



Arlington
Public
Schools



LONG BRANCH ELEMENTARY SCHOOL

ARLINGTON PUBLIC SCHOOLS

TASK #3—LONG BRANCH ELEMENTARY

Feasibility Study Revised 8/25/17



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1. EXECUTIVE SUMMARY

In response to the challenges of enrollment growth and limited land resources in Arlington County, Arlington Public Schools (“APS”) wanted to determine the feasibility of expanding its student capacity at Long Branch Elementary School. Consequently, this assessment was commissioned to explore the feasibility of adding four (4) or more classrooms at the school. The project team conducting the assessment was tasked with exploring a vertical expansion option containing four (4) classrooms by adding a floor on top of an occupied wing of the school. During the course of the assessment, the project team developed an alternative option to accommodate the additional student capacity at a minimum, analyze the results to determine feasibility and viability, and provide conclusions and recommendations to APS for the proposed expansion options.

Approach:

The project team consisted of program managers Brailsford & Dunlavey, Inc. and construction consultants Hanscomb Consulting. The project team coordinated with APS, structural engineers Ehlert Bryan, and geotechnical engineers Haley Aldrich to determine the feasibility of the proposed options.

The project team conducted site visits, gathered information from APS and the school, and studied the site and building conditions, as well as other pertinent information such as the existing structural, architectural, and topographical drawings. Based on existing documentation and feedback from APS, the project team developed and vetted possibilities and arrived at two (2) potential options for expansion.

At a programmatic level, a layout plan was developed for each option and analyzed from both an architectural and structural perspective to determine constructability, efficiency, and viability. As part of the conceptual analysis, the project team developed the following for each option:

- Scope of work
- Location plan
- Site access and logistics plan
- Structural review and analysis
- Conceptual level schedule
- Programmatic/conceptual budget estimate
- List of major pros and cons

A total project cost estimate for each option is provided

based on the scope of work developed. The total project cost estimate includes the following assumptions:

- Design contingency: 10%
- General conditions, bond, insurance, overhead, and profit: 15.75%
- Escalation to mid-point of construction: 3% per year compounded
- Construction contingency: 10%
- Soft costs: 25%
- Owner’s contingency: 10%

Note that these percentages are based on assumptions made at the time of this report for the purposes of comparing total project cost for each option. However, the actual percentages could vary based on a variety of factors, including but not limited to market conditions and schedule.

For all options presented, and for comparison purposes, the estimated construction cost and schedule are based on the approval of a new or amended Use Permit, design and construction permitting within a fifteen (15) month time frame. However, please note this process could take up to 18-24 months, which will influence the proposed project completion date, and escalate the project cost.

Viable Options:

Option 1 is a second-story vertical expansion (5,400 SF) on top of an existing four- (4-) classroom segment of the existing school. It was believed that the 1995 addition was designed to accommodate a future second-floor expansion of four (4) classrooms along the south wing of the building, near the west side of the new gymnasium. However, structural analysis conducted as part of this assessment revealed that neither the structure nor the foundations are adequately sized for a second floor and modifications to the existing structure would be required to support a second-floor expansion.

The project team identified a solution for mitigating structural modifications and intrusion of the existing structure by adding a mid-span column in the classroom party walls. However, foundations would need to be added for this new set of columns. To accomplish this solution, portions of the floors in each classroom would need to be cut out and excavated to install new foundations. In addition, utilities in the first-floor ceiling cavity would have to be removed temporarily and relocated to accommodate

the second-floor structure on a set of additional roof joists. As the proposed structural intrusion would be fairly significant, it was concluded that the classrooms on the first floor would need to be taken out of service for the duration of the estimated eleven- (11-) month construction period and replaced with portable temporary classrooms in the school yard during construction. Considering construction is expected to greatly impact the lower classroom floor, the analysis used a total of 10,800 SF to evaluate the total impact of the proposed expansion.

Option 1 is feasible with respect to its connection to the existing building. Although it needs to be confirmed, the elevation of the existing roof structure appears to accommodate additional floor structure needed for a second floor. The second floor addition could connect to the existing second floor structure near the stair tower without additional infrastructure, such as bathrooms, an elevator or a staircase.

The Option 1 expansion would require an amendment to the Use Permit due to the additional student capacity and parking. It should be noted that during construction several parking spaces would be temporarily displaced. Additionally, construction entry and access through the existing parking lot would require coordination between construction traffic and school traffic.

The total project cost for Option 1 is estimated at just under \$5 Million (\$462/SF), which equates to \$1.25 Million per added classroom. Based on 23.33 students per classroom, the cost of this option is \$53,667 per seat. While the cost per square foot for Option 1 is 33% less than the cost per square foot for Option 2, the cost per seat is 48% higher as this option yields only four (4) additional classrooms versus the eight (8) additional classrooms in Option 2.

Option 2 is a stand-alone, two- (2) story, eight- (8) classroom building addition (9,800 SF) proposed to be located in the back of the school, adjacent to the east side of the existing gymnasium on the blacktop recreational area.

The building construction would be a free-standing steel frame with a composite steel/concrete second floor with a bar joist-supported, lightweight, insulated membrane roof. The building envelope will consist of brick and stucco veneer with ribbon or punch windows to complement the existing school's architectural features. With only a

connecting corridor to the existing building, this addition would require a stair, elevator, and bathroom core.

Despite the fourteen- (14) month construction schedule, Option 2 could be executed with less disruption to the existing school operations in terms of exposure to weather impacts, parking, and on-going operational considerations. Also, this option provides more square footage than Option 1. The added square feet could be used either for classrooms or for support program spaces, depending on the needs of the school.

Due to the proposed increase to the building's footprint and the added student capacity, Option 2 would require the development and approval of a Use Permit and likely additional parking. The Use Permit approval period is longer than a Use Permit Amendment as required for Option 1. Depending on the layout and final architectural design of the addition, the school's existing lot line would be very close to the proposed addition. Therefore, the addition may have to be built partially on land owned by the County. Land acquisition or at least permission to build on County property would need to be secured by APS – an additional step required for the feasibility of Option 2. Furthermore, as the location of the proposed stand-alone addition is on the existing recreational blacktop area, the school would either lose or have to relocate its blacktop recreational area. Construction access would have to be through the shared parking lot.

The total project cost for Option 2 is estimated at \$6.7 Million (\$690/SF), which equates to eight (8) classrooms at \$845,000 per classroom, including the construction of a stair, elevator, and bathroom core. Based on 23.33 students per classroom, the cost of Option 2 is \$36,342 per seat. This equates to a lower cost per seat in comparison to Option 1, but is about \$1.7 Million greater in total project cost.

Conclusion:

Option	No. of Classrooms Added	Seats Added	Estimated Total Project Cost	Cost per Seat
1	4	93	\$4,991,042	\$53,667
2	8	186	\$6,759,665	\$36,342

Based on the feasibility assessment, Option 1 with the four- (4-) classroom expansion is the more efficient option as it needs no additional support, infrastructure, or land. However, contrary to some assumptions, structural investigation confirms that the first floor was not constructed to accommodate a second-floor addition and the existing structure will require fairly significant intrusion and displacement of the first-floor classrooms. The risk of exposure to weather, the need for structural enhancement, the impact to operations/displacement of students, and the cost at \$53,667 per seat are significant considerations for Option 1.

While less intrusive and therefore less risky with respect to construction, Option 2 with a stand-alone two- (2-) story structure requires its own infrastructure and therefore costs more per square foot. Option 2 yields more space and the total project cost per seat of \$36,342 is significantly less than Option 1. Potential risks to be considered for Option 2 include the need for site plan approval and acquisition of land (or permission to construct on land) that is required for the addition, which may cause significant schedule impacts to the start of construction. Costs associated with potential land acquisition are not factored into the total project cost.

In addition, neither option provides for additional parking to support the added program. This issue can be addressed by developing an agreement for overflow parking with the neighboring parking lot based on zoning approval.

Each option has benefits and drawbacks. The risks, impacts, and costs provided in this report should be carefully considered when evaluating the viability of the options.

2. NARRATIVE

A. Project Approach & Team

The team of **Brailsford & Dunlavy** and **Hanscomb Consulting**, Program Managers, working with Arlington Public Schools (APS), was tasked with developing and exploring the feasibility and impact of adding four (4) or more classrooms at Long Branch Elementary School. The program management team collaborated with structural engineer, **Ehler Bryan** in determining the structural feasibility of the options and geotechnical engineer **Haley Aldrich**. It was determined early in the study that only broad geotechnical information was required at the feasibility stage, so specific geotechnical analysis is not used in this report.

The team began the study with a review of the existing building, followed by the development and review of various possible options, and then the determination with APS of the most viable options to further explore. All available drawings of the existing school and structure, site plans, aerial photographs, and other schematic drawings were reviewed. The options were developed in concept and vetted with the school system to ensure alignment with the school's program. Incorporating the school system's

requirements, and assessing the existing school capacity versus future projected enrollment, two (2) options were identified as the most likely to accommodate the school's needs and were developed further.

At a programmatic level, a layout plan was developed for the two (2) options and analyzed from both an architectural and structural perspective to determine constructability, efficiency, and viability. As part of the conceptual options, the team developed the scope of work, location plan, site access plan, structural review, conceptual budget, and a schedule for the proposed school expansion plan. A summary of pros and cons, schedule, and project budget analysis has been developed for comparison purposes (see Appendix) to assist the school division in analyzing the options, and developing a conclusion.

The estimates included throughout the report include: hard construction costs, approximate escalation, construction and owner's contingency, and project soft costs for information.



B. Existing Construction & Site Description

The existing building, in its current configuration, consists of an original construction in 1972 with an addition in 1995. Both constructions are two- (2-) level, steel frame buildings with no below grade spaces. The roof structure from the 1972 construction consists of a 2 inch lightweight, insulating concrete fill over a 1½ inch form-board with bulb tees. The roof structure from the 1995 construction consists of 1½ - 20 GA metal roof deck. Both roof systems are supported on open-web steel bar joists with wide flange steel girders and steel columns.

The elevated floor consists of a 4-inch-thick composite concrete slab over a metal deck supported on wide flange steel framing. Headed shear studs are provided on the top flange of the steel beams to provide composite action between the slab and the beams. In the 1972 construction, lightweight concrete fill was provided over the metal deck in the 1995 construction, normal weight was provided.

