

II. Cora Kelly Master Plan and Technical Data

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Introduction

Cora Kelly School for Math, Science, and Technology

Cora Kelly Elementary School was built in 1955 on an undersized 4.5-acre lot and has not built any addition addressing changes in student population or curriculum guidelines. It is located west of Commonwealth Avenue, south of Four Mile Run Stream, surrounded by a variety of housing densities and commercial sites. The school is dedicated to preparing its students for the 21st century through science, technology, engineering, and math (STEM). The site is bound by an RPA (resource protection area) line along the west and northwest of the site which limits both scale and location for future growth.

Critical Findings

Given the projected student capacity, the current site would exhibit a strain on on-site access for parking and drop-off, the shared recreation center gym would be over-utilized due to an increase in student population, and less open green space would be available. The master plan study provides possible scenarios in either relocating the school and site access which creates a stronger dialogue with the creek and Four Mile Run Park, which reinforces the academic nature of Cora Kelly (a STEM school), and establishing a clearer adjacency of recreational programs for the public. Other master plan studies explore the possible scenarios of replacing the school in place and sharing resources with the existing recreation center and public open space.

The Limits and Benefits of a Feasibility Study

Although a TSSA and a Masterplan Study provides a plethora of information with respect to cost, time, and quantity, the TSSA and Masterplan do not offer, nor does it try to offer, a level of specificity that can be used as a solution or design. The benefits of a TSSA and Feasibility Study can be found both in its objective assessment of current conditions, and conceptual rigor of conveying the possible approaches to current challenges.

Issues that Require Future Study

The RPA boundary is critical in understanding the limits and possibilities of future growth, whether it is an addition or replacement and reorientation of the school. Currently, zoning does not allow any new construction other than passive recreation on the RPA boundary. If Cora Kelly experiences a substantial growth of student capacity, the current site configuration will experience severe limitations with accommodating new addition while maintaining public open space.

Educational Specification Assessment

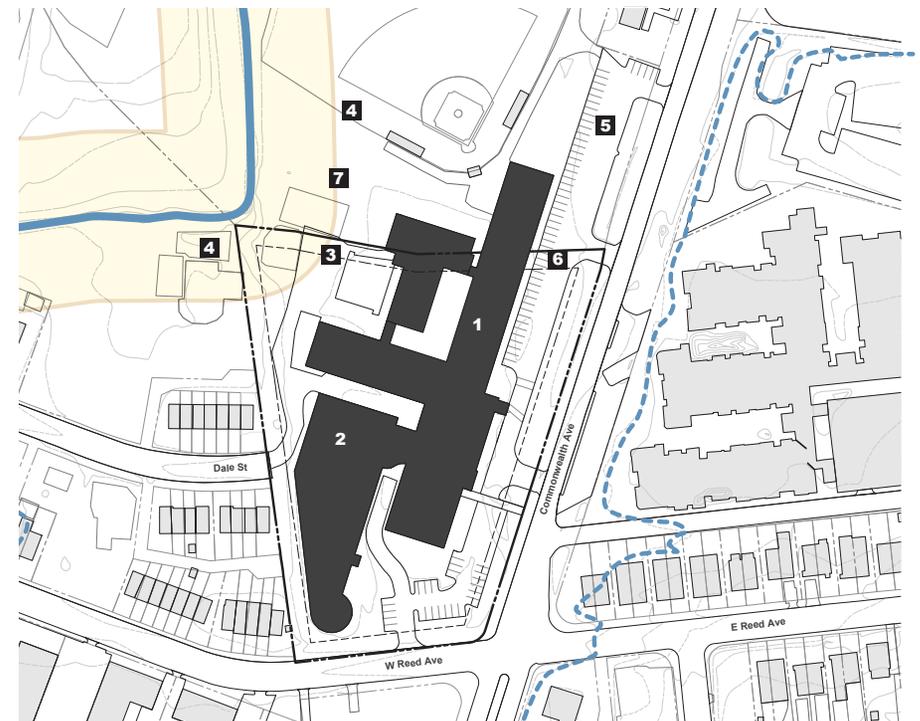
Capacity and Program

Cora Kelly is currently 76,840 gross square feet. Per the Ed Specs, the school is **28,102 square feet deficient** in gross building area without a new gymnasium and **37,624 square feet deficient** in gross building area with a new gymnasium. The school is **54,670 square feet deficient** in the outdoor play space area. Cora Kelly's projected enrollment capacity is **720 students**, with an enrollment of 379 students.

Cora Kelly contains a STEM Program, Head Start Program, and Citywide ED Program which was also included in the assessment.

Site Plan

1. Existing renovated school
2. Existing rec center limits siting of new construction or renovation.
3. Limited exterior play space.
4. Encroachment into POS.
5. Existing car drop-off
6. 72 Existing parking space.
7. RPA Line



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Site Assessments

Zoning and Site Utilization

Cora Kelly School for Math, Science, and Technology is located on 3600 Commonwealth Ave in an RB (Townhouse) zoning district. The current lot is 197,673 square feet and the school currently shares the lot with the Leonard Armstrong Recreation Center. Cora Kelly encroaches over the property line into the public open space (POS).

Map and Zoning Information



Address	3600 Commonwealth Ave	
Tax Map	15.02	7.04
Zoning	RB	POS
Lot Size	197,673	1,953,958
Current SF	69,516	
FAR	0.75	
Allowed SF	148,255	
Setbacks	Front- 20'	
	Side- 25', 1:1 ratio	
	Rear- 25', 1:1 ratio	
Max Height	45'	
Parking	~36 reqd, ~72 exst	

Notes:

Existing school and modular classrooms encroach on POS parcel.

Far is maxed out for RB parcel only, School used POS lot to build modular classroom addition in 2010

Site Access and Circulation

Table 9 provides a summary of the existing and future demands for Cora Kelly. The planned increase in student population will increase the number of buses serving the site, parking demand, and the maximum dismissal queue length. This assumes that each category of demand will increase linearly by approximately 91% to 106%, due to the 91% to 106% increase in student population.

Table 9
Cora Kelly

	Population/Demand	
	Existing	Future
Students	379 students	650-700 students
Buses Serving Demand	3 buses	5-6 buses
Parking Demand	59 spaces	114-123 spaces
Maximum Dismissal Queue	16 vehicles	31-33 vehicles

Play and Open Space

In addition to the state requirements, Alexandria's new Green Building Policy requires that the existing and future stormwater demands for Cora Kelly and George Mason are 100% treated by green infrastructure practices.

To achieve 100% treatment of stormwater and meet BMP requirements, it is recommended to divide the site into multiple drainage areas. A combination of rain gardens, stone base, and under basins below permeable turf fields, over 50% green roof, and permeable parking spaces would achieve a phosphorous removal over the required 2.81 lb/yr.

All play areas should be protected from vehicular and pedestrian traffic, so students can be assured of a safe and secure environment on the entire school site. The Virginia Department of Education Facilities Guidelines recommends that each school "site have areas that can be developed to provide the minimum number of play areas require for physical education;" as indicated by the chart on **Table 11**.

Alexandria school sites are urban in nature and most current and future sites cannot accommodate the recommendations outlined in the Guidelines for School Facilities in Virginia's Public Schools. However, every elementary school site should accommodate non-structured or natural play-areas as well as at least one playground. It is recommended that architects work with ACPS and RPCA to prioritize types of outdoor space development on a site-specific basis.

The Ed. Specs recommend approximately 73,400 - 83,640 square feet (sf) of play area for a 600-student population. Cora Kelly is heavily deficient due to its site constraints of being bound to the recreation center and the baseball fields in the public open space. Cora Kelly currently has 28,970 sf of play space, which is **54,670 sf deficient** of the recommend play space area.

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Table 11
Playspace Size and Quantity

SPACE	QUANTITY
Multiuse (Hard Surface)*	(2) 100' x 120'
Fitness Development Fenced Equipment Area (PK-1)	(1) 100' x 120'
Fitness Development Fenced Equipment Area (2-5)	(1) 100' x 120'
Multiuse Field Play Area	(2) 180' x 140'

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

**Ed Specs are for a school population of 600+

Building Assessment

Safety and Security

ACPS maintains an inviting and de-institutionalized environment, while simultaneously providing a safe environment for students, staff, and community who use the facility and adjacent support services. Studio 27 Architecture evaluated the safety and security of each school in 6 categories: Building Layout, Building Materials, Uses of Technology, Visitor Management, Vehicular and Pedestrian Traffic, and Other Site Concerns.

The categories of largest concern for Cora Kelly Elementary are Building Layout, Building Materials, and Visitor Management. Interior circulation paths are long and illogical, with poor sightlines along corridors and from staff spaces for passive surveillance. Interior finishes were adequate when installed but are now in poor condition. There is a lack of a secured entry vestibule and security desk with clear sightlines of the approach to the school.

Envelope

Cora Kelly and George Mason Elementary schools are housed in aging facilities and will require a substantial renovation or upgrade to meet LEED and Net Zero standards. Studio 27 Architecture interviewed school leaders and visited both schools to assess the current conditions of the building envelopes and evaluate the impact of the observed envelope issues.

The largest concern for Cora Kelly is the continued maintenance of the masonry, EIFS system, entrances, and envelope penetrations. There is visible masonry cracking at multiple locations and damage to the EIFS system. Exterior grilles are in poor condition and stains on the brick below window sills. Water appears to pool where the play surface meets the exterior brick. Most entrance doors are in poor condition with visible rust and large undercuts allowing unwanted thermal transfer between the interior and exterior.

Due to the sprawling nature of Cora Kelly’s plan, the envelope is much larger in surface area than it needs to be for a new school with the same interior square footage. This larger form factor has a big impact on energy use and consequently higher operations costs.

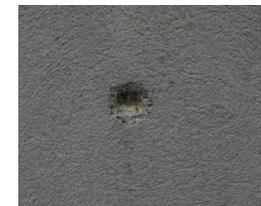
Accessibility

ACPS has made it a strong priority to make its facilities accessible to all students and staff. Universal Design is one of ACPS’s 10 driving design principles, established in the 2015 Educational Specifications. Universal Design is the design of buildings and environments to make them accessible to all people, regardless of age, disability, or other factors.

Since 2012, accessibility in schools has been the law. Title II of the Americans with Disabilities Act prohibits disability discrimination by all public entities, including schools, at the local and state level.

The highest priority item of concern for Cora Kelly Elementary School is that the school does not have an elevator. The second story of the building contains areas of primary function to the school curriculum that students in wheelchairs can not access. Many plumbing fixtures and facilities at Cora Kelly are not ADA accessible. This includes water fountains in the corridors, sinks in classrooms, and bathrooms in classrooms. The majority of the library is not accessible because of the sunken ‘pit’ design of the central area.

Existing Envelope Condition



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Technical Information

Traffic Study

This memorandum presents the findings of an operational review of the existing Cora Kelly School for Math, Science, and Technology located at 3600 Commonwealth Avenue in Alexandria, Virginia. The purpose of this memorandum is to review site circulation, student arrival and dismissal, and parking at this location to help plan for future improvements.

At the time when Gorove/Slade, our certified traffic engineering firm observed conditions at the existing location, the Cora Kelly School served a total of 340 students. The site includes a 70-space surface parking lot with an additional 30 spaces across from the school on the east side of Commonwealth Avenue. The school is planned to increase its student population to include approximately 650 to 700 students in the future. Potential changes to arrival/dismissal operations and parking on the site are currently being evaluated. Figure 1 provides a map showing an overview of the Cora Kelly School site.

This memorandum reaches the following conclusions:

- Based on observations, the existing Cora Kelly school does not have any significant parking or queuing issues during arrival and dismissal. This is mainly because most of these activities take place in the on-site parking lot and the north end of Commonwealth Avenue is a dead end and does not have high non-school traffic volumes. Currently, parent/guardian pick-up/drop-off is assisted by school staff/teachers.
- Parent/guardian pick-up/drop-off activity does occur external to the on-site lot, along both sides of Dale Street and Reed Avenue, the cul-de-sac on the north end of Commonwealth Avenue, and the Four Mile Run Trail. No significant queuing issues were observed on the adjacent streets due to this.

Site Operations

Regular school hours for the Cora Kelly School are from 8:00 AM to 2:35 PM. Gorove/Slade performed arrival/dismissal site observations on Tuesday, November 19, 2019, from 7:15 AM to 8:15 AM and on Thursday, November 21, 2019, from 2:15 PM to 3:15 PM. Based on these observations, the arrival and dismissal operations are summarized in Figure 2 and Figure 3.

Arrival Operations

Bus

There are three (3) buses that serve the school and the existing bus area can

accommodate the demand with no queuing issues during arrival. Bus arrivals begin at approximately 7:30 AM. Buses enter from the designated bus entrance on Commonwealth Avenue and drop off students in the unloading area in front of the lobby entrance. The second and third buses arrive in 5 to 10-minute intervals after the first, dropping off students in the same location. Parents/guardians that arrive after all buses have departed use the bus area to drop off their student(s) closest to the front door of the school.

Parent/Guardian Drop-off

Parent/guardian drop-off operations occur between 7:30 AM and 8:15 AM. The designated area for parent/guardian drop-off is located in the on-site parking lot. Vehicles enter the drop-off area using the signed entrance on Commonwealth Avenue. As vehicles arrive, school staff/teachers are present to supervise and assist with the drop-off. The maximum peak vehicle queue was observed at approximately 7:40 AM and consisted of five (5) vehicles. This queue was contained within the on-site parking lot and did not extend onto Commonwealth Avenue. Once students exit each vehicle, the vehicle departs the area allowing the following vehicles to drop-off. Vehicles exit the parking lot using a driveway shared by buses entering the site, as shown in Figure 2. Additional drop-off activity occurs along Dale Street, Reed Avenue, and the adjacent recreation center parking lot. At these locations, parents/guardians opt to park and walk in their student(s). Overall, arrival operations are effective with no significant queuing issues.

Student Bike/Walk

In addition to bus and parent/guardian drop-off, there are several students that bike and walk to the Cora Kelly School. Starting from 7:25 AM, a crossing guard is stationed at the intersection of Reed Avenue and Commonwealth Avenue to assist with students that are crossing. Students begin arriving at approximately 7:30 AM. Most students arrive via Reed Avenue, from the east and west, and the Four Mile Run Trail, from the north, and enter the school through the cafeteria entrance on the south end of the school.

Dismissal Operations

Bus

Three (3) buses queue in the bus loading area by approximately 2:20 PM to wait for student dismissal at 2:35 PM. Once dismissed, students exit the school from the front entrance and load onto their respective buses. Parents/guardians that arrive after all buses have departed use the bus area to pick-up their student(s) closest to the front door of the school.

Parent/Guardian Pick-up:

Parent/guardian drop-off operations occur between 2:20 PM and 3:10 PM. The

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designated area for parent/guardian pick-up is also located in the on-site parking lot. Vehicles enter the drop-off area using the signed entrance on Commonwealth Avenue. Because vehicles arrive before students are dismissed at 2:35 PM, the maximum peak queue length occurs at approximately 2:30 PM and was observed to consist of 16 vehicles. This queue did extend onto Commonwealth Avenue. However, since the north end of Commonwealth Avenue is effectively a dead end, the queue minimally impedes non-school traffic. Once students are dismissed, school staff/teachers are present to supervise pick-up and match students to the vehicles. Once students enter their vehicle, the vehicle departs the area allowing the following vehicles to enter the pick-up area. Vehicles exit the parking lot using a driveway shared by buses entering the site, as shown in Figure 3. Overall, dismissal operations are effective with no significant queuing issues.

Because the maximum queue for the designated pick-up area extends onto Commonwealth Avenue, pick-up activity was observed to occur in several other locations. Heavy pick-up activity occurs along Dale Street, Reed Avenue, and the south side of Commonwealth Avenue. Some activity was observed to occur along the Four Mile Run Trail but was minimal. To prevent parents/guardians from parking in the recreation center parking lot adjacent to the school, this area is closed to all traffic during dismissal.

