Red Hill Elementary School

Phase 2: Gym Addition and Renovations
Schematic Design Submission

October 10, 2019

MOSELEY ARCHITECTS

Albemarle County Public Schools

Team Firms

Owner
Albemarle County Public Schools
401 McIntire Road
Charlottesville, VA 22902
(434) 296-5820

Architecture
Moseley Architects
50 West Market Street
Harrisonburg, VA 22801
(540) 434-1346

Civil Engineering and Landscape Architecture
Timmons Group
608 Preston Avenue, Suite 200
Charlottesville, VA 22903
(434) 295-5624

Structural Engineering
Moseley Architects
3200 Norfolk Street
Richmond, VA 23230
(804) 794-7555

Mechanical, Electrical, Plumbing, and Fire Protection Engineering
Moseley Architects
3200 Norfolk Street
Richmond, VA 23230
(804) 794-7555

Sustainable Design Consulting
Moseley Architects
3200 Norfolk Street
Richmond, VA 23230
(804) 794-7555

Cost Estimating
Downey & Scott
6799 Kennedy Road, Unit F
Warrenton, VA 20187
(540) 347-5001

Team Members

Albemarle County School Board

Ms. Kate Acuff
Jack Jouett Magisterial District

Ms. Katrina Callsen
Rio Magisterial District

Mr. Jason Buyaki
Rivanna Magisterial District

Mr. Graham Paige
Vice-Chairman
Samuel Miller Magisterial District

Mr. Stephen Koleszar
Scottsville Magisterial District

Mr. David Oberg
White Hall Magisterial District

Mr. Jonno Alcaro
Chairman
At-Large

Albemarle County Public Schools Educational Planning Committee

Ms. Debora Collins
Deputy Superintendent
Albemarle County Public Schools

Ms. Michele Del Gallo Castner
Director of Elementary Education
Albemarle County Public Schools

Ms. Rosalyn Schmitt
Chief Operating Officer
Albemarle County Public Schools

Mr. Joe Letteri
Director of Building Services
Albemarle County Public Schools

Ms. Nancy McCullen
Principal
Red Hill Elementary School

Ms. Sheila Hoopmann
Capital Projects Manager
Building Services Department
Albemarle County Public Schools

Mr. Tyler Gifford
Senior Project Manager
Facilities Planning and Construction
Albemarle County

Ms. Lisa Glass
Pre-Construction Manager
Facilities Planning and Construction
Albemarle County

Design Team

Moseley Architects
Mr. Jim Henderson
Managing Principal

Ms. Molly Merlo
Project Manager

Mr. Paul Gagnon
Structural Engineer

Mr. Josh Landis
Plumbing Designer

Mr. Seth Lehman
Mechanical Engineer

Timmons Group
Mr. Craig Kotarski
Civil Engineer

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.

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.

Five Objectives

1. Engage every student.
2. Implement balanced assessments.
3. Improve opportunity and achievement.
4. Create and expand partnerships.
5. Optimize resources.

Guiding Principles

- Safety and Security
- Choice and Comfort
- Project-Based, Problem-Based, and Passion-Based Learning
- Making Everywhere
- Transparency
- Inside and Outside Learning Environments
- Flexibility and Adaptability
- Universal Design for Learning/Individualization
- Evident Sustainable Design
- Unified, Blended, and Inclusive
- Fun

History

Red Hill Elementary School is a rural school serving students Pre-K through 5th grade. It is located on 11 acres in the Samuel Miller District. The service area is Route 29 South of I-64 to the Nelson County line, east and west, and all areas east to Appleberry Mountain Range, including Old Lynchburg Road between Dudley Mountain Road and Red Hill Road. Representative areas and communities are Covesville, Heards, Hickory Hill, North Garden, Sherwood Farms, and Southern Hills.

Students feed into Walton Middle School and Monticello High School. Instructional facilities include a Media Center, cafeteria, and gymnasium. An after-school program is available. The school play areas and multi-purpose fields serve as a community park after school hours.

The current building is a combination of several additions and has expanded through the years. The original octagonal section was one of three octagonal, open-planned County schools constructed in the early 1970s and opened in 1973.

The Red Hill school was expanded and renovated in 1980, the octagonal building was divided into classrooms and support spaces. The addition expanded the number of classrooms and introduced a multipurpose room, kitchen, stage, physical education space, and Media Center.

In 2016 Red Hill expanded again in Phase one with a new administration and entrance addition. Phase one also included renovation of the existing classrooms and relocation of the Media Center and creation of an art/maker space in the original open plan octagon space.

Project Justification

The targeted modernization efforts in classrooms and the media center were complete during the 2016/17 school year. As a top priority, this work was intended to be Phase 1 of a larger previously requested project. The scope identified above is Phase 2 and would complete the required work at this school.

The additions and renovations to Red Hill are necessary for increased functionality of school operations, as well as for parity. The new gym would provide the school with a full size gym. The small gym they currently have is very limited and often encourages observation rather than full participation. A full size gym would also be utilized by the community as a whole and outside organizations. The school currently uses three mobile classrooms which hold auxiliary functions and specialty staff (i.e., speech, ESOL, etc.) The addition & renovation will allow the specialty staff to have sufficient space to work with students in the building.

If the project is not complete, the school would continue to utilize trailers and the small gym.

