OUTDOOR LEARNING SPACES

The design of the building maximizes access to outdoor space on the small urban site, creating large pockets of outdoor learning spaces from the cascading terraces to the athletic field.

The four terraces are informed by the four eco-regions that are nearest to the building's site. These eco-regions help define the identity of each terrace, including its spatial organization and range of plant species. This allows for unique activities at each terrace that correspond to the adjacent floor.

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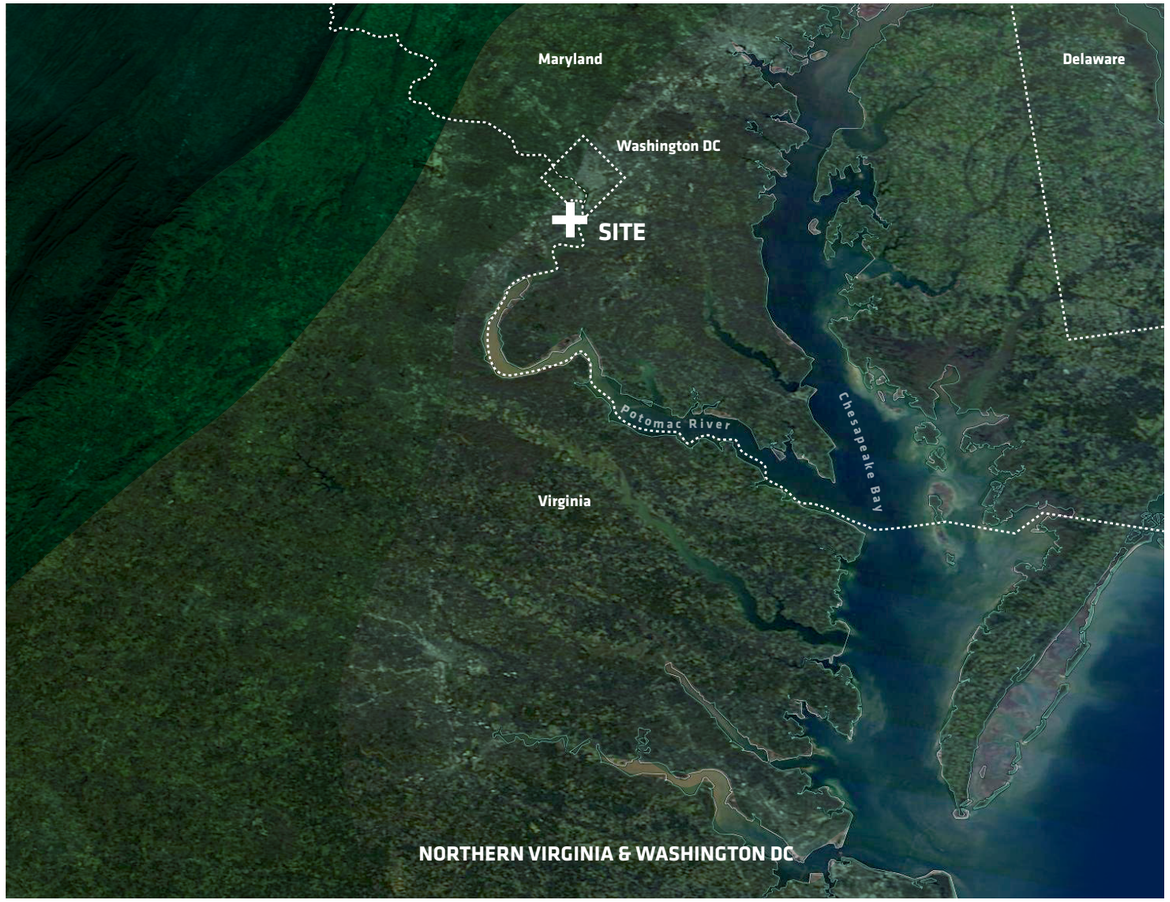
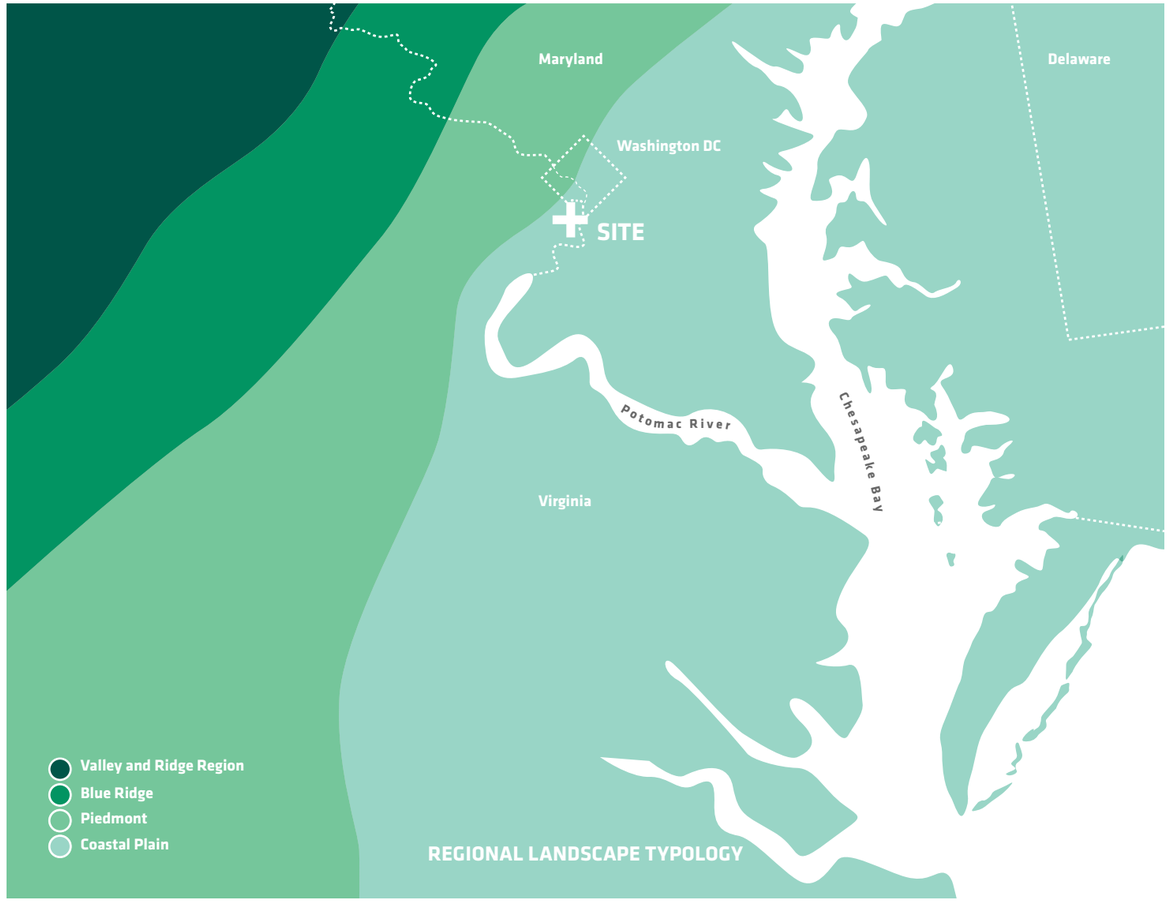
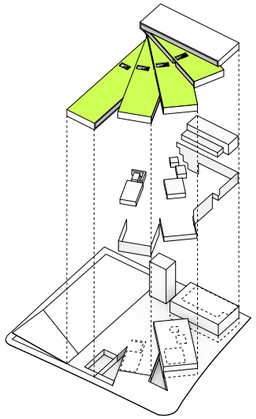
2. SITE 13
3. CONCEPT 19
4. BUILDING DESIGN 23
5. MASSING / ARTICULATION 45
6. **OUTDOOR LEARNING SPACES 65**
7. COST ESTIMATE 75
8. BUILDING SYSTEMS NARRATIVES 81



The school sits near diverse landscapes, on one of the most significant estuaries in the United States.

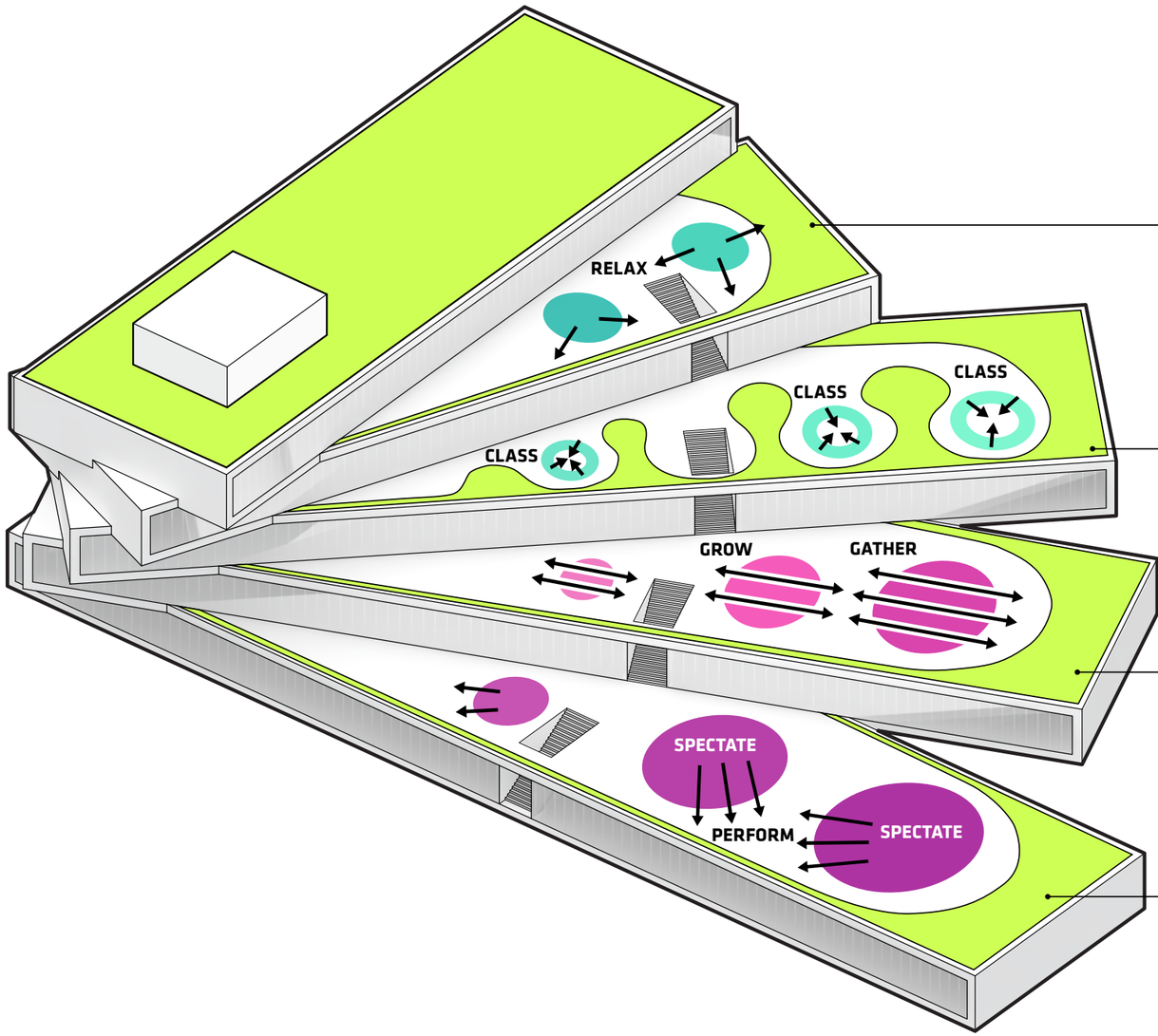


The regional landscapes of Northern Virginia can inform the outdoor classrooms, teaching students about their own backyard.



TERRACES

The four terraces are informed by the four eco-regions that are nearest to the building's site. These eco-regions help define the identity of each terrace, including its spatial organization and its range of plant species. This allows for unique activities at each terrace that correspond to the adjacent floor.