Student Bike/Walk

Similar to arrival, there are several students that bike and walk from the Cora Kelly School. A crossing guard is stationed at the intersection of Reed Avenue and Commonwealth Avenue to assist with students that are crossing. Students exit the school through the cafeteria entrance that they enter through in the morning. Most students exit toward Reed Avenue, to the east and west, and the Four Mile Run Trail, to the north.

Parking

The Cora Kelly School provides a total of 100 parking spaces. There is a 70-space surface parking lot located on the site. Additional off-street staff-only parking is provided across from the school on the east side of Commonwealth Avenue. Parking activities in these locations are primarily designated for staff-only throughout the day.

The 30 staff-only parking spaces on the east side of Commonwealth Avenue are typically occupied first, most likely due to their proximity to the school's front entrance. These spaces are mostly full by approximately 7:15 AM before students arrive. Because these spaces are nearly or full before students arrive, the parent/guardian drop-off and vehicle queue in the parking lot may block empty parking spaces in the parking lot adjacent to the school. Both staff parking locations remain mostly full throughout the day and during the dismissal period. Similar to the student arrival period, some occupied parking spaces are blocked by the parent/guardian pick-up vehicle queue.

Expected Future Demand

The planned increase in student population will increase the number of buses serving the site, parking demand, and the maximum dismissal queue length. This memorandum assumes that each category of demand will increase linearly by approximately 91% to 106%, due to the 91% to 106% increase in student population. Table 1 provides a summary of the existing and future demands for the Cora Kelly School. The future parking demand projection is based on linear growth and maybe lower, either through having fewer than the planned number of students or through additional Transportation Demand Management (TDM) programs and policies. Thus, they represent the worst-case projections of demand.

- **Buses Serving Demand**
There is capacity within the existing bus area on the site to accommodate the increased bus demand.
- **Parking Supply and Demand**
The increased parking demand; cannot be accommodated within the existing 100-space parking supply on-site and on Commonwealth Avenue. If additional parking cannot be added on-site, there is an opportunity for additional parking along Commonwealth Avenue.
- **Maximum Dismissal Queue**
The increased dismissal queuing demand; can be accommodated within the existing pick-up/drop-off area. While the existing queue extends outside of the designated area onto Commonwealth Avenue, the projected increase in the queue will not extend past Reed Avenue or impede non-school traffic.

Table 1
Summary of Demand

	Population/Demand	
	Existing	Future
Students	379 students	650-700 students
Buses Serving Demand	3 buses	5-6 buses
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Maximum Dismissal Queue	16 vehicles	31-33 vehicles

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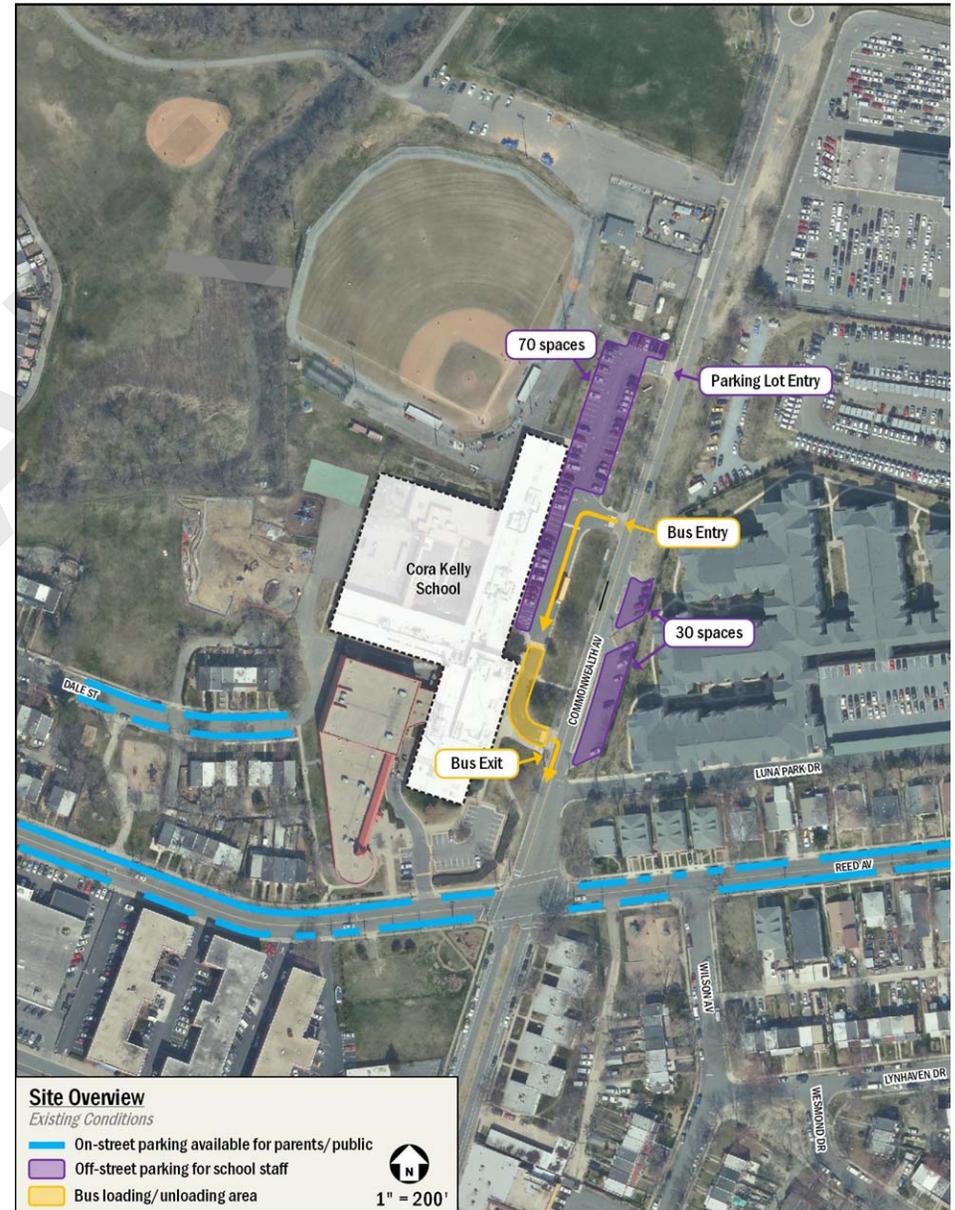
Conclusions

The goal of arrival/dismissal operations is to minimize impacts the site may have on the surrounding areas. This memorandum concludes that the arrival and dismissal operations observed and outlined above are adequate for the needs on the site and can be conducted efficiently and effectively with minimal impacts on nearby streets. The planned increase in student population and potential site improvements present opportunities to better meet the demands of the site. Based on the projections outlined above, this memorandum recommends providing a bus loading/unloading area that can accommodate up to six (6) buses, up to 123 parking spaces, and up to 33 queued pick-up vehicles during dismissal to meet the anticipated demand. Several changes can be made to better accommodate these projected demands, specifically adjustments to; (1) the size and location of the bus area, (2) the amount of available parking, and (3) the size and location of the designated pick-up/drop-off area.

As previously outlined, staff parking is located on-site and across the street on Commonwealth Avenue. If the parking on Commonwealth Avenue is removed in the future, there would most likely be overflow onto the nearby streets, which are generally occupied by the residents without driveways, unless those parking spaces are added elsewhere on the site. If spaces cannot be added, there is potential to increase the parking supply on Commonwealth Avenue to meet the demand. If the long dismissal queue length on Commonwealth Avenue is a concern, the designated pick-up/drop-off area can be expanded, and/or the queue could instead extend north on Commonwealth Avenue rather than south toward Reed Avenue.

Figure 2
Existing Site Overview

December 12, 2019



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Figure 3
Existing Drop-off Procedure Driving Arrival

December 12, 2019

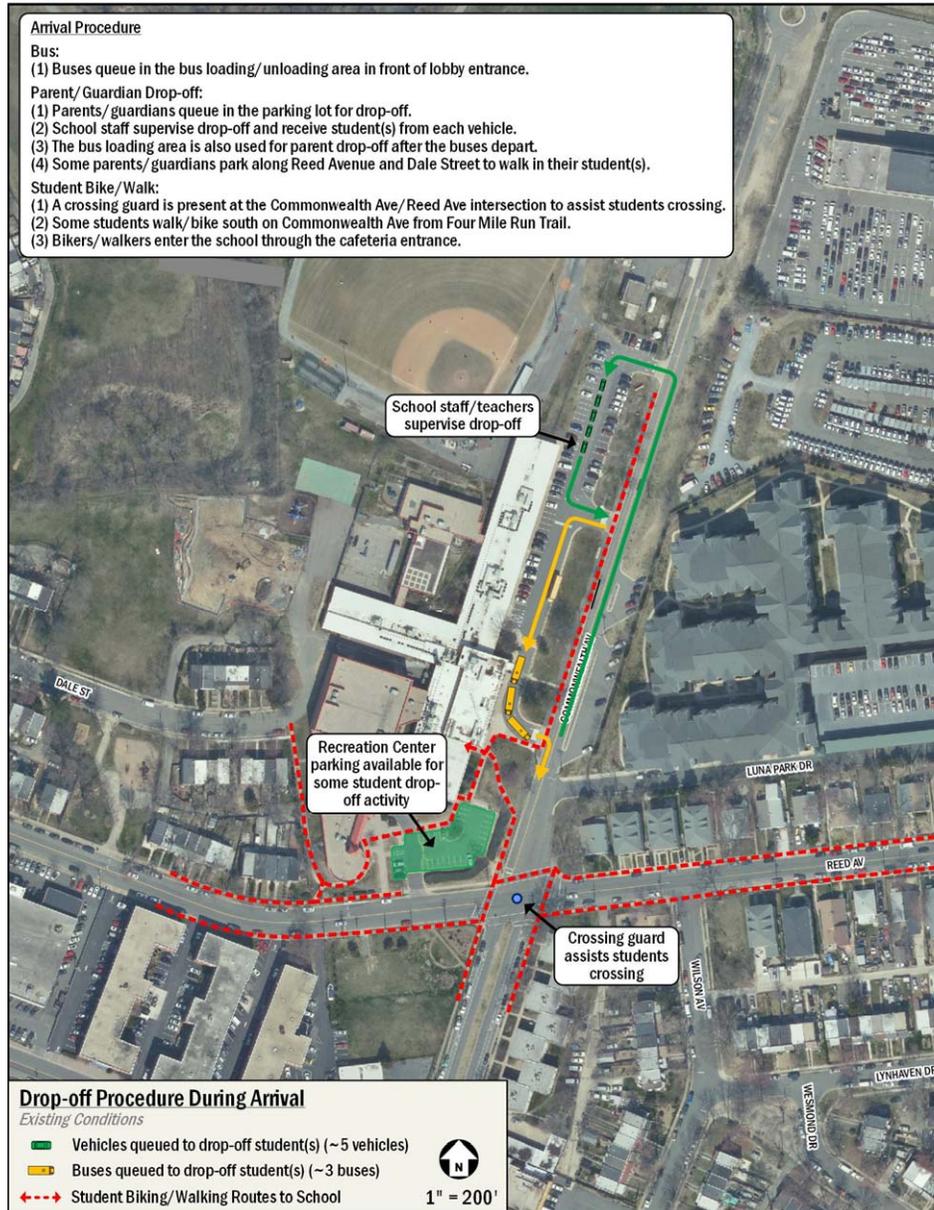
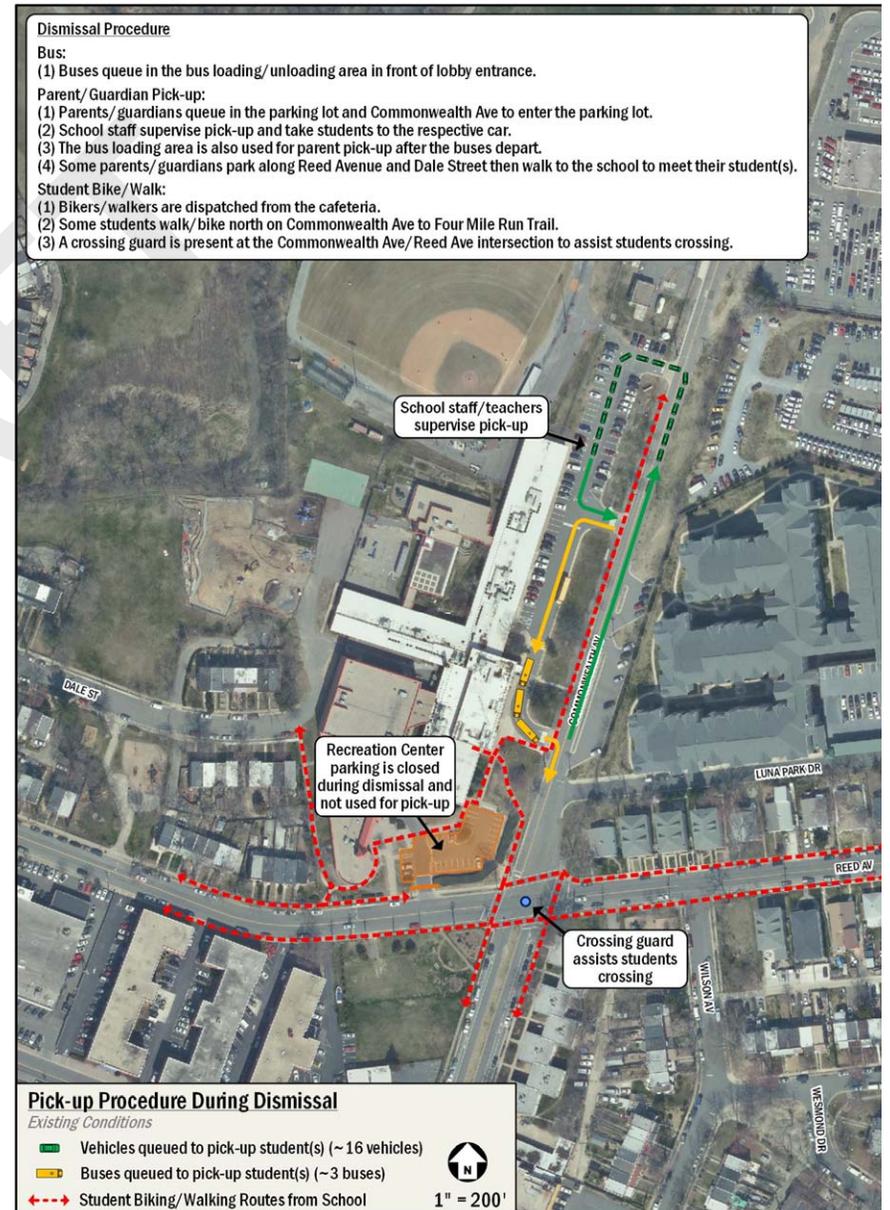


Figure 4
Existing Pick-up Procedure During Dismissal

December 12, 2019



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Technical Information

Building Assessment Data

Structural Assessment

Structural Introduction

The purpose of this technical site assessment is to review the existing building structures and to provide structural input on possible renovation or replacement solutions to meet the growing capacity needs of the Alexandria City Public School system. Our evaluation included visits to each site to observe the existing building. Existing structural drawings were not available for our use at either school. Visual observation was performed to determine the type of construction and basic building components. The surveys included the entire roof and perimeter of the buildings. For the interiors, ceiling tiles were removed in select locations to allow for structural observation. No other finishes were removed and in many areas hard ceilings, equipment and furnishing limited our review to structural elements that were exposed to view.

Cora Kelly Elementary School

The existing school was constructed in 1955 and two additions have been built in the years since. In 1991, a community center and gymnasium were added on the south-west corner of the site. The gymnasium is shared between the community center and the school and may not be included in future renovations. The gymnasium is connected to the school building through a hallway and the music room. In 1996 a classroom addition was constructed on the north-west portion of the site between the original classroom wings enclosing an interior courtyard. The original building is mainly a one-story structure, with a second floor over the main entrances, offices, and library. The gymnasium and classroom additions are one-story structures.