The building is founded on conventional spread, column and wall footings engineered to bear on soil with an allowable bearing pressure of 2,500 PSF. The ground floor

consists of a wire-mesh reinforced 4 inch thick concrete grade slab over a 4 inch thickness of a gravel drainage fill. Based on our review of the foundation plans, the footings appear to have been constructed fairly deep in the ground. The top elevation of the footings ranges from 3 feet below the floor level, to as much as 7 feet or more below slab level. Top of footings in the 1995 addition appear to be situated at higher elevations.

For the most part, neither set of construction drawings identifies a distinct lateral stability system for building adequacy under wind or seismic loading; however, in the 1972 drawings, distinct masonry shear walls are identified at several locations below the second floor. Based on this notation, the general review of the drawings, and the design practice at the time of construction, it is anticipated that lateral stability is achieved from shear action of the exterior and interior masonry walls at the upper and lower levels.

Based on a review of the two (2) drawing sets, design parameters and loads are as follows:

1972 Drawing Set (Original Construction)		1995 Drawing Set (Addition)	
Building Code Reference	None	Building Code Reference	BOCA 1993
Roof	30 PSF	Roof	Ground Snow (Pg) 30 PSF Roof Snow Not Indicated
Elevated Floor	100 PSF	Elevated Floor	40 PSF Classroom
			80 PSF Office
			80 PSF Corridor
Stairs/Exits	100 PSF	Stairs/Exits	100 PSF
Mechanical Space	150 PSF	Mechanical Space	None Indicated
Wind Load	None Indicated	Wind Load	80 MPH
Seismic Load	None Indicated	Seismic Load	None Indicated

C. Structural Design Criteria for Construction

Structural Design Codes

New construction and additions to the building will be designed to meet current building codes and ordinances applicable to construction in Arlington County, Virginia. These include, but are not necessarily limited to:

1. Virginia Uniform Statewide Building Code (VUSBC / 2012)
2. Building Code Requirements for Reinforced Concrete ACI-318, American Concrete Institute, Detroit, MI
3. Manual of Steel Construction ASD, American Institute of Steel Construction, Chicago, IL
4. AISI "Specification for the Design of Cold-Formed Steel Structural Members," American Iron and Steel Institute, Washington, DC
5. Building Code Requirements for Masonry Structures and Specifications for Masonry Structures ACI-530 / 530.1, American Concrete Institute, Detroit, MI

Design Loads

Structural design parameters and loads for the building will be as follows:

- Risk Category III
- Roof Live Load
 - Roof – 30 PSF minimum
- Floor Live Load
 - Assembly / Exits – 100 PSF
 - Classrooms – 40 PSF
 - Offices / Admin – 50 PSF
 - Mechanical / Storage – 125 PSF
 - Elevated Corridors – 80 PSF
- Snow Loads
 - Ground Snow (Pg) – 25 PSF
 - Snow Importance Factor – 1.10
 - Flat-roof snow load (pf) – 22 PSF
 - Snow exposure factor (Ce) – 1.0
 - Thermal factor (Ct) – 1.0
 - Snow Drift per ASCE-7
- Wind Loads
 - Vult - 120 MPH (3 Second Gust)
 - Vasd – 92 MPH
 - Exposure B
- Seismic Loads
 - Seismic Importance Factor = 1.25
 - Ss – 0.160g
 - S1 – 0.053g
 - Site Classification – D assumed (TBD in Geotechnical Report)
 - Reinforced Masonry Shear Walls
 - Equivalent Lateral Force Method

Material Specifications for New Construction

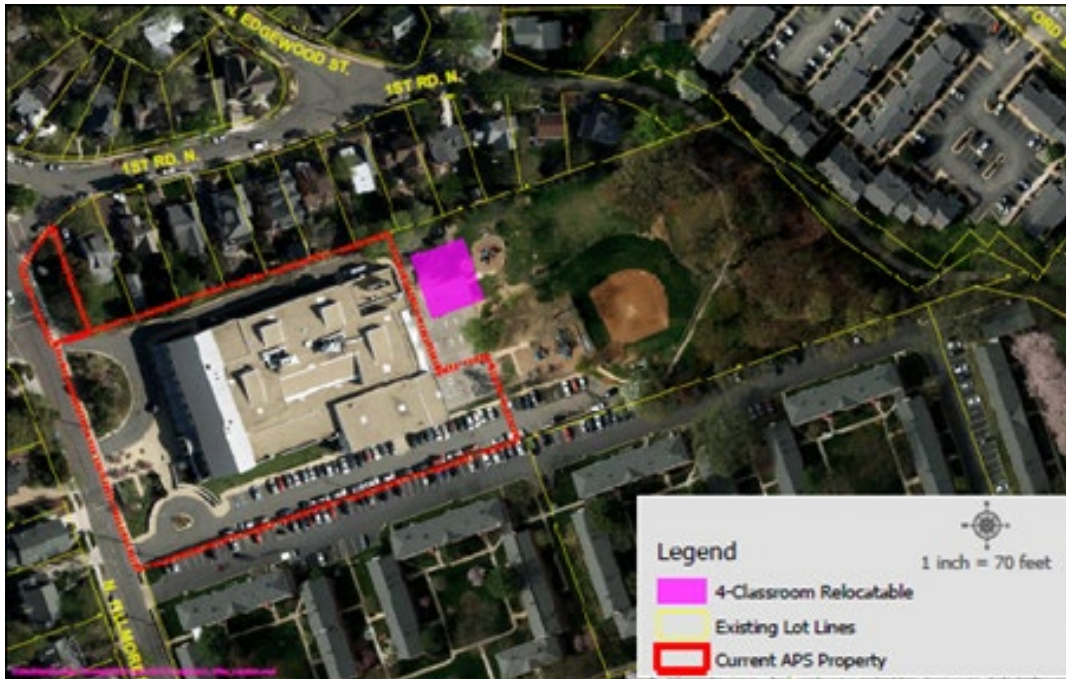
Material specifications to be used in the building design will be as follows:

- Cast in place concrete
 - Grade Slabs – 3,500 PSI
 - Foundations – 3,000 PSI
 - Fill on Metal Deck – 3,000 PSI
- Concrete / Masonry Reinforcing Steel
 - Deformed Bars - ASTM A615, Grade 60
 - Welded Wire Fabric – ASTM A185
- Concrete Unit Masonry
 - Concrete Masonry Units – ASTM C90, f'm = 1,500 PSI
 - Mortar – ASTM C270, Type M or S
- Structural Steel
 - Primary Steel Framing – ASTM A992
 - Miscellaneous Steel – ASTM A36
 - Hollow Steel Sections – ASTM A500, Gr B
- Cold Formed Metal Framing
 - Metal framing – ASTM A525 (fy=33 and 50 KSI)
- Soils Design Values – 2,500 PSF (assumed)
 - Subgrade modulus and foundations/allowable soil bearing pressure to be determined per recommendation of Geotechnical Engineer based on Subsurface Soils Investigation and Report.

D. Site Description

Long Branch Elementary School is located at 33 North Fillmore Street, Arlington, Virginia. The property includes a blacktop area and playground where the current

relocatable classrooms are located at the northeast corner of the school. The school currently does not own this land. Below are the site limitations of the school.



E. Overview of Options

Option 1

Option 1 anticipates a vertical expansion on the south wing of the building on top of four (4) existing classrooms totaling 5,400 SF. This is a great option if the school does not want to increase the total footprint of the building. During the construction process the four (4) lower classrooms affected would need to be relocated. This cost is included in the total project cost. Rebuilding the four (4) lower classrooms drives the total square footage of the project from 5,400 SF to 10,800 SF. The option would yield a net of four (4) additional classrooms, adding 5,400 square feet to the school. The total estimated cost is \$4,991,042, which is \$462/SF (based on 10,800 SF), and breaks out to cost \$53,667 per seat. The construction schedule would extend from the time school gets out in June until the following May for a total of eleven (11) months.

Option 2

Option 2 proposes to add a new freestanding structure on the east side of the school in the current location of the blacktop area, adjacent to the existing gymnasium. The existing relocatable classrooms would remain in the same area, in the northeast corner of the school. This option would yield eight (8) classrooms, adding 9,800 square feet to the school. The total estimated cost is \$6,759,665, which is \$690/SF, and breaks out to \$36,342 per seat. The schedule would extend from the time school gets out in June until the following July for a total of fourteen (14) months.

3. OPTIONS

A. Option 1—Vertical Expansion

1. Description of Option & Scope of Work

The idea of a 2nd floor addition at the south wing was derived from the original plans for the school. When the school was first constructed, this second floor was initially planned, but was removed from the construction plans due to budgetary constraints. APS required verification if the structure was sized during the original construction to accommodate the second floor. However, Ehlert Bryan's structural analysis revealed neither the structure nor the foundations are sized for a second floor, and the roof joists are inadequate to carry the load of a second floor.

The option to add the second floor would yield four (4) new classrooms and would connect with the existing second floor structure adjacent to the existing stairwell located near the front of the school. Even though the addition will add the originally contemplated second floor, the structure will have to be modified in order to carry the weight of the proposed second floor, and would affect the four (4) existing classrooms below the proposed addition. Accordingly, these existing classrooms would have to be taken out of service for the duration of the construction. In order to accommodate this, a "swing" space consisting of four (4) relocatable classrooms would be required for one school year. The added classrooms on the second floor would be under 900 square feet each, making them available for grades 1–5.

Construction of this option would have a duration of eleven (11) months and would include the following scope of work:

- Establish the construction site limitations (refer to the site access plan included in this section).
- Install four (4) additional relocatable classrooms at the back of the school.
- Install temporary protections to the existing school to minimize unnecessary damage and impact areas outside of the construction zone.
- Remove the roof structure of the existing four (4) classrooms and parts of the floors and walls of the classrooms on the first floor to access required structural modifications.
- Remove and re-route any utilities in the first floor ceiling cavity to allow the existing joists to be fortified or to add new joists.
- Make necessary adjustments to the existing steel

columns and beams to support the second floor and the roof.