Stakeholder and Community Input

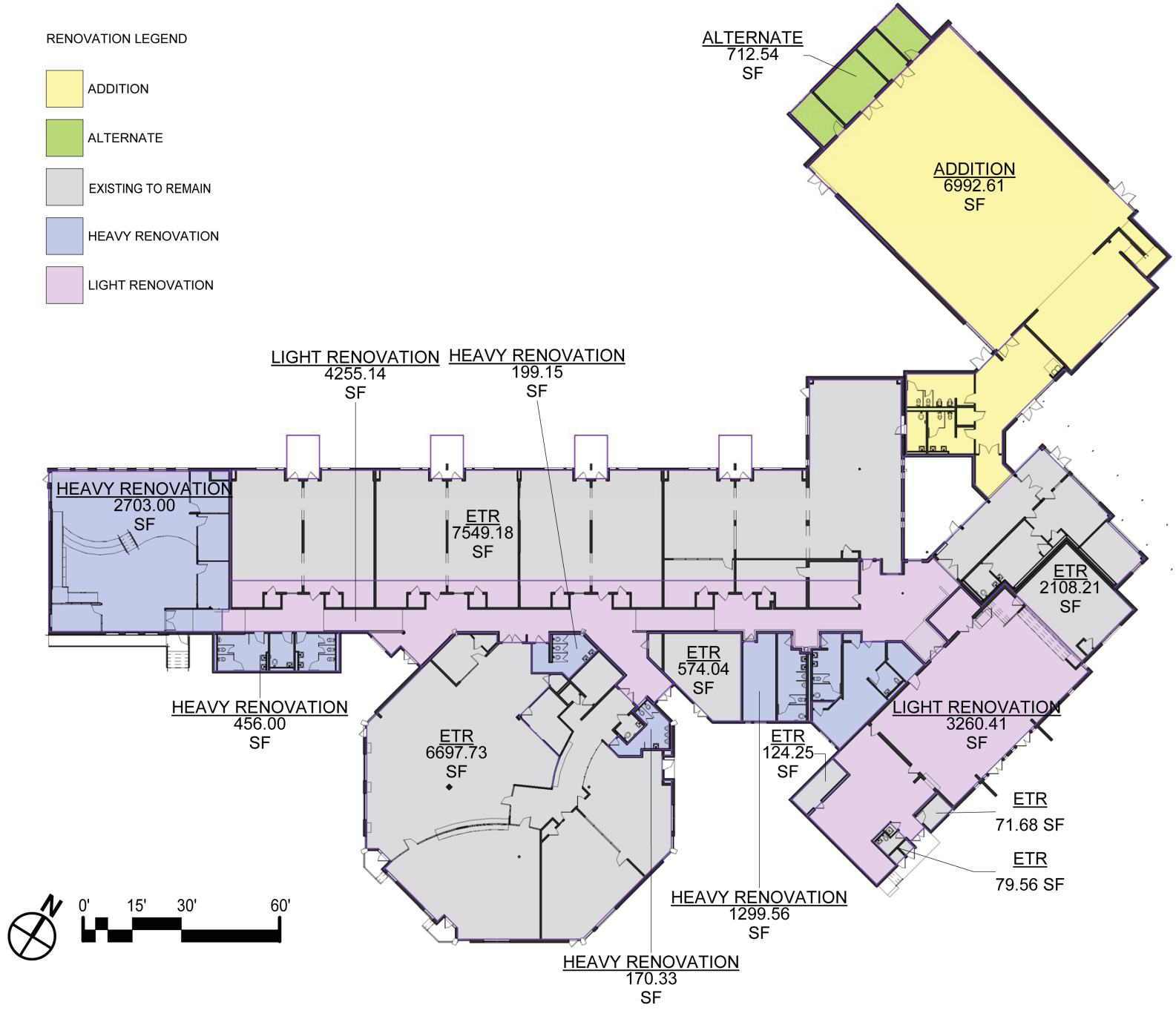
The design team met with the teachers and staff at Red Hill Elementary School on September 5, 2019 and presented to the PTO on September 10, 2019. The purpose of the meetings was to review the preliminary concept and phasing plans with the school staff and community. After the presentation, the staff and community members offered feedback to the design team that will be incorporated into the design. The following items were discussed:

- Gymnasium addition location for community use
- Improvements to outdoor learning spaces
- Adequate storage space for materials, book room, PTO storage
- Concerns over safety of paved play area, and access to the area, gates and fencing to provide barrier between students and parking
- Quantity and size of Flex spaces for small group work, collaboration, and itinerant staff
- The new Media Center to take advantage of volume of existing gym. Design will address acoustic concerns and provide additional natural light.
- Acoustic concerns at shared classrooms
- Preserve the large Oak tree adjacent to the existing paved play area

Scope

This project is the second phase of work done at Red Hill Elementary. Phase 2 includes an addition, renovations and site improvements:

- The project will add approximately 7,000 sf to the building to include a new gymnasium, PE offices and storage , After School program office and storage, and toilets.
  - An alternate to increase the addition by 700 sf and would add a stage to the project.
  - If the alternate is not accepted as part of Phase two, a future project could include the conversion of the storage an office spaces into a stage, and an addition to replace those spaces.
- Renovations to existing building will include repurposing the current media center into instructional space, repurposing the current gym into a media center and renovations to the cafeteria, toilets, hallways, support spaces, kitchen and serving line. Exterior renovations will include painting & fascia/ soffit repair
- Site work will include additional parking, site improvements and outdoor learning areas.


RENOVATION LEGEND
ADDITION
ALTERNATE
EXISTING TO REMAIN
HEAVY RENOVATION
LIGHT RENOVATION
ALTERNATE
712.54
SF
ADDITION
6992.61
SF
LIGHT RENOVATION
4255.14
SF
HEAVY RENOVATION
199.15
SF
HEAVY RENOVATION
2703.00
SF
ETR
7549.18
SF
ETR
2108.21
SF
ETR
574.04
SF
HEAVY RENOVATION
456.00
SF
ETR
6697.73
SF
ETR
124.25
SF
LIGHT RENOVATION
3260.41
SF
ETR
71.68 SF
ETR
79.56 SF
HEAVY RENOVATION
1299.56
SF
HEAVY RENOVATION
170.33
SF
0'
15'
30'
60'