Existing Structural Systems

The original building roof system typically uses open web steel joists with bulb tee purlins supporting gypsum

sheathing. Often with this type of construction, a shallow layer of gypsum topping is poured on the sheathing, but this could not be verified as it was hidden by the roofing. The additions typically use open web steel joists with metal decking for the roof structure. A portion of the classroom addition has an extensive green roof system with a growing medium depth of approximately six inches. The structure supporting the green roof was hidden from view but would need to be more robust compared to the typical roof system we observed. The roof structure is typically flat, or shallowly sloped for drainage. Mechanical units are supported on the roof with steel dunnage or curbs above the roof structure. There is a recessed mechanical well above the hallway of the west classroom wing. A steel-framed roof-mounted screen wall shields the mechanical equipment zone on the classroom addition. There is a steel-framed canopy structure over the main entrance to the building that is not original to the building. It was likely added concurrently with one of the building additions. The second-floor construction was not verified due to a lack of access. Typically, the ground floors are concrete grade slabs. The vertical support for the floors and roof is a combination of structural steel beams, columns, and load-bearing masonry walls. The building is likely supported on shallow spread footings which are commonly used for buildings of this type. The original 1955 building has multi-wythe masonry perimeter bearing walls with punched window openings. The perimeter walls of the classroom addition have a masonry base, and exterior insulation and finish system (EIFS) above. The classroom wings of the original building appear to have been modified to match the classrooms of the 1996 addition. The original brick was removed from the roof down to the same height as the masonry base on the addition walls. The upper portion of the walls was infilled with an EIFS system with windows incorporated into it.

Existing Conditions Assessment

A site visit was performed on August 26th, 2019 by Lee Ressler, PE. Generally, the existing building complex is in good structural condition with no significant structural deterioration or deficiencies observed. The existing roofing was being replaced on portions of the building while we were on-site, and the remaining areas of the roofing had been recently replaced.

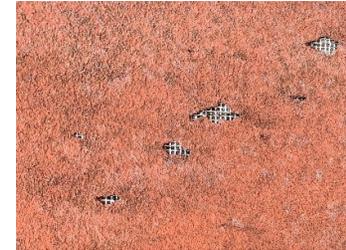


Photo #1
Typical EIFS Deterioration



Photo #2
Typical EIFS Deterioration Bearing



Photo #3
Typical Brick Crack & Repairs



Photo #4
Typical Brick Crack Repairs

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The EIFS exterior wall system has deteriorated and generally is in poor condition. In many locations, the exterior stucco finish has cracked and spalled, exposing the reinforcing mesh (see photos #1 and #2).

Around the exterior perimeter of the original building, there were a few cracks observed in the brick masonry. Many of these cracks were around openings and appeared to be related to thermal movement, restraint cracking, and rust jacking of the lintels (see photos #3 thru #5). In select locations, repairs have been made previously to damaged areas of brick. These repairs included repointing of the mortar joints and replacement of damaged brick (see photos #3 and #5).

At the front entrance of the building, the steel-framed canopy is bearing on a multi-wythe masonry brick wall with decorative punched openings. The canopy beam is bearing directly above one of these openings and brick is beginning to deteriorate (see photo #6).

Summary

Generally, the structure of the building is in good working condition with only minor deficiencies observed. The building envelope and exterior wall system have age-related deterioration and these issues will continue to progress and require periodic maintenance. The gypsum roof system used in the original building construction is susceptible to degradation if exposed to water. Water damage to the roof was not observed in the survey, but it is possible that this type of damage has occurred and is hidden from view. To identify and locate damage of this type the roofing would need to be removed and the gypsum deck inspected.

MEP Assessment

Current Code and Standard Compliance:

2015 Virginia Statewide Building Code (VUSBC)

2015 International Building Code (IBC) with Virginia Amendments

2015 International Mechanical Code (IMC) with Virginia Amendments

2015 International Plumbing Code (IPC) with Virginia Amendments

2015 Virginia Statewide Fire Prevention Code NFPA 90A

2014 National Electric Code / NFPA 70

2015 International Fuel Gas Code (IFGC) with Virginia Amendments

2015 International Energy Conservation Code (IECC) (or ASHRAE equivalent)

ASHRAE 90.1-2010

ASHRAE 55-2013

2005 SMACNA HVAC Duct Construction Standards - Metal and Flexible

Existing Facility Mechanical

Overview

The majority of the existing building is served by rooftop-mounted VAV air handling units that were manufactured in 2000. Some rooftop units were indicated to have been manufactured in 2012. RTUs are gas-fired and DX cooled. In a replacement scenario, it is not recommended to repurpose any of these units.

Building air is exhausted with roof-mounted exhaust ventilators. The ventilators are in fair to poor condition. It is recommended to plan on replacement of roof exhaust ventilators.

All existing units, associated ductwork, controls, and air devices in areas to be renovated shall be removed. Existing terminal equipment, such as unit heaters, VAVs, etc. shall be removed. It is not anticipated that any existing mechanical infrastructure in renovated areas will be utilized for future use.

Demolition of existing equipment shall be performed in a phased manner as required by overall project phasing.



Photo #5
Typical Brick Deterioration & Repair



Photo #6
Brick Deterioration at
Canopy Bearing

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Scope of Work

New Facility Mechanical

If it is determined that the existing building will be demolished or be required to have a major renovation, see the following recommendations for new system design.

Replacement Design Conditions

The design criteria listed below shall be used for conceptual HVAC design, payback evaluation, and heating/cooling load calculations.

Site Data:

Building Location: Alexandria, VA
 Physical Address: 3600 Commonwealth Ave
 Square Footage of Renovated Area: See Architectural sq. ft.
 Main Building Total Area: See Architectural sq. ft.
 Latitude: 38.84 / Longitude: -77.055, Elevation: 20 feet
 Building Orientation: Main entrance faces East/Southeast
 ASHRAE 90.1 Climate Zone: 4A

Outdoor Design Conditions

Based on ASHRAE 2017 Handbook - Fundamentals for Ronald Reagan Washington Natl, VA, USA

Heating - ASHRAE 99.6% Peak Design Condition: 17.9 deg F DB
 Cooling - ASHRAE 0.4% Peak Design Condition: 94.7 deg F DB / 75.5 deg F MCWB

Indoor Design Conditions

Equipment shall be sized and designed to maintain the following setpoints within a 2-degree deadband. The maximum class size is assumed to be 24 students and one teacher.

Existing Facility Mechanical

The facility is anticipated to be occupied Monday through Friday, 7 am-5 pm and Saturday/Sunday based on a special event scheduling only. The building will not be utilized year-round. The administration area (out of scope) is the only area that was stated to have year-round occupancy. Detailed occupancy and loading schedules shall be provided as part of future space by space analysis.

Classrooms / Support Spaces:

Heating Season: Occupied Mode: 70 deg F DB / no humidity control

Vacant Mode: 68 deg F DB
 Unoccupied Mode: 60 deg F DB

Cooling Season: Occupied Mode: 75 deg F DB / 40-60% RH

Vacant Mode: 78 deg F DB
 Unoccupied Mode: 85 deg F DB

Toilet Rooms / Group Restrooms: Ventilated/Exhausted

Cafeteria:

Heating Season: Occupied Mode: 70 deg F DB / no humidity control

Vacant Mode: 68 deg F DB
 Unoccupied Mode: 60 deg F DB

Cooling Season: Occupied Mode: 78 deg F DB / 40-60% RH

Vacant Mode: 82 deg F DB
 Unoccupied Mode: 85 deg F DB

System Options

System modeling and selection will be determined during the design phase. For budgeting purposes, two probable system options are as follows:

Option 1 - Geothermal Heat Pumps with DOAS

This option has been explored by CMTA due to energy performance and overall system simplicity as it relates to controls and operation.

The HVAC system for this option consists of unitary geothermal heat pumps for zone thermal comfort control and dedicated outdoor air handling units (DOAS) with fixed-plate energy recovery for delivery of code required outside air. The ventilation (outside) air is de-coupled from the HVAC heating and cooling with each space (or zone) receiving outside air separately utilizing demand control ventilation.

Each heat pump will be a high efficiency, variable speed compressor heat pump unit (below 5 tons) with an ECM fan motor. Units can be horizontally hung and installed in the plenum space above the ceiling or floor mounted in closets outside of the classroom. Each heat pump unit will utilize refrigerant R-410A and will have an

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ozone-depleting potential (ODP) of 0.05 or less.

Each classroom zone is anticipated to have its heat pump and space temperature sensor, one per room or shared (1 per two adjacent classrooms – TBD). The unit will operate by maintaining the temperature of the space based on the adjustable space temperature setpoint. Each space temperature sensor shall have a push-button override for a 2-hour (adjustable) override to the occupied mode of operation.

Each office and corridor zone is anticipated to have a shared heat pump with VAV diffusers to allow thermal comfort control in each office. The unit will operate with a static pressure reset controlling the ECM fan motor. Each space temperature sensor shall have a push-button override for a 2-hour (adjustable) override to the occupied mode of operation.

The Cafeteria will each have a new single-zone VAV geothermal water-cooled packaged RTU installed. The unit will operate by maintaining the temperature of the space, based on averaging multiple space temperature sensors. Each space temperature sensor shall have a push-button override for a 2-hour (adjustable) override to the occupied mode of operation.

Where demand control ventilation is applied, spaces will include a CO2 sampling/measuring port and occupancy sensors. The thermostat (and associated sensors), CO2, and occupancy sensors are to interface to the building automation system. The CO2 measuring port and occupancy sensor inputs will be utilized to control the space ventilation terminal unit and space temperature setpoints.

All heat pump units shall have a fully ducted supply and return with sheet metal ductwork. Each heat pump unit will include a duct-mounted pre-filter rack. The pre-filters shall be 24"x24" Flanders/FFI PrePleat 40. Each heat pump shall include an integral disconnect switch. Condensate for each unit will be disposed of through a floor drain or open receptacle into the sanitary system.

Approximate sizes are as follows:

- Classrooms - The heat pump unit zones serving classrooms will utilize units sized between 2-6 tons, depending on classroom size and location within the building.
- Corridors - The heat pump unit zones serving corridors will utilize units sized at approximately 2 tons.
- Offices - The heat pump unit zones serving offices will utilize units sized at approximately 2 -3 tons, depending on office zone size and location within the building.
- Cafeteria – The water-cooled packaged RTU will be sized for approximately 25-tons. The DOAS unit shall provide ventilation air as described in Option 2. However, it shall be configured as a water-cooled unit with listed manufacturers as Trane, Valent, or Carrier or other approved equal.

Geothermal Well Field and Piping System

The well field geothermal system pumping system shall consist of two variable flow pumps (one operational – one 100% standby) for pumping the water to all heat pumps and geo AHU's/RTU's throughout the building. The pumps shall be located in the Mechanical Room and circulate water throughout the well field.

Option 2 - 4-Pipe Fan Coil Units and Dedicated Outdoor Air System (DOAS)

The HVAC system for this option shall utilize 4-pipe fan coil units for zone thermal comfort control and outside air handling units with fixed-plate energy recovery for delivery of code required outside air. A central air-cooled chiller, pumping system, and chilled water piping network will be utilized to circulate chilled water to each unit. Chiller shall be equal to Trane Stealth, tonnage to be determined. Chiller contains two refrigerant circuits. The boilers shall be gas-fired, high-efficiency condensing style boilers to reduce energy consumption. Boilers shall be equal to Viessmann Vitocrossal 300, 3,000 MBH, 2 each.

The ventilation (outside) air is de-coupled from the HVAC heating and cooling with each space (or zone) receiving outside air separately utilizing demand control ventilation.

Each fan coil unit will be equipped with an ECM fan motor, 1" disposable MERV 8 filter, hydronic heating and cooling coil, piping package with two-way modulating control valve, strainer, balance valve, and isolation valves. Units can be configured horizontally (hung and installed in the plenum space above the ceiling) or vertically (floor-mounted in the space). The unit controller shall either be provided by Temperature Controls Contractor and field installed or provided by Unit Manufacturer and factory-installed.

Hydronic (chilled water and heating hot water) piping and insulation shall be as follows:

- 2" and smaller: Type L drawn-copper tubing with brazed or pressure-seal (Propress) joints and wrought, cast copper fittings, brazed or pressure-seal. Mineral fiber preformed pipe insulation with all service jacket for indoor, concealed piping.
- 2 ½" and larger: Carbon steel, Schedule 40, with wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, welded and flanged joints. Mechanical grooved couplings may be considered as a bid alternate. Mineral fiber preformed pipe insulation with all service jacket for indoor, concealed piping. Outdoor exposed piping shall have astucco embossed aluminum jacket.

Each classroom zone is anticipated to have its unit and space temperature sensor, one per room. The unit will operate by maintaining the temperature of the space based on the adjustable space temperature setpoint. Each space temperature sensor shall have a push-button override for a 2-hour (adjustable) override to the occupied mode of operation.

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Each office zone is anticipated to have a shared unit with VAV diffusers to allow thermal comfort control in each office or a dedicated unit. The unit will operate with a static pressure reset controlling the ECM fan motor for variable flow with shared units. Each space temperature sensor shall have a push-button override for a 2-hour (adjustable) override to the occupied mode of operation.

The Cafeteria will be served by a single-zone VAV Air Handling Unit, 4-pipe. The unit will operate by maintaining the temperature of the space-based on averaging multiple space temperature sensors. Each space temperature sensor shall have a push-button override for a 2-hour (adjustable) override to the occupied mode of operation.

IT Rooms shall be served by air-cooled DX split systems, approximately 1 to 1.5 tons each.

Where demand control ventilation is applied, spaces will include a CO2 sampling/measuring port and occupancy sensors. The thermostat (and associated temperature sensors), CO2, and occupancy sensors are to interface to the building automation system. The CO2 measuring port and occupancy sensor inputs will be utilized to control the space ventilation terminal unit and space temperature setpoints.

All fan coil units mounted above the ceiling shall have a fully ducted supply and return with sheet metal ductwork. Each unit shall include an integral disconnect switch. Condensate for each unit will be gravity drained where possible.

Approximate sizes are as follows:

- Classrooms - The zones serving classrooms will utilize units sized between 2-6 tons, depending on classroom size and location within the building.
- Corridors - The zones serving corridors will utilize units sized at approximately 2 tons.
- Offices - The zones serving offices will utilize units sized at approximately 2 -3 tons, depending on office zone size and location within the building.
- Cafeteria – The RTU will be sized for approximately 25-tons.

Ventilation Systems (DOAS)

The DOAS unit shall provide ventilation air as described in Option 2. However, it shall be configured as a water-cooled unit with listed manufacturers like Trane, Valent, Carrier, or other approved equal.

The outside air systems for the building shall be de-coupled from the conditioning systems. In general, outside air shall be provided directly to the occupied zone. The dedicated outside air handling unit will be outdoor, roof-mounted, double-wall construction, and include dual supply/exhaust plenum fans. The units shall be variable volume energy recovery type units utilizing building exhaust and general exhaust air to precondition the outside air through a total energy recovery enthalpic plate. All conditioned outside air ductwork and building exhaust air ductwork will not

be insulated – this applies to positive pressure outside air ductwork and negative pressure exhaust air ductwork. All un-conditioned air ducts shall be insulated with 3” thick, ¾ pcf duct wrap with vapor barrier – this applies to negative pressure outside air ductwork and positive pressure exhaust air ductwork.