BLUE RIDGE
Rocky Landscape

VALLEY
Green Valley

PIEDMONT
Linear Arrangement

COASTAL PLAINS
Sand Dunes

FIELD AND TERRACES

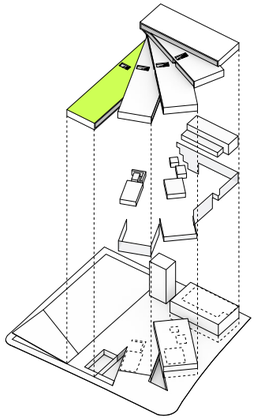
VIEW FROM FIELD TILT-UP

SITE PLAN

PLANTING AND TERRACE FEATURES

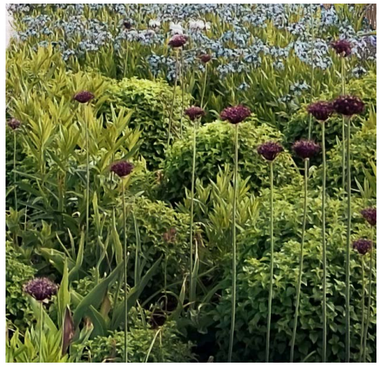
TERRACES

VIEW OF LEVEL 2 TERRACE



TERRACE L2

The Level 2 terrace is open to the public, accessible from an exterior stair that connects to the athletic field. Green dunes provide the required soil depth for trees while creating spaces where students and neighbors can gather for various activities; small concerts, outdoor plays, morning yoga and outdoor reading.



INTENSIVE GREEN

Extent: Perimeter of terraces

TURF

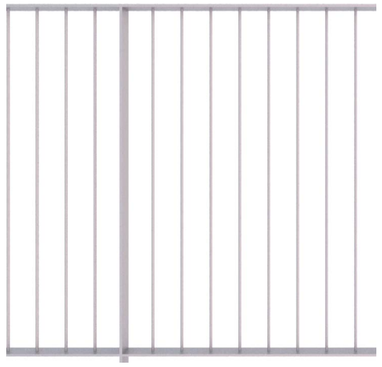
Extent: Sloped lawns at dunes

CONCRETE PAVER

Extent: Terrace paving

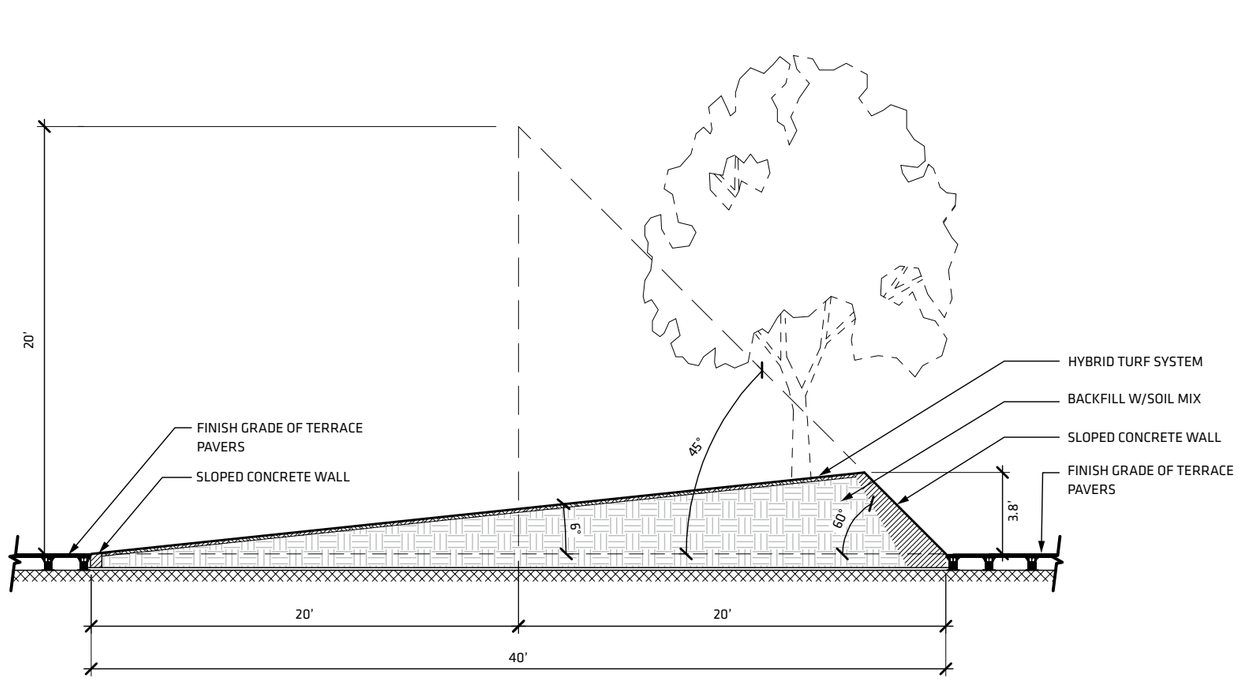
STAINLESS STEEL

Extent: Handrails

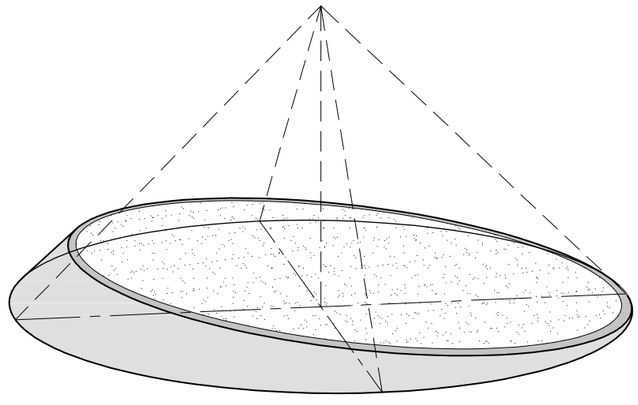


VERTICAL PICKETS

Extent: Guardrails



SECTION THROUGH SLOPED LAWN



SLOPED LAWN AXONOMETRIC

PLANTING SELECTION
TREES & SHRUBS

FOSTER HOLLY

Type: Evergreen Tree
Extent: L2, L3, L4, L5 Terraces

FIRESPIRE AMERICAN HORNBEAM

Type: Medium Deciduous Tree
Extent: L3, L4, L5 Terraces

WHITE FRINGETREE

Type: Small Deciduous/Ornamental Tree
Extent: L2, L3, L4 Terraces

AMERICAN HAZELNUT

Type: Large Shrub
Extent: L3, L4, L5 Terraces

SWEETFERN

Type: Small Shrub
Extent: L4, L5 Terraces

AMERICAN HOLLY

Type: Evergreen Tree
Extent: L2, L3, L4 Terraces

BLACK GUM

Type: Medium Deciduous Tree
Extent: L2, L3, L4, L5 Terraces

CHEROKEE BRAVE

Type: Small Deciduous/Ornamental Tree
Extent: L2, L3, L4, L5 Terraces

BLUE MUFFIN ARROWWOOD VIBURNUM

Type: Large Shrub
Extent: L3, L4 Terraces

DWARF FOTHERGILLA

Type: Small Shrub
Extent: L2, L3 Terraces

PLANTING SELECTION
SHRUBS, GRASSES & GROUNDCOVER

DWARF RED TWIG DOGWOOD

Type: Small Shrub
Extent: L3, L4 Terraces

PURPLE LOVE GRASS

Type: Grass
Extent: L2, L3, L4, L5 Terraces

SIDEOATS GRAMA

Type: Grass
Extent: L2, L3, L4, L5 Terraces

PRAIRIE SUNDROPS

Type: Groundcover/Perennial
Extent: L2, L3, L4, L5 Terraces

BLUE EYED GRASS

Type: Groundcover/Perennial
Extent: L2, L3, L4, L5 Terraces

DWARF INKBERRY

Type: Small Shrub
Extent: L2, L3 Terraces

LITTLE BLUESTEM

Type: Grass
Extent: L2, L3, L4, L5 Terraces

PENNSYLVANIA SEDGE

Type: Grass
Extent: L2, L3, L4, L5 Terraces

CHRISTMAS FERN

Type: Groundcover/Perennial
Extent: L2, L3, L4 Terraces

BROWNIES ALUMROOT

Type: Groundcover/Perennial
Extent: L2, L3, L4, L5 Terraces

COST ESTIMATE

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	Amount
Major Construction Bonds	$85,900,000
Other (Operating)[1]	$1,900,000
Capital Reserve	$7,000,000
FY 2017 Closeout[2]	$2,620,000
Reserved Parking Garage Funding	($5,000,000)
Subtotal	**$92,420,000**
County/School Board Joint Fund	
•APS Funding[3]	$3,000,000
•ACG Funding[4]	$5,290,000
Subtotal	**$8,290,000**
Additional ACG Funding[5]	$290,000
Grand Total Funding Available	**$101,000,000**

Notes:
1. Furniture and equipment that cannot be bond funded.
2. To be allocated directly to Wilson project rather than to Capital Reserve.
3. Matches amount approved by the School Board at Schematic Design on July 20, 2016.
4. Includes jointly funded items, costs associated with 18th Street redevelopment and costs associated with the temporary fire station.
5. For transportation and utility costs associated with the temporary fire station.

PROPOSED PROJECT BUDGET

	Amount
Proposed GMP (Construction Costs)[1]	$81,481,364
Owner (Soft) Costs[2]	$19,518,636
Total	**$101,000,000**

Notes:
1. Includes school building, site, and redevelopment of 18th Street. Also includes previously approved early work Package 1 ($810,002) and Package 2 ($14,088,865).
2. Owner costs include design, project management, and other professional services fees, utility/permitting fees, furniture, equipment, and project contingencies

#	Description	Cost
1	Community Use of 2nd Level Terrace	$ 1,110,000
2	Utility Undergrounding	$ 880,000
3	Publically Accessible Restrooms for Park	$ 90,000
4	Emergency Responder Network	$ 160,000
5	Streetscape Improvements	$ 900,000
6	18th Street Improvements	$ 1,300,000
7	Costs Associated with Temporary Fire Station[1]	$ 2,420,000
8	Building Design to Maximize Open Space	$ 1,430,000
	Total - Joint Fund	**$ 8,290,000**

Notes:
1. Funded entirely by ACG.

BUILDING SYSTEM NARRATIVES

This section summarizes information and analysis for specific engineering and consultant disciplines that was produced to support the design of the new school.

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CIVIL ENGINEERING

GORDON

Demolition

The proposed Wilson School will result in the demolition of several facilities and utilities within the site limits. Specifically, demolition is anticipated for the following areas (note: values are approximate):

A. Existing parking lot and travel way that supports 50 parking spaces and 1 handicap accessible parking space
B. Existing Wilson School building (7-Eleven to remain)
C. Overhead Electric (OHE):
    i. Two (2) utility poles with mounted light fixtures and OHE between the two poles along the west side of the existing parking lot will be removed.
    ii. Two (2) utility poles along the western frontage of N. 18th and OHE between the two poles will be removed. Note: removal of the existing equipment mounted on the eastern-most utility pole (# C079) must be coordinated with Dominion Virginia Power.
    iii. Existing utility pole at the northeast corner of the property will be removed.
D. Storm Sewer
    i. Remove 320 feet of storm sewer utilities on site.
    ii. Remove storm structures in the site:
        a. Manholes to be removed - (3)
        b. Curb inlets to be removed - (2)
        c. Grate inlets to be removed - (1)
        d. Outfall structures to be removed - (1)
E. Sanitary Sewer: existing 8" sanitary sewer line located east of the site will likely remain in place.
F. Water: existing 6" water line located east of site is anticipated to remain in place.
G. Playground Equipment: recreational area located north-adjacent to existing Wilson building will be removed (2,600 sf).
H. Sidewalk / Trail / Walkway: segments located throughout the site will be removed (550 lf). Public sidewalk along Wilson Boulevard is expected to remain.
I. Fence: 1,050 linear feet of fencing to be removed.
J. Asphalt Pavement:
    i. Remove 3,000 sf of asphalt pavement on northern property boundary.
    ii. Entrance driveways to parking lot and school at south and west of the site to be removed.
    iii. Asphalt parking lot to be removed.
    iv. ADA ramps, accessible routes and curb and gutters within the site to be removed.
K. Trees: 25 trees on site will need to be removed.
L. Retaining Wall: 200 lf of retaining wall to be removed on-site.