Existing Site Plan

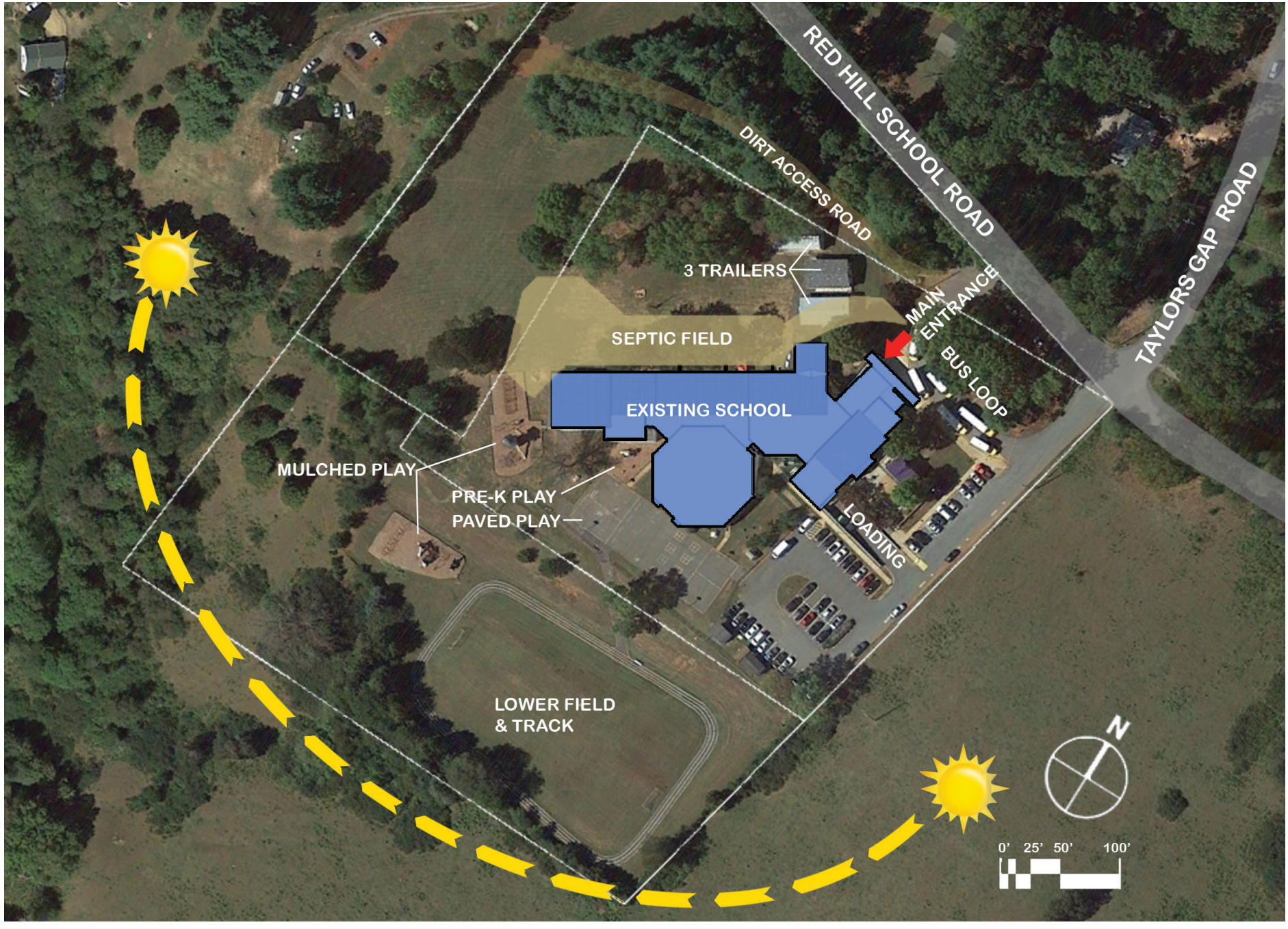
Existing Site Conditions

Red Hill Elementary School is located on a sloping 11-acre site at the intersection of Red Hill School Road and Taylors Gap Road. The school property is comprised of three parcels of land. The school is bounded by Red Hill School Road to the North, pasture land to the South and East and wooded residential and the South Branch North Fork Hardware River to the Southwest.

There is a dirt road in an access easement for an abandoned well off the bus loop. The septic field extends the full length of the north side of the building. There is a dense stand of trees on the north side of the property separating the buildings from the road. There are also large stands of trees on the South and West sides of the property.