- Install a new structure, including party wall mid-span foundations and steel columns to carry the weight of the second floor, up through and including a new roof at the second floor using bar joists, a metal deck and a mechanically fastened roof system.
- Reinstall removed first floor ceiling utilities. Rough in all necessary mechanical, electrical, and plumbing, and install any new mechanical units as required.
- Install an exterior EIFS (Exterior Insulation Finish System) building skin to match the existing building skin and glazing.
- Fit out the interior of the spaces of the four (4) new classrooms to include suspended acoustical ceilings, light fixtures, millwork, doors frames and hardware, paint, and flooring.
- Test and balance the air-conditioning system for the classrooms below and the new classrooms to ensure commissioning is effective.
- At the end of construction, turn the site back over to the school and replace any landscaping or grading that was disturbed before the new school year.

The additional permanent capacity of this option is 93 seats based on 23.33 students per classroom. This would increase the total permanent capacity of the school from 533 seats to 626 seats.

2. Plan View



3. Structural & Soil Review

In a typical bay at the location of the proposed vertical expansion, the existing roof consists of 1 ½ - 20 GA Type B metal roof deck over 16K4 joists spanning 26'-6". The joists are installed level and span between W18X46 steel beams, also level, that are supported on 4X4X5/15 steel tube columns. The columns are founded on 4'-6" X 4'-6" X 12" concrete footings.

No geotechnical testing was performed for consideration in the performance of this study. However, based on the two (2) sets of original drawings, foundations for both constructions were engineered for an allowable soil bearing pressure of 2,500 PSF. The 1995 drawings also indicated that a geotechnical report was provided at that time. It is reasonable to consider 2,500 PSF for soil bearing since it has been proven twice before; however, a geotechnical testing would have to be performed at the time of the new construction in order to confirm the foundation design parameters and provide a document for permit submission.

Per current building code, the elevated floor of the proposed vertical expansion would be required to support a live load suitable for classrooms. The bare minimum this could be is 40 PSF. In order to construct a floor at the same level as the current 2nd floor, a minimum of 4½ inches would have to be placed over the existing metal roof deck. Considering the addition of 4 ½ inches of light-weight concrete fill at 110 PCF and a 40 PSF live load, the following conditions would exist:

- The 1½ - 20 GA metal roof deck would be adequate to support the wet weight of concrete and to perform as a floor.
- The 16K4 joists would be 64% overstressed due to the added dead and live loads
- The W18 steel beam would be 12% overstressed due to added loading, but will also have a ½-inch live load deflection at the cantilever end under 40 PSF transient loading.

Also, considering the addition of the roof structure above the proposed second floor, the existing columns would need to be extended to the roof level to support a joist and beam construction with a metal deck roof. Considering this scenario along with a 30 PSF snow load, the following

conditions would exist:

- The interior 4X4X5/16 tube column would be 17% overstressed, but the exterior 4X4X5/16 column would be structurally adequate.
- Similarly, the footing at the interior column would be 66% overstressed due to soils pressure, but the exterior wall column would only be overstressed by about 7%.

Based on this analysis, Ehlert Bryan found that the existing structure is not able to support the vertical addition without strengthening of the steel framing, columns, and foundations. In order to resolve the column and footing issues, a new column and footing may be placed halfway between the two existing columns. This serves to shorten the span of the W18, thus making it structurally adequate. It also serves to render the columns and footings structurally adequate by reducing the distribution of load to those components.

Traditionally, open web steel bar joists may be reinforced to increase their load-carrying capacity. This is generally done by welding parallel smooth round rods to the existing chords—top and bottom. In general, it is possible to increase the load capacity 30% to 40%, but achieving a 64% increase will not be feasible. Consequently, we recommend installing additional joists halfway between the existing joists. This will serve to reduce the loading distribution to these existing joists by half, or doubling the load capacity of the overall joist framing. This scope of work will also require the removal and replacement of the roof deck, the relocation of the existing electrical conduits, and the relocation or temporary removal of pipes, which will be replaced after the new joists are installed.

For the construction of the future roof, it is anticipated that a 1½-inch metal deck will be supported on new open-web steel bar joists. The joists would bear on steel beams in the same alignment as the floor below, and would be supported on new tube columns that would align with the existing columns, below. The exterior wall construction at the south side would consist of the same masonry construction with a veneer; however, it is expected that the interior walls and the exterior wall on the north side would consist of cold-formed metal framing in order to minimize weight.

4. Site Access

The construction staging area, pictured below, for this addition would have to be placed in the parking lot next to the school during the summer. When school resumes, it could be confined to a smaller area during the fit out phase of the project. The staging area is outlined with the orange dotted line. It is recommended that the contractor utilizes an exterior stair tower and material lift to minimize construction traffic within the school.

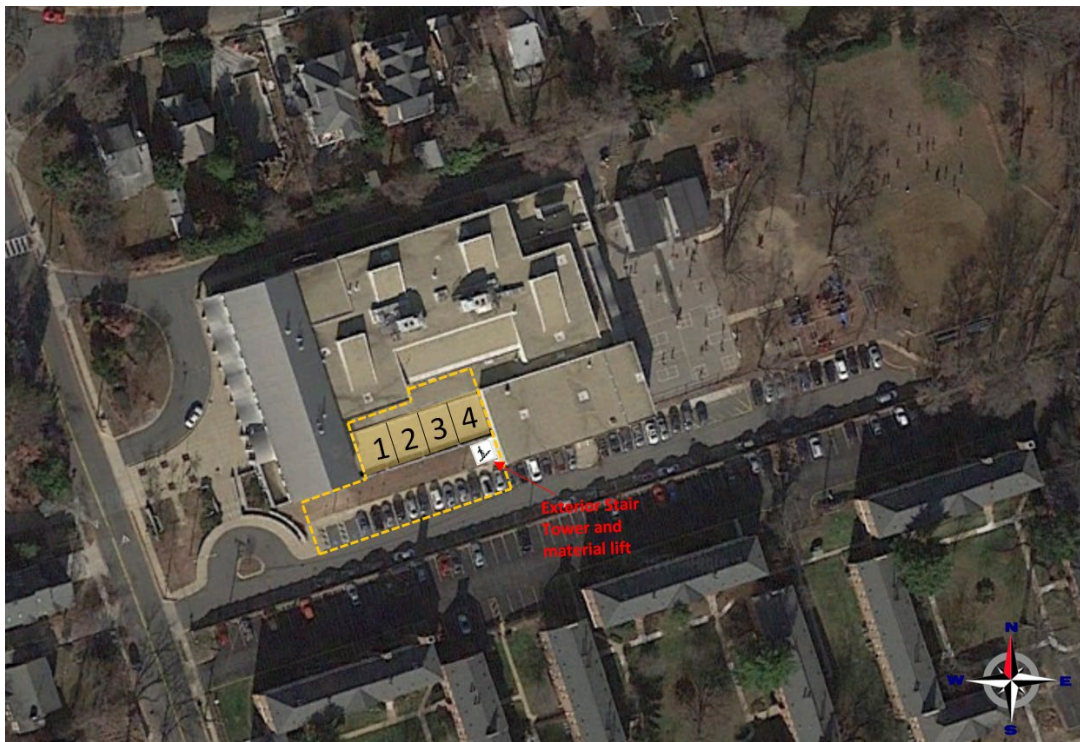




Photo 1.1



Photo 1.2

5. Estimated Budget

The total estimated cost for this addition is \$4,991,042.

This includes hard costs, escalation, soft costs, and owner's contingency. The breakdown of the estimate can be found on the following pages.

Long Branch Elementary School School Expansion Feasibility Options



Option 1 Summary

			\$/SF	TOTAL	%
		Gross Area:	10,800 SF		
A10	Foundations		6.61	71,336	2%
A20	Basement Construction		0.65	7,000	0%
A	Substructure		7.25	78,336	2%
B10	Superstructure		33.55	362,350	11%
B20	Exterior Enclosure		24.89	268,818	8%
B30	Roofing		12.56	135,600	4%
B	Shell		71.00	766,768	23%
C10	Interior Construction		22.63	244,353	7%
C20	Stairways		0.00	0	0%
C30	Interior Finishes		17.75	191,700	6%
C	Interiors		40.38	436,053	13%
D10	Conveying Systems		0.00	0	0%
D20	Plumbing Systems		4.63	49,950	2%
D30	Heating, Ventilation & Air Conditioning		26.00	280,800	9%
D40	Fire Protection		3.00	32,400	1%
D50	Electrical Lighting, Power & Communications		31.50	340,200	10%
D	Services		65.13	703,350	21%
E10	Equipment		4.00	43,200	1%
E20	Furnishings		3.65	39,451	1%
E	Equipment & Furnishings		7.65	82,651	3%
F10	Special Construction		9.26	100,000	3%
F20	Selective Demolition		1.95	21,060	1%
F	Special Construction & Demolition		11.21	121,060	4%
G10	Site Preparation		1.33	14,310	0%
G20	Site Improvements		5.79	62,500	2%
G30	Site Mechanical Utilities		8.15	88,000	3%
G40	Site Electrical Utilities		3.47	37,500	1%
G90	Other Site Construction		0.00	0	0%
G	Building Sitework		18.73	202,310	6%
Z1	Design Contingency	10.00%	22.13	239,053	7%
BUILDING & SITEWORK DIRECT COST BEFORE GC MARK-UPS			243.48	2,629,581	80%
Z10	General Conditions	8.00%	19.48	210,366	6%
Z11	Phasing/Interface	1.00%	2.63	28,399	1%
Z12	Bonds & insurances	1.75%	4.65	50,196	2%
Z13	Contractors Overhead & Profit	5.00%	13.51	145,927	4%
TOTAL CONSTRUCTION COST BEFORE ESCALATION			283.75	3,064,470	93%
Z30	Escalation	7.68%	21.80	235,393	7%
ESTIMATED CONSTRUCTION COST AT AWARD			305.54	3,299,862	100%
Construction Contingency		10.00%		329,986	
Project Soft Costs		25.00%		907,462	
Owner's Contingency		10.00%		453,731	
ESTIMATED TOTAL COST			462.13	4,991,042	