The DOAS unit shall be a packaged air-cooled, DX cooling, natural gas heat, unit with listed manufacturers like Trane, Valent, Carrier, or other approved equal. The outside air units will consist of the following sections/components: stacked and in the direction of airflow will be an inlet filter, enthalpic plate, plenum type, dual exhaust air fans (each sized at 50% airflow), on the bottom will be an inlet filter, enthalpic plate, access, gas-fired heating section, access, plenum type, dual supply air fans (each sized for 50% airflow), and final filter bank. Each fan bank will be controlled by a VFD for varying airflow conditions. During low ventilation conditions, only one of the fans would be needed to meet the ventilation requirements. The exhaust fan is sized at 20% reduction in capacity (thus maintaining building pressurization). The supply air distribution system will supply outside air to terminal units for distribution of outside air to each zone. The outside air conditioning system will be provided with an air-cooled DX circuit. The resulting winter supply temperature is approximately 70 degrees F and summer supply air temperature shall be approximately 68 degrees F DB/63 degrees F WB.

To control outside air, a central CO2 monitoring system (Aircuity) will be provided to take advantage of building diversity. Each variable occupied area/room will contain a CO2 measuring port with a high quality central CO2 sensor. The VAV terminal will modulate in accordance with the space CO2 measurements. The VAV terminal will also be interlocked with a room occupancy sensor. The ventilation rate will be modulated based on occupied and vacant spaces conditions. The total space by space occupancy count is expected to exceed actual building occupancy. Designing a variable ventilation system based on actual building occupancy reduces the central ventilation system by approximately 30 percent, thus reducing the overall HVAC load.

Building Automation System (BAS) / HVAC Controls

All new packed equipment shall be provided with DDC controllers for integration to BAS. All existing equipment shall be integrated into the new BAS.

The following shall be included as part of the controls scope of work:

- Control or integration of new terminal equipment (fan coil units). Control devices (valves, sensors, etc.) and controller by TCC or equipment manufacturer have not yet been determined.
- Integration of new Air Handling Units and DOAS Units. It is anticipated that unit-level controls and the controller will be provided by the unit manufacturer.
- Integration of rooftop HVAC units (gym, etc).
- Integration of HVAC central plant (boilers/chillers)
- Control of hydronic pumps

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- Exhaust fan control for toilet rooms, restrooms, etc.
- Supplemental heater control (unit heaters, cabinet heaters, etc.)
- IT Server / MDF rooms – space temperature monitoring and alarming
- Plumbing –domestic hot water heater temperature monitoring and alarming
- Plumbing –domestic water circulation pump control and monitoring
- Kitchen –makeup air unit monitoring and cooler/freezer temperature monitoring and alarming
- Energy Meters – monitoring and BTU/energy tabulation for primary natural gas and electric consumption

Existing Facility Plumbing

Overview

The existing building plumbing systems, including domestic hot and cold water, sanitary, and vent piping. The existing piping systems in the original building appear to be original to the building.

Natural Gas Service

A metered natural gas service is currently supplied to the building by Washington Gas. The service serves the RTUs and domestic hot water heaters. No documentation was found to indicate the age of the existing piping system. The exterior piping has flaking paint and is beginning to rust on surface and at flanges. Recommend refinish/paint exposed piping if the building is to remain and be renovated.

Plumbing Waste and Vent Piping

Waste and Vent piping that was observed appeared to be original which is 60+ years old and past its rated useful life. Recommend replace all building original piping with new.

Roof Drains and Piping

Roof Drains appear to have been recently replaced and are in fair to good condition. Storm piping that was

observed throughout the building appears to be original which is 60+ years old and is past its rated useful life. Recommend replace all building original piping with new

Domestic Water Piping

Domestic water enters the building into a classroom's casework on Commonwealth Ave side of the building. The service size is approximated as 2 1/2". Domestic water piping that was observed appeared to be original which is 60+ years old and past its rated useful life. Recommend replace all building original piping with new. In addition, it is recommended to relocate the service entrance to an area where it can be serviced. A check valve was not observed.

Plumbing Fixtures

Plumbing fixtures appear to be original to the building.

Water closets – White vitreous china; with battery or manual operated flush valve

Urinals – White vitreous china; with battery-operated flush valve

Sinks – Wall-mounted are white vitreous china

Sinks – Wall-mounted gang are solid surface (3) gang; sensor operated

Sinks – Counter mounted are stainless steel.

Electric water fountains in facility are found to wall-mounted and free-standing.

New Facility Plumbing

If it is determined that the existing building will be demolished or be required to have a major renovation, see the following recommendations for new system design.

Plumbing Waste and Vent Piping

- Extra Heavy Hubless Cast Iron pipe and fittings shall be manufactured from gray cast iron and shall conform to ASTM A 888 and CISPI Standard 301. All pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute ® and listed by NSF® International. Hubless Couplings



Figure 1
Fan Coil Units

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shall conform to CISPI Standard 310 and be certified by NSF® International. Heavy Duty couplings shall conform to ASTM C 1540 and shall be used. Gaskets shall conform to ASTM C 564. All pipe and fittings to be produced by a single manufacturer and are to be installed in accordance with the manufacturer's recommendations and applicable code requirements. Couplings shall be installed in accordance with the manufacturer's band tightening sequence and torque recommendations. Tighten bands with a properly calibrated torque limiting device. The system shall be hydrostatically tested after installation to 10 ft. of head (4.3 psi maximum).

- Type DWV copper drainage piping with cast bronze drainage pattern fittings with solder joints.
- The sanitary piping will require cleanouts at every pipe direction change and on 75-foot centers. All sanitary and roof drainage piping shall service weight cast iron hub and spigot piping with compression gasket joints. All plumbing vents shall terminate a minimum of 50 feet from any outdoor air intake.

Roof Drains and Piping

The primary roof drainage system shall consist of standard round dome-type drains with cast iron body, flashing clamp, sump receiver, and 15" cast iron locking strainers. The secondary roof drainage system shall consist of overflow scuppers provided on flat roof areas with parapets or roof drains adjacent to the primary drains with standard round dome-type drains, cast iron body, flashing clamp, sump receiver, 15" cast iron locking strainers, and 4" pipe overflow extension.

Domestic Water Piping

The domestic water system for the building shall be served by a NSF 61 compliant water supply with gate service valves and ASSE or CSA compliant reduced pressure zone backflow preventer located in the main mechanical room. A domestic water booster pump is not anticipated to be required.

Domestic water distribution within the building will serve

the toilet rooms, janitor closets, classrooms, kitchen, health unit, pantries, drinking fountains, hose bibbs, and non-freeze wall hydrants. Piping shall be NSF 61 compliant type L Hard Copper with lead-free solder and 150 lb, flanged or screwed, gate or ball, bronze valves. Piping insulation shall be a minimum of 1 inch for all hot water and a minimum of 1/2 inch for cold water 4 inches and above.

Domestic Hot Water shall be provided by two (2) hydronic natural gas-fired condensing style boilers, an indirect storage tank, ASME rated thermal expansion tank, in-line circulating pumps, and ASSE 1017 compliant central thermostatic mixing valve. Domestic hot water shall be designed for 140 deg F supply distribution temperature and a 120 deg F return water temperature at peak demand.

Plumbing Fixtures

Plumbing fixtures shall be lead-free, low flow, Water Sense type, and ADA compliant. All water closets, lavatories, sinks, drinking fountains, emergency showers, floor drains, etc. shall be commercial grade.

- Student water closets shall be Water Sense and ADA compliant floor-mounted type with "Capacitive sensor" type handsfree top spud flush valves with a side-mounted operator and a maximum flow rate of 1.28gpf. The power source shall be (4) "C" size battery or self-generating with battery backup.
- Adult water closets shall be Water Sense and ADA compliant wall-mounted type with "Capacitive sensor" type handsfree, top spud flush valves with a side-mounted operator, and a maximum flow rate of 1.28gpf. The power source shall be (4) "C" size battery or self-generating with battery backup.
- Urinals shall be Water Sense and ADA compliant wall-mounted type with "Capacitive sensor" type handsfree, top spud flush valves with a side-mounted operator, and a maximum flow rate of 0.125gpf. The power source shall be (4) "C" size battery or self-generating with battery backup.
- Lavatory faucets shall be Water Sense and ADA compliant "Capacitive sensor" type handsfree



Figure 2
DOAS Unit with Heat Recovery

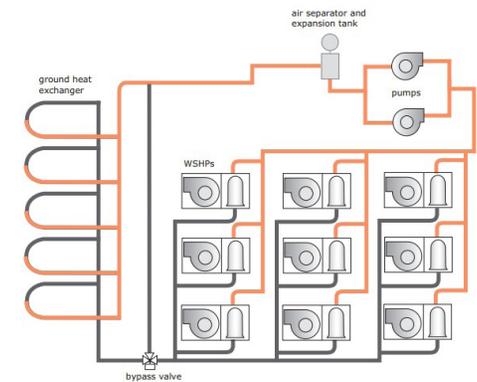


Figure 3
Ground Loop Heat Pumps



Figure 4
Water Source Heat Pump

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faucets with a maximum flow rate of 0.5gpm. The power source shall be battery or self-generating with battery backup. Lavatories shall have an ASSE 1070 compliant manual thermostatic mixing valve w/ lockable box centrally located to control a maximum of 4 lavatories.

- Sinks serving pantries, classrooms, and art areas shall be stainless steel type with a maximum flow rate of 2.5gpm and local sediment interceptors provided as required. Classroom sinks shall have a 5.25" radius gooseneck faucet, less bubbler, centered on the back ledge with lever handles.
- Electric water cooler and drinking fountains shall be bi-level ADA compliant with manually operated bubbler controls. Indoor electric water coolers shall have bottle fillers and filters while the exterior non-chilled drinking fountains shall be non-freeze type units.
- Floor drains shall be provided to serve mechanical equipment, drain discharges, bathrooms, kitchens, and washdown areas. Floor drains shall be of size and type suitable for the application.

Existing Facility Electrical

Electrical Distribution

The facility is served by a 480Y/277 volt, 3-phase, 4 wire 1600A electric service. The main electric switchboard is manufactured by GE with a bus rated at 1600A with a 1600A switch. The switchboard is in fair condition. Recommend annual maintenance, infrared scanning as well as completion of a short circuit/coordination/arc flash hazard study. Surge protection was not observed on the main switchgear or on any of the secondary panel boards. The addition of surge protection is recommended to minimize the effects of electrical transients that may be transmitted on the incoming power lines. Voltage surges and other electrical transients can cause damage to equipment resulting in untimely equipment replacement or repair.

The switchboard serves multiple 480:208/120V step down transformers that in turn feed branch panel boards throughout the space. The transformers are estimated to be approximately 20 years old. The transformers are surrounded by storage materials. It is recommended that the room be cleared out and all materials around the transformers are removed to allow the transformer to vent.

The normal power main switchboard and some distribution panel boards are located in the main Electric Room. Branch panel boards are located throughout the school in hallways, classrooms, etc. Most of the Panel boards appear to be antiquated and original to the building and it is recommended that they and their associated feeders be replaced. Infrared scanning is recommended for all electrical connections in the panel boards that are to remain to ensure proper operation and prevent future failures.

All new panel boards that are installed to replace old shall be hinged cover (door-in-door) construction. All feeders and exposed branch circuits shall be insulated copper conductors routed in EMT conduit.

Emergency Electrical Distribution

The building is not served by an emergency generator. The Emergency lighting is provided by emergency light sets as well as integral battery packs. These fixtures are past their useful life and should be replaced.

Interior Lighting

Most areas in the facility utilize linear fluorescent lighting. Linear fluorescent fixtures in the facility are typically 2'x4' troffers with acrylic or parabolic lens with T-8 lamps. The fluorescent lighting is estimated to be near or past its rated useful life, in addition, is very inefficient as compared to current LED lighting solutions. Recommend replacement with new LED light fixtures. This will assist with energy efficiency and help lower electric utility costs. Other lighting such as specialty lighting in private restrooms and closets appears to be original to building. It is recommended that these fixtures be replaced with new LED lighting fixtures.

Exterior Lighting

Exterior lighting is provided by wall mounted high-intensity discharge wall packs. These are inefficient and should be replaced.

Wiring Devices

Switches and receptacles that were observed in the original sections of the school appeared to be original. Multiple layers of paint have been applied to the devices which can affect their operation. In addition, some of the light switches did not appear to be switching normally and were a little "spongy". It is recommended that all wiring devices that are original to the facility be replaced with new.

Wiring

The wiring that is existing in the building is estimated to be approximately 63 years old. The useful life expectancy for wiring is 50 years. It is recommended that all wiring that is original to the facility be replaced with new.

Fire Alarm

The building is served by multiple FA systems.. (1) antiquated Simplex analog type and (1) Honeywell addressable system. Devices throughout the facility are past their useful life. Recommend complete replacement of FA devices and antiquated system components.

New Facility Electrical

If it is determined that the existing building will be demolished or be required to have a major renovation, see the following recommendations for new system design.

Electrical Distribution

Underground primary electric service shall be routed to a new pad mounted utility transformer located near the new building. A new secondary service will be extended from the utility transformer to feed the new 2000A/277/480V/3PH/4W (est) switchgear located in the main electric room. Each floor of the building shall have dedicated electrical spaces with 277/480V/3PH/4W and 120/208V/3PH/4W branch circuit panel boards separated for specific loads such as mechanical equipment, lighting, receptacles, etc.

A multi-circuit sub-metering device connected to the building automation system shall monitor all building load categories including renewable energy and report to the energy dashboard system.

All wiring shall be copper, minimum #12AWG installed in conduit, minimum size ¾". MC cable is not acceptable. Power connections and code required disconnecting means will be provided for all HVAC and plumbing equipment. Combination starter/fusible disconnects will be provided for selected equipment as required.

Integral surge protective devices will be provided for the main service switchgear and all branch circuit panels. Main Circuit breaker on the switchgear will be equipped with Phase loss monitors and undervoltage/overvoltage trip settings.

Receptacles will be located at each teacher's workstation location, equipment locations, and on each wall for convenience. All collaboration spaces in the corridors will be provided with additional power per classroom standards.

Emergency Electrical Distribution

A new 150kW diesel generator (BOD: Cummins) with 48-hour dual-wall sub-base fuel tank will be provided for life-safety and general emergency loads.

All Life safety emergency electrical distribution equipment will be housed in a separate room from the normal power equipment. The Emergency system shall consist of two automatic transfer switches - one each for life-safety and general branch, two distribution transformers - one each for life-safety and general branch, and a limited number of life-safety and general branch panel boards. All life-safety emergency loads shall be selectively coordinated to 0.1 seconds. A remote generator annunciator panel will be provided.

Interior Lighting

Interior artificial lighting will be accomplished with recessed high-performance LED direct/indirect fixtures throughout the building with more decorative LED lighting in selected spaces such as Media Center, Entry Lobby, Dining, etc. Alternate pricing shall be provided for Dynamic Lighting fixtures (tunable white) in all classrooms with the ability to independently raise/lower lighting intensity and CCT. Lighting in the

Gymnasium will be LED high bays with semi -diffuse acrylic lens. Lighting throughout will meet the latest Illuminating Engineering Society of North America (IESNA)

Interior egress lighting shall be connected to the life-safety branch of emergency power.

100% occupancy/vacancy sensor coverage will be provided throughout except in electrical and mechanical rooms. Occupancy sensors will be automatic on/automatic off. Vacancy sensors will be manual on/automatic off. Automatic daylight dimming will be employed in all daylight zones.

Dimming controls/scene controls will be provided in all classrooms and offices. All interior lighting controls will be stand-alone systems (BOD: nLight).

Exterior Lighting

Dark sky compliant LED exterior lighting will be provided at all exit doors for egress lighting. Site pathway lighting will be post top LED fixtures (BOD: Lithonia #DSX) on a straight round aluminum poles and in accordance with the site guidelines. Color temperature shall be 4000K. Backlight shielded optics will be utilized to minimize glare to adjacent properties as necessary. Exterior lights will also feature integral motion sensing for reduced glare, energy usage, and extended LED lamp life. Exterior egress lighting shall be connected to the life-safety branch of emergency power.