Site Issues and Constraints

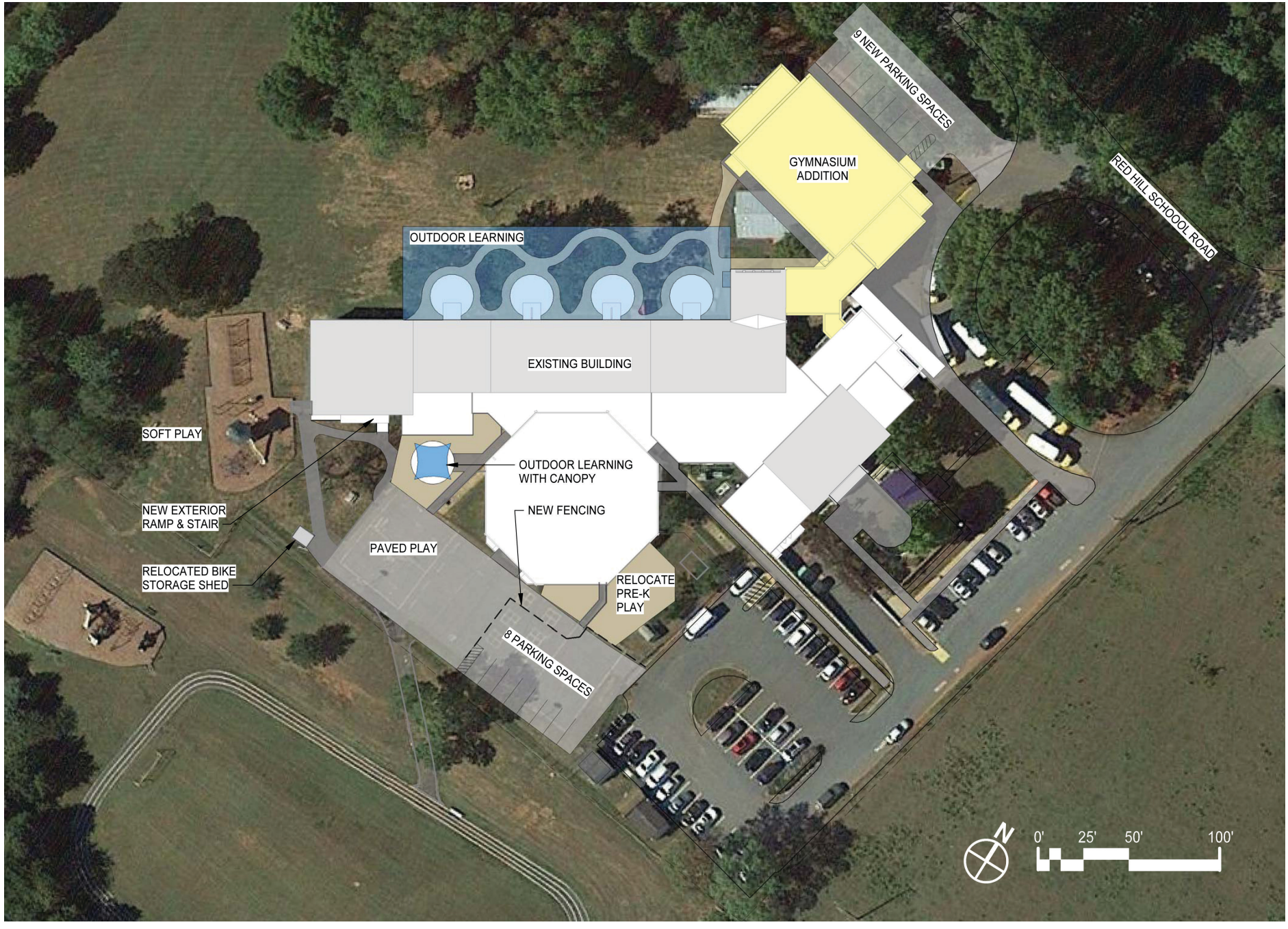
- The school needs additional parking and better access for community use of the new Gym after hours.
- The well has been abandoned and the easements for the road need shall be removed.
- The addition should be easily accessed by the commu¬nity and additional accessible parking provided closer to the main entrance.
- Three mobile classrooms will be relocated at the start of the project, and shall remain occupied during construction. They will be removed at the completion of the project
- Increased impervious area resulting from addi¬tional paving and roof surfaces will require an increase in stormwater retention facilities on site.
- Existing Pre-K play structures shall be relocated.
- Additional fencing is needed to separate cars from the children play areas.
- Safe access needed from the bike shed to the paved play area.
- Existing outdoor learning areas are too small for classes to use. Expand the outdoor learning spaces.
- The existing tree beside between the pre-k and upper grade play structures shall remain.


RED HILL SCHOOL ROAD
DIRT ACCESS ROAD
TAYLORS GAP ROAD
3 TRAILERS
MAIN ENTRANCE
SEPTIC FIELD
BUS LOOP
EXISTING SCHOOL
MULCHED PLAY
PRE-K PLAY
PAVED PLAY
LOADING
LOWER FIELD & TRACK
N
0' 25' 50' 100'

Proposed Site Plan

Site Modifications

- Additional 17 parking spaces.
- Better access for after hours use of gym.
- New fencing separates cars from the children play areas.
- Relocated pre-K play for better adjacency and access by classes.
- Relocated bike shed for safe access to the paved play area.
- Improved classroom outdoor learning areas.
- Northern section of septic field impacted by addition.


9 NEW PARKING SPACES
GYMNASIUM ADDITION
RED HILL SCHOOOL ROAD
OUTDOOR LEARNING
EXISTING BUILDING
SOFT PLAY
OUTDOOR LEARNING WITH CANOPY
NEW EXTERIOR RAMP & STAIR
NEW FENCING
PAVED PLAY
RELOCATED BIKE STORAGE SHED
RELOCATE PRE-K PLAY
8 PARKING SPACES
N
0'
25'
50'
100'

Existing Building

Existing Overall Floor Plan

- Newly updated classrooms, Media Center and Administration addition in 2016
- Ten Classrooms within building
- Counselor, Bookroom, Classroom, small group flex space and Itinerant spaces in 3 portable classrooms on site
- Small Gym with non ADA compliant ramp
- Two ADA compliant toilet rooms – remainder non-compliant


GYMNASIUM
STORAGE
CLASS
CLASS
CLASS
CLASS
CLASS
CLASS
ART
CLASS
CLASS
FLEX
FLEX
COUNS
RECEPT
NURSE
OFF
MUSIC
CUST
O
L
T
T
T
DIG PROD
T
MECH
MECH
WORK
T
T
T
FLEX
O
T
VEND
MULTIPURPOSE
CONF
WK ROOM
T
T
LIBRARY
FLEX
KITCHEN
O
T
CLASS
PRE-K
N
0'
15'
30'
60'

Proposed Building Plans

New Overall Floor Plan

- Eleven Classrooms within building
- Large Gym addition located at the front/public side of building
- Improvements to toilet room accessibility
- Expanded Professional space
- Existing Gym converted to Media Center
- Media Center converted to two classrooms and itinerant space
- Multiple Flex and Itinerant spaces throughout the building