Long Branch Elementary School School Expansion Feasibility Options



Option 1

	Quantity	Unit	Rate	Total
A10 Foundations				
Add/Modify spread footings	12	SF	3,200.00	38,400
Modify perimeter wall footing	27	CY	525.00	14,036
Patch 6" thick slab on grade, incl. 6" gravel	1,890	SF	10.00	18,900
				71,336
A20 Basement Construction				
A2010 Basement Excavation				
Excavate/fill as required	140	CY	30.00	4,200
Backfill with excavated material	140	CY	20.00	2,800
				7,000
B10 Superstructure				
B1010 Floor Construction				
Steel frame	24	Tons	4,500.00	109,350
Metal deck & concrete	5,400	SF	11.00	59,400
B1020 Roof Construction				
Steel frame	32	Tons	4,500.00	145,800
Roof decking & insulation	5,400	SF	7.00	37,800
Steel Roof dunnage	1	LS	10,000.00	10,000
				362,350
B20 Exterior Enclosure				
B2010 Exterior Walls				
Brick & stud back-up cavity wall, incl. insulation etc	1,089	SF	40.00	43,560
EIFS to upper floor	3,303	SF	28.00	92,492
Coping	330	LF	35.00	11,550
B2020 Exterior Windows				
Fixed windows (35%)	1,779	SF	65.00	115,616
B2030 Exterior Doors				
Solid exterior doors, complete; double	2	PR	2,800.00	5,600
				268,818

Long Branch Elementary School School Expansion Feasibility Options



Option 1

	Quantity	Unit	Rate	Total
B30 Roofing				
B3010 Roof Coverings				
Roof coverings & insulation	5,400	SF	24.00	129,600
B3020 Roof Openings				
Allowance for penetrations	6	EA	1,000.00	6,000
				135,600
C10 Interior Construction				
C1010 Partitions				
Interior partitions allowance	7,290	SF	13.50	98,415
Interior glazing/storefront allowance	4,050	SF	2.75	11,138
Allow for misc. metals and blocking	5,400	SF	2.50	13,500
C1020 Interior Doors				
Interior doors including door, frame & hardware complete, allow				
- Single leaf	16	EA	1,400.00	22,400
- double leaf	2	EA	2,200.00	4,400
C1030 Fittings				
Allowance	6,750	SF	14.00	94,500
				244,353
C30 Interior Finishes				
C3010 Wall Finishes				
Allowance - Includes 15% wall touch up/finish for 1st fl	6,750	SF	4.50	30,375

Long Branch Elementary School School Expansion Feasibility Options



Option 1

	Quantity	Unit	Rate	Total
C3020 Floor Finishes				
Allowance - includes 15% floor patching on 1st floor	6,750	SF	9.50	64,125
C3030 Ceiling Finishes				
Allowance - New ceilings floors 1 and 2	10,800	SF	7.50	81,000
Allowance for premium ceilings	1,080	SF	15.00	16,200
				191,700
D20 Plumbing Systems				
<u>Plumbing Fixtures</u>				
Allowance - Plumbing rework at first floor ceiling	5,400	SF	\$1.85	9,990
<u>Domestic Water Distribution</u>				
Allowance - Water line distribution rework at 1st fl ceiling	5,400	SF	\$2.60	14,040
<u>Sanitary Waste and Vent Distribution</u>				
Allowance - includes rework at 1st floor ceiling	5,400	SF	\$2.20	11,880
<u>Storm Distribution</u>				
Allowance - includes rework at 1st floor ceiling	5,400	SF	\$1.40	7,560
<u>Other Plumbing Systems</u>				
Allowance - includes rework at 1st floor ceiling	5,400	SF	\$1.20	6,480
				49,950
D30 Heating, Ventilation & Air Conditioning				
Allowance - includes some rework on first floor	5,400	SF	\$52.00	280,800
				280,800
D40 Fire Protection				
Allowance - All new both floors	10,800	SF	\$3.00	32,400
				32,400
D50 Electrical Lighting, Power & Communications				
Allowance - includes rework at 1st fl ceiling	8,100	SF	\$42.00	340,200

Long Branch Elementary School School Expansion Feasibility Options



Option 1

	Quantity	Unit	Rate	Total
				340,200
E10 Equipment				
E1020 Institutional Equipment				
Allowance	10,800	SF	\$4.00	43,200
				43,200
E20 Furnishings				
E2010 Fixed Furnishings				
Window Treatments	1,779	SF	7.00	12,451
General allowance	10,800	SF	2.50	27,000
				39,451
F10 Special Construction				
F1010 Special Structures				
New temporary classrooms	4	EA	\$25,000.00	100,000
				100,000
F20 Selective Demolition				
F2010 Building Elements Demolition				
Selective demolition & haul existing bldg & roof	32,400	CF	0.65	21,060
F2020 Hazardous Components Abatement				
<i>Excluded</i>				Excluded
				21,060
G10 Site Preparation				
G1010 Site Clearing				
Allowance for areas around existing building	2,700	SF	1.00	2,700
G1020 Site Demolition and Relocations				
Allow for removal of slab on grade & footings	2,700	SF	2.50	6,750
Allow for relocating underground utilities		LS	15,000.00	

Long Branch Elementary School School Expansion Feasibility Options



Option 1

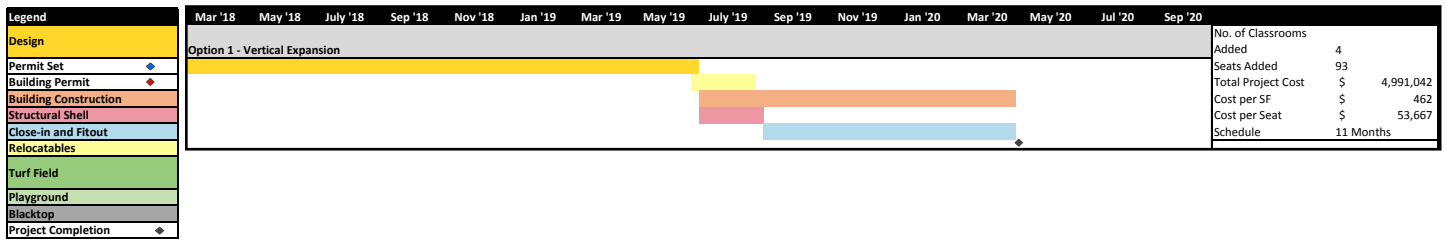
	Quantity	Unit	Rate	Total
G20 Site Improvements				
G2030 Pedestrian Paving Allowance	500	SF	30.00	15,000
G2040 Site Development				
Clear & prepare pad for temporary classrooms	7,500	SF	3.00	22,500
Allowance for site walls, ramps etc	1	LS	10,000.00	10,000
G2050 Landscaping Allowance	1	LS	15,000.00	15,000
				62,500
G30 Site Mechanical Utilities				
Water - allowance, incl. to temporary classrooms	1	LS	\$18,000.00	18,000
Storm drainage - allowance	1	LS	\$35,000.00	35,000
Sewer - allowance, incl. to temporary classrooms	1	LS	\$35,000.00	35,000
				88,000
G40 Site Electrical Utilities				
G4010 Electrical Distribution Allowance, incl. to temporary classrooms	1	LS	22,500.00	22,500
G4020 Site Lighting Allowance	1	LS	7,500.00	7,500
G4030 Site Communications & Security Allowance	1	LS	7,500.00	7,500
				37,500

6. Schedule

The construction schedule for this option would span over a summer and the next consecutive school year for a total length of roughly eleven (11) months. It assumes starting construction in June when school gets out. The first June that would allow adequate time for the design phase is June 2019. Due to the length of the schedule, the four (4) classrooms impacted by the addition would have to be supported by additional relocatables for one school year.

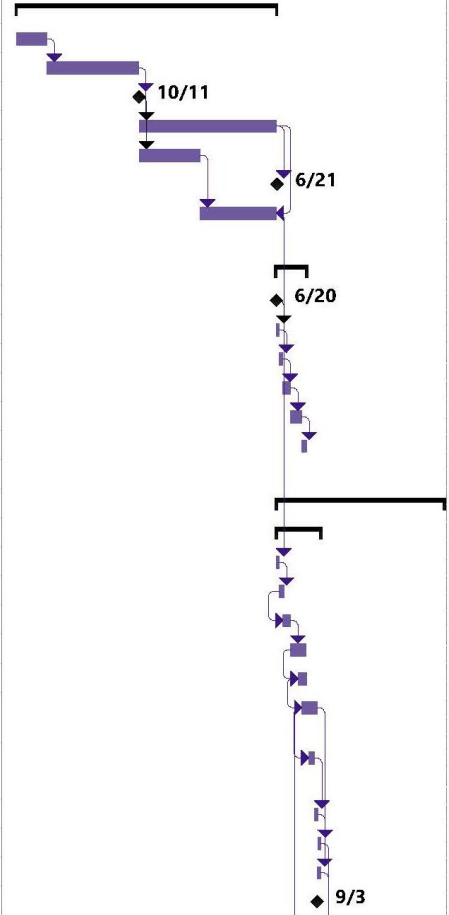
Below you can find a timeline of the Option 1 schedule including the design phase. A full schedule can be found on the following pages.