Exterior lighting will be controlled through a photocell/timeclock combination. A lighting contractor will be provided with HOA option and tied into the BAS system. Exterior light fixtures will feature integral motion sensors for reduced glare, energy usage, and extended LED lamp life.

Fire Alarm

A new fully addressable voice evacuation type fire alarm system (BOD: Simplex) shall be provided with notification and initiation devices per NFPA requirements. All peripheral devices shall be installed per ADA requirements. Manual pull stations will be located within five (5) feet of each exterior egress door and within 150 feet of an egress door. Fire alarm strobe/audio devices will be provided to comply with ADA requirements. Smoke detectors will be photoelectric type. Connections will be provided to all fire suppression equipment, air handling units over 2,000CFM, door access controls, etc. A Graphic annunciator panel will be placed at the main entrance to the building and at each fire department entrance into the building.

Technology

Telephone/Data

The contractor will provide all rough-in's, faceplates, cabling paths, cabling, and patch panels for all telephone and data systems. The telephone system shall be IP based. The owner shall provide active components including wireless access points. The minimum stub-out conduit size will be 1" and cabling paths will consist of 12"

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cable tray with J-hook assemblies on 48" centers.

The horizontal data network will utilize CAT 6 infrastructure. Wireless coverage will be provided for the entire school utilizing CAT 6A cabling.

WAPs will be laid out to create a fence to fence coverage pattern both on the interior of the building and the exterior of the building.

The phone system will be as per owner's specification.

Fiber backbone will consist of 12 strand multimode OM3 fiber optic cable with LC connectors supporting full 10gig uplinks.
Public Address System

A building-wide Public Address System will be integrated into the Unified Communications system with visual devices in select rooms that will be determined as the design progresses.

Electronic Safety & Security

A new ESS system will include interior and exterior Video Management Systems (VMS) coordinated with Dedicated Micros and a Security Management Control System (SMS) (BOD: Software House).

The SMS includes door access and logic capabilities such as visitor management, time schedules, intrusion detection, and digital signage for emergency notification features. VMS will include security cameras that will be specified along with servers and analytics (motion detection) that run them. Both VMS and SMS systems will be integrated with a single web portal interface at a later time after this project is complete by the District.

Lightning Protection

See attached document for lightning protection risk analysis. The building shall feature a complete Lightning Protection System certified to NFPA 780 standards. The system shall comply with UL #96A. Building steel shall not be used as a down conductor. Down conductors shall be concealed within the building. Each down conductor shall be terminated to a dedicated ground rod. Surge protective devices shall be provided for all systems identified in NFPA 780.

Fire Protection

The existing 6" fire service currently serves the newer addition, leaving the remainder of the facility without sprinklers. The existing building is not fully sprinklered.

Recommend extension and/or expansion of the fire suppression system to cover the entire building.

Safety and Security

ACPS maintains an inviting and de-institutionalized environment, while simultaneously providing a safe environment for students, staff, and community who use the facility and adjacent support services. Studio27 Architecture evaluated the safety and security of each school in 6 categories: Building Layout, Building Materials, Uses of Technology, Visitor Management, Vehicular and Pedestrian Traffic, and Other Site Concerns.

The categories of largest concern for Cora Kelly Elementary are Building Layout, Building Materials, and Visitor Management. Interior circulation paths are long and illogical, with poor sightlines along corridors and from staff spaces for passive surveillance. Interior finishes were adequate when installed but are now in poor condition. There is a lack of a secured entry vestibule and security desk with clear sightlines of the approach to the school.

Envelope

The largest concern for Cora Kelly is the continued maintenance of the masonry, EIFS system, entrances, and envelope penetrations. There is visible masonry cracking at multiple locations and damage to the EIFS system. Exterior grilles are in poor condition and stains on the brick below window sills. Water appears to pool where the play surface meets the exterior brick. Most entrance doors are in poor condition with visible rust and large undercuts allowing unwanted thermal transfer between the interior and exterior.

Due to the sprawling nature of Cora Kelly's plan, the envelope is much larger in surface area than it needs to be for a new school with the same interior square footage. This larger form factor has a big impact on energy use and consequently higher operations costs.

Accessibility

ACPS has made it a strong priority to make its facilities accessible to all students and staff. 'Universal Design' is one of ACPS's 10 driving design principles, established in the 2015 Educational Specifications. Universal design is the design of buildings and environments to make them accessible to all people, regardless of age, disability, or other factors. Since 2012, accessibility in schools has been the law. Title II of the Americans with Disabilities Act prohibits disability discrimination by all public entities, including schools, at the local and state level.

The highest priority item of concern for Cora Kelly Elementary School is that the school does not have an elevator. The second story of the building contains areas of primary function to the school curriculum that students in wheelchairs can not currently access. Many plumbing fixtures and facilities at Cora Kelly are not ADA accessible. This includes water fountains in the corridors, sinks in classrooms, and bathrooms in classrooms. The majority of the Library is not accessible because of the sunken 'pit' design of the central area.

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Cora Kelly Safety and Security Evaluation

Category	Consideration
Building Layout	Maintain clear lines of sight along circulation paths and avoid blind spots, corners, and cubby holes
	Locate administrative and teacher preparation with good visual contact of major circulation areas
	Develop spatial relationships that naturally transition from one location to another
	Locate toilets in close proximity to classrooms
	Design Toilets to balance the need for privacy with the ability to supervise
	Locate areas likely to have significant community use (after school) close to parking and where these areas can be closed off from the rest of the building
Building Materials	Use durable wall surfaces and maintainable flooring material that are easy to clean so graffiti and dirt can be removed
	Operational windows should high above ground to prevent access
	Install non-slip floors and walk-off mats at points of entry
	Use of interior glass to create a transparent environment within the school
	Use of colors, natural day lighting, and interior furnishings to create an environment that is aesthetically pleasing in order to support student and faculty pride within the building
Uses of Technology	Phones in every instructional and support area
	Building wide all-call or intercom system to be heard throughout the school and in outdoor play spaces when needed
	Exterior and interior video security cameras
	Motion or infra-red detectors
	Smoke and heat detectors location throughout the building
	Magnetic locking systems and carefully selected door hardware to facilitate lock downs if needed
Visitor Management	The main lobby should be welcoming and inviting for students, staff, and visitors and a central visitor registration area should be prominent upon entry
	Clear wayfinding signage should be included that directs visitors upon campus arrival to visitor registration as well as throughout the building to provide overall building guidance
	A secured double vestibule system with either clear sight lines to a security desk or a video enabled front intercom buzzer system should be provided to manage visitor entry
	Front lobby and security desk should have clear views to parking lot and building approach
Vehicular and Pedestrian Traffic	Bus drop off area should be separated from other vehicular traffic
	Clear wayfinding signage and pavement striping should direct vehicular traffic on where to go
	Sperate staff and community parking areas
	Sperate pedestrian traffic from vehicular traffic and if possible avoid having pedestrian traffic cross vehicular drive lanes
Other Site Concerns	Use native high trees and low bushes (less than 3'-0" high) to deter hiding
	Use aesthetically pleasing fencing around perimeter of the building
	Non-intrusive lighting should light all areas or site, according to the LEED light pollution credit guidelines with no lighting to leave the property line
	Provide security lighting around building and parking lots with photocell timer, motion sensor, and on/off capacity

Rating	Notes
Poor	
Poor	
Inadequate	
Fair	
Fair	
Fair	<i>Location is acceptable, however doors to close off these spaces from academic wings do not exist</i>
Fair	<i>Glazed block in corridors is very durable and graffiti resistant however it is in bad condition</i>
Poor	
Inadequate	
Inadequate	
Poor	
Fair	<i>Phones located in most classrooms</i>
Fair	<i>Speakers are located in classrooms, exterior unknown</i>
Fair	<i>Exterior security cameras were observed, interior unknown</i>
TBD	
Fair	
TBD	
Fair	
Poor	
Inadequate	
Inadequate	
Poor	
Fair	
Poor	<i>Perimeter fence around some play areas</i>
Fair	
Poor	

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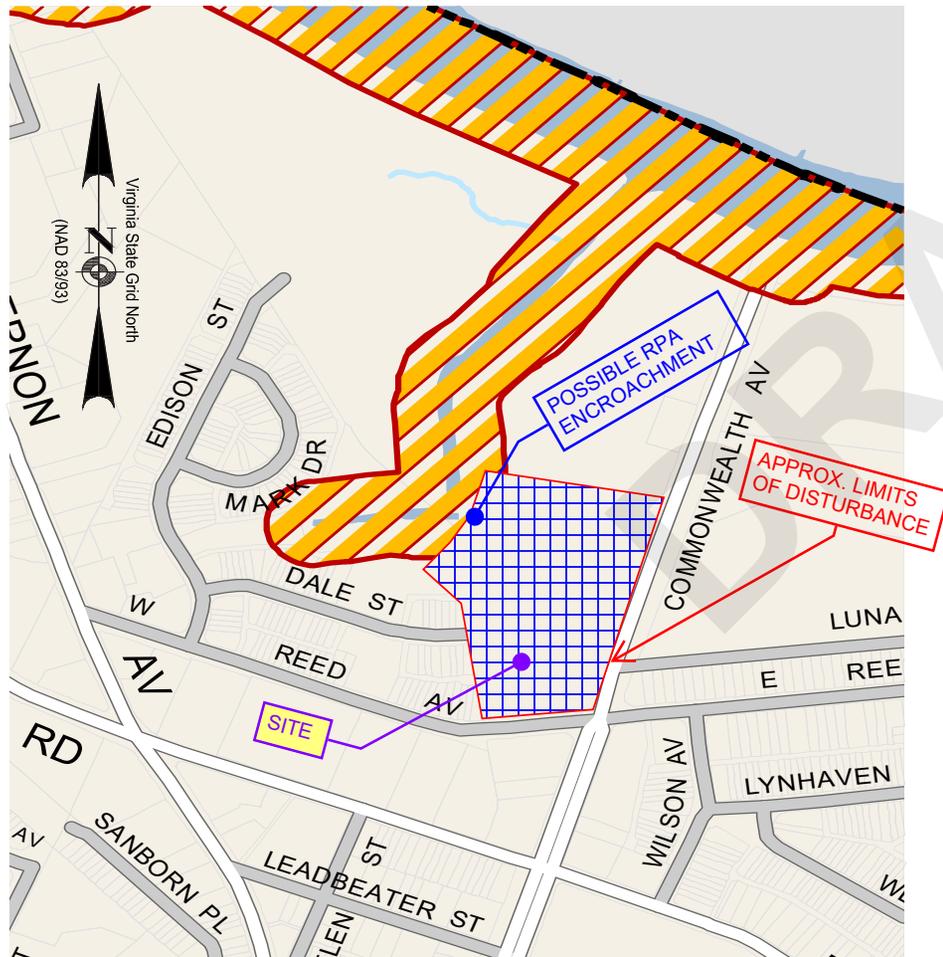
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Concerns

The proposed playgrounds and fields encroached on the RPA. Refer to **Exhibit 6** of site location to RPA. A RPA Delineation would need to be performed to determine the exact extents of the RPA on the property.

Exhibit 6

(FROM THE CITY RPA MAP)
NOT TO SCALE



Site Assessment Data

The subject site for this study is Cora Kelly School for Math, Science, and Technology, and it's located in the City of Alexandria at 3600 Commonwealth Ave, Alexandria VA 22305. Refer to **Exhibit 1** for the Site Location Map. The scope of our site study includes the evaluation of Best Management Practices (BMP), Storm Water Management (SWM), Sanitary Sewer, and Waterline. For our analysis, we gathered information from:

- Available records of approved plans of surrounding relevant projects
- Existing utility locations of the project area
- Boundary survey of the project area
- Soil maps of the area
- RPA maps of the area
- City of Alexandria stormwater technical criteria.
- City of Alexandria GIS, and
- CAD provided by Studio 27

Exhibit 1



II. Cora Kelly Master Plan and Technical Data

Findings

BMP Evaluation

To determine BMP requirements, we used the Virginia Runoff Reduction Method (VRRM) spreadsheet and made some assumptions of the area disturbed and the pre-developed and post-developed pervious/impervious areas. We assumed a total disturbed area of 5.49 acres as the BMP area. We then calculated the amount of existing and proposed pervious/impervious areas and entered the VRRM spreadsheet to calculate the required Total Phosphorus removal of 2.81 lb/yr. Refer to **Exhibit 2** for existing and proposed pervious/impervious areas. In addition to the state requirements, City's new Green Building Policy requires treatment of 100% of the stormwater through green infrastructure.

Exhibit 2

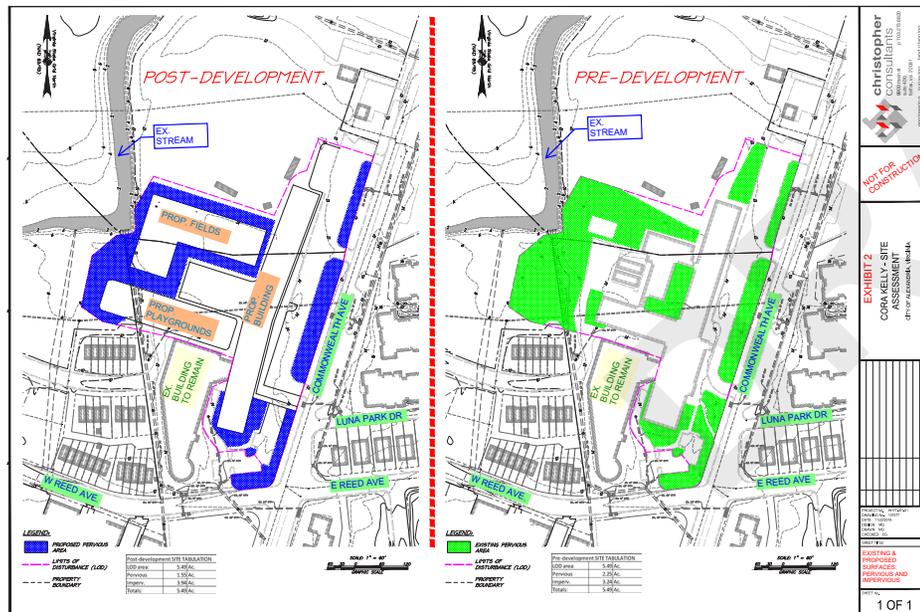
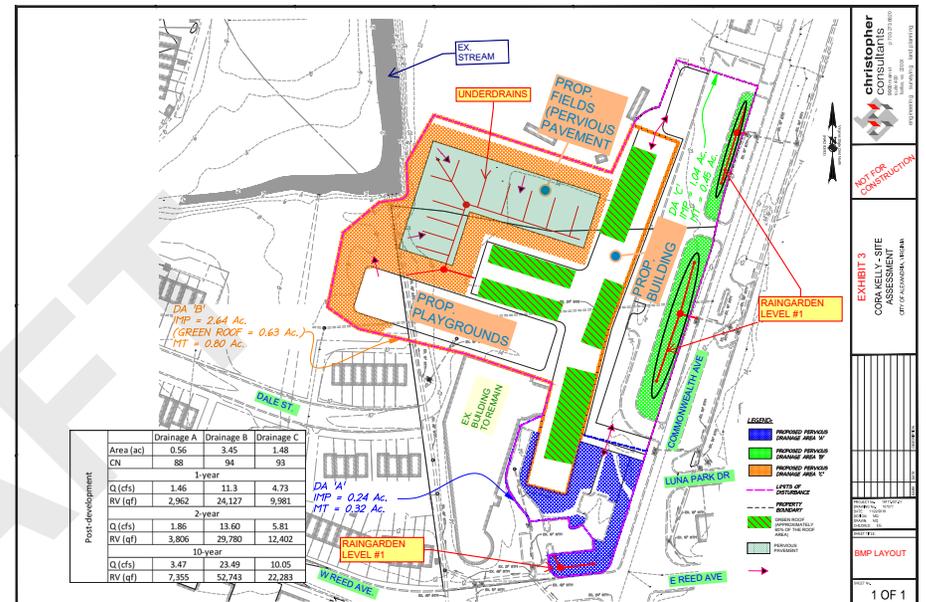


Exhibit 3



Assumptions Made:

- The overall site drains to the west to an existing stream therefore we assumed that proposed layout will maintain the same drainage.
- We assumed that proposed fields will be turf and its ground cover is considered impervious and outfalling to the west.
- Overall green roof area on the roof accounts for up to 60% of the roof surface area.
- The building's roof drains outfall to the west.
- For any impervious area that is untreated, a contribution will need to be paid into City's WQIF at \$2 per SF.