O
ST
STOR
O
GYMNASIUM
STAGE
VEST
T
JC
T
CLASS
OFFICE
MEDIA CENTER
FLEX
FLEX
FLEX
CLASS
CLASS
CLASS
CLASS
CLASS
CLASS
FLEX
CLASS
FLEX
COUN
CONF
ADMIN.
CLINIC
PRIN.
T
MUSIC
CUST.
T
T
T
ITEN
T
M
ITEN
MECH.
ITEN
T
T
WORK
ST
MULTIPURPOSE
CLASS
T
T
CLASS
FLEX
ST
KITCHEN
OFF.
ART / MAKER
PRE-K
N
0'
15'
30'
60'

Proposed Addition Plans

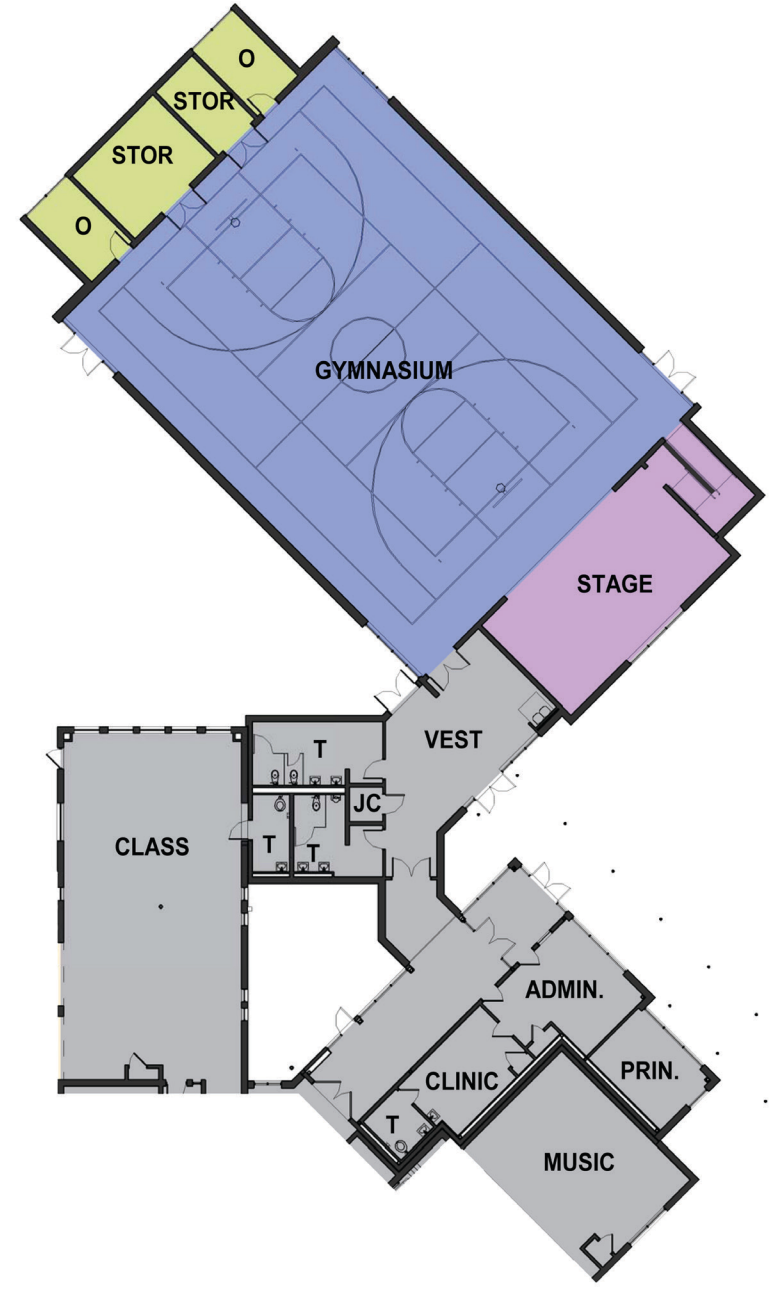
Base Bid Plan

- Secure connection to existing school
- New Gymnasium with Storage and PE office
- Additional Office for after-school activities and associated storage space.
- Two new toilet rooms able to be secured for after hours use of gym
- One new toilet directly off adjacent classroom

Alternate Plan

- Storage and office space moved to northwest side of Gym
- Stage and Ramp included in Gym space.

Base Bid Addition Plan



Alternate Addition Plan

Exterior Character

Aerial view from east

Aerial view from south

Aerial view from west

Gym addition at main entrance

Media center from west

Media center from south

Structural Basis of Design

Applicable Codes

Design Loads
Structural design is in accordance with the provisions of the International Building Code (IBC), 2015 Edition as modified by the Virginia Uniform Statewide Building Code (USBC), 2015 Edition.

Concrete
ACI 318-14 Building Code Requirements for Structural Concrete and ACI 318R-14 Commentary.

Structural Steel
AISC Steel Construction Manual – 14th Edition.

Masonry
TMS 402-13: Building Code Requirements for Masonry Structures.

Cold-formed Metal Framing
AISI S100-12, North American Specification for the Design of Cold-Formed Steel Structural Members.

Foundations and Framing Systems

Foundation System
It is anticipated that the structure will be supported on shallow foundations bearing on compacted fill and/or approved existing soil. Soil bearing capacity is contingent on the results of the geotechnical investigation. Available construction documents for the existing buildings indicate a bearing capacity of 2000 psf.

Ground Floor
Ground floor construction will consist of 4-inch thick concrete slab-on-grade reinforced with 6x6-W2.9xW2.9 welded wire reinforcing. The slab will bear on a vapor barrier over a 6 inch layer of well graded granular fill.

Roof Framing System
Roof construction will consist of 1-1/2" x 22 gage, type B, steel deck supported on steel joists spaced approximately 5'-0" on-center. Deck at gymnasium shall be acoustical. The steel joists will be supported on reinforced CMU bearing walls and wide steel flange beams where required.