Option 1—Vertical Expansion



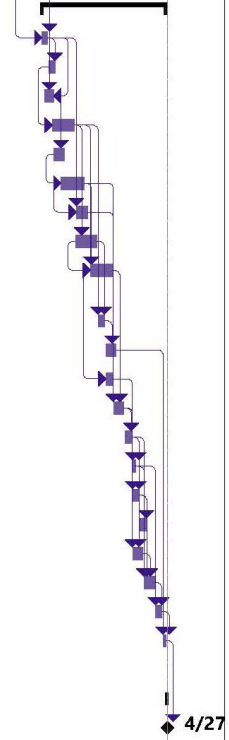
Schedule Option 1 - Long Branch - One floor vertical expansion

ID	Task Name	Duration	Start	Finish	Predecessors	Half 1, 2018	Half 2, 2018	Half 1, 2019	Half 2, 2019	Half 1, 2020	Half 2, 2020
						F	M	A	M	J	J
1	Design Phase	342 days	Thu 3/1/18	Fri 6/21/19							
2	Designer procurement	40 days	Thu 3/1/18	Wed 4/25/18							
3	Design development	120 days	Thu 4/26/18	Wed 10/10/18	2						
4	Permit Set complete	1 day	Thu 10/11/18	Thu 10/11/18	3						
5	Building plan approval/permit	180 days	Fri 10/12/18	Thu 6/20/19	3,4						
6	Construction drawings	80 days	Fri 10/12/18	Thu 1/31/19	4						
7	Building permit	1 day	Fri 6/21/19	Fri 6/21/19	5						
8	General contractor procurement	100 days	Fri 2/1/19	Thu 6/20/19	5FF,6						
9											
10	Install demountable classrooms	41 days	Thu 6/20/19	Thu 8/15/19							
11	Last Day of School	1 day	Thu 6/20/19	Thu 6/20/19							
12	Mobilize contractor	3 days	Fri 6/21/19	Tue 6/25/19	8,11						
13	Site prep for demountables	5 days	Wed 6/26/19	Tue 7/2/19	12						
14	U/G utilities for demountables	10 days	Wed 7/3/19	Tue 7/16/19	13						
15	Install demountables	15 days	Wed 7/17/19	Tue 8/6/19	14						
16	Site concrete - SW/Stairs	7 days	Wed 8/7/19	Thu 8/15/19	15						
17											
18	Building Construction	221 days	Fri 6/21/19	Fri 4/24/20							
19	Structure	58 days	Fri 6/21/19	Tue 9/10/19							
20	Mobilize contractor	3 days	Fri 6/21/19	Tue 6/25/19	8						
21	Temp protections	7 days	Wed 6/26/19	Thu 7/4/19	20						
22	Roof and select demolition	10 days	Wed 7/3/19	Tue 7/16/19	21SS+5 days						
23	Strengthen foundations & columns	20 days	Wed 7/17/19	Tue 8/13/19	22						
24	Masonry at stair towers	12 days	Wed 7/31/19	Thu 8/15/19	23SS+10 days						
25	Steel frame - new 2nd fl, walls & roof steel	20 days	Wed 8/7/19	Tue 9/3/19	24SS+5 days						
26	First elevated floor structural framing	9 days	Mon 8/19/19	Thu 8/29/19	25SS+8 days						
27	First elevated fl metal decking	4 days	Fri 8/30/19	Wed 9/4/19	26						
28	Slab @ elevated deck prep/pour	4 days	Thu 9/5/19	Tue 9/10/19	27						
29	Roof joists and decking	5 days	Wed 9/4/19	Tue 9/10/19	25						
30	First Day of School	1 day	Tue 9/3/19	Tue 9/3/19							



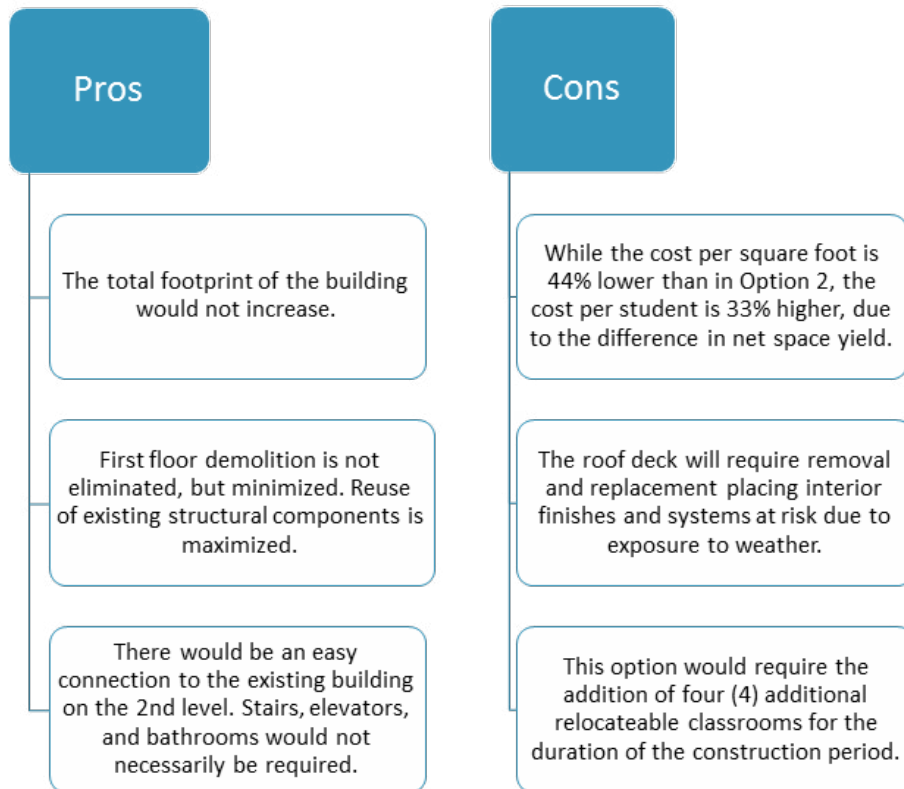
Schedule Option 1 - Long Branch - One floor vertical expansion

ID	Task Name	Duration	Start	Finish	Predecessors	alf 1, 2018	Half 2, 2018	Half 1, 2019	Half 2, 2019	Half 1, 2020	Ha
						F M A M J	J A S O N D	J F M A M J	J A S O N D	J F M A M J	J
31	Close in and fit out	163 days	Wed 9/11/19	Fri 4/24/20							
32	Building exterior wall framing	8 days	Wed 9/11/19	Fri 9/20/19	25SS+7 days,28						
33	Exterior wall sheathing	10 days	Mon 9/23/19	Fri 10/4/19	32						
34	Roofing	12 days	Mon 9/16/19	Tue 10/1/19	29,32FF+7 days						
35	Exterior building skin	30 days	Mon 9/30/19	Fri 11/8/19	33SS+5 days						
36	Interior wall framing	14 days	Wed 10/2/19	Mon 10/21/19	34						
37	MEP Rough in walls and ceilings	30 days	Wed 10/16/19	Tue 11/26/19	36SS+10 days						
38	Set Mechanical Equipment	15 days	Wed 11/13/19	Tue 12/3/19	32,37SS+20 days						
39	Windows	30 days	Mon 11/11/19	Fri 12/20/19	35						
40	Wall close in	30 days	Mon 12/9/19	Fri 1/17/20	37,35,39SS+20 days						
41	Exterior grading	10 days	Mon 12/23/19	Fri 1/3/20	35,39						
42	Site concrete - SW/Stairs	15 days	Mon 1/6/20	Fri 1/24/20	41						
43	Set door frames	10 days	Mon 1/6/20	Fri 1/17/20	40SS+20 days						
44	Ceiling grid and light fixtures	15 days	Mon 1/20/20	Fri 2/7/20	37,40,38						
45	Finishes/Paint	10 days	Mon 2/10/20	Fri 2/21/20	44						
46	Grilles, registers and diffusers	5 days	Mon 2/24/20	Fri 2/28/20	44,45						
47	Elec Trimout	10 days	Mon 2/24/20	Fri 3/6/20	44,45						
48	Specialties	10 days	Mon 3/9/20	Fri 3/20/20	47						
49	Doors and Hardware	15 days	Mon 2/24/20	Fri 3/13/20	43,45						
50	Flooring	15 days	Mon 3/16/20	Fri 4/3/20	45,46,47,49						
51	Test and balance	10 days	Mon 4/6/20	Fri 4/17/20	46,50						
52	Building Turnover	5 days	Mon 4/20/20	Fri 4/24/20	42,51						
53											
54	Project Completion	1 day	Mon 4/27/20	Mon 4/27/20							
55	Project Completion	1 day	Mon 4/27/20	Mon 4/27/20	52						



7. Pros & Cons

The team offers the following pros and cons for consideration.



8. Summary

A second-floor addition at the south corner of the school would yield four (4) new classrooms. The total estimated costs to complete this work is \$4,991,042 with a construction duration of approximately eleven (11) months, extending over a summer and the consecutive school year. The cost per square foot is relatively low, as the addition consists only of classrooms, without the need for additional support program spaces. Additionally, the connection to the existing school would be relatively simple, without the need for an elevator or additional set of stairs. While the estimated cost per square foot is relatively low, it translates to an investment of \$53,667 per seat.

Attempting to build out the structure and return the classrooms on the first floor by the start of school in the Fall may be possible; however, the risks of attempting this include:

- Significant schedule pressure, driving up cost significantly
- Exposure of the school to weather
- Significant risk of not completing the addition in time for the start of school
- Safety risks of working around an occupied space

Therefore, the approach to this option will include removing the existing first-floor four (4) classrooms from use for a year and providing temporary classrooms as “swing” space for the students. These conditions will add cost and will reduce play space and require temporary classrooms.

B. Option 2—New Structure at Blacktop Area

1. Description of Option & Scope of Work

Option 2 includes a new freestanding structure at the current location of the blacktop, adjacent to the gymnasium. This option adds 9,800 SF to the school, which can be used for up to eight (8) additional classrooms, or for other support program space. The building would have four (4) classrooms per floor and would include an internal staircase, elevator, small group bathrooms, and some additional storage space. Under this program, classroom sizes are under 900 square feet each, making them ideal for grades 1–5. Construction duration is anticipated to be fourteen (14) months and would include the following:

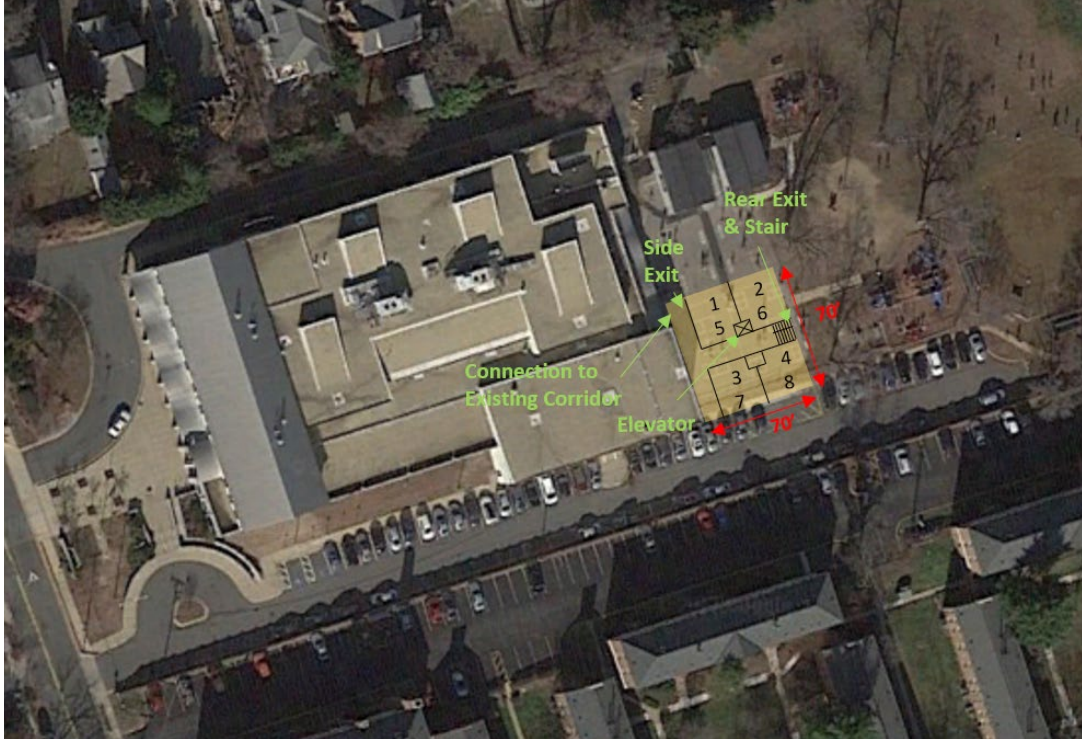
- Establish the construction site limits (refer to the site access plan included in this section).
- Install temporary protections to the existing school and around the proposed building site to segregate construction activities, minimize unnecessary damage, and impact areas outside of the construction zone.
- Remove the blacktop and install underground utilities.
- Grade the existing area and construct all structural foundation work.
- Install a new steel-frame two-story structure, with metal stud interior and exterior walls.
- The second floor roof is anticipated to be a conventionally framed bar-joist composite steel and concrete framed deck.
- Rough in for all necessary mechanical, electrical and plumbing and install any new units as required.
- Install the building skin using an exterior brick veneer cavity wall with metal stud backing, sheathing on the first floor, and EIFS on the second floor.
- Install a mechanically-fastened membrane flat roofing over the metal deck.
- Install ribbon or punch windows.
- Fit out the interior spaces of the eight (8) new classrooms ((four (4) per floor)) with impact-resistant

drywall, suspended acoustical ceiling, light fixtures, millwork, doors, frames and hardware, paint, and flooring. Flooring is anticipated to be carpet in the classrooms and wearable surface in the corridors.

- Test and balance the air-conditioning system for the classrooms below and the new classrooms to ensure commissioning is effective.
- At the end of construction, turn the site back over to the school and replace any landscaping or grading that was disturbed before the new school year.

The additional permanent capacity of this option is 186 seats based on 23.33 students per classroom. The additional permanent capacity of the school would increase from 533 seats to 719 seats.

2. Plan View



3. Structural & Soil Review

For the construction of a two-story addition to the building, Ehlert Bryan anticipates that the structural systems would be similar to the original building.

1½-metal roof deck over open web steel bar joists spaced at 5'-0" is anticipated for the roof system. Elevated floors would be a composite system consisting of 5-inch normal weight concrete over 2-inch metal deck supported by wide flange beams spaced at 8 feet, on center. The roof and elevated floors would be supported on either steel columns or loadbearing masonry walls. Conventional grade slabs and spread footings bearing at shallow depths below the ground surface are anticipated.

Interior and exterior walls for the building are expected to consist of masonry. Cold-formed metal stud framing will be used where prudent; high durability wall finishes are less important.

The addition would be a separate building, with a fire wall, from the original building, as needed by area calculations. This will also aid in phasing the fire alarm and sprinkler construction relative to the existing systems. A fire wall is anticipated between the new and existing construction. Some renovation to the existing building will be needed to interface the addition to the existing construction. Lateral stability for the addition is best provided using shear action of the interior and exterior masonry walls.

No geotechnical testing was performed for consideration in the performance of this study. However, based on the two (2) sets of original drawings, foundations for both constructions were engineered for an allowable soil bearing pressure of 2,500 PSF. The 1995 drawings also indicated that a geotechnical report was provided at that time. It is reasonable to consider 2,500 PSF for soil bearing since it has been utilized before; however, geotechnical testing would have to be performed at the time of new construction in order to confirm the foundation design parameters and provide a document for permit submission.



4. Site Access

Site access would be restricted to the back of the building. The contractor would most likely need to occupy a few parking spaces during the construction period. The construction fence could be kept close to the footprint of the addition with a small laydown space for materials. The rest of the blacktop area, relocatable classrooms, and playground would all remain as usable space during the school year. Construction traffic would have to travel through the school parking lot. To limit impact of noise and

large deliverables to the school, schedule most of the heavy civil and structural construction to be done throughout the summer.

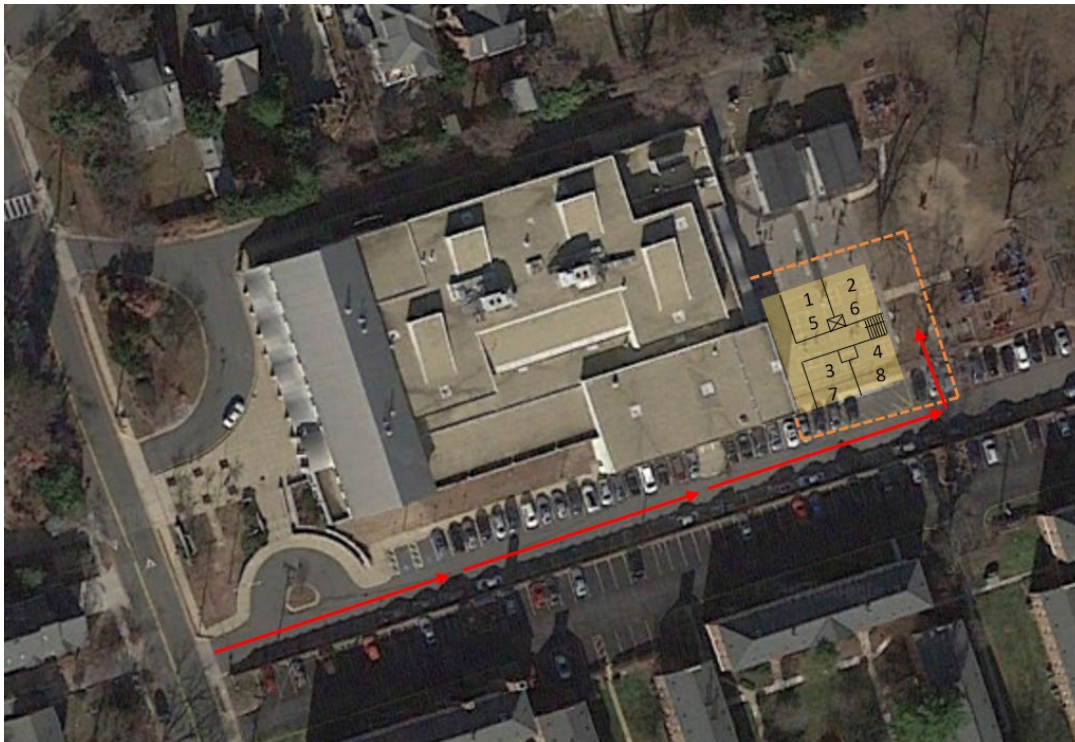




Photo 2.1



Photo 2.2



Photo 2.3



Photo 2.4

5. Estimated Budget

The total estimated cost for this addition is \$6,759,665.

This includes hard costs, escalation, soft costs, and owner's contingency. Not included in the cost is land acquisition, storm water management, or hazardous waste remediation for site preparation or selective demolition. The breakdown of the estimate can be found on the following pages.

Long Branch Elementary School School Expansion Feasibility Options



Option 2 Summary

			\$/SF	TOTAL	%
	Gross Area:		9,800 SF		
A10	Foundations		15.62	153,111	3%
A20	Basement Construction		7.92	77,640	2%
A	Substructure		23.55	230,751	5%
B10	Superstructure		37.02	362,800	8%
B20	Exterior Enclosure		38.50	377,254	8%
B30	Roofing		12.51	122,600	3%
B	Shell		88.03	862,654	19%
C10	Interior Construction		39.69	388,950	9%
C20	Stairways		3.07	30,080	1%
C30	Interior Finishes		23.00	225,400	5%
C	Interiors		65.76	644,430	14%
D10	Conveying Systems		9.18	90,000	2%
D20	Plumbing Systems		8.95	87,710	2%
D30	Heating, Ventilation & Air Conditioning		52.00	509,600	11%
D40	Fire Protection		3.00	29,400	1%
D50	Electrical Lighting, Power & Communications		42.00	411,600	9%
D	Services		115.13	1,128,310	25%
E10	Equipment		4.00	39,200	1%
E20	Furnishings		3.98	39,015	1%
E	Equipment & Furnishings		7.98	78,215	2%
F10	Special Construction		0.00	0	0%
F20	Selective Demolition		1.02	10,000	0%
F	Special Construction & Demolition		1.02	10,000	0%
G10	Site Preparation		4.42	43,275	1%
G20	Site Improvements		14.29	140,000	3%
G30	Site Mechanical Utilities		7.14	70,000	2%
G40	Site Electrical Utilities		3.06	30,000	1%
G90	Other Site Construction		0.00	0	0%
G	Building Sitework		28.91	283,275	6%
Z1	Design Contingency	10.00%	33.04	323,763	7%
BUILDING & SITEWORK DIRECT COST BEFORE GC MARK-UPS			363.41	3,561,397	80%
Z10	General Conditions	8.00%	29.07	284,912	6%
Z11	Phasing/Interface	1.00%	3.92	38,463	1%
Z12	Bonds & insurances	1.75%	6.94	67,984	2%
Z13	Contractors Overhead & Profit	5.00%	20.17	197,638	4%
TOTAL CONSTRUCTION COST BEFORE ESCALATION			423.51	4,150,394	93%
Z30	Escalation	7.68%	32.53	318,806	7%
ESTIMATED CONSTRUCTION COST AT AWARD			456.04	4,469,200	100%
	Construction Contingency	10.00%		446,920	
	Project Soft Costs	25.00%		1,229,030	
	Owner's Contingency	10.00%		614,515	
ESTIMATED TOTAL COST			689.76	6,759,665	