Erosion Sediment Control

Assume typical Virginia Erosion Sediment Control requirements, including temporary dewatering during construction and one to two construction entrances.

Maintenance of Traffic

The project should assume the costs associated with temporary pedestrian and vehicular traffic controls to maintain sidewalk and roadway circulation in the vicinity of the project. These may include, but are not limited to, temporary lane closure(s), covered walkway(s), etc.

Grading and Earthwork

Based on the proposed plan there will be excavation for the basement and ground level portions of the building. Additionally, we anticipate some excavation for the utility and storm water management installations, including an electrical transformer vault, cistern, and BMP facility. The project will not be a balanced earthwork site. The current dimensions of the underground portion of the building yield approximately 41,600 cubic yards of anticipated material haul-off.

According to the geotechnical report, soils on site include controlled fill from previous construction activities and a mix of fine and coarse grained soils which were classified as very stiff and very dense, respectively, from Standard Penetration Tests. Schnabel states that groundwater was encountered at depths between 24 feet and 51 feet below existing grades. They anticipate that groundwater will be above the lowest levels of the proposed school, therefore de-watering of the proposed excavation will be necessary.

The following provisions and site improvements are proposed:

Wet Utilities

Water (Domestic and Fire): Assume domestic and primary fire service connection from either the existing 8" water line in Wilson Boulevard. Domestic service will include installation of new meter vault proposed for the south corner along the east side of the building. Fire department connection (FDC) to be installed on the address side of the building (Wilson Boulevard) – this will be building-mounted, and must be within 75' of a fire hydrant. The FDC cannot encroach on the clear public sidewalk.

Sanitary Sewer: A sanitary sewer lateral is anticipated on the east side of proposed site, connecting to a proposed doghouse manhole on the existing 8" sanitary sewer parallel to the eastern property boundary, and draining from south to north. Assume an 8-inch sanitary sewer lateral to the building.

Additionally, sanitary sewer service for the basement and ground floor levels of the proposed building will likely require pumping due to the shallow nature of the existing sanitary sewer in the vicinity of the project site. Arlington County follows the State Building Code that allows pumps for sanitary sewer subject to certain provisions.

Storm Sewer: Assume existing storm drain inlets on Wilson Boulevard, N. Quinn St., and the southwestern corner of N. 18th St. will remain. New curb and gutter installation on the south side of N. 18th Street along the project frontage may necessitate the installation of additional storm drain infrastructure – assume two (2) new inlet structures on N. 18th Street, along with approx. 100 lf of storm drain pipe.

Service Utilities

Electric: There is existing electric service along Wilson Boulevard. Refer to electrical design narrative for information regarding project's anticipated electric loads. A new transformer will be installed along Wilson Boulevard from the electric lines to serve the new building. In many urban neighborhoods of Arlington, such as the Wilson site, the County typically requires electric transformers to be located underground in large vaults.

Communications: New connections to the "Arlington Connects" system are provided to the proposed building via 4-2" PVC conduits along the southwest frontage of Wilson Boulevard.

Natural Gas: There is existing natural gas service along Wilson Boulevard and new connection will be provided at the southeast corner of the site. A meter room on the outside of the building will be located near the visitor entrance on the east side.

Storm Water Management

Through a storm water analysis, it is determined that both storm water detention and storm water quality will be required to comply with the new storm water management regulations which require both types of control for redevelopment projects such as this. The following items are being considered to support the expansion.

Water Quantity Facilities (Detention): consisting of one underground concrete vault to received drainage from the entire approx. 2.6 acre limit of disturbance.

Approximate volume is estimated at 24,000 cubic feet of storage. If the entire 2.6 acres of disturbance cannot drain to the detention vault, then additional storage will be required to compensate for areas bypassing the detention system. Access to the control structure will be required via a manhole/junction box. The structure is planned along the northeast face of the foundation wall adjacent to the footprint of a proposed future parking garage.

Water Quality Facilities (BMP): The new treatment standard is assumed to apply to a new impervious area of approximately 1.7 acres, while the 20% reduction standard is assumed to apply to an existing impervious area of 0.9 acres (Existing imperviousness approximately 35%). As a result, the site will likely generate a load of approx. 5.8 pounds per year of phosphorus, and require a reduction of approximately 3 pounds per year of phosphorus, for an average treatment efficiency of 51%. Water Quality facilities consist of several practices including:

1.) 18,700 Square Feet of Vegetated Roof (VA DEQ BMP Clearinghouse Specification #5, Level 1) consisting of up to 4" of media, drainage mats no more than 20% organic matter in media. All design must be in conformance to ASTM (2005) International Green (Vegetated) Roof standards. Provides 0.55 pounds per year of phosphorus removal. The vegetated roof will be required to drain in series to the Manufactured BMP, then to the Water Quantity (Detention) system.

2.) 30,000 gallon cistern (VA DEQ BMP Clearinghouse Specification #6) to collect rainwater from approximately 0.5 acres of roof area (Supply) to be used for internal reuse via irrigation (Demand). Cistern will require pre-filtration to keep sediment, leaves and other debris from the system. This pre-filtration/first flush divert could be a hydrodynamic separator or vortex filter. The overflow outlet will be required to drain in series to the Manufactured BMP, then to the Water Quantity (Detention) system. The cistern provides Runoff Reduction Volume Credit of approximately 70% and will provide approximately 2.5 pounds per year of phosphorus removal.

Overview of Surrounding Road Work

18th Street N.
- Proposed curb and gutter along the school side of the street.
- New sidewalk is proposed along the length of the block, approximately 340 LF.
- 9 new street trees and tree pits with special soil mix to meet County standards (part of Phase II).
- Curb nub bump-outs on the project frontage at the eastern- and western-most ends of the frontage are provided for traffic calming.

N. Quinn Street
- Curb nub bump-outs are provided for traffic calming purposes on the corners at 18th Street North and Wilson Boulevard. New curb and gutter along with 370 LF of sidewalk is to be installed along the length of the road to accommodate the new parallel parking and demolished existing entryway.
- Existing trees are to be removed to allow proposed parallel parking, and replaced with 7 new trees and tree pits with special soil mix to meet County standards.
- North Quinn is categorized as a Type B- Primary Urban mixed use arterial with a bike lane/shared lane, 6 to 12 foot wide sidewalks and a 6-foot furniture zone.

Wilson Boulevard
- New curb and gutter is proposed along the school side of Wilson Boulevard to block the existing entryway in between the 7-Eleven and existing Wilson School. New sidewalk will be installed along the existing driveway (70 LF) to extend the existing sidewalk to the property boundary.
- 8 new street trees and tree pits with special soil mix to meet County standards.
- Installation of 12 Class II bike racks to meet County standard.
- Wilson Boulevard is categorized as a Type A-Primary Retail Oriented Mixed Use arterial with a bike lane/shared lane, 10 to 16 foot sidewalks and a 6 foot furniture zone, improvements to the street to meet County standard may be required.

Recreational Elements

Sport Field: A new outdoor athletic field will be provided on the north face of the building, consisting of an infilled synthetic turf carpet over a base pad able to support the turf and provide horizontal drainage. We do not recommend the turf moving up a slope greater than 1.5%, otherwise the infill will migrate.

There will be a temporary field at Phase I, extended field at Phase II. The rectangular field will be designed with flexibility in mind. A perimeter fence of 10'-12' height will be provided on the north edge of the field.

Temporary Construction Easements

Construction should all occur on-site. Temporary clearing and grading easements may be required on adjacent parcels or roadways.

Additional Considerations

The portion of property directly adjacent to the rear of the existing 7-Eleven building and protruding into the Wilson School property is currently County Board owned.
Care must be taken not to damage the adjacent property, nor interrupt utility service to the property during construction. Wilson Boulevard is one-way in the project area; therefore, careful planning for construction hauling to and from the site is required. Temporary lane closure(s) along Wilson Boulevard during construction, whether for loading/unloading, construction activities, etc., may not be permitted during rush hours (630a-930a and 330p-630p) and should be considered for scheduling accordingly.

LANDSCAPE ARCHITECTURE

GORDON

The summary below describes the general scope and extent of landscape architecture for the new Wilson School project.

Terraces
At levels 2-5, the outdoor terraces will contain a mix of paving systems, seat walls, extensive and intensive green roof planting that will include small-to-medium sized trees in drip-irrigated raised planting beds with undulating planted berms. To meet the County's tree replacement requirements, the terraces provide space for tree plantings to supplement the proposed street trees being placed on Wilson Boulevard, North Quinn, and 18th Streets.

Lower Courtyards
The ground level outdoor courtyards will have a mix of paved areas and planted areas, including some trees requiring drip irrigation.

Front Entry Plaza / Pocket Park
The Wilson Blvd street frontage will contain a mix of paving surfaces and seat walls surrounding planted areas. Plantings will include a mix of groundcover, small shrubs, and both small and larger shade trees. Some bike racks will be provided for visitor use.

Athletic Field
The athletic field at the north side of the building will be a synthetic turf play surface surrounded by a ball field fence. The area will be accessible from adjacent Rosslyn Highlands Park and from stairs and ramps that connect to the first level of the school building. Field lights will supply appropriate illumination levels for extended usage. The local community will have access to the field during after-school hours.

Streetscape / Public Space
The streetscape and public spaces surrounding the building will contain street trees and sidewalks which comply with Arlington County standards.