SWM Evaluation

To meet SWM requirements in Section 13-109 of City of Alexandria, we analyzed Channel Protection and Flood Protection of the three drainage areas of the proposed development. The site is located within the Four Mile Run Watershed. Refer to below values of Pre and Post development of drainage areas, curve number, peak discharge (Q), and runoff volume (RN).

II. Cora Kelly Master Plan and Technical Data

Pre-development		Drainage A	Drainage B	Drainage C
	Area (ac)	0.51	3.49	1.39
	CN	88	94	92
	1-year			
	Q (cfs)	1.33	11.79	4.26
	RV (cf.)	2,697	25,179	8,889
	2-year			
	Q (cfs)	1.69	14.36	5.26
	RV (cf)	3,466	31,079	11,119
	10-year			
Q (cfs)	3.16	24.52	9.24	
RV (cf)	6,698	55,043	20,268	

Post-development		Drainage A	Drainage B	Drainage C
	Area (ac)	0.56	3.45	1.48
	CN	88	94	93
	1-year			
	Q (cfs)	1.46	11.30	4.73
	RV (cf)	2,962	24,127	9,981
	2-year			
	Q (cfs)	1.86	13.76	5.81
	RV (cf)	3,806	29,780	12,402
	10-year			
Q (cfs)	3.47	23.49	10.05	
RV (cf)	7,355	52,743	22,283	

Channel Protection

The extent of the review to meet channel protection of drainage areas A and B of the proposed school ends in a pipe, not causing any erosion, therefore no detention is required. As for drainage Area C, this drainage area was not contributing 1% of the watershed area per the requirement of city code 13-109-F-c-i. Therefore, we used the Improvement Factor (IF) equation and determined that detention will be not required:

$$Q_{\text{Developed}} \leq \text{I.F.} * (Q_{\text{Pre-developed}} * RV_{\text{Pre-developed}}) / RV_{\text{Developed}}$$

Flood protection

To meet flood protection requirements per city code 13-109-F-2, the 10-year post-developed peak flow must be less than the pre-developed peak flow for the same storm. Based on our assumptions made on the site's drainage areas and ground covers, drainage area B meets the flood protection requirements without any detention. The 10-year peak flow for drainage areas A and C slightly increases the amount of peak flow and some detention will be required. The detention can be provided in the rain gardens for both of these drainage areas.

Note:

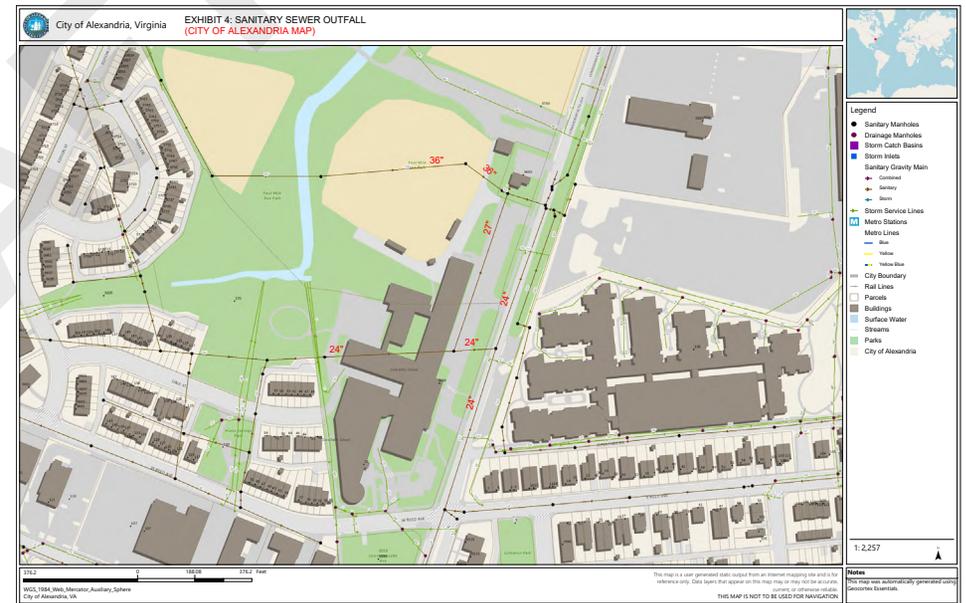
Due to location in drainage shed and proximity to Potomac River, A waiver for the detention requirement can be applied for. Refer to City Code section 13-109-F

Sanitary Sewer Analysis

Based on available information, we do not know exactly where the building's sanitary sewer lateral outfalls to, but we assume it flows out to the east towards Commonwealth Avenue and then to the north to Four Mile Run pump station. We assume that the new school will outfall to the same general area and the net increase in estimated peak wastewater flow does not exceed 10,000 GPD. Based on the City's memo to industry 06-14, a sanitary sewer outfall analysis will not need to be provided. However, if the

net increase in flow exceeds 10,000 GPD, the sanitary sewer outfall analysis shall be completed up to a trunk sewer downstream with a minimum diameter of 24-inches (or to a point as directed by T&ES staff). We have reached out to the City to try and obtain any available City studies of the sewershed in this area and found out that there are none available. Without having any as-built data of the existing sanitary sewer or the existing flows of the system, the capacity of the system cannot be confirmed. However, it is our opinion that if the system currently has capacity, with an approximate 30% increase in the building size, the sanitary system would still have the capacity to serve the school. Refer to **Exhibit 4** for the sanitary sewer system and the extent of the outfall analysis.

Exhibit 4:



Waterline Analysis

The proposed building can tap into the existing 8" waterline located along Commonwealth Ave. Based on a fire hydrant flow test completed by Virginia American Water on 1/4/19, the calculated flow is 1215 gpm at a residual pressure of 20 psi. See **Exhibit 5** of Virginia American Water Flow test.

II. Cora Kelly Master Plan and Technical Data

Exhibit 5a

Virginia American Water – Fire Flow test

Virginia American Water Fire Hydrant Flow Test Summary

Location:	15 W Glebe Rd	Contact Person	Matthew Ganci
Date:	1/4/2019	Main Size	8 inches
Time:	1:45pm		Project Engineer
Total Flow	1215 gpm	Flow Hydrant #	Virginia American Water
		Hydrant A	2225 Duke St.
Static pressure	48 psi	Residual Hydrant #	Alexandria, VA 22314
Residual pressure	20 psi	Hydrant B (2195)	Office: 703-706-3862
			Email: matthew.ganci@amwater.com

Calculated Flow gpm	Residual psi
1532	5
1433	10
1215	20
618	40
#NUM!	60
#NUM!	80
#NUM!	100
#NUM!	120
#NUM!	140

Notes:

- Table calculation is for reference only. Virginia American Water will not guarantee the calculated flow.
- 3500 gpm is the limit of available fire flow.
- Individual (Non-public water supply) fire suppression systems shall be designed by the property owner to meet needed fire flow in excess of 3,500 gpm.
- VAW does not provide hydrant elevations.

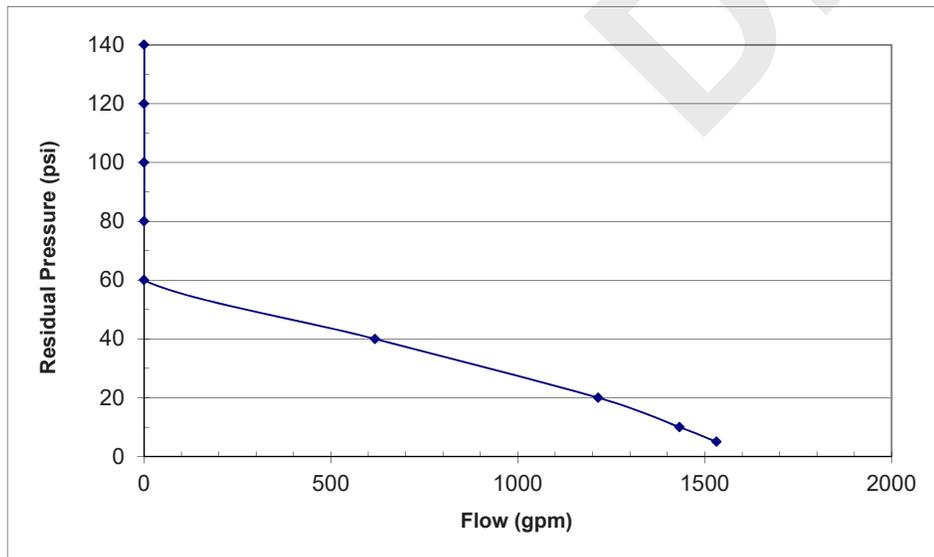


Exhibit 5b

REQUEST FOR FIRE FLOW TEST INFORMATION

Requested by Brian Currie
 Phone (240) 375-9147 Fax _____
 Email brian.currie@redhawkus.com
 Project Name Glebe House Apartments
 Request Reason Need flow information for hydraulic calculations

District (A) P
 Project address 15 W Glebe Rd
 Map sheet # _____

Flow Hydrant# Hydrant A use 4" nozzle *w/diffuser*
 Residual Hydrant # Hydrant B
 Main size 8 inches

Note: Before running this flow test, check all surroundings to avoid any potential damage to nearby residents landscaping, grounds, etc.

Flow duration 3-5 minutes

Tester D. Klakamp
 Date 1/4/19
 Time 1:45p

Residual Hyd# Hydrant B - 2195 Make Mueller
 Static Pressure (PSI) 48
 Residual Pressure (PSI) 20

Residual FH MUST Get at least a 10 lb. drop

Flow Hydrants	1	2	3	4
Hydrant#	2194 (A)			
Hydrant make	Resunsaolar			
Nozzle Diameter (inch)	4			
Flow reading (PSI)	8			
Static Reading (PSI)	48			

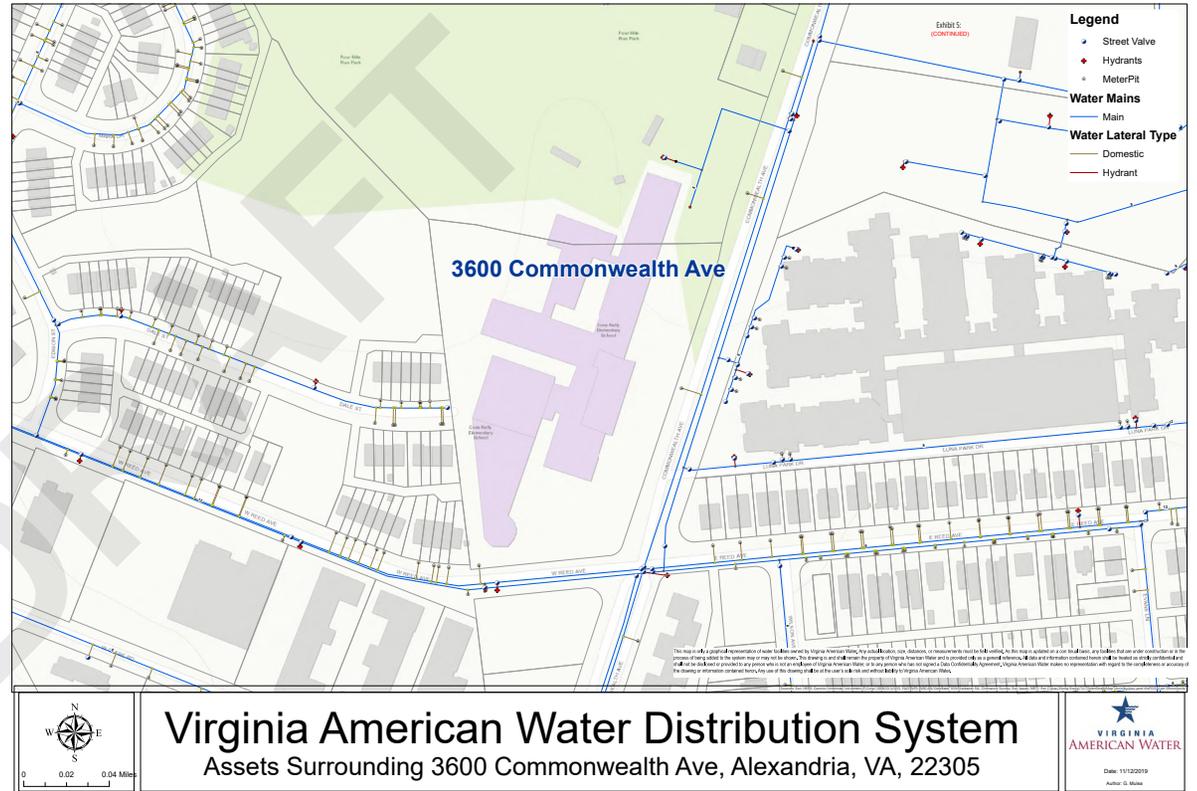
Engineering Department

Requested by Matthew Ganci Date 12/5/2018

Recommendations

- To reduce the requirements for BMP and SWM, changing the field and playground material from turf to grass will greatly help.