Renovation
Existing gymnasium will be converted into a Media Center. Openings will be introduced to the north exterior bearing wall and a platform will be added to the elevated mechanical unit located in the gym.

Lateral Force Resisting System
CMU shear walls will make up the lateral force resisting system. Steel roof deck diaphragms will be designed to distribute lateral load to the shear walls.

Design Loads

Live Loads

Slab-on-Grade	150 psf
Minimum Roof Live Load	20 psf

Snow Loads

Ground Snow Load	30 psf
Importance Factor (I_s)	1.1
Exposure Factor (C_e)	1.0
Thermal Factor (C_t)	1.0
Min Roof Snow Load, I_s x pg	23 psf

Wind Loads

Ultimate Design Wind Speed (3-Second Gust)	120 mph
Exposure Category	B
Internal Pressure Coefficient (GC_{pi})	±0.18

Seismic Loads

Importance Factor (IE)	1.25
Mapped Spectral Response Acceleration at Short Periods (SS)	0.23g
Mapped Spectral Response Acceleration at 1 Second Periods (S1)	0.07g
Site Class	D (assumed, pending geotechnical report)
Seismic Design Category	B
Basic Seismic-Force-Resisting System	Bearing Wall
Response Modification Factor (R)	3

Structural Materials

Foundation Concrete	3,000 psi
Slab-on-grade Concrete	4,000 psi
Reinforcing Steel	ASTM A-615, Fy = 60 ksi
Structural Steel - Wide Flange	ASTM A-992 or ASTM A572, Fy = 50 ksi
Structural Steel - Misc	ASTM A-36, Fy = 36 ksi
Metal Deck	SDI, Fy = 50 ksi

Mechanical Systems

Applicable Codes and Standards

The heating, ventilation and air conditioning systems will be designed based on the criteria set forth in the 2015 Virginia Uniform Statewide Building Code (VUSBC) which references the following International model codes:

- 2015 International Mechanical Code (IMC)
- 2015 International Energy Conservation Code (IECC)
- 2015 International Fuel Gas Code (IFGC)

ASHRAE Standard 90.1-2013 Energy Standard for Buildings Except Low-Rise Residential Buildings which dictates energy efficiency requirements of HVAC equipment, controls, building envelope, lighting, power and service water heating.

ASHRAE Standard 62.1-2013 Ventilation for Acceptable Indoor Air Quality provides requirements for the ventilation design.

ASHRAE Standard 55-2004 Thermal Environmental Conditions for Human Occupancy provides the requirements for indoor design conditions to ensure occupant comfort.

Design Conditions

Design outdoor conditions will be based on ASHRAE Handbook data for the Charlottesville-Albemarle Airport, Virginia:

Winter: 16.1°F dry bulb

Summer: 93.1°F dry bulb, 74.0°F wet bulb

Evaporative Cooling: 76.9°F wet bulb

Indoor design conditions will be based on the following:

Occupancy	Summer	Winter
Offices/Meeting Rooms	75°F / 50%RH	70°F
Dining Areas	75°F / 50%RH	70°F
Classrooms	75°F / 50%RH	70°F
Gymnasium	75°F / 50%RH	70°F
Mechanical Rooms, Electrical Rooms, Storage Rooms	Ventilate	50°F

Existing Systems

Red Hill Elementary school contains several existing mechanical systems due to numerous additions and renovations.

Heating hot water is provided to a dual temperature loop and the variable air volume (VAV) system in the existing media center by two (2) H.B. Smith cast iron boilers, both installed in 2004. The boilers and domestic water heater are all fuel-oil fired. There is an underground 8,000 gallon fuel oil tank adjacent to the sidewalk leading to the main mechanical room. Typical service life of a cast iron boiler is 20-30 years. The boilers will not be replaced as part of this addition/renovation. Hot water is distributed by a Bell & Gossett inline pump.

Chilled water for the dual temperature system is served by a 54 ton Trane roof mounted air-cooled chiller. The chiller was replaced in 2008. The chiller is about 2/3 of the way through it's expected service life and will not be replaced as part of this addition/renovation.

The classrooms are served by dual temperature system feeding unit ventilators/fan coil units. Ventilation air for the classrooms is served by a dedicated outdoor air system (DOAS) with packaged direct expansion (DX) rooftop unit with energy recovery wheel (2,310 cfm OA). Dual temperature water is circulated by a 5 horsepower Bell & Gossett e-1510 base mounted end-suction pump rated for 134 gpm at 68 ft of head. The cafeteria and stage/music room are served by the same dual temperature loop. Ceiling hung unit ventilators serve ventilation air, conditioning and heating to the spaces. There have been humidity complaints during shoulder seasons (spring/fall) due to the inability of the dual temperature systems to adequately provide dehumidification to these spaces without a DOAS unit. A residential dehumidifier has been mounted in the space, but it is unable to properly dehumidify the cafeteria. All fan coil units were replaced as part of the administration addition/HVAC renovation project in 2016.

The existing media center is served by an indoor VAV system with hot-water reheat terminal units (2,400 cfm, 25 tons). The split system indoor Trane AHU cooling is served by a Carrier DX condensing unit mounted on the roof. The system utilizes R-22 refrigerant. The air handling unit was replaced as part of a 2010 renovation. The roof mounted condensing unit was installed in 2006.

The lobby and corridor are served by a single zone air handling unit on the dual temperature loop (2,100 cfm, 6 tons).

The existing gymnasium is served by a dual temperature McQuay (Daikin Applied) 5,200 cfm, 21 ton air handling unit. The indoor unit is mounted on service platform at the gym entrance. The current access to the unit does not meet access code requirements. The platform will need to be extended and guardrails added for the unit to remain in its existing location. There have been humidity complaints during shoulder seasons (spring/fall) due to the inability of the dual temperature systems to adequately provide dehumidification to the gymnasium. A residential dehumidifier has been mounted in the space, but it is unable to properly dehumidify the gymnasium.