STRUCTURE

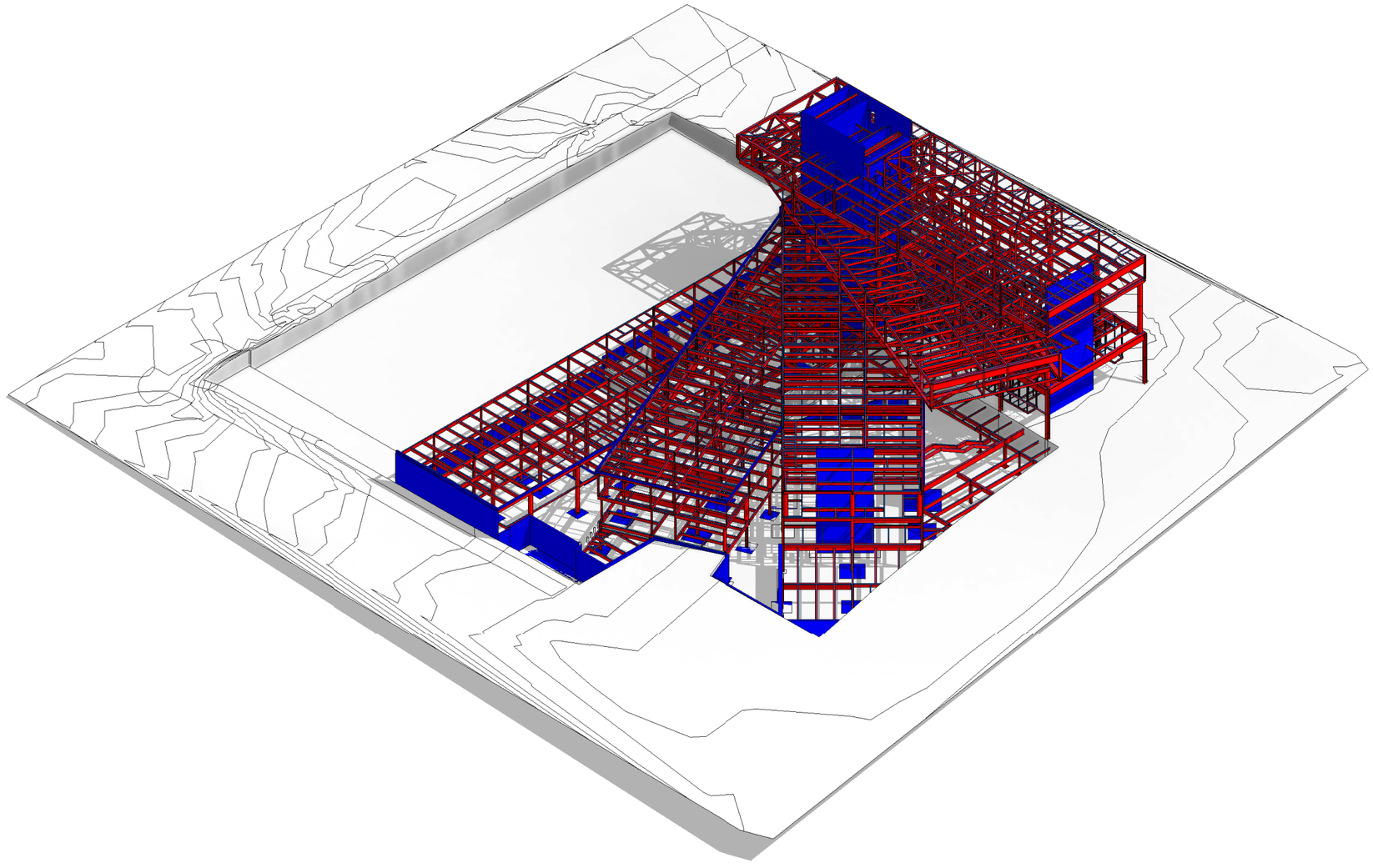
SILMAN

Primary Structure

- The primary core structure will be a vertical concrete core at the intersection point of the five bars that extends from the roof to the foundation, and a steel frame at the end of each of the five bars that extends from the roof to the foundation.
- The steel infill framing will be typical beam/girder construction.
- The floor and roof slabs will be concrete on steel deck.
- The structure will step down where it transitions from interior floor to exterior roof terrace to accommodate pavers and vegetated roofing.
- Bars one, three, and five, will have columns at the sides that extend down to the foundation. Bars two and four will have columns that will transfer out to the columns from bars one, three, and five or will have hanger columns down from the underside of the bar above.
- The 65 ft. width of the bars may require full moment connection field splicing of the girders depending on availability and transportation logistics of obtaining 65 ft. long steel sections.
- Columns supporting the higher bars will be heavy and may require full moment connection field splices.
- Lateral bracing is required at the ends of bars one, three, and five.
- Sunken courtyard walls and basement walls are anticipated to be typical concrete retaining and/or basement wall construction.

STRUCTURAL FRAMING DIAGRAM

PRIMARY STEEL STRUCTURE AND LATERAL BRACING



MEP DESIGN

INTERFACE ENGINEERING

General

The goal of the design is to create a highly efficient educational space and provide a sustainable, environmentally conscious project. A brief description of the MEP design strategies and design criteria, in addition to energy analysis of the latest design, is outlined in the sections below.

Mechanical Systems

The mechanical systems are designed with a focus on energy efficiency while providing adequate comfort for cooling and heating. The mechanical systems will be designed and installed in accordance with the latest adopted versions of the Virginia Construction codes, and are suitable for the expected use in the facility.

Mechanical Design Criteria

For building envelope and zones, refer to Energy Model Input Table in Appendix A.

Design Temperature Conditions			
		Proposed Design Criteria	Minimum ASHRAE 90.1 Design Criteria[1]
HVAC Design Criteria	Summer Outdoor Conditions	92˚F DB/ 76˚F WB	92˚F DB/ 76˚F WB
	Winter Outdoor Conditions	15˚F DB	15˚F DB
Temperature Set Points (Occupied Areas)		75˚F Summer 70˚F Winter	75˚F Summer 70˚F Winter

1. Criteria from ASHRAE 90.1-2010 for Climate Zone 4A (Washington DC Metro Area)

Interior Mechanical Cooling Load Criteria			
	Lighting	Plug Loads	People
Space Heat Gain	50% of Load to the Space Refer to Target	0.25 W/SF	250 BTU/H Sensible 200 BTU/H Latent
	Lighting Power Density		710 BTU/H Sensible 1090 BTU/H Latent for Gymnasium

Rates per ASHRAE 90.1-2010

Mechanical Ventilation and Occupancy				
Space Type	Occupant Density #People / 1000 sf	Outdoor Air Flow Rate (CFM) Per Person	Outdoor Airflow Rate (CFM) per sf	Exhaust Airflow Rate (CFM) per sf
Media Center	25	10	0.12	-
Auditorium	150	5	0.06	-
Classroom	35	10	0.12	-
Computer Lab	25	10	0.12	-
Cafeteria	100	7.5	0.18	-
Gymnasium	-	-	0.30	-
Office	5	5	0.06	-
Corridor	-	-	0.06	-
Art Room	20	10	0.18	0.7
Music/Theater/ Dance	35	10	0.06	-
Science Laboratories	25	10	0.18	1.0
Multiuse assembly	100	7.5	0.06	-
Conference Room	50	5	0.06	-
Kitchen	-	-	-	0.7
Locker Room	-	-	-	0.5
Toilet Room	-	-	-	50/Toilet Fixture
Storage	-	-	0.12	-
Entry Lobby / Reception	10	5	0.06	-
Library	10	5	0.12	-
Fitness Center / Weight Room	10	20	0.06	-

Rates Based on 2012 Virginia Mechanical Code

Cooling and Heating

Classroom and Administration Areas
A Variable Refrigerant Flow (VRF) system with interior dedicated outside air handling unit for ventilation shall be designed for the classroom and administration areas, and offers an efficient, easily maintainable design.

Both cooling and heating would be provided by a VRF fan coil unit located in the corridor adjacent to each classroom. Rooms larger than 1,000 square feet would be provided with two fan coils for multiple zones in the room. Administration areas shall receive a fan coil unit for every 800 square feet of open office area and a separate fan coil for each conference room. Air shall be distributed into the room by 2x2 ceiling diffusers in the interior zones and linear diffusers along the perimeter.

Water cooled VRF heat recovery condensing units would be located in mechanical rooms on each floor. Each of the six floors shall have approximately 35-tons of water cooled VRF heat recovery condensing modules installed. The condensing units act as a variable flow heat pump, providing heat and cooling to the fan coils, whichever is called for by the space controller. These units allow for the exchange of heat between different rooms, without the need of mechanical cooling when conditions are right, which allows the system to run at high efficiency levels.

Gymnasium, Cafeteria, and Auditorium Areas
The Gymnasium, Cafeteria, and Auditorium area shall all be heated and cooled by dedicated water cooled DX self-contained air conditioning units with heat recovery wheels. Heating shall be provided by direct fired natural gas located in each air handling unit. The Gymnasium and Auditorium units shall be approximately 50-tons each, while the Cafeteria unit shall be approximately 30-tons.

Elevator Machine Room Cooling
The elevator machine room, or, if designed, the control center of a machine room less elevator, shall be cooled by a dedicated 3-ton DX split system. The indoor evaporator section shall be located at the motor control center, while the outdoor section shall be located on the roof or at grade. All refrigerants for HVAC equipment shall be free of CFC, HCFC and shall be environmentally safe per LEED Credit EAp3 - Fundamental Refrigerant Management.

Ventilation

Classroom and Administration Areas
Ventilation air to the education and administration areas air shall be provided by dedicated outside air direct expansion (DX) units with heat recovery wheel, hot gas reheat, and natural gas supplemental heat located in mechanical rooms on each floor of the new building. Each dedicated outside air unit shall have ultraviolet lights factory installed downstream of cooling coils and above drain pans to inhibit the growth of bacteria in the supply air stream. All dedicated outside air units shall have a bypass around the energy recovery wheel with 100% air side economizer mode.

Each dedicated outside air unit shall be approximately 4,500 CFM. Duct velocities shall be limited to 1,500 feet per minute maximum. Face velocities of supply and return air grills shall be limited to 500 feet per minute.

Main supply and return ductwork shall be installed down the corridors of each floor from the mechanical room. Branch ductwork from the duct mains would be installed to each room to supply and return the code required ventilation air. Ventilation air would be supplied at room temperature and would not affect the cooling or heating operation.

Toilet exhausts, Science Laboratory exhausts, Art Classroom exhausts, and general exhausts shall be connected to the exhaust air stream of the dedicated outside air units to recover the discharge heat. Air from these exhausts shall not be recirculated back into the building. All intakes and exhausts shall communicate to the exterior through side wall louvers located at each floor.

Gymnasium, Cafeteria, and Auditorium Areas

Ventilation to the Gymnasium, Auditorium, and Cafeteria shall be supplied by dedicated air handlers with energy recovery wheels. Each chilled water air handler shall have a variable frequency drive (VFD) on the fan motor and a modulating damper at the outside air intake to respond to demand controlled ventilation via CO2 levels measured by sensors located in each space. Each air handler shall have ultraviolet lights factory installed downstream of cooling coils and above drain pans to inhibit the growth of bacteria in the supply air stream. All dedicated chilled water air handlers shall have a bypass around the energy recovery wheel with 100% air side economizer mode.

All ventilation air shall be filtered with MERV 13 equivalent or higher filtration per LEED Credit IEQc5 – Indoor Chemical and Pollutant Source Control. Contractor shall provide breakout pricing for filtration option using “Dynamic V8” system or equivalent.

HVAC Heat Rejection Source

The mechanical system will utilize jrooftop cooling towers for heat rejection for the mechanical equipment. Source water will be pumped to the VRF condensing units and packaged DX dedicated outside air units via a base mounted end suction pumps located in the basement level.

Building HVAC Controls

All mechanical controls shall be BACnet protocol. A central building BMS shall be provided that will allow the operator to adjust set points and scheduling.

Cafeteria Kitchen
The new cafeteria kitchen is to be a full cooking kitchen similar to the existing kitchen. The kitchen hood exhaust fan is assumed to be 3,000 CFM and shall be ducted with fully welded steel ductwork wrapped with two layers of fire rated duct wrap. The makeup air is assumed to be provided by a 2,400 CFM gas fired heat kitchen makeup air unit that will be interlocked with the operation of the hood and exhaust fan. The makeup air unit shall be selected to provide a 70˚F rise in temperature and shall fully modulate the gas heat. Final exhaust and makeup air unit size shall be determined based on the hood design performed by the kitchen consultant.

Miscellaneous Support Spaces
Electric cabinet unit heaters shall be provided at the base of each of the four stairwells to condition the stairwells during the winter season. Electric recessed wall heaters shall be provided at all the entrances on both the first and second floors to mitigate the effects of wind driven infiltration during the winter season. A ceiling hung electric unit heater shall be provided in the water service room to provide heating during the winter season to keep pipes from freezing.

The main electric room shall have a thermostatically controlled exhaust fan for air circulation and heat dissipation. All electrical closets with transformers shall also be provided with a thermostatically controlled exhaust fan for air circulation and heat dissipation.

Plumbing Systems

The plumbing systems are designed with a focus on water conservation and energy efficiency. The plumbing systems will be designed and installed in accordance with the latest adopted versions of the Virginia Construction Codes (VCC) and are suitable for the expected usage in the facility.

Plumbing Design Criteria

Design Fixture Flow Rates			
Fixture Type	Code Required Maximum Flow Rates (2012 VCC)	LEED Baseline Flow Rates	Design Flow Rates
Lavatory, public	.5 gpm	.5 gpm	.35 gpm
Shower head	2.5 gpm	2.5 gpm	2 gpm
Sink faucet	2.2 gpm	2.2 gpm	1.5 gpm
Urinal	1 gpf	1 gpf	.125 gpf
Water Closet (tank type)	1.6 gpf	1.6 gpf	1.28 gpf
Water Closet (flushometer)	1.6 gpf	1.6 gpf	1.28 gpf

Pipe Sizing Criteria			
Pipe Type	Design Velocity (fps) or Slope (in/ft)	Design Pressure Drop (psi/100ft)	Load Criteria
Domestic Water, main	6 fps	2 psi/100ft	WSFU per 2012 VCC
Domestic Water, branch	6 fps	3 psi/100ft	WSFU per 2012 VCC
Domestic Hot Water and Hot Water Return	4 fps	2 psi/100ft	WSFU per 2012 VCC
Sanitary	1/8 in per ft. min		DFU per 2012 VCC
Vent	Positive slope towards drain		DFU per 2012 VCC
Storm	1/8 in per foot minimum		3.2 in/hr per 2012 VCC

MEP DESIGN (CONT.)