Long Branch Elementary School School Expansion Feasibility Options



Option 2

	Quantity	Unit	Rate	Total
A10 Foundations				
A1010 Standard Foundations				
Spread Footings	20	EA	1,500.00	30,000
Perimeter wall footing	75	CY	525.00	39,472
Elevator pit	1	EA	7,500.00	7,500
Waterproofing to pit walls	180	SF	12.00	2,160
Perimeter foundation drain	290	LF	20.00	5,800
A1020 Special Foundations				
n/a				
A1030 Slab on Grade				
Excavate for SOG	121	CY	12.00	1,453
Dispose off-site	121	CY	25.00	3,026
6" thick slab on grade, incl. 6" gravel	4,900	SF	10.00	49,000
Underslab drainage system	4,900	SF	3.00	14,700
				153,111
A20 Basement Construction				
A2020 Basement Walls				
Foundation walls, 12" CMU, complete	1,475	SF	24.00	35,400
Elevator shaft wall, 8" thick, complete	1,920	SF	22.00	42,240
				77,640
B10 Superstructure				
B1010 Floor Construction				
Steel Frame	29	ton	4,500.00	132,300
First elevated floor decking	4,900	SF	3.50	17,150
First elevated slab on deck	4,900	SF	7.50	36,750
B1020 Roof Construction				
Steel Frame	29	ton	4,500.00	132,300
Roof decking & insulation	4,900	SF	7.00	34,300
Steel roof dunnage	1	LS	10,000.00	10,000
				362,800
B20 Exterior Enclosure				
B2010 Exterior Walls				
Brick veneer insulated cavity wall on stud back up	2,871	SF	40.00	114,840
EIFS to upper level	3,350	SF	28.00	93,786
Coping	290	LF	35.00	10,150

Long Branch Elementary School School Expansion Feasibility Options



Option 2

	Quantity	Unit	Rate	Total
B2020 Exterior Windows				
Windows (25%)	2,074	SF	65.00	134,778
B2030 Exterior Doors				
Glass door, complete; single	2	EA	4,800.00	9,600
Glass door, complete; double	1	PR	10,500.00	10,500
Solid exterior doors, complete; single	2	EA	1,800.00	3,600
				377,254
B30 Roofing				
B3010 Roof Coverings				
Roof coverings & insulation	4,900	SF	24.00	117,600
B3020 Roof Openings				
Allowance for penetrations	5	EA	1,000.00	5,000
				122,600
C10 Interior Construction				
C1010 Partitions				
Interior partitions allowance	9,800	SF	13.50	132,300
Interior glazing/storefront allowance	9,800	SF	2.75	26,950
Allow for misc. metals and blocking	9,800	SF	2.50	24,500
C1020 Interior Doors				
Interior doors including door, frame & hardware complete, allow				
- Single leaf	36	EA	1,400.00	50,400
- double leaf	8	PR	2,200.00	17,600
C1030 Fittings				
Allowance	9,800	SF	14.00	137,200
				388,950
C20 Stairways				
C2010 Stair Construction				
Interior stairs, incl. railings	32	Riser	850.00	27,200
C2020 Stair Finishes				
Paint and sealer egress stair - concrete sealant	32	Riser	90.00	2,880
				30,080

Long Branch Elementary School School Expansion Feasibility Options



Option 2

	Quantity	Unit	Rate	Total
C30 Interior Finishes				
C3010 Wall Finishes				
Allowance	9,800	SF	4.50	44,100
C3020 Floor Finishes				
Allowance	9,800	SF	9.50	93,100
C3030 Ceiling Finishes				
Allowance	9,800	SF	7.50	73,500
Allowance for premium ceilings	980	SF	15.00	14,700
				225,400
D10 Conveying Systems				
D1010 Elevators & Lifts				
2-stop elevator	1	EA	90,000.00	90,000
				90,000
D20 Plumbing Systems				
<u>Plumbing Fixtures</u>				
Allowance	9,800	SF	1.80	17,640
<u>Domestic Water Distribution</u>				
Allowance	9,800	SF	2.50	24,500
<u>Sanitary Waste and Vent Distribution</u>				
Allowance	9,800	SF	2.15	21,070
<u>Storm Distribution</u>				
Allowance	9,800	SF	1.35	13,230
<u>Other Plumbing Systems</u>				
Allowance	9,800	SF	1.15	11,270
				87,710
D30 Heating, Ventilation & Air Conditioning				
Allowance	9,800	SF	52.00	509,600
				509,600

Option 2

	Quantity	Unit	Rate	Total
D40 Fire Protection				
Allowance	9,800	SF	3.00	29,400
				29,400
D50 Electrical Lighting, Power & Communications				
Allowance	9,800	SF	42.00	411,600
				411,600
E10 Equipment				
E1020 Institutional Equipment				
Allowance	9,800	SF	4.00	39,200
				39,200
E20 Furnishings				
E2010 Fixed Furnishings				
Window treatments	2,074	SF	7.00	14,515
General allowance	9,800	SF	2.50	24,500
				39,015
F20 Selective Demolition				
F2010 Building Elements Demolition				
Allowance - tie in to existing school	1	LS	10,000.00	10,000
F2020 Hazardous Components Abatement				
<i>Excluded</i>				Excluded
				10,000
G10 Site Preparation				
G1010 Site Clearing				
Allowance	14,700	SF	0.75	11,025
G1020 Site Demolition and Relocations				
Allow for concrete paving removal	4,900	SF	2.00	9,800
Allow for miscellaneous selective removal	1	LS	15,000.00	15,000
G1030 Site Earthwork				
Rough grading	4,900	SF	0.50	2,450
Allow for erosion control	1	LS	5,000.00	5,000
G1040 Hazardous Waste Remediation				
<i>Excluded</i>				Excluded

Long Branch Elementary School School Expansion Feasibility Options



Option 2

Quantity Unit Rate Total

43,275

G20 Site Improvements

G2010 Roadways

G2020 Parking Lots

G2030 Pedestrian Paving
Allowance

2,500 SF 30.00 75,000

G2040 Site Development
Allowance for site walls, ramps etc

1 LS 50,000.00 50,000

G2050 Landscaping
Allowance

1 LS 15,000.00 15,000

140,000

G30 Site Mechanical Utilities

Water - allowance

1 LS \$15,000.00 15,000

Storm drainage - allowance

1 LS \$35,000.00 35,000

Sewer - allowance

1 LS \$20,000.00 20,000

70,000

G40 Site Electrical Utilities

G4010 Electrical Distribution
Allowance

1 LS 10,000.00 10,000

G4020 Site Lighting
Allowance

1 LS 12,500.00 12,500

G4030 Site Communications & Security
Allowance

1 LS 7,500.00 7,500

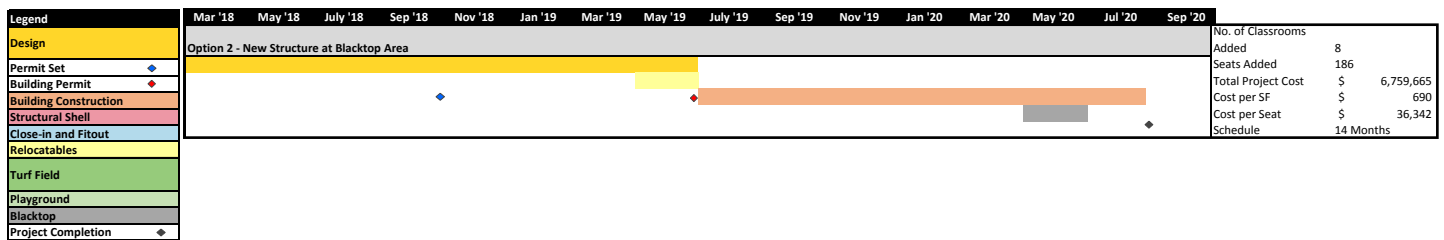
30,000

6. Schedule

The construction schedule for this option would span over a summer and the consecutive school year for a total length of roughly fourteen (14) months. It assumes starting construction in June when school gets out. The first June that would allow adequate time for the design phase is June 2019. This assumes ownership and access to the land not owned by APS at this time can occur by March 2018.

The chart below shows the schedule for Option 2 including the design phase. A full schedule can be found on the next two pages.