The 2016 administration addition is served by a 6-ton constant volume packaged DX rooftop heat pump unit.

The kitchen is served by a grade mounted 7.5-ton constant volume packaged DX heat pump. A conference room and office adjacent to the generator service yard are served by through-wall packaged terminal air conditioners.

Mechanical Systems

continued

Addition

The gym addition will be served by a single zone VAV, packaged DX heat pump rooftop unit equipped with an energy recovery wheel to pre-condition outside air. The unit will be equipped with hot-gas reheat to dehumidify during the shoulder seasons. The unit will be sized using the gym as a multi-use assembly space. Space mounted CO2 sensors will be provided to provide demand control ventilation when the space is not fully occupied. New restrooms and custodial closets will be provided with a roof mounted exhaust fan. Entrance vestibules will be provided with either ceiling or wall mounted electric heaters.

Renovation

The unit serving the existing gymnasium that will be converted into the new media center will be retrofitted to include a duct mounted electric heating coil. The controls will be re-programmed to vary the supply air to 50% of max cooling in order to then reheat with the duct mounted electric coil for dehumidification control in the shoulder seasons. Supply and return diffusers and grilles will be replaced to match the new layouts of the space.

The existing media center is served by hot water VAV terminals. Low pressure duct and diffusers will be re-configured to match the new space layouts. Temperature sensors will be relocated as required by space reconfiguration. The existing AHU serving the VAV terminals is in good condition and will not be replaced. The outdoor condensing unit is in fair condition and was installed in 2006. It is nearing the end of its service life. It is yet to be determined if the condensing unit will be replaced as part of this project or a maintenance project in the future. The AHU DX coil may need to be replaced, depending on the compatibility of the coil with R-410A to match current refrigerant condensing units available.

The cafeteria and music rooms require another system in order to properly dehumidify the spaces. An add-alternate will be included to add a packaged DOAS unit with energy recovery wheel, DX cooling with hot-gas reheat to ventilate and dehumidify the space. The existing unit ventilators outside air louvers will be capped and the units will operate in full-recirculation mode for cooling/heating only. The DOAS unit will be sized to provide all ventilation and dehumidification required for both the cafeteria and the music room.

Bathroom exhaust fans will be replaced, and ductwork reconfigured for the new bathroom layouts.

HVAC Controls

The building is equipped with an existing central direct digital control (DDC) building automation system (BAS) provided by Siemens. Some components of the system utilize pneumatic controls. New equipment will be specified with a BACnet interface. Further discussion is still required to determine the integration of the new equipment with the existing building automation system.

Plumbing Systems

Reference Cut Sheets in conjunction with the following narrative:

General

Work will comply with all current federal, state, and local codes, standards and ordinances including:

- 2015 Virginia Plumbing Code
- 2015 Virginia Fuel Gas Code

The contractor will be responsible to give all necessary notices, obtain all permits and pay all taxes and fees necessary to obtain approvals and complete the work herein. The contractor will obtain all required certificates of inspection and deliver same to owner.

The work includes all labor, materials, equipment and services necessary to complete the work as shown on the drawings and specified herein.

Provisions for the physically handicapped as required by the building code will be included.

Potable water supply will be protected against backflow, back-siphonage, cross connection and other unsanitary conditions.

Lead-Free Statement

Several plumbing fixtures described in this section fall under jurisdiction of the Federal Reduction of Lead in Drinking Water Act (42 USC 300G) which mandates that, effective January 4, 2014, the wetted surfaces of any valve, fitting, or fixture that comes in contact with potable water must have a weighted-average lead content of no more than 0.25 percent. The contractor will be responsible for providing products that are lead-free products and meet the requirements of Safe Drinking Water Act Section 1417 (e) (Section 9 of NSF/ANSI Standard 61) and the authorities having jurisdiction.

Plumbing Fixtures and Equipment

Plumbing fixtures will be high efficiency commercial grade units and specified to reduce water consumption. Fixtures accessible to the physically handicapped will be provided where required by the building code. Water closets will be floor-mounted, floor-outlet, valve-type units with manually-operated, 1.60gpf flush valves; Toilet room lavatories will be wall-hung and/or counter-mounted, self-rimming units with manually-operated, dual-temp, 0.50gpm faucets; Mop basins will be floor-mounted, units with manually-operated faucets with integral vacuum breaker, supply check stops, male thread hose end, pail hook, and adjustable wall anchor; Electric water coolers will be bi-level units with integral cane aprons and bottle filling stations where desired.

Floor drains will be provided in all public group toilet rooms, mechanical rooms, and janitor's closets. Trap primer devices will be provided for all floor drain and floor sink locations. Exterior wall hydrants will be non-freeze, self-draining units enclosed in lockable, recessed wall boxes. Hose bibbs will be provided with integral vacuum breakers and be located in all mechanical rooms.

Domestic water service will extend from the existing building domestic water service entrance room or mechanical room.

Domestic Water Piping System

The domestic water system will extend and connect to all plumbing fixtures, miscellaneous fixtures, and equipment. All under-ground domestic water piping will be Type K, soft copper piping with brazed joints and wrought copper fittings. All above-ground domestic water piping will be Type L, hard-drawn copper piping with wrought copper and copper alloy solder joint pressure fittings in conformance with ANSI B 16.22. Pipe insulation for the domestic water systems will be fiberglass insulation with ASJ. PVC or aluminum jacketing and/or weatherproofing will be provided for insulation where applicable.

The domestic hot water system demand will be provided by the use of electric, domestic, tank type, water

heaters. Final domestic hot water storage will be set to maintain a storage temperature of 140°F minimum. Building domestic hot water will be provided by an ASSE 1017 thermostatic master mixing valve, dedicated 110°F loop, and recirculation pump. Storage and thermal expansion tanks associated with the domestic hot water system will be ASME rated and water heaters shall be UL listed.