INTERFACE ENGINEERING

Domestic Hot Water System Sizing Criteria		
Criteria		Code or Design Reference
Generation Temperature	140°F	2012 VCC 501.2, 2011 ASHRAE Applications Handbook 50.10
Building Distribution and Return Temperature	140°F / 130°F	2011 ASHRAE Applications Handbook 50.10
Kitchen Equipment Distribution and Return Temperature	140°F / 130°F	2011 ASHRAE Applications Handbook Table 50.3
Longest Dead-end Branch	50ft	2012 VCC 607.2
Design Volume Between Circulated line and Fixture	Lav: 0.0158 gal Other: 0.188 gal	2012 IgCC
Building Demand Criteria		2011 ASHRAE Applications Chapter 50
Kitchen Demand Criteria		2011 ASHRAE Applications Handbook Table 50.11, 50.12

Level 1 Gray and Rain Water Treatment Standards (Table 70-A 9VAC25-740-70 and 2012 VCC 1303.2)	
Treatment	Secondary treatment with filtration and higher-level disinfection.
Bacterial Standards	1. Fecal coliform: monthly geometric mean less than or equal to 14 colonies/100ml; corrective action threshold at greater than 49 colonies/100ml or 2. E. coli: monthly geometric mean less than or equal to 11 colonies/100 ml; corrective action threshold at greater than 35 colonies/100ml or 3. Enterococci: monthly geometric mean less than or equal to 11 colonies/100ml corrective action threshold at greater than 24 colonies/10ml.
Disinfection	If chlorine is used: 1. Total Residual Chlorine: Correction action threshold at less than 1.0 mg/l after a minimum contact time of 30 minutes at average flow or 20 minutes at peak flow. 2. Not more than 4 mg/L of free chlorine, combined chlorine, or total chlorine. If ozone is used: 1. Ozone content in non-potable water shall not exceed 0.1 parts per million at the point of use.
pH	6.0-9.0 standard units
Five-day Biochemical Oxygen Demand (BOD_5)	1. BOD_5: monthly average less than or equal to 10 mg/l; or 2. Carbonaceous Biochemical Oxygen Demand ($CBOD_5$): monthly average less than or equal to 8 mg/l.
Turbidity	Daily average of discrete measurements recorded over a 24-hour period less than or equal to 2.0 nephelometric turbidity units (NTU) ; corrective action threshold at greater than 5.0 NTU.
Filter	If utilized for water closet or urinal flushing the non-potable water must pass through a 100 micron or finer filter.

Plumbing Design Narrative

With regard to water use reduction strategies, the project anticipates the following strategies:
With regards to Water Efficient Landscaping, planted areas will be irrigated via recycled rainwater on site. With regards to the Water Use Reduction credit, we anticipate a 40% reduction and will assess this goal throughout the project. It is anticipated at this time that this reduction will be achieved through low-flow fixture selection and on-site rainwater treatment for reuse in landscape irrigation.

Domestic Water
The proposed domestic water system is based on the current program of the building using occupancy calculations per International Building Code and fixture counts per International Plumbing Code. It is anticipated that the building WSFU load will range between 950 and 1050 WSFU's. Given the proposed load, we are on the very high limit of a 4" main. It is currently anticipated that a booster pump will be required to meet the buildings pressure requirements. A variable speed triplex booster pump utilizing a 50/50/50 split will be provided.

Reduced Pressure Principle devices and meters shall be provided for the following and installed 24" to 60" above the floor:
1. Water service entrance
2. Irrigation
3. Non-potable make-up

Domestic Hot Water
The proposed domestic hot water system is based on the current program of the building. The current intent is to not provide locker room showers for the gym. The system equipment sizes are estimated using the recovery and storage capacity graphs in Chapter 50 of ASHRAE Fundamentals. The proposed equipment includes:
1. (2) 150,000 BTUH 100gal condensing gas storage water heaters
2. Expansion tank
3. Master thermostatic mixing valve
4. Recirculating pump
5. Balancing valve assemblies

The gas water heating equipment will be provided at the basement level to minimize the length of the gas flues. Given the threat of Legionella growth within

the temperature range of 68°F-122°F the domestic hot water system will supply 140°F water and return at 130°F. Each fixture will be provided with an individual thermostatic mixing valve to limit the temperature at the fixture per code to prevent scalding.

Given that the bulk of the domestic hot water load is 0.35 gpm lavatories, the intent is to provide a recirculating hot water line directly behind each lavatory to limit the wait time for hot water. The intent is to limit the number of separate recirculating lines to minimize the number of balancing valves required.

Sanitary and Vent
The proposed sanitary and vent system is based on the current program of the building using occupancy calculations per International Building Code and fixture counts per International Plumbing Code. It is anticipated that the building DFU load will range between 500 and 700 DFU's. Given the proposed load a single 6" sanitary service exit sloping at 1/8" per foot would be required. A sewage ejector will be required to collect and discharge the waste from fixtures located at the basement level. The sewage ejector will discharge to the proposed 6" sanitary service located at the ground level.

Vents through the roof will be placed on unoccupiable portions of the roof.
There is a proposed kitchen designed to provide approximately 300 meals per day. Floor sinks will be provided to collect the indirect waste from fixtures intended to hold food and items that will come in contact with food. A new below grade grease interceptor will be provided to treat waste water from the pre-wash sinks.

Storm
The proposed storm system is based on the current building and site footprint and Table 1106.3 from the International Plumbing Code. It is anticipated that the building footprint is approximately 56,000 sf and the field footprint is approximately 38,000 sf. Given the proposed load 12" and 15" storm service exit sloping at 1/8" per foot would be required. The 12" service would be provided for the field area and the 15" would cover the building footprint.

A stormwater collection and reuse system is planned which will meet the requirements of Arlington County Code § 60-11. The proposed stormwater collection and reuse system will consist of:

1. Collection surface diversion per 2012 Virginia Construction Code Section 1303.4.
    a. Divert the first 0.04 inches of each rain event from entering the storage tank without using manually operated valves or devices.
2. Pre-tank filtration per 2012 Virginia Construction Code Section 1303.5.
    a. All water entering the tank shall be filtered to remove materials larger than 0.015 inches.
3. (2) Storage tanks sized to meet requirements of Virginia State Water Agency Regulation 9VAC25-870-66. Separate storage tanks will service the athletic field and building drainage. Each storage tank will be provided with overflow (one 12" and one 15") and means of diverting water around the tank to allow for maintenance.
4. Packaged rainwater treatment system designed to meet Level 1 effluent quality requirements per 2012 Virginia Construction Code Section 1303.2 and 9VAC25-740-70 (See table in Plumbing Design Criteria). Confirmation will be required by the Virginia Department of Health.
5. Non-potable water storage tank designed to hold 2 days' worth of water to supply the flushing fixtures within the building. This tank will have a potable water make-up connection protected via backflow preventer.
6. Duplex pump to supply the non-potable water to the flushing fixtures via a separate non-potable piping system.

Given the high water table, it is expected that means of protecting the foundation from high water pressure will be required. A duplex sump pump sized to handle anticipated load will be required. The sump pump will be sized based on the analysis provided in the site geotechnical report. The current design intent is to connect the sump pump to the 15" building stormwater exits noted above. The sump pump would connect downstream of the rainwater storage tank. Note that the sump pump may require a separate exit from the building to connect to the municipal system.

Elevator sump pumps will be provided in each continuous elevator pit. The pump will be designed to handle 50 gpm at an appropriate head to discharge indirectly into the building storm sewer system. Where hydraulic elevators are provided an oil minder system designed to prevent discharge of oil into the storm sewer will be provided on each elevator sump pump.

Natural Gas
The proposed natural gas system is based on the current program and the current proposed mechanical and plumbing equipment. The following items will require natural gas:

1. Mechanical Ventilation Air Handling equipment
2. Condensing domestic hot water heaters
3. Kitchen equipment
4. Science lab stations in science classrooms.
5. Emergency generator

Current design intent is to distribute at low pressure (less than 1.5 psi) to avoid gas regulators and regulator venting. If pipe sizes become large and expensive the design team will look into distributing at medium pressure (2 psi). The boilers are currently intended to be in the basement, along with the domestic hot water heaters.

Electrical Systems

The design of the electrical system will be based on the adopted edition of the Virginia Construction Code. The design's emphasis will be on energy efficiency while maintaining the highest level of reliability.

Electrical Design Criteria

Normal Power
The estimated connected load for the new normal power service is determined by the following criteria:

Building Area[1] =180,677 SF			
Load Type	Connected Load[2] (VA/SF)	Connected Load (kVA)	Demand Load[5] (kVA)
Lighting[3]	0.99	178.9	2122.8kVA/180,677SF =11.75 VA/SF First 3 VA/SF at 100% = 3 VA/SF x 180,677= 542kVA Remaining VA/SF at 75% = 8.75 VA/SF x 180,677 x 0.75 =1185.6 kVA
Power	1.7	307.2	
Misc[4]	1.3	234.9	
Elevators[7]	N/A	137.2	
HVAC	7	1264.7	
Total Load (kVA)		2122.8	1727.6
Building Voltage (V)		480	
New Total Amps (A)		2553.4	2078.0

MEP DESIGN (CONT.)

INTERFACE ENGINEERING

1. Building Area obtained from Project Summary on G-002.
2. Except for Lighting, connected load values are per RS Means Book, Table 9.0-1151 for low rise office buildings.
3. Lighting connected load is based on IECC-2012, School Building reduced lighting power density, Table C406.3.
4. Miscellaneous loads include Fire Alarm, IT and Security.
5. Building Area obtained from Studio 27.
6. Lighting connected load is based on IECC-2012, Parking Garage lighting power density.
7. Elevator connected load is based on QV-001.

Emergency Power

The estimated connected load for the emergency power is determined by the following list equipment provided by Arlington County Public School (APS):

Item	Rating[1]	Qty.	Connected (kVA)	Demand (kVA)
Emergency Lighting	15 KW	1	15	15
Fire Alarm	1 KW	1	1	1
Clinic Refrigerator	1.2 KW	1	1.2	1
PA Rack	1 KW	1	1	0.8
Main Elec Room Rec.	0.2 KW	1	0.2	0.2
Admin Area Receptacle Rec.	0.2 KW	1	0.2	0.2
Ext. Security Lights	6 KW	1	6	6
Master Clock	0.2 KW	1	0.2	0.2
Telecom Equipment	6 KW	1	6	4.8
DTS-UPS	10 KW	1.0	10	10
Swipe Card System	1 KW	1	1	0.8
CATV	1 KW	1	1	0.8
Security Alarms	0.5 KW	1	0.5	0.4
Jockey Pump	10 HP	1	12	10
Kitchen Freezers & Coolers[2]	9.5 KW	1	9.5	7.6
Sump Pumps	1 HP	2	3	2.4
Fire Pump	50 HP	1	54	43
Elevator	30 HP	1	33	33
Elevator Sump Pump	0.5 HP	1	1.2	1
Elev. Cab Lights+ Fan	1 KW	1	1	1
Spare (10%)			19.3	16.92
Total[3]			212.3	186.12

Notes:
1. All ratings indicated are approximate values to equipment typically installed in projects.
2. Assumed one (1) Walk-in Freezer, one (1) Walk-in Refrigerator and one (1) Cooler.
3. Total is based on estimated numbers. Final load totals will be reflected on the construction documents.

Electrical Design & Power Distribution

Normal Power Systems

The new service to the building will be provided by means of a new, exterior transformer located in a vault below the sidewalk on Wilson Boulevard provided by the utility company, Dominion Virginia Power (DOM). The new service will be rated for 1600A, 480/277V, 3 , 4-wire. Inside the building the service feeders will run in Rigid Galvanized Steel (RGS) conduits and terminate at a service entrance switchboard located in the main electrical room. All service conductors from the transformer and up to five (5) feet from exterior wall will be owned and installed by DOM. If the distance inside the building is greater than five feet, all conductors will be owned and installed by APS.