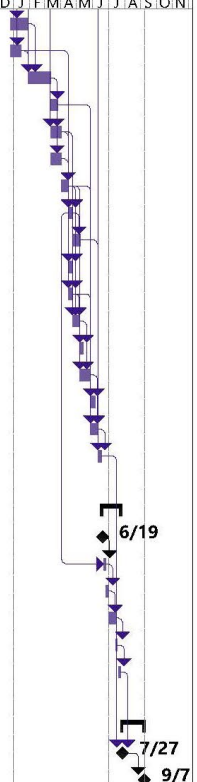
Option 2—New Structure at Blacktop Area



Option 2 - Stand alone school addition

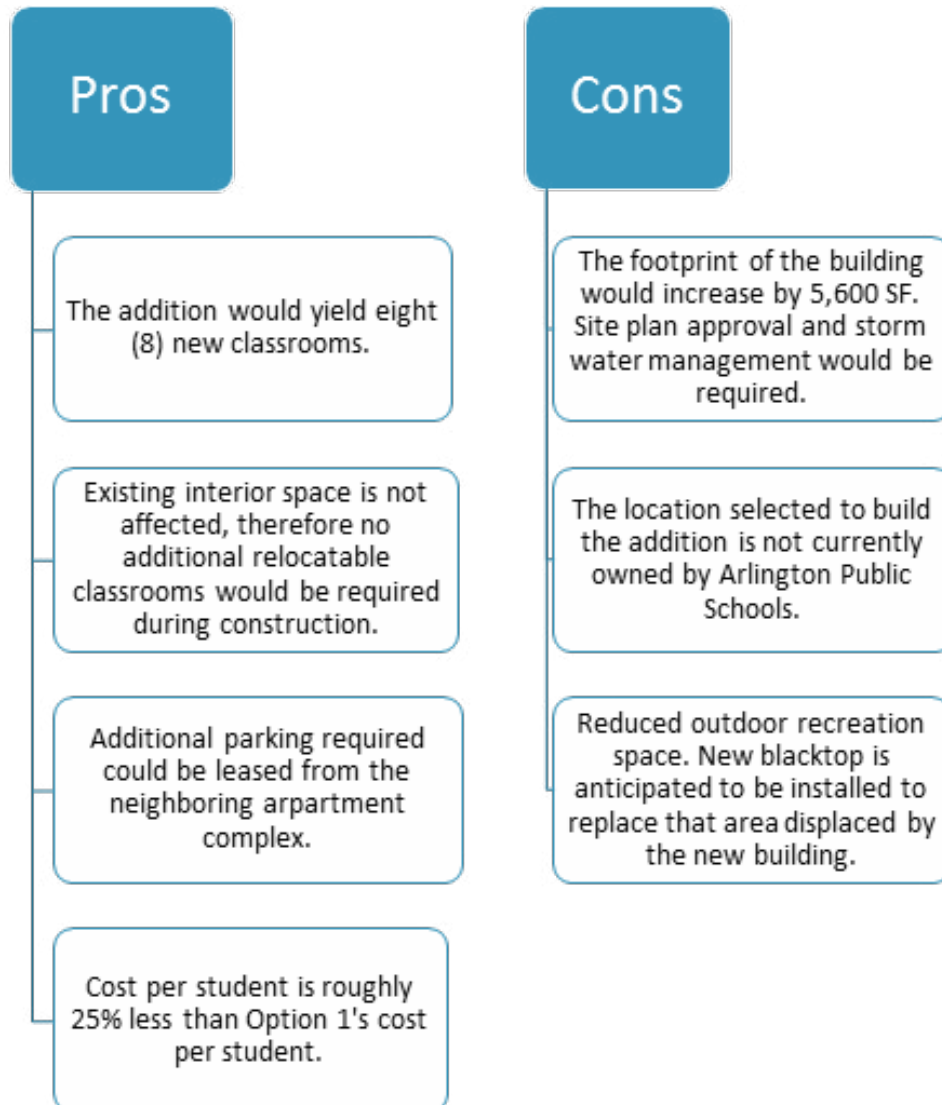
ID	Task Name	Duration	Start	Finish	Predecessors	Half 1, 2018	Half 2, 2018	Half 1, 2019	Half 2, 2019	Half 1, 2020	Half 2, 2020
						F M A M J J	J A S O N D	J F M A M J	J A S O N D	J F M A M J	J A S O N D
1	Design Phase	342 days	Thu 3/1/18	Fri 6/21/19							
2	Designer procurement	40 days	Thu 3/1/18	Wed 4/25/18							
3	Site plan development	40 days	Thu 4/26/18	Wed 6/20/18	2						
4	Site plan approval	200 days	Thu 6/21/18	Wed 3/27/19	3						
5	Design development	120 days	Thu 4/26/18	Wed 10/10/18	2						
6	Permit Set complete	1 day	Thu 10/11/18	Thu 10/11/18	5						
7	Building plan approval/permit	180 days	Fri 10/12/18	Thu 6/20/19	5,4FF,6						
8	Construction drawings	80 days	Fri 10/12/18	Thu 1/31/19	6						
9	Building permit	1 day	Fri 6/21/19	Fri 6/21/19	7						
10	General contractor procurement	100 days	Fri 2/1/19	Thu 6/20/19	7FF,8						
11											
12	Building Construction	260 days	Thu 6/20/19	Wed 6/17/20							
13	Last day of school	1 day	Thu 6/20/19	Thu 6/20/19							
14	Mobilize contractor	3 days	Fri 6/21/19	Tue 6/25/19	10						
15	Clearing, grading & erosion control	12 days	Wed 6/26/19	Thu 7/11/19	14						
16	U/G Site utilities	14 days	Fri 7/12/19	Wed 7/31/19	15						
17	Foundations	12 days	Tue 7/23/19	Wed 8/7/19	15,16SS+7 day						
18	U/G MEP Rough In	15 days	Thu 8/1/19	Wed 8/21/19	16,17FF+5 day						
19	Steel frame - two story	20 days	Thu 8/8/19	Wed 9/4/19	17						
20	Slab on grade	10 days	Thu 8/22/19	Wed 9/4/19	18						
21	2nd floor metal deck	6 days	Mon 8/26/19	Mon 9/2/19	19SS+12 days						
22	F, R, P 2nd floor composite slab	8 days	Tue 9/3/19	Thu 9/12/19	21						
23	First Day of School	1 day	Wed 9/4/19	Wed 9/4/19							
24	Roof joists and decking	10 days	Thu 9/5/19	Wed 9/18/19	19						
25	Masonry at core, elevator and bathrooms	25 days	Tue 8/13/19	Mon 9/16/19	20FF+8 days,17						
26	Elevator install	80 days	Tue 9/17/19	Mon 1/6/20	25						
27	Roofing	15 days	Mon 9/23/19	Fri 10/11/19	24,28FF+7 day						
28	Building exterior wall framing	12 days	Tue 9/17/19	Wed 10/2/19	20,29SS						
29	Building Interior wall framing	25 days	Tue 9/17/19	Mon 10/21/19	20,25,22						
30	Exterior wall sheathing	15 days	Thu 10/3/19	Wed 10/23/19	28						
31	MEP Rough in walls and ceilings	65 days	Tue 10/8/19	Mon 1/6/20	29SS+15 days						
32	Exterior building skin	45 days	Thu 10/24/19	Wed 12/25/19	30						
33	Set Mechanical Equipment	25 days	Tue 11/19/19	Mon 12/23/19	31SS+30 days						

Option 2 - Stand alone school addition											
ID	Task Name	Duration	Start	Finish	Predecessors	Half 1, 2018	Half 2, 2018	Half 1, 2019	Half 2, 2019	Half 1, 2020	Half 2, 2020
						F M A M J	J A S O N D	J F M A M J	J A S O N D	J F M A M J	J A S O N D
34	Windows	25 days	Thu 12/26/19	Wed 1/29/20	32						
35	Entry storefront/glazing	15 days	Thu 12/26/19	Wed 1/15/20	32						
36	Wall close in	30 days	Thu 1/30/20	Wed 3/11/20	31,32,34,35,26						
37	Set door frames	10 days	Thu 3/12/20	Wed 3/25/20	36						
38	Ceiling grid and light fixtures	15 days	Thu 3/12/20	Wed 4/1/20	36,31						
39	Tile	15 days	Thu 3/12/20	Wed 4/1/20	36						
40	Finishes/Paint	10 days	Thu 4/2/20	Wed 4/15/20	38,39						
41	Exterior grading	5 days	Thu 4/16/20	Wed 4/22/20	35,40						
42	Site concrete - SW/Stairs	12 days	Thu 4/23/20	Fri 5/8/20	41						
43	Plumbing Fixtures	5 days	Thu 4/16/20	Wed 4/22/20	39,40						
44	Grilles, registers and diffusers	5 days	Thu 4/16/20	Wed 4/22/20	38,40						
45	Elec Trimout	10 days	Thu 4/23/20	Wed 5/6/20	38,40,44						
46	Specialties	5 days	Thu 5/7/20	Wed 5/13/20	40,45						
47	Flooring	15 days	Thu 5/7/20	Wed 5/27/20	40,44,45						
48	Doors and Hardware	7 days	Thu 5/28/20	Fri 6/5/20	40,37,47						
49	Test and balance	10 days	Thu 5/28/20	Wed 6/10/20	44,47						
50	Building Turnover	5 days	Thu 6/11/20	Wed 6/17/20	49,42,26						
51											
52	Blacktop	26 days	Fri 6/19/20	Fri 7/24/20							
53	Last day of school	1 day	Fri 6/19/20	Fri 6/19/20							
54	Grade for blacktop	4 days	Mon 6/22/20	Thu 6/25/20	41SS,53						
55	Install new blacktop	3 days	Fri 6/26/20	Tue 6/30/20	54						
56	Install playground equipment	10 days	Wed 7/1/20	Tue 7/14/20	55						
57	Striping	3 days	Wed 7/15/20	Fri 7/17/20	56						
58	Fencing	5 days	Mon 7/20/20	Fri 7/24/20	57						
59											
60	Project Completion	31 days	Mon 7/27/20	Mon 9/7/20							
61	Project Completion	1 day	Mon 7/27/20	Mon 7/27/20	50,58						
62	First Day of School	1 day	Mon 9/7/20	Mon 9/7/20	61						



7. Pros & Cons

The team offers the following pros and cons for consideration.



8. Summary

The stand-alone two-story addition would yield eight (8) new classrooms. The total project cost to complete this option is estimated to be \$6,759,665, with a construction duration of fourteen (14) months, extending over two (2) summers and a school term year. While the cost is estimated to be \$690/SF and is significantly higher than Option 1, this option translates to a cost of \$36,342 per seat. In addition, the new wing could accommodate

additional support program space until the building capacity is required to meet future enrollment. Finally, construction can:

- Occur during normal business hours
- Be segregated from the on-going school operation to maximize safety and reduce risk to the contractor
- Be connected to the school relatively easily
- Result in more efficient investment (greater value for the dollar invested)

A. List of Drawings

1972 Plans

- Architectural Sheets:
 - A1
 - A2
 - A3
 - A4
 - A5
 - A6
 - A7
 - A8
 - A9
 - A10
 - A11
 - A12
 - A13
 - A14
 - A15
 - A16
 - A17
 - A18
 - A19
 - A20
- Structural Sheets:
 - S1
 - S2
 - S3
 - S4
 - S5
 - S6
- Mechanical Sheets:
 - M1
 - M2
 - M3
 - M4

- Plumbing Sheets:
 - P1
 - P2
 - P3
- Electrical Sheets:
 - E1
 - E2
 - E3
 - E4
 - E5
 - E6
 - E7
 - E8

1992 Plans

Cover Sheet

- Site Plan
- Drainage Divides & Erosion & Sediment Control Plan
- Waterline & Storm Water Detention Profile & Details
- Existing Conditions/Drainage Divides

1999 Plans

- Information Technology Sheets:
 - IT1
 - IT2
 - IT3
 - IT4
 - IT5

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