Sanitary Piping System

The building sanitary system will extend and connect to all plumbing fixtures, floor drains, miscellaneous fixture and equipment and be designed to discharge by gravity to the site sanitary sewer system. Below grade soil, waste, and vent piping will be service weight cast-iron hub and spigot assembled with mechanical joints or schedule 40 DWV PVC where approved by owner. Above grade soil, waste, and vent piping will be cast-iron no-hub assembled with no-hub couplings and fittings

Storm Water Piping System

The building storm water system will be designed to discharge by gravity through gutters and downspouts to splash blocks on grade.

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 is sufficiently sized for the Gym addition and renovations. The existing electric service is 480 volts, 3-phase, 3,000 amps terminated in a 3-section main switchboard.

The switchboard has a C.T. Compartment with a main breaker and a distribution section with feeder breakers. The switchboard serves lighting and mechanical loads. The switchboard serves step-down, dry-type transformers that serve 120/208 volt, 3-phase distribution panelboards. These distribution boards serve branch circuit panelboards that provide power to receptacles, small mechanical loads, and miscellaneous loads throughout.

A new 480volt circuit breaker shall be provided in the switchboard for the gymnasium addition. A feeder shall provide a 277/480voltelectrical service. A step-down, dry-type transformer shall serve a 120/208 volt, 3-phase distribution panelboard for receptacles and mechanical loads.

The new media center shall utilize existing branch circuits to serve lighting, receptacles and mechanical loads.

Emergency Generator

The existing emergency generator system shall remain. A new emergency circuit shall be routed to the gymnasium to accommodate egress lighting. The existing egress lighting circuit shall be reused to serve the media center egress lighting.

Receptacles

Receptacles will be provided throughout the renovated media center and gymnasium 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 gym addition and media center 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. Fixtures will not be replaced in areas of the building that has been recently renovated.

Egress lighting in the gymnasium addition and media center renovation areas will be powered by the emergency generation system as described above. Egress lighting will be provided per code requirements to provide the needed illumination along the path of egress, including building 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 shall be:

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

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 EMT 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:

1. 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, 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:

1. Underground conduits, concrete-encased, outside the perimeter of the building and routed under the concrete floor slab-on-grade.
2. 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.

F. Conductors:

1. Conductor Color Coding will be per codes and standards.
2. 208 Volt will be Phase A - Black, Phase B - Red, Phase C - Blue, Neutral - White, Ground - Green.
3. All control and instrumentation wiring will be number coded at all points of access.
4. Conductors will be soft annealed copper unless otherwise indicated.
5. All conductors #8 AWG or larger will be stranded.
6. All conductors will be de-rated for voltage drop.
7. All power wiring will be #12 AWG minimum unless otherwise indicated.
8. All control wiring will be #14 AWG minimum for NEC Class I and #16 AWG minimum for NEC Class II, extra fine stranding.
9. Building Wiring: Conductors will be type THWN or THHN unless otherwise indicated.

Electrical Systems

continued

10. 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.

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.

1. 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.
2. 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).
3. 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.
4. 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.

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

1. All line voltage control wiring, 110 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.
2. 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.

3. 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. 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.

Statement of Probable Costs

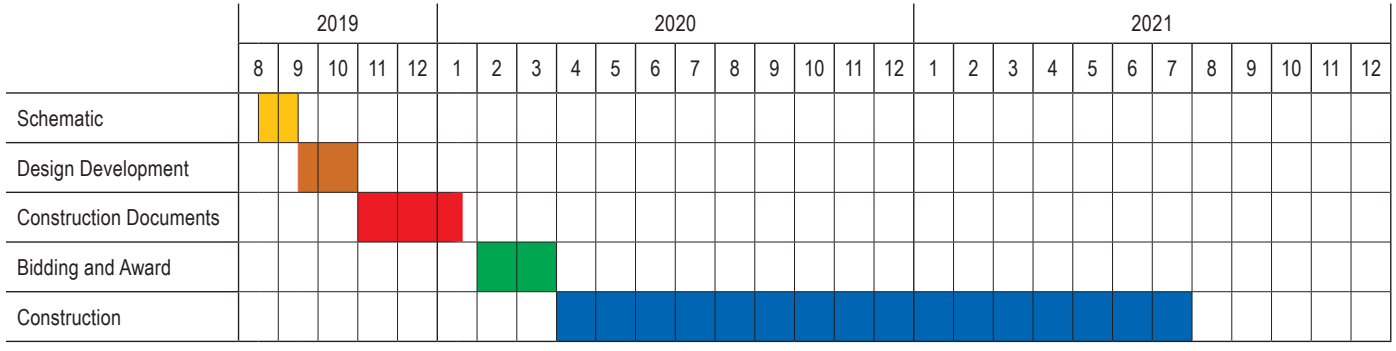
Construction Costs

Addition Cost	
Light Renovation	
Heavy Renovation	
Septic Adjustments	
Hazardous Materials Allowance	
Trailer Relocation/Rental	
Existing Media Center Modifications	
Kitchen Line Serving Improvements	
Outdoor Learning	
Total Construction Costs	**$3,938,539**
NTE Budget	**$4,000,000**
Furniture and Equipment Budget	$150,000
Technology Budget	$100,000

Alternates

Alternate No. 1 – HVAC Improvements to Dining	$100,000
Alternate No. 2 – Stage	$200,000

Schedule



August 14, 2019–September 19, 2019	Schematic Phase
September 20, 2019–October 31, 2019	Design Development Phase
October 31, 2019–January 16, 2020	Construction Documents
February–March 2020	Bidding and Award Phase
June 2020–August 2021	Construction Phase
August 2021	Project Complete