The new 1600A, 480/277V, 3 , 4W service entrance switchboard shall be free standing front accessible, with manually operated, fixed mounted molded case main circuit breaker and manually operated, group mounted, molded case circuit breakers. The main circuit breaker shall be equipped with ground fault protection. The switchboard shall have a copper bus and an internally installed Surge Protective Device (SPD) and rated for the service voltage and comply with requirements of UL96A Master Label for installation requirements for lightning protection systems. The switchboard will be equipped with a DOM approved metering section, a main disconnect section and multiple distribution sections. The short circuit rating of the switchboard will be determined based on the utility short circuit contribution provided by DOM. The switchboard will be sized to serve the full design load.

Emergency Power Systems

Emergency power to the building will be served by means of a 250kVA 480/277V, 3 natural gas-powered generator. The generator, located at the roof, will be Level 2, Class 8, and Type 10. The generator will be designed to restore power within 10 seconds (Type 10) and maintain operation for 8 hours (Class 8). Inside the building, the feeders will be routed in RGS type conduits. All feeders from the generator will terminate at a 400A, 480/277V, 3 , emergency panelboard. The loads fed from the emergency panelboard are as follow:

- Life-Safety Branch: This includes emergency egress lighting in corridors and stairways, fire alarm systems, stair pressurization fans and fire pump.
- Legally-Required Branch: This includes garage ventilation, sump pumps and stair pressurization fans.
- Optional Standby Branch: This includes water pumps, sewage ejector pump, security and IT equipment, elevators and other miscellaneous loads requested by APS.

Each branch of the emergency system will have its own 4-pole, open transition automatic transfer switch (ATS) and distribution panels. The fire pump and elevators will have their own transfer switches. The fire pumps transfer switch will be integral to the fire pump controller. The emergency panelboard, all ATSs, and emergency distribution panelboards will be housed in the main electrical room.

Power Distribution

Voltage Utilization

The voltage utilization for the new building shall be as follows:

- 13.8kV – Site power to utility transformer
- 480Y/277 – Incoming service
- 277V - General lighting
- 480V – Motors 3/4HP and above
- 120V – General power and convenience receptacles
- 208V– General power and equipment
- Special equipment shall receive voltage and ampere rating as required

Power Distribution

Building interior distribution will be provided through branch panels served from the main electrical room. The branch panels will be located in dedicated, stacked electrical closets, one (1) per floor. Additional satellite electrical closets will house branch panels as required to eliminate voltage drop on the branch circuits.

Dedicated electrical closets for the kitchen and gymnasium will also house branch panels to serve the kitchen equipment and gym/stage equipment respectively. All branch panels will feed power devices, lighting, equipment, HVAC and elevator. All distribution panelboards, branch panels and shall be dead front construction with copper bussing utilizing bolt-on thermal magnetic circuit breakers. Circuit

breakers 150amp and above shall be true RMS solid state circuit breakers with adjustable Long/Short/Instantaneous (LSI) trip units. All circuit breakers shall be fully rated. No series rated devices allowed. All panelboards and branch panels shall meet the withstand rating of the available fault current. Internal SPD protection will be located at the distribution and branch panels as determined by system load configuration.

Dry-type transformers will be general purpose, air cooled, three coil, two winding type. Transformer windings shall be copper. Insulation will be Class H, 220C with average temperature rise not exceeding 150C above a 40C ambient at full load. Ratings will be 480V, 3 , 3-Wire primary with 208/120V, 3 , 4-Wire secondary.

Safety switches will be fusible and non-fusible type, heavy duty construction, horsepower rated, quick-make and quick-break with visible blades in OFF position, pad lockable in OFF position. Fuses will be Class RK5 dual element time delay current limiting rejection type. Interior and exterior switches shall be NEMA 1 and NEMA 3R enclosures respectively.

Conductors sizes #10AWG and smaller will be solid copper with Type THWN or THHN 600-volt insulation. Conductor sizes #8AWG and larger will be stranded copper type XHHW, THWN or THHN 600-volt insulation unless noted otherwise. Branch circuits shall have a minimum wire size of #12 AWG. Control Wiring shall have a minimum wire size of #20 AWG. Lighting and receptacle branch circuits may utilize type MC Cable in lieu of wire in conduit in indoor dry concealed locations where permitted by code. Voltage drop will be limited to less than 2% for main feeder runs and less than 3% for branch circuits.
Exposed conduits will be Rigid Galvanized Steel (RGS) or Intermediate Metal Conduit (IMC) below 6 FT above the floor. Conduit in contact with earth will be RGS, IMC or heavy wall PVC with a ground conductor sized in accord with NEC section 250-95. Connections to all vibrating equipment and for branch circuit wiring in casework and in millwork will be flexible metal (steel) conduit in accordance with NEC article 350. All other conduits will be electric metallic tubing (EMT) with compression fittings, minimum size ¾". EMT may be used exposed directly above equipment with installed height of 6 FT or more above the floor.

All receptacles shall be specification heavy duty, side wired type. Minimum receptacle ampacity shall be 20amps. All exterior receptacles shall be weather proof type installed in cast aluminum boxes with "while in use" covers. Self-testing GFCI receptacles will be installed where required by code. The following receptacle layout criteria are assumed unless directed otherwise. Specific locations of devices will be shown on later submissions.

- Each class room shall have a minimum of one duplex receptacle per wall.
- AV equipment, such as class room projectors, projection screens, LCDs, lecterns, and conference room tables, etc. shall be provided with a duplex receptacle installed in a FSR Inc. Model PWB-250 Plasma/Flat Panel Display Wall box. This box shall include AV connections jacks and have space for cable and cord management within the recessed box enclosure.
- Computer stations in class rooms and computer labs shall be provided with a duplex receptacle. Corridors shall have a duplex receptacle every 50 feet for cleaning with a maximum of two per circuit.
- Receptacle circuits will typically be limited to eight (8) duplex receptacles per circuit.
- Wireless network access nodes shall be provided with a duplex receptacle. If they are installed in concealed ceilings they shall be installed in a flush recess wireless access enclosure (Oberon Inc. or equal) for accessibility and mounting of the wireless node equipment.
- Classrooms will not share receptacle circuits with adjacent rooms.
- The Server Room shall have a minimum of one duplex every 12 feet around the room perimeter or one per wall for convenience. Two (2) NEMA L6-30R outlets and two (2) NEMA 5-20R outlets each with dedicated circuits for server racks and equipment on the south wall.
- The IT closets and AV rooms shall have a minimum of one duplex every 12 feet around the room perimeter or one per wall for convenience. Telephone equipment will be provided two NEMA L6-30R outlets and two NEMA 5-20R outlets each with dedicated circuits. Each IT and server rack shall be provided two NEMA 5-20R dedicated outlet.

Lighting and Lighting Control

Lighting

Lighting design shall conform to or exceed latest versions of ASHRAE 90.1-2010 and IESNA: The Lighting Handbook, Edition 10. Design will incorporate concepts and equipment that effectively support the needs of each space. Efficient light sources and luminaires will be used to reduce electrical loads. LED fixtures with electronic and dimming ballasts will be used typically throughout interior and exterior spaces. Lighting power density per space and Illumination levels are presented below:

Lighting Criteria			
Space Type	Lighting Power Density (W/SQFT)[1]	Lighting Power Density (Target)	Average Illumination Levels (FC)[2]
Media Center	0.93	0.65	30
Auditorium	0.79	0.55	30
Classroom	1.24	0.87	50
Computer Lab	1.24	0.87	50
Cafeteria	0.65	0.46	15
Gymnasium	0.43/1.2[4]	0.30 / 0.84	15/50[5]
Corridor	0.66	0.46	5
Office	1.11	0.78	30
Art Room	1.24	0.87	50
Music / Theater / Dance	1.24	0.87	50
Science Laboratory	1.28	0.90	50
Multiuse Assembly	1.23	0.86	50
Conference Room	1.23	0.86	30
Kitchen	0.99	0.69	50
Locker Room	0.75	0.53	5
Toilet Room	0.98	0.69	5
Storage	0.63	0.44	10
Lobby / Reception	0.9	0.63	40
Library	0.93	0.65	30

MEP DESIGN (CONT.)

INTERFACE ENGINEERING

Fitness Center / Weight Room	0.72	0.50	40

Notes:
1. Per ASHRAE 90.1-2010
2. Per IES Lighting Handbook – 10th Edition, horiz. plane values.
3. General / Ramp / Entrance
4. Audience Seating / Playing Area
5. Assuming Class II Arena per IES Lighting Handbook – 10th Ed.

Lighting Control

To conform to ASHRAE 90.1-2010 and promote additional energy, an efficient lighting control system will be installed that utilizes occupancy sensors, dimming where appropriate, daylight harvesting and time management options. Lighting control relays will be installed on every floor to manage all lighting control aspects. The table below provides the lighting control criteria per space.

Lighting Control				
Space Type	Occupancy Sensors	Daylight Harvesting[1]	Time Clock	Dimming[2]
Media Center	X	X	X	X
Auditorium		X	X	X
Classroom	X	X	X	X
Computer Lab	X	X	X	X
Cafeteria	X	X	X	X
Gymnasium	X	X	X	X
Corridor	X	X	X	X
Office	X	X	X	X
Art Room	X	X	X	X
Music / Theater / Dance	X	X	X	X
Science Laboratory		X	X	X
Multiuse Assembly	X	X	X	X
Conference Room	X	X	X	X
Kitchen			X	
Locker Room	X		X	
Toilet Room	X		X	
Storage	X		X	
Lobby / Reception	X	X	X	X
Library		X	X	X
Fitness Center / Weight Room		X	X	X

Notes:
1. Areas with Fenestrations
2. Dimming shall be continuous.

Additional Controls

To further reduce energy consumption and achieve net zero, additional controls will be implemented. These controls include:

- 50% or more of the receptacles in an office, classroom, computer labs, and other spaces will be controlled by occupancy sensors. When no motion is detected in a space, all receptacles connected to the occupancy sensor will be shut down to further reduce power consumption.
- All spaces with individual HVAC controls will be controlled by occupancy sensors. When no motion is detected in a space, the occupancy sensors will trigger any individual HVAC terminal units to shut down, and further reduce energy consumption.

ENERGY ANALYSIS

INTERFACE ENGINEERING

Wilson Secondary School is designed with a focus on substantial increases in energy efficiency and overall building performance. Many energy conservation measures are being implemented in order to reduce the energy footprint of the school including a VRF mechanical system, enhanced building envelope with high performance glazing and enhanced roof and wall insulation, low-energy LED lighting with daylight responsive and occupancy controls, all EnergyStar building equipment, and demand responsive ventilation with energy recovery.

In addition to energy efficiency, high performance design strategies for water use reduction are also a focus for the Wilson Secondary School. Strategies such as water efficient landscaping, low-flow plumbing fixtures, and on-site rainwater treatment and reuse for flushing fixtures and irrigation are being implemented.

The proposed building systems are anticipated to provide 33.8% energy cost savings over a baseline building, using ASHRAE 90.1-2007. The project's EUI (energy use intensity) aims to be 29.5 kbtu/ft^2.

LEED SCORECARD

SUSTAINABLE DESIGN CONSULTANTS

The Wilson School is pursuing LEED certification through the LEED for Schools v3 (2009) rating system. The project is required to achieve a minimum rating of LEED Silver (or equivalent) per Arlington County requirements, but the project is currently tracking towards LEED Gold.