Exhibit 5c



II. Cora Kelly Master Plan and Technical Data

Cost Estimates - New Construction

CLARIFICATIONS & ASSUMPTIONS	
PROJECT:	ACPS CORA KELLY ES
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS
LOCATION:	ALEXANDRIA, VA
A / E:	STUDIO 27 ARCHITECTS
C/M:	N/A
PHASE:	MASTER PLAN ESTIMATE
February 4, 2020	
CLARIFICATIONS & ASSUMPTIONS	
BUILDING INFORMATION	
Building Type:	EDUCATIONAL
Project Type:	NEW CONSTRUCTION
Building GSF:	114,385 SF
Stories:	3
MARK-UPS	
General Conditions:	10.0%
Cm Fee:	5.0%
Design Contingency:	15.0%
Bonds & Insurance:	2.0%
Escalation:	EXCLUDED
DOCUMENTS	
Technical Site Study Assessment dated December 12, 2019 as issued by Studio 27 Architects	
EXCLUSIONS	
A-E Fees	
Phasing	
Overtime	
Escalation	
Deep foundation systems	
Furniture and loose equipment	
Library shelving	
Lockers	
Photovoltaic systems	
Playground equipment	
Bleachers (exterior)	
Electronic score boards	
Trash compactors/bins	
Change order contingency	
Finance cost	
QUALIFICATIONS	
Assume conventional concrete strip foundation systems	
Assume 12' floor to slab height for existing building	
Assume structural steel frame construction with concrete on metal deck slabs	
Structural steel framing assumed @ 12lbs/sf for the 1st level and 6.5lbs/sf for the 2nd level	
Assume typical floor to slab height of 14', double volume areas 25'	
Assume conventional built-up roof waterproofing system to 30% of overall roof area, green roof of 70% of roof area	
Assume 30lf of millwork per classroom	
Assume one (1) elevator with two (2) stops	
New school is assumed without a basement a slab on grade	
The existing building is assumed to maintain existing site utilities no upgrades	

PROJECT SUMMARY							
PROJECT:	ACPS CORA KELLY ES						
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS						
LOCATION:	ALEXANDRIA, VA						
A / E:	STUDIO 27 ARCHITECTS						
C/M:	N/A						
PHASE:	MASTER PLAN ESTIMATE						
February 4, 2020							
DIVISION	DESCRIPTION	TOTAL		CORA KELLY		REC CENTER	
		GROSS SF:	114,385 SF	GROSS SF:	114,385 SF	GROSS SF:	61,619 SF
		TOTAL	RATE/GSF	TOTAL	RATE/GSF	TOTAL	RATE/GSF
DIVISION 01	GENERAL REQUIREMENTS	\$ 80,000	\$ 0.70	\$ 80,000	\$ 0.70	\$ -	\$ -
DIVISION 02	EXISTING CONDITIONS	\$ 1,997,840	\$ 17.47	\$ 1,997,840	\$ 17.47	\$ -	\$ -
DIVISION 03	CONCRETE	\$ 3,680,717	\$ 32.18	\$ 2,359,039	\$ 20.62	\$ 1,321,678	\$ 21.45
DIVISION 04	MASONRY	\$ 6,712,500	\$ 58.68	\$ 4,312,500	\$ 37.70	\$ 2,400,000	\$ 38.95
DIVISION 05	METALS	\$ 4,723,908	\$ 41.30	\$ 2,974,289	\$ 26.00	\$ 1,749,619	\$ 28.39
DIVISION 06	WOODS & PLASTICS	\$ 1,214,006	\$ 10.61	\$ 776,578	\$ 6.79	\$ 437,429	\$ 7.10
DIVISION 07	THERMAL AND MOISTURE PROTECTION	\$ 3,585,250	\$ 31.34	\$ 2,055,044	\$ 17.97	\$ 1,530,206	\$ 24.83
DIVISION 08	OPENINGS	\$ 3,910,750	\$ 34.19	\$ 2,456,250	\$ 21.47	\$ 1,454,500	\$ 23.60
DIVISION 09	FINISHES	\$ 5,332,921	\$ 46.62	\$ 3,465,866	\$ 30.30	\$ 1,867,056	\$ 30.30
DIVISION 10	SPECIALTIES	\$ 243,604	\$ 2.13	\$ 160,824	\$ 1.41	\$ 82,781	\$ 1.34
DIVISION 11	EQUIPMENT	\$ 2,810,000	\$ 24.57	\$ 1,755,000	\$ 15.34	\$ 1,055,000	\$ 17.12
DIVISION 12	FURNISHINGS	\$ 132,003	\$ 1.15	\$ 85,789	\$ 0.75	\$ 46,214	\$ 0.75
DIVISION 13	SPECIAL CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
DIVISION 14	CONVEYING EQUIPMENT	\$ 330,000	\$ 2.88	\$ 110,000	\$ 0.96	\$ 220,000	\$ 3.57
DIVISION 21	FIRE SUPPRESSION	\$ 1,073,624	\$ 9.39	\$ 697,749	\$ 6.10	\$ 375,876	\$ 6.10
DIVISION 22	PLUMBING	\$ 2,640,060	\$ 23.08	\$ 1,715,775	\$ 15.00	\$ 924,285	\$ 15.00
DIVISION 23	HVAC	\$ 14,080,320	\$ 123.10	\$ 9,150,800	\$ 80.00	\$ 4,929,520	\$ 80.00
DIVISION 25	INTEGRATED AUTOMATION	\$ 2,640,060	\$ 23.08	\$ 1,715,775	\$ 15.00	\$ 924,285	\$ 15.00
DIVISION 26	ELECTRICAL	\$ 6,336,144	\$ 55.39	\$ 4,117,860	\$ 36.00	\$ 2,218,284	\$ 36.00
DIVISION 27	COMMUNICATIONS	\$ 1,619,237	\$ 14.16	\$ 1,052,342	\$ 9.20	\$ 566,895	\$ 9.20
DIVISION 28	ELECTRONIC SAFETY AND SECURITY	\$ 1,408,032	\$ 12.31	\$ 915,080	\$ 8.00	\$ 492,952	\$ 8.00
DIVISION 31	EARTHWORK	\$ 2,306,875	\$ 20.17	\$ 1,894,375	\$ 16.56	\$ 412,500	\$ 6.69
DIVISION 32	EXTERIOR IMPROVEMENTS	\$ 7,292,400	\$ 63.75	\$ 6,301,250	\$ 55.09	\$ 991,150	\$ 16.09
DIVISION 33	UTILITIES	\$ 870,000	\$ 7.61	\$ 435,000	\$ 3.80	\$ 435,000	\$ 7.06
DIRECT COST TOTAL		\$ 75,020,252	\$ 655.86	\$ 50,585,023	\$ 442.23	\$ 24,435,229	\$ 396.55
GENERAL CONDITIONS: 10.0%		\$ 7,502,025	\$ 65.59	\$ 5,058,502	\$ 44.22	\$ 2,443,523	\$ 39.66
SUB TOTAL		\$ 82,522,277	\$ 721.44	\$ 55,643,525	\$ 486.46	\$ 26,878,752	\$ 436.21
CM FEE: 5.0%		\$ 4,126,114	\$ 36.07	\$ 2,782,176	\$ 24.32	\$ 1,343,938	\$ 21.81
SUB TOTAL		\$ 86,648,391	\$ 757.52	\$ 58,425,701	\$ 510.78	\$ 28,222,690	\$ 458.02
DESIGN CONTINGENCY: 15.0%		\$ 12,997,259	\$ 113.63	\$ 8,763,855	\$ 76.62	\$ 4,233,403	\$ 68.70
SUB TOTAL		\$ 99,645,649	\$ 871.14	\$ 67,189,556	\$ 587.40	\$ 32,456,093	\$ 526.72
BONDS & INSURANCE: 2.0%		\$ 1,992,913	\$ 17.42	\$ 1,343,791	\$ 11.75	\$ 649,122	\$ 10.53
SUB TOTAL		\$ 101,638,562	\$ 888.57	\$ 68,533,348	\$ 599.15	\$ 33,105,215	\$ 537.26
ESCALATION: EXCLUDED		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL CONSTRUCTION COST		\$ 101,638,562	\$ 888.57	\$ 68,533,348	\$ 599.15	\$ 33,105,215	\$ 537.26

II. Cora Kelly Master Plan and Technical Data

ESTIMATE					
+C+					
PROJECT:	ACPS CORA KELLY ES				
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS				
LOCATION:	ALEXANDRIA, VA				
A / E:	STUDIO 27 ARCHITECTS				
C/M:	N/A				
PHASE:	MASTER PLAN ESTIMATE	GROSS SF: 114,385 SF	February 4, 2020		
DIVISION	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
01	DIVISION 01 - GENERAL REQUIREMENTS				
	Temporary construction fence	4,000	LF	\$ 20.00	\$ 80,000
					\$ -
TOTAL FOR	DIVISION 01 - GENERAL REQUIREMENTS				\$ 80,000
02	DIVISION 02 - EXISTING CONDITIONS				
	Demolish existing building	76,840	SF	\$ 13.00	\$ 998,920
	Allowance for removal of hazardous materials	76,840	SF	\$ 13.00	\$ 998,920
					\$ -
TOTAL FOR	DIVISION 02 - EXISTING CONDITIONS				\$ 1,997,840
03	DIVISION 03 - CONCRETE				
	Concrete foundations for new building	114,385	GSF	\$ 6.50	\$ 743,503
					\$ -
	Concrete slab-on-grade, including stone fill, damp proofing complete	42,042	SF	\$ 10.25	\$ 430,931
	Under slab drainage system	42,042	SF	\$ 3.50	\$ 147,147
					\$ -
	Concrete on metal decking	72,343	SF	\$ 13.00	\$ 940,459
					\$ -
	New concrete stairs and landings	6	FLIGHTS	\$ 13,000.00	\$ 78,000
					\$ -
	Elevator pit complete	1	EA	\$ 19,000.00	\$ 19,000
					\$ -
TOTAL FOR	DIVISION 03 - CONCRETE				\$ 2,359,039
04	DIVISION 04 - MASONRY				
	Allowance for Brick veneer on back-up system, includes insulation, air barriers, damp proofing, etc. complete (assume 70% is brick veneer and 30% is glazed system) Excludes curtain wall systems	57,500	SF	\$ 75.00	\$ 4,312,500
					\$ -
TOTAL FOR	DIVISION 04 - MASONRY				\$ 4,312,500
05	DIVISION 05 - METALS				
	Structural steel framing at 1st level @ 12lbs/sf	253	TON	\$ 5,500.00	\$ 1,391,500
					\$ -
	Structural steel framing 2nd & 3rd floor @ 6.5lbs/sf	236	TON	\$ 5,500.00	\$ 1,298,000
	Structural steel framing for roof MEP and equipment screens (allow 20lbs/lf of screen area)	5	TON	\$ 4,900.00	\$ 24,500
					\$ -
	Stair handrails	6	FLIGHTS	\$ 4,300.00	\$ 25,800
					\$ -
	Miscellaneous metals allowance	114,385	GSF	\$ 2.05	\$ 234,489
					\$ -
TOTAL FOR	DIVISION 05 - METALS				\$ 2,974,289

ESTIMATE					
+C+					
PROJECT:	ACPS CORA KELLY ES				
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS				
LOCATION:	ALEXANDRIA, VA				
A / E:	STUDIO 27 ARCHITECTS				
C/M:	N/A				
PHASE:	MASTER PLAN ESTIMATE	GROSS SF: 114,385 SF	February 4, 2020		
DIVISION	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
06	DIVISION 06 - WOODS & PLASTICS				
	Rough carpentry	114,385	GSF	\$ 1.50	\$ 171,578
	Allowance for millwork/casework	1	ALLOW	\$ 605,000.00	\$ 605,000
					\$ -
TOTAL FOR	DIVISION 06 - WOODS & PLASTICS				\$ 776,578
07	DIVISION 07 - THERMAL AND MOISTURE PROTECTION				
	Insulation, damp proofing, air barrier, etc. to brick veneer façade				Incl. in Div. 4
	Insulation to the interior face of the existing exterior walls				Assume not required
					\$ -
	Roof waterproofing system 30% of total roof area (built-up roofing)	12,613	SF	\$ 25.00	\$ 315,325
	Roof waterproofing system with green roof 70% of roof total	29,430	SF	\$ 51.00	\$ 1,500,930
					\$ -
	Metal panels at roof screens assume 375lf at 8' high	3,000	SF	\$ 51.00	\$ 153,000
					\$ -
	Allowance for joint sealants, fireproofing, etc.	114,385	GSF	\$ 0.75	\$ 85,789
					\$ -
TOTAL FOR	DIVISION 07 - THERMAL AND MOISTURE PROTECTION				\$ 2,055,044
08	DIVISION 08 - OPENINGS				
	Exterior glazing at new building (30% of total façade)	17,250	SF	\$ 95.00	\$ 1,638,750
					\$ -
	Skylights allowance	1,000	SF	\$ 250.00	\$ 250,000
					\$ -
	Exterior double doors at main entrance	2	PAIR	\$ 20,000.00	\$ 40,000
	Secondary entrance double doors	6	PAIR	\$ 15,000.00	\$ 90,000
					\$ -
	Interior doors allowance	175	LEAFS	\$ 2,500.00	\$ 437,500
					\$ -
TOTAL FOR	DIVISION 08 - OPENINGS				\$ 2,456,250
09	DIVISION 09 - FINISHES				
	Interior wall construction (allowance includes all types of walls, including interior glazing)	114,385	GSF	\$ 8.10	\$ 926,519
					\$ -
	Wall finishes, including tack boards, acoustical panels, paint, ceramic wall tile etc.	114,385	GSF	\$ 6.50	\$ 743,503
					\$ -
	Floor finishes allowance	114,385	GSF	\$ 8.75	\$ 1,000,869
	Ceiling finish allowance	114,385	GSF	\$ 6.95	\$ 794,976
					\$ -
					\$ -
TOTAL FOR	DIVISION 09 - FINISHES				\$ 3,465,866

II. Cora Kelly Master Plan and Technical Data

ESTIMATE +C+					
PROJECT:	ACPS CORA KELLY ES				
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS				
LOCATION:	ALEXANDRIA, VA				
A / E:	STUDIO 27 ARCHITECTS				
C/M:	N/A				
PHASE:	MASTER PLAN ESTIMATE	GROSS SF: 114,385 SF	February 4, 2020		
DIVISION	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
10 DIVISION 10 - SPECIALTIES					
	Toilet partitions, accessories, mirrors and vanity counter tops	114,385	GSF	\$ 1.10	\$ 125,824
					\$ -
	Interior signage/way finding allowance	1	ALLOW	\$ 35,000.00	\$ 35,000
					\$ -
TOTAL FOR	DIVISION 10 - SPECIALTIES				\$ 160,824
11 DIVISION 11 - EQUIPMENT					
	Food service equipment	1	ALLOW	\$ 650,000.00	\$ 650,000
					\$ -
	Gymnasium equipment (bleachers, scoreboards, basketball hoops,	1	ALLOW	\$ 205,000.00	\$ 205,000
					\$ -
	Audiovisual equipment - gymnasium	1	ALLOW	\$ 150,000.00	\$ 150,000
	Audiovisual equipment - cafeteria	1	ALLOW	\$ 75,000.00	\$ 75,000
	Audiovisual equipment - Music classroom	1	ALLOW	\$ 75,000.00	\$ 75,000
	Audiovisual equipment - classrooms, etc.	1	ALLOW	\$ 475,000.00	\$ 475,000
					\$ -
	Dry eraser marker boards, etc.	1	ALLOW	\$ 125,000.00	\$ 125,000
					\$ -
TOTAL FOR	DIVISION 11 - EQUIPMENT				\$ 1,755,000
12 DIVISION 12 - FURNISHINGS					
	Window blinds @ exterior windows	114,385	GSF	\$ 0.75	\$ 85,789
					\$ -
TOTAL FOR	DIVISION 12 - FURNISHINGS				\$ 85,789
13 DIVISION 13 - SPECIAL CONSTRUCTION					
					\$ N/A
					\$ -
TOTAL FOR	DIVISION 13 - SPECIAL CONSTRUCTION				\$ -
14 DIVISION 14 - CONVEYING EQUIPMENT					
	Elevator 2 stops	1	EA	\$ 110,000.00	\$ 110,000
					\$ -
TOTAL FOR	DIVISION 14 - CONVEYING EQUIPMENT				\$ 110,000
21 DIVISION 21 - FIRE SUPPRESSION					
	Fire sprinkler system	114,385	GSF	\$ 6.10	\$ 697,749
					\$ -
TOTAL FOR	DIVISION 21 - FIRE SUPPRESSION				\$ 697,749

ESTIMATE +C+					
PROJECT:	ACPS CORA KELLY ES				
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS				
LOCATION:	ALEXANDRIA, VA				
A / E:	STUDIO 27 ARCHITECTS				
C/M:	N/A				
PHASE:	MASTER PLAN ESTIMATE	GROSS SF: 114,385 SF	February 4, 2020		
DIVISION	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
22 DIVISION 22 - PLUMBING					
	Plumbing system allowance	114,385	GSF	\$ 15.00	\$ 1,715,775
					\$ -
TOTAL FOR	DIVISION 22 - PLUMBING				\$ 1,715,775
23 DIVISION 23 - HVAC					
	HVAC systems allowance	114,385	GSF	\$ 80.00	\$ 9,150,800
					\$ -
TOTAL FOR	DIVISION 23 - HVAC				\$ 9,150,800
25 DIVISION 25 - INTEGRATED AUTOMATION					
	HVAC systems controls allowance	114,385	GSF	\$ 15.00	\$ 1,715,775
					\$ -
TOTAL FOR	DIVISION 25 - INTEGRATED AUTOMATION				\$ 1,715,775
26 DIVISION 26 - ELECTRICAL					
	Electrical systems allowance	114,385	GSF	\$ 36.00	\$ 4,117,860
					\$ -
TOTAL FOR	DIVISION 26 - ELECTRICAL				\$ 4,117,860
27 DIVISION 27 - COMMUNICATIONS					
	Telecommunications, public address, clock and radio	114,385	GSF	\$ 3.25	\$ 371,751
	IT/Data systems	114,385	GSF	\$ 5.20	\$ 594,802
	A/V conduits and cabling	114,385	GSF	\$ 0.75	\$ 85,789
					\$ -
					\$ -
TOTAL FOR	DIVISION 27 - COMMUNICATIONS				\$ 1,052,342
28 DIVISION 28 - ELECTRONIC SAFETY AND SECURITY					
	Access control and CCTV systems	114,385	GSF	\$ 3.75	\$ 428,944
	Fire alarm	114,385	GSF	\$ 2.75	\$ 314,559
	Intrusion detection system	114,385	GSF	\$ 1.50	\$ 171,578
					\$ -
					\$ -
TOTAL FOR	DIVISION 28 - ELECTRONIC SAFETY AND SECURITY				\$ 915,080

