighting fixtures, ceiling mounted HVAC equipment or ceiling tiles in order to allow full access to the ceiling void.

Fire Alarm: The existing fire alarm system will be extended as necessary to provide code required initiation and notification appliances and circuits in the area of renovation and addition. Devices added will be compatible with the existing system and loop calculations of the existing system will be verified to ensure circuits are not overloaded. This verification will be performed by the Fire Alarm Installing Trade during the shop drawing phase.

Low-Voltage Systems: The low-voltage systems in the building will be extended as required to the areas of renovation and addition to provide similar coverage in those areas as compared to the rest of the existing building area. These systems include the data network, telephone, CATV, intrusion detection, CCTV, access control, and others. Specific requirements for each of these systems will be coordinated with the Architect and Owner as design progresses.

Grounding System: Equipment grounding of all conduits, motor frames, metal casings, receptacles, switches, solid neutrals, etc., will be provided as required by the latest publication of NFPA-70. Grounding electrodes and conductors for the main electric service and all separately derived services will be provided as required by NFPA-70. A separate telecommunications grounding system will be provided for interconnection and grounding isolation of data racks and equipment. A separate grounding bus bar will be provided in the MDF and in each IDF. These bus bars will be connected to one another via separate insulated grounding conductor. Each rack will be individually grounded to the bus bar in each respective communications room for any equipment added.

Appendix 5

Special Thanks

Special Thanks to the Design Committee:

Debora Collins	ACPS Deputy Superintendent
Michele Castner	ACPS Director of Elementary Education
Rosalyn Schmitt	ACPS Chief Operating Officer
Staci England	Principal, Scottsville Elementary School
Gwedette Crummie	Principal, Crozet Elementary School
Joe Letteri	ACPS Director of Building Services
Lindsay Snoddy	ACPS Deputy Director of Building Services
Walter Harris	AC F&ES Project Manager

And to the faculty, parents, students, community, and board members, who contributed their knowledge, wisdom, and creative ideas to make this addition and renovation project a true transformation to make Scottsville Elementary School an inspiring, state of the art place for next generation learning.

Schematic Design Statement of Probable Cost

Addition Cost	**$5,278,000**
Renovation Cost	**$2,149,000**
Site Cost	**$1,340,800**
Sub Total	**$8,767,800**
Escalation to Mid-Point @ 5.67%	**$497,200**
Sub Total	**$9,265,000**
Hazardous Material Allowance	**$115,000**
Gymnasium Equipment Budget	**$45,000**
Furniture Budget	**$400,000**
Classroom Technology Budget	**$200,000**

NTE Budget	Total Schematic Design Statement of Probable Cost
$10,140,400	**$10,025,000**

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