Y	?Y	?N	N			
				Minimum Program Requirements		
Y				PIf1	**Minimum Program Requirements**	
Y				PIf2	**Project Summary Details**	
Y				PIf3	**Occupant & Usage Data**	
Y				PIf4	**Schedule & Overview Documents**	
19	1		5	**Sustainable Sites**	Possible Points	**24**
Y	?Y	?N	N			
Y				Prereq 1	**Construction Activity Pollution Prevention**	
Y				Prereq 2	**Environmental Site Assessment**	
1				Credit 1	**Site Selection**	1
4				Credit 2	**Development Density & Community Connectivity**	4
1				Credit 3	**Brownfield Redevelopment**	1
4				Credit 4.1	**Alternative Transportation:** Public Transportation Access	4
1				Credit 4.2	**Alternative Transportation:** Bicycle Storage & Changing Rooms	1
2				Credit 4.3	**Alternative Transportation:** Low Emitting & Fuel Efficient Vehicles	2
2				Credit 4.4	**Alternative Transportation:** Parking Capacity	2
			2	Credit 5.1	**Site Development:** Protect or Restore Habitat [RP]	1
1				Credit 5.2	**Site Development:** Maximize Open Space	1
1				Credit 6.1	**Stormwater Design:** Quantity Control	1
			1	Credit 6.2	**Stormwater Design:** Quality Control	1
1				Credit 7.1	**Heat Island Effect:** Non-Roof	1
1				Credit 7.2	**Heat Island Effect:** Roof	1
			1	Credit 8	**Light Pollution Reduction**	1
	1			Credit 9	**Site Master Plan**	1
			1	Credit 10	**Joint Use of Facilities**	1
10			3	**Water Efficiency**	Possible Points	**11**
Y	?Y	?N	N			
Y				Prereq 1	**Water Use Reduction:** 20% Reduction	
2			2	Credit 1	**Water Efficient Landscaping**	4
3				Credit 2	**Innovative Wastewater Technologies** [RP]	2
5				Credit 3	**Water Use Reduction:** 30%/ 35%/ 40% [RP]	4
			1	Credit 4	**Process Water Use Reduction**	1
20		2	13	**Energy & Atmosphere**	Possible Points	**33**
Y	?Y	?N	N			
Y				Prereq 1	**Fundamental Commissioning of Building Energy Systems**	
Y				Prereq 2	**Minimum Energy Performance**	
Y				Prereq 3	**Fundamental Refrigerant Management**	
16			4	Credit 1	**Optimize Energy Performance:** 8% and up	19
			8	Credit 2	**On-Site Renewable Energy:** 1%-13% [RP]	7
2				Credit 3	**Enhanced Commissioning**	2
1				Credit 4	**Enhanced Refrigerant Management**	1
1			1	Credit 5	**Measurement & Verification**	2
		2		Credit 6	**Green Power**	2

[RP] - Regional Priority credit

Y	?Y	?N	N			
6			7	**Materials & Resources**	Possible Points	**13**
Y	?Y	?N	N			
Y				Prereq 1	**Storage & Collection of Recyclables**	
			2	Credit 1.1	**Building Reuse:** Maintain Existing Walls, Floors, and Roof	2
			1	Credit 1.2	**Building Reuse:** Maintain 50% of Interior Non-Structural Elements	1
2				Credit 2	**Construction Waste Management:** 50%/ 75%	2
			2	Credit 3	**Materials Reuse:** 5%/ 10%	2
2				Credit 4	**Recycled Content:** 10%/ 20%	2
2				Credit 5	**Regional Materials:** 10%/ 20%	2
			1	Credit 6	**Rapidly Renewable Materials:** 2.5%	1
			1	Credit 7	**Certified Wood:** 50%	1
11	1	2	5	**Indoor Environmental Quality**	Possible Points	**19**
Y	?Y	?N	N			
Y				Prereq 1	**Minimum IAQ Performance**	
Y				Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	
Y				Prereq 3	**Minimum Acoustical Performance**	
			1	Credit 1	**Outdoor Air Delivery Monitoring**	1
			1	Credit 2	**Increased Ventilation:** 30%	1
1				Credit 3.1	**Construction IAQ Management Plan:** During Construction	1
1				Credit 3.2	**Construction IAQ Management Plan:** Before Occupancy	1
1				Credit 4.1	**Low-Emitting Materials:** Adhesives & Sealants	1
1				Credit 4.2	**Low-Emitting Materials:** Paints	1
1				Credit 4.3	**Low-Emitting Materials:** Flooring Systems	1
1				Credit 4.4	**Low-Emitting Materials:** Composite Wood & Agrifiber Products	1
		1		Credit 4.5	**Low-Emitting Materials:** Furniture & Furnishings	1
			1	Credit 4.6	**Low-Emitting Materials:** Ceiling & Wall Systems	1
			1	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1				Credit 6.1	**Controllability of Systems:** Lighting	1
1				Credit 6.2	**Controllability of Systems:** Thermal Comfort	1
1				Credit 7.1	**Thermal Comfort:** Design	1
1				Credit 7.2	**Thermal Comfort:** Verification	1
	1	2		Credit 8.1	**Daylight & Views:** Daylight 75% of Spaces	3
			1	Credit 8.2	**Daylight & Views:** Views for 90% of Spaces	1
			1	Credit 9	**Enhanced Acoustical Performance**	1
1				Credit 10	**Mold Prevention**	1
6				**Innovation & Design Process**	Possible Points	**6**
Y	?Y	?N	N			
1				Credit 1.1	**SSc4.1 E.P.**	1
1				Credit 1.2	**Reduced Mercury in Light Bulbs**	1
1				Credit 1.3	**SSc5.2 E.P.**	1
1				Credit 1.4	**WEc3 E.P.**	1
1				Credit 2	**LEED Accredited Professional**	1
1				Credit 3	**The School as a Teaching Tool**	1
72	2	4	33	**Total**	Possible Points	**110**

Certified 40 to 49 points **Silver 50 to 59 points** Gold 60 to 79 points Platinum 80 to 110 points

CODE & FIRE PROTECTION

GHD

Fire Suppression Requirements

Automatic Sprinkler System
Wilson School will be provided with an automatic sprinkler system as the fire areas exceed 20,000 square feet (VUSBC 903.2.3). The building will be provided with a wet pipe sprinkler system throughout, except in any areas where the temperature could fall below 40 degrees Fahrenheit. The underground parking garage, in which temperatures are capable of falling below 40 degrees Fahrenheit, will be provided with a dry pipe sprinkler system.

Sprinkler types will be provided as follows:
- Upright sprinklers in unfinished ceiling areas, such as mechanical rooms.
- Recessed pendent sprinklers in finished ceiling areas.
- Sidewall sprinklers at the bottom of the elevator pit.

Any upright sprinklers subject to mechanical damage will be provided with sprinkler guards.

Standpipe System
As the highest story of Wilson School is located 30 feet above grade and the lowest level of fire department access, a standpipe system is required to be provided in the building (VUSBC Section 905.3.1) with the following criteria:
- As the building will be provided with full automatic sprinkler protection throughout, the standpipe system would be a Class I standpipe system (VUSBC 905.3.2 Exception 1). Since the distance from the lowest level of fire department access to the highest story is less than 150 feet in height, the standpipe system will be a manual wet standpipe system (VUSBC 905.2).
- Fire hose connections would be installed within the building at the following locations (VUSBC 905.4):
  A. In every required stairway, a hose connection will be provided at the intermediate floor landing.
  B. Per NFPA 14 Section 7.8.1, the standpipe system will provide 100 psi at the hydraulically remote 2 ½ in. hose valve.
  C. At the highest landing of a stairwell with access to the roof.
  D. Where the most remote portion of a story is more than 200 feet from a hose connection.

Zoning
NFPA 13 Section 8.2.1 limits the maximum area per sprinkler zone to 52,000 square feet for Light and Ordinary Hazard occupancies.
The zone control assembly for each zone will be connected to a sprinkler riser which will be located at each level in one of the stairwells. Each zone control assembly will be provided with a water flow switch connected to the building fire alarm system. The zone control valves for each zone will be provided with a valve supervisory switch for monitoring by the building fire alarm system. In addition, the building contains elevators. Sprinkler(s) will be located at the bottom of the shaft and within the elevator controller room/closet. Sprinklers will be on a dedicated control valve assembly with water flow switch. A sidewall sprinkler will also be provided within 24 inches of the bottom of the elevator shaft. Activation of the bottom of shaft sidewall sprinkler will not initiate elevator shunt trip. Shunt trip will be initiated using heat detectors.

Additional Supervision
- Each standpipe system will be provided with a base of riser control valve provided with a valve supervisory switch for monitoring by the building fire alarm system.
- The exterior post indicated valve will be provided with a valve supervisory switch for monitoring by the building fire alarm system.
- The double check backflow preventer will be provided with a valve supervisory switch on each OS&Y valve for monitoring by the building fire alarm system.

Hazard Classification
Wilson School consists mainly of classrooms, assembly spaces, offices and associated support spaces such as mechanical, electrical, and custodial rooms. The following summarizes the hazard classifications and corresponding sprinkler system densities, hose stream requirements, design areas and maximum coverage area per sprinkler based on the requirements of NFPA 13.
- Light Hazard Occupancy
  A. Density: 0.10 gpm/sqft over 1,500 ft
  B. Hose Stream: 100 gpm
  C. Use: Offices, Classrooms, gym, theatre, lounges, offices, and other low combustible areas.
- Ordinary Hazard, Group 1 Occupancy
  A. Density: 0.15 gpm/sqft over 1,500 ft
  B. Hose Stream: 250 gpm
  C. Use: mechanical rooms, storage rooms, electrical rooms, kitchen
  D. It is currently anticipated that no Extra Hazard occupancies will not be present within the building.

NFPA requires that 100 gpm of the required hose stream be taken inside buildings with multiple standpipes. The remaining hose stream is applied at the fire service connection to the municipal water supply.

Water Supply
The water supply for the fire protection systems in the building will be provided by a dedicated fire service and will not utilize the same incoming piping as the domestic water supply. The fire protection water supply will be provided with a double-check backflow preventer assembly. The water supply will be evaluated in future submissions.

Fire Detection/Alarm Requirements
Per VUSBC Section 907.2.3 Exception 3, a manual fire alarm system is not required, provided the building is fully sprinklered and manual activation is provided from a normally occupied location, such as a main office / reception. However, GHD recommends to provide pull stations even when they aren't required, as most occupants have been trained that if there is a fire/problem they can utilize a pull-station upon exiting the building. If the Wilson School is deemed a high-rise building, an emergency voice/alarm communication system is required to be provided in accordance with Section 907.2.13.

In accordance with VUSBC Section 907.5.2.2, operation of initiation devices should sound an alert tone followed by voice instructions giving approved information and directions for evacuation. A manual override shall be provided for the system and it shall also have the capacity to broadcast live voice messages by paging zones. VUSBC 907.2.3 states that manual fire alarm boxes shall not be required in Group E occupancies where building is provided with an automatic sprinkler system and manual activation is provided from a normally occupied location.

VUSBC Section 907.2 requires at least one manual fire alarm box and Section 907.4.2.1 requires that the manual fire alarm boxes be located not more than 5 feet from the entrance to each exit, with additional boxes required to be located so that travel distance to the nearest box does not exceed 200 ft.
VUSBC Section 907.5 requires the fire alarm system annunciate at the panel, and initiate notification upon activation of sprinkler waterflow devices, manual fire alarm boxes, and automatic fire detectors. VUSBC Section 907.5.2.1 requires audible alarm notification appliances that emit a distinctive sound and that is not to be used for any other purpose other than fire alarm. This section also requires the audible alarm notification to be 15 decibels dBA above average ambient sound level. Section 907.5.2.3 requires visible alarm notification appliances to be provided in public areas and common areas.
Notification devices will consist of ADA-compliant strobes and audible speakers. Visible alarm notifications appliances (strobes) will be provided in all public and common areas except exits. Strobes are required to be mounted 80-96 inches above the highest floor level within the space or 6 inches below the ceiling, whichever is lower.

Audible alarm notification appliances (speakers) will be provided and will not be used for any purpose other than that of a fire alarm. The audible alarm notification appliances will provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level in every occupied space within the building.

FOOD SERVICE

HOPKINS FOOD SERVICE SPECIALISTS

Introduction

Arlington Public Schools will construct a 775-seat secondary school, the Wilson School, to receive the existing H.B. Woodlawn and Stratford School programs. The H.B. Woodlawn program is a +/- 675 seat middle school/high school academic program focused on the arts, and typically includes performance and practice spaces for drama, music, and film making, including a black box theatre and a multi-use performance hall. The Stratford School is a separate special-needs educational facility with 100 students. The school kitchen should be sufficiently sized to serve an additional 10% of students on a day-to-day basis.

Leo A. Daly and Hopkins Foodservice Specialists (HOPKINS) have interviewed representatives of Arlington Public Schools (APS) to confirm the following criteria required to complete the design of the food service spaces within this building.