II. Cora Kelly Master Plan and Technical Data

ESTIMATE +C+					
PROJECT:	ACPS CORA KELLY ES				
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS				
LOCATION:	ALEXANDRIA, VA				
A / E:	STUDIO 27 ARCHITECTS				
C/M:	N/A				
PHASE:	MASTER PLAN ESTIMATE	GROSS SF: 114,385 SF	February 4, 2020		
DIVISION	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
31	DIVISION 31 - EARTHWORK				
	Rough grading site	470,500	SF	\$ 3.75	\$ 1,764,375
	Erosion and sediment control measures	1	ALLOW	\$ 130,000.00	\$ 130,000
					\$ -
					\$ -
TOTAL FOR	DIVISION 31 - EARTHWORK				\$ 1,894,375
32	DIVISION 32 - EXTERIOR IMPROVEMENTS				
	Clearing and grubbing site preparations	240,000	SF	\$ 1.65	\$ 396,000
	Asphalt driveways and parking area	73,000	SF	\$ 6.75	\$ 492,750
	Concrete curbs	3,800	LF	\$ 40.00	\$ 152,000
	Walkway allowance	6,500	SF	\$ 22.00	\$ 143,000
	Site fencing allowance	3,500	LF	\$ 90.00	\$ 315,000
	Landscaping allowance	1	ALLOW	\$ 375,000.00	\$ 375,000
	Site lighting allowance	1	ALLOW	\$ 210,000.00	\$ 210,000
	Baseball field backstop, bases, etc.	1	ALLOW	\$ 35,000.00	\$ 35,000
	Soccer field artificial turf Full sized	80,500	SF	\$ 21.00	\$ 1,690,500
	Goals	2	EA	\$ 3,500.00	\$ 7,000
	Soccer field artificial turf Junior	51,500	SF	\$ 21.00	\$ 1,081,500
	Goals	2	EA	\$ 3,500.00	\$ 7,000
	Field lighting	1	ALLOW	\$ 460,000.00	\$ 460,000
	Courtyard for outdoor activities and views	14,700	SF	\$ 45.00	\$ 661,500
	Stormwater bio-retention area	1	ALLOW	\$ 275,000.00	\$ 275,000
					\$ -
					\$ -
TOTAL FOR	DIVISION 32 - EXTERIOR IMPROVEMENTS				\$ 6,301,250
33	DIVISION 33 - UTILITIES				
	Domestic water service	1	ALLOW	\$ 100,000.00	\$ 100,000
	Sanitary sewer service	1	ALLOW	\$ 75,000.00	\$ 75,000
	Strom water service	1	ALLOW	\$ 75,000.00	\$ 75,000
	Electrical service	1	ALLOW	\$ 185,000.00	\$ 185,000
					\$ -
TOTAL FOR	DIVISION 33 - UTILITIES				\$ 435,000

ESTIMATE +C+					
PROJECT:	ACPS CORA KELLY ES				
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS				
LOCATION:	ALEXANDRIA, VA				
A / E:	STUDIO 27 ARCHITECTS				
C/M:	N/A				
PHASE:	MASTER PLAN ESTIMATE	GROSS SF: 61,619 SF	February 4, 2020		
DIVISION	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
01	DIVISION 01 - GENERAL REQUIREMENTS				
					\$ N/A
					\$ -
TOTAL FOR	DIVISION 01 - GENERAL REQUIREMENTS				\$ -
02	DIVISION 02 - EXISTING CONDITIONS				
					\$ N/A
					\$ -
TOTAL FOR	DIVISION 02 - EXISTING CONDITIONS				\$ -
03	DIVISION 03 - CONCRETE				
	Concrete foundations for new building	61,619	GSF	\$ 6.50	\$ 400,524
	Concrete slab-on-grade, including stone fill, damp proofing complete	30,810	SF	\$ 10.25	\$ 315,797
	Under slab drainage system	30,810	SF	\$ 3.50	\$ 107,833
	Concrete on metal decking	30,810	SF	\$ 13.00	\$ 400,524
	New concrete stairs and landings	6	FLIGHTS	\$ 13,000.00	\$ 78,000
	Elevator pit complete	1	EA	\$ 19,000.00	\$ 19,000
					\$ -
TOTAL FOR	DIVISION 03 - CONCRETE				\$ 1,321,678
04	DIVISION 04 - MASONRY				
	Allowance for Brick veneer on back-up system, includes insulation, air barriers, damp proofing, etc. complete (assume 70% is brick veneer and 30% is glazed system) Excludes curtain wall systems	32,000	SF	\$ 75.00	\$ 2,400,000
					\$ -
TOTAL FOR	DIVISION 04 - MASONRY				\$ 2,400,000
05	DIVISION 05 - METALS				
	Structural steel framing at 1st level @ 12lbs/sf	185	TON	\$ 5,500.00	\$ 1,017,500
	Structural steel framing 2nd @ 6.5lbs/sf	101	TON	\$ 5,500.00	\$ 555,500
	Structural steel framing for roof MEP and equipment screens (allow 20lbs/lf of screen area)	5	TON	\$ 4,900.00	\$ 24,500
	Stair handrails	6	FLIGHTS	\$ 4,300.00	\$ 25,800
	Miscellaneous metals allowance	61,619	GSF	\$ 2.05	\$ 126,319
					\$ -
TOTAL FOR	DIVISION 05 - METALS				\$ 1,749,619

II. Cora Kelly Master Plan and Technical Data

ESTIMATE +C+					
PROJECT:	ACPS CORA KELLY ES				
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS				
LOCATION:	ALEXANDRIA, VA				
A / E:	STUDIO 27 ARCHITECTS				
C/M:	N/A				
PHASE:	MASTER PLAN ESTIMATE	GROSS SF: 61,619 SF	February 4, 2020		
DIVISION	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
22 DIVISION 22 - PLUMBING					
	Plumbing system allowance	61,619	GSF	\$ 15.00	\$ 924,285
					\$ -
TOTAL FOR	DIVISION 22 - PLUMBING				\$ 924,285
23 DIVISION 23 - HVAC					
	HVAC systems allowance	61,619	GSF	\$ 80.00	\$ 4,929,520
					\$ -
TOTAL FOR	DIVISION 23 - HVAC				\$ 4,929,520
25 DIVISION 25 - INTEGRATED AUTOMATION					
	HVAC systems controls allowance	61,619	GSF	\$ 15.00	\$ 924,285
					\$ -
TOTAL FOR	DIVISION 25 - INTEGRATED AUTOMATION				\$ 924,285
26 DIVISION 26 - ELECTRICAL					
	Electrical systems allowance	61,619	GSF	\$ 36.00	\$ 2,218,284
					\$ -
TOTAL FOR	DIVISION 26 - ELECTRICAL				\$ 2,218,284
27 DIVISION 27 - COMMUNICATIONS					
	Telecommunications, public address, clock and radio	61,619	GSF	\$ 3.25	\$ 200,262
	IT/Data systems	61,619	GSF	\$ 5.20	\$ 320,419
	A/V conduits and cabling	61,619	GSF	\$ 0.75	\$ 46,214
					\$ -
TOTAL FOR	DIVISION 27 - COMMUNICATIONS				\$ 566,895
28 DIVISION 28 - ELECTRONIC SAFETY AND SECURITY					
	Access control and CCTV systems	61,619	GSF	\$ 3.75	\$ 231,071
	Fire alarm	61,619	GSF	\$ 2.75	\$ 169,452
	Intrusion detection system	61,619	GSF	\$ 1.50	\$ 92,429
					\$ -
TOTAL FOR	DIVISION 28 - ELECTRONIC SAFETY AND SECURITY				\$ 492,952
31 DIVISION 31 - EARTHWORK					
	Rough grading site	110,000	SF	\$ 3.75	\$ 412,500
					\$ -
TOTAL FOR	DIVISION 31 - EARTHWORK				\$ 412,500

ESTIMATE +C+					
PROJECT:	ACPS CORA KELLY ES				
OWNER:	ALEXANDRIA CITY PUBLIC SCHOOLS				
LOCATION:	ALEXANDRIA, VA				
A / E:	STUDIO 27 ARCHITECTS				
C/M:	N/A				
PHASE:	MASTER PLAN ESTIMATE	GROSS SF: 61,619 SF	February 4, 2020		
DIVISION	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
32 DIVISION 32 - EXTERIOR IMPROVEMENTS					
	Clearing and grubbing site preparations	120,000	SF	\$ 1.65	\$ 198,000
					\$ -
	Asphalt driveways and parking area	45,800	SF	\$ 6.75	\$ 309,150
	Concrete curbs	1,800	LF	\$ 40.00	\$ 72,000
					\$ -
	Walkway allowance	3,500	SF	\$ 22.00	\$ 77,000
					\$ -
	Landscaping allowance	1	ALLOW	\$ 125,000.00	\$ 125,000
					\$ -
	Site lighting allowance	1	ALLOW	\$ 110,000.00	\$ 110,000
					\$ -
	Stormwater bio-retention area	1	ALLOW	\$ 100,000.00	\$ 100,000
					\$ -
TOTAL FOR	DIVISION 32 - EXTERIOR IMPROVEMENTS				\$ 991,150
33 DIVISION 33 - UTILITIES					
	Domestic water service	1	ALLOW	\$ 100,000.00	\$ 100,000
	Sanitary sewer service	1	ALLOW	\$ 75,000.00	\$ 75,000
	Storm water service	1	ALLOW	\$ 75,000.00	\$ 75,000
	Electrical service	1	ALLOW	\$ 185,000.00	\$ 185,000
					\$ -
TOTAL FOR	DIVISION 33 - UTILITIES				\$ 435,000

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II. Cora Kelly Master Plan and Technical Data

Program - Capacity

Cora Kelly Existing Program

Ed Spec Student Model

Table 1 Core Academic Program

Use	Program Space	Cora Kelly Existing Program			Ed Spec Student Model		
		# of spaces	Avg SF / Room	Total SF	# of Spaces	SF / Room	Total SF
Core Academic	Pre-K	1		830	8	1,175	9,400
	Kindergarten	3	1,062	3,185	5	1,175	5,875
	K-2	1		965			
	1st Grade	3	773	2,320	4	900	3,600
	2nd Grade	3	715	2,145	4	900	3,600
	3rd Grade	3	800	2,400	4	900	3,600
	4th Grade	3	710	2,130	4	900	3,600
	5th Grade	3	778	2,335	4	900	3,600
	Extended Learning Area	2	775	1,550	5	600	3,000
	Classroom Bathroom						
	Special Ed	2	775	1,550	3	250	750
	Resource Classroom (Other)				2	250	500
	TAG	1	800	800	1	900	900
	Student Project Storage				1	150	150
	Headstart	2	873	1,745	2	873	1,745
	Citywide ED Program	4	733	2,930	4	733	2,932
	STEM Specialist	1		1,255	1	1,255	1,255
	Math Specialist	1		710	1	710	710
	Reading Specialist	1		770	1	710	710
	Sensory Room	1		275			
	Misc. Pullout	1		160			
	ELL	4	713	2,850	4	713	2,852
	Student Services				4	100	400
	Psychologist	1		215			
	Counselor	1		340			
	Speech Language Provider (SLP)	1		255			
	Occupational Therapist (OT)	1		310	1	400	400
	Storage				4	200	800
	Teacher Collab Room				5	250	1,250
	Early Childhood Learning				1	2,000	2,000
Early Childhood Storage				1	200	200	
Total			32,025			53,829	

21,804 SF Deficiency 40.51% Deficiency

II. Cora Kelly Master Plan and Technical Data

Table 2 Shared Program

Cora Kelly Existing Program				Ed Spec Student Model				
Use	Program Space	# of spaces	Avg SF / Room	Total SF	# of Spaces	SF / Room	Total SF	
Visual Art / Music / Science	Art Lab	1		805	1	1,200	1,200	
	Kiln Room				1	75	75	
	Art Storage	1		300				
	General Music Room				1	1,200	1,200	
	Instrumental Music Room				1	1,000	1,000	
	General Music Storage				1	150	150	
	Instrument Storage				1	250	250	
	Orchestra/Music	1		870				
	Total			1,975			3,875	1,900 SF Deficiency 49.03% Deficiency
Media Center / Library	Reading / Learning / Circulation	1		4,375	1	3,000	3,000	
	Technical Processing Room				1	200	200	
	Combined Office / Workroom				1	200	200	
	Device / Changing Room				1	150	150	
	Storage				1	200	200	
	Small Group Room				2	150	300	
	Computer Lab	1		755				
	Total			5,130			4,050	-1,080 SF (Excess) -26.67% (Increase)
Physical Education	Gymnasium	1		9,265	1	6,500	6,500	
	PE Office				2	150	300	
	PE Storage				2	250	500	
	Multi-Purpose	-		-	1	1,500	1,500	
	Total			9,265			8,800	Uses Existing Rec Center
Student Dining and Food Services	Student Dining Area	1		3,725	1	3,000	3,000	
	Chair and Table Storage				1	350	350	
	Serving Area				1	700	700	
	Kitchen Suite	1		1,655	1	2,150	2,150	
	Stage with Storage				1	1,100	1,100	
	Total			5,380			7,300	1,920 SF Deficiency 26.30% Deficiency

II. Cora Kelly Master Plan and Technical Data

Table 3 Admin. Program

Cora Kelly Existing Program				Ed Spec Student Model						
Use	Program Space	# of spaces	Avg SF / Room	Total SF	# of Spaces	SF / Room	Total SF			
Administration	Lobby	1		565	1	700	700			
	Welcome Center	1		390	1	450	450			
	Conference Room	1		230	1	250	250			
	Principals Office	1		220	1	180	180			
	Asst. Principals Office				1	150	150			
	Misc. Office	1		270						
	Administrators' Workroom	2		370	1	200	200			
	Teacher Lounge	1		450						
	Mail Room				1	125	125			
	Records Room				1	150	150			
	Family and Community Engagement				1	470	470			
	Staff Toilet				1	50	50			
	Student Services Office				2	150	300			
	Student Services Conference				1	200	200			
	Health Suite	1		650	1	900	900			
	Child and Family Network	1		710	1	710	710			
	Data/Instructional Coach	1		235						
After School Storage				1	250	250				
Total				4,090			5,085	995 SF Deficiency	19.57%	Deficiency
Maint./ Custodial Services										
	Total			60			850	790 SF Deficiency	92.94%	Deficiency
Building Services and Restrooms	Corridors			12,625			13,400			
	Other Services and Restrooms			2,760			8,600			
	Total			15,385			22,000	6,615 SF Deficiency	30.07%	Deficiency

II. Cora Kelly Master Plan and Technical Data

Cora Kelly Existing Program

Ed Spec Student Model

Table 4 Support Program and Total

Use	Program Space	# of spaces	Avg SF / Room	Total SF	# of Spaces	SF / Room	Total SF			
Total Net Area (sf)				73,310			105,789	<u>32,479 SF Deficiency</u>	<u>30.70%</u>	Deficiency
Total Gross Bldg. Area (sf)				76,840			114,464	<u>37,624 SF Deficiency</u>	<u>32.87%</u>	Deficiency

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