Wilson School will require a very efficient layout. Although some departmental functions may be assigned to other floors, the overall building's food service program square footage area cannot increase. Leo A Daly and HOPKINS request the client to review this program and notify us of any exceptions to our understanding of the following information.

Food Service Management

The food service operation will be self-operated by school personnel who will assemble and serve meals, however, most of the food they serve will be partially processed convenience heat/cook and serve products.

School Profile

There is no regulatory requirement to feed all students. The high school feeds 70% of those students who do not go off campus. Approximately 70 of the Stratford Group students are served first at 11am. The primary meal period is 12 to 12:30. Other than the Stratford students, students are allowed to take food or carry back anywhere they want. After the 8th grade, students may leave campus for the lunch period. Local restaurants are available between one block away to a five minute walk. Currently several hundred students (1/3rd of students) participate in the lunch program and about 100 participate in the breakfast program.

Currently, food and ice cream (and candy) trucks are permitted but likely to be curtailed. Food-truck prices are higher than APS Food Service. No special accommodations are required as a vocational residential kitchen is already in the building program. Three lunch periods are proposed as maximum seating capacity in the cafeteria is 200 seats based on a minimum code requirement of 15 square feet per seat.

Meal Service

Meals Served
Breakfast and Lunch meal will be served, five days a week.
The kitchen will not be accessible to the general public and the Wilson High School will not be designed for use as an emergency shelter.

Service
Two serving kiosks will be provided in the current plan as an ala carte and a standard menu kiosk. Each line can easily support up to 150 students per seating (capacity 300 students per shift).
The new location could support two kiosks. As long as there is sufficient sales to maintain it, the kitchen could be open longer hours or access to one of two kiosks could be extended.

Sequence of Service
The students arriving at the cafeteria will queue up at the "in" service line. The students will enter from one end and either pickup up a pre-packaged food from the air screen merchandiser or move down the line to the hot entrée. Hot food will be plated and portioned by an attendant who will set plates on the counter for student pick up. Serving staff will replenish the line food from either (1) from reach-in refrigerators adjacent to the serving line, or from (2) pass through refrigerators and warmers linked to the kitchen. Students will then move to a stocked cold pan to select salads, fruit, etc., and then proceed down the line to select from items on an open utility counter. Cafeteria customers may select milk from a case, and/or frozen novelties from a chest freezer, before moving to the cashier and entering the dining room.

When finished, students will carry their trays to a corner of the dining room where they will dispose of the trash into a container under supervision of an aide, and then return to their classrooms.
Custodial staff will maintain the dining room, empty the trash cans and remove the plate waste to the outside of the building.

Service ware
All service ware is disposable and compostable. Disposable service trays and plastic utensils used by students will be set out on a mobile tray shelf on the serving line. One cashier station with a tray slide on both sides will be provided to serve both kiosks. If extended service is implemented, the cash register can be relocated to the a la carte serving line. Multi-compartment dish/tray may be used in lieu of trays at the option of APS management. Utensils will be picked up at the cashier.

Staffing
3-4 service staff and a manager will prepare the meals and serve them.

Method of Payment
All meals for both student and staff will be paid for at the end of the serving line. No cash will be collected; students and staff will use debit cards. A student ID card will be swiped at a card scanner or card pad to identify the student.

Seatings
Wilson High School's students will eat in the cafeteria in two shifts. The Stratford Program will be served first and will require segregated seating adjacent to the servery. The dining room may be open to the students for special events catering.

Menu Profile
APS has a district-wide menu which must be adhered to. However, the ala carte menu can promote popular foods, national brand ingredients, custom packaging and presentation which is necessary to compete with off-campus food options.

Bread comes frozen from the primary vendor. Both proof-and-bake and raw dough are used. The Student/Staff menu ingredients will consist of frozen entrees, canned vegetables and some frozen vegetables, and prepared desserts. Some commodity foods will be used, as the supply or storage space becomes available. 1/3 of menu is USDA foods and the volume changes based on the number of free and reduced price meals the school must offer in any school year.

The convenience of an attractive alternative menu option in a potential lounge offered in the new building rather than the full size traditional dining hall may sway students to increase their on-campus food participation. To compete with local food service- the school system has established relationships with national chains but each location's lease with its brands is volume dependent. APS may offer Pizzeria UNO products.

Staff will usually eat the same menu as the students but may pre-order special salads and sandwiches that can be picked-up on the student serving line and make payment at the cashier station on the student serving line.

Lunch:
- Hot Meal.
- Cold meal replacement.
- Peanut butter and jelly sandwich.
- Canned fruit or applesauce.
- On-site cooking of pizza, chicken patties, hamburgers, baked "French" fries.
- Juice-delivered daily by the vendor.
- Milk- delivered daily by vendor.
- Frozen Ice Cream Novelties- vendor provided cabinet.

All student beverages will be commercially packed in plastic or aluminum containers.

ACOUSTICS

JAFFE HOLDEN

Room Acoustics

The 400 seat Auditorium is the primary performance space in the school. Therefore, it should have a flexible acoustic environment that can accommodate performances ranging from theater to concert music. The key features to accommodate this flexibility include deployable acoustic drapery to vary the room's reverberation; hinged proscenium wall panels which deploy to create a proscenium opening for theater and store for a more concert hall-like environment; storage for deployable orchestra shell towers for various music ensembles. In addition, the room's volume and shaping/construction of wall and ceiling elements will be designed to create a diffuse and balanced sound field beneficial for all events.

The Black Box Theater will be provided with distributed absorptive surfaces for a fixed acoustic environment suitable for speech clarity of theater productions.
The Band and Choral Rehearsal Rooms will be designed for musical rehearsal. A large room volume, distributed fixed absorption, and diffusively shaped walls and overhead reflectors all contribute to a diffuse sound field without causing overbearing sound levels during loud passages. In addition, deployable drapes along walls are recommended to vary the rooms' reverberation at the discretion of the instructor. Practice rooms will be provided with fixed absorption suitable for individual/small ensemble rehearsal.

Other spaces throughout the building will be provided with sound absorptive finishes, primarily in ceiling treatment, to reduce reverberation and sound build-up which can be detrimental to speech intelligibility. Reverberation in core learning spaces will comply with LEED for School v2009 prerequisite IEQp3 Minimum Acoustical Performance.

Sound Isolation

Isolation from exterior noise sources – primarily vehicular traffic and air traffic – will be driven by the composition of the exterior glazed assemblies. A construction consisting of insulated glazing with laminated glass has been recommended which is expected to meet or exceed the sound transmission class (STC) 35 requirement of LEED for schools credit IEQc9 for Enhanced Acoustical Performance. Thicker assemblies have been recommended at more noise critical spaces such as the Auditorium.

Room-to-room isolation throughout the building will comply with LEED credit IEQc9 standards. Typical wall/ceiling/floor assemblies have been provided to the design team which meet these standards. These requirements are summarized in the following table. Further sound isolation at acoustically sensitive spaces will be achieved with acoustically enhanced doors.

Table 1: Minimum STC ratings required for single or composite wall and floor-ceiling assemblies that separate a core learning space from an adjacent space

Space Adjacent to Core Learning Space	Minimum STC
Music Room	60
Gymnasium	60
Cafeteria	60
Mechanical Room	60
Common-use Toilet Rooms	53
Core Learning Space (Classrooms, Library)	50
Corridor or Staircase	45
Office or Conference Room	45

Building Systems Noise Control

HVAC, electrical, and plumbing systems will be designed to meet target background noise levels for good speech intelligibility in all spaces and enhanced listening environments for the performance and rehearsal spaces. These target background noise levels are based on compliance with LEED credit IEQc9 as well as our firm's experience with similar projects. The target background noise levels are summarized in the following table. These criteria are established in terms of Noise Criterion (NC) ratings as described in ASHRAE 2001 Fundamentals Handbook, Chapter 7 (Sound and Vibration).

Table 2: Background Noise Criteria

Space	NC Rating
Acoustically-sensitive Spaces	
Auditorium	25
Black Box Theater	25
Band Rehearsal	25
Choir Rehearsal	25
Control Rooms	30
Sound & Light Locks	30
Music Practice Rooms	30
Classrooms	30
Library	30
Acoustically Non-sensitive Spaces	
Gymnasium / Fitness	35
Offices	35
Lobbies / Circulation	40
Dining	40

PERFORMING ARTS

THEATRE PROJECTS

The new performing arts venues at the Wilson school are intended to fill a deep need for the program that the current spaces do not. In addition to providing students with spaces that are safe to work in, they will also deliver a level of technology and performance aesthetic that can be found in the real world; preparing students to go on to college.

The auditorium will be a flexible room that can accommodate everything from acoustic music to fully staged musicals. By simply "folding" the proscenium frame back the room opens up to behave more like a concert hall; one volume of space that is friendly to music usage. With the panels deployed, the separation between audience and performer, required to create theatrical magic is created. The relationship of the approximate 400 seat audience to performer, regardless of the art form is intended to be intimate and create a "community" within the room that embraces young artists. The auditorium will be outfitted with the latest in theatrical equipment to enable quick changeovers and expose students to the state of the art found in ever increasing numbers of performing arts venues.

The black box is for more scaled back performances of a more intimate nature. Small dramatic works, staged readings, one person shows and the like are intended to fill the use of this space. Seating about 100 people, the room is reconfigurable to achieve endstage, thrust and arena seating arrangements by reconfiguring seating platforms about the performance area. Similar to the auditorium, the black box will contain the latest in theatre technology that any student would find in the real world.

AUDIOVISUAL & TELECOMMUNICATIONS

SEXTANT GROUP

AUDIOVISUAL & TELECOMMUNICATIONS

This document outlines the AV system criteria for the programmed spaces of the Wilson School for Arlington Public Schools. This report will offer a general overview of the AV systems included within each Performance venue of the facility. Project specific solutions and details will be developed in the coming phases as the design progresses.

The Wilson School contains the 400 seat Auditorium, and a 100 seat flexible Black-Box Theatre. This report outlines the AV systems for each of these performance venues, plus their respective and shared support facilities, including Back-of-House (BOH) and Front-of-House (FOH).

The AV systems have been designed from programming documentation and discussion with the end users, providing a highly flexible yet easy to use series of systems. These systems are designed to operate 24 hours a day, 7 days a week, and to facilitate continuous and simultaneous use of the two performance venues, be it for performance or rehearsal need.

The facility is designed as a comprehensive, multi-use arts space suitable for conceptually derived productions, or outside rentals. As such, the AV Systems are designed for flexibility and interconnectivity between the various performance spaces, allowing each to operate autonomously or together as one building should the need arise.

The Auditorium AV system is designed to fill multiple requirements – subtle voice lift for lectures and drama, moderately higher outputs for reinforced music, and controlled vocal imaging and sound effects for musical theater & opera. Types of equipment included are loudspeakers & amplifiers, digital signal processing & matrixing, AV connection panels, portable equipment (microphones, loudspeakers, cables), video projection equipment, and control systems.

The Black Box AV system has unique requirements due to the flexibility required for productions presented in different arrangements. As such, the loudspeakers and video projection equipment is loose and portable, allowing the artists to position and connect the equipment to suit the needs of that particular production. To facilitate this flexibility, AV facilities panels are located throughout the stage deck and catwalk areas, providing identical infrastructure to any arrangement required by the production. Types of equipment included are loudspeakers & amplifiers, digital signal processing & matrixing, AV connection panels, portable equipment (microphones, loudspeakers, cables), video projection equipment, and control systems.

Additional to the performance venue systems are support AV systems for front and back of house activities, including late-comer video and audio show relay, digital signage, back of house program and page capabilities, and interconnections to other rooms within the facility.

Lastly, all audio and video systems are powered by a separate Audio & Video Technical Power system (AVTP) to ensure noise-free operation. The AVTP system runs on a dedicated transformer and all associated outlets utilize dedicated isolated ground wires and hospital-grade outlets. The AVTP system is used only for audio and video equipment. The AVTP System also includes stage disconnects (company switches) in major performance spaces to facilitate outside events. Design of system and location of transformer (and if it is several) to be coordinated with the electrical engineer.

Arlington Public Schools

Gilbane

LEO A DALY

BIG