# WILLIAM BYRD HIGH SCHOOL

## ARCHITECTURAL

William Byrd High School (WBHS) was originally built in 1969. The building has since been partially renovated in 2010 with the addition of a new entry and administration area, bringing total square footage to 188,056 SF. As a result of these additions and renovations, a reasonably wide range of materials, finish levels, and conditions exist throughout the facility. Each portion of the building loosely complies with the accessibility requirements of the time in which the work was performed; however, some spaces do not comply with current standards. The building is equipped with a limited area sprinkler system, located in storage areas. There are no mobile units serving as classrooms at the school. Renovations are currently taking place in the locker rooms attached to the gymnasium.

### Exterior Finishes

Exterior Cladding:

Exterior wall material is, generally, brick with pre-finished metal panels occurring at eaves and other infill locations. Brick was observed to be in good condition with some areas needing repointing of joints. Brick at the chiller enclosure and nearby chimney is in need to raking and repointing. Rusting steel in the wall has forced mortar out of the joints. Previous repairs have been performed and are visible on the exterior of the enclosure. Limited areas of the building are clad in an “Exterior Insulation and Finish System” (EIFS). These areas were in good condition with some water staining on the surface of the material. Areas exhibiting excessive staining area likely associated with non-draining roof areas. Pre-finished metal flashings and drip edges occur at wall/roof intersections and are in, generally, good condition. Joints at these flashings and drip edges have suffered some degradation. Sealant should be replaced as required.

Windows have brick rowlock and precast concrete window sills. Joints in these sills should be monitored and resealed as sealant failure occurs.

Roof:

Areas of the building were re-roofed during the building renovations and/or additions. In general, maintenance activities should be increased on the roof. Several roof drains have had strainer baskets removed. These should be replaced as quickly as possible to avoid accumulation of debris in leader piping. Drains were observed with debris blocking passage of water. Debris should be removed from the roof; in one instance, debris had been removed from a drain and piled on the roof. Several areas of the roof had plastic strainer baskets at drain locations. These have suffered significant UV damage and should be monitored. Any breakage could limit their effectiveness and lead to blocked piping.

There are two membrane types, a black EPDM and a white single ply membrane. Areas roofed with the black membrane have experienced minimal ponding. Areas with the white single ply membrane have experienced large amounts of ponding. This ponding is more extreme at equipment locations and areas where roof height transitions take place. The roof slope is minimal, and should be evaluated as a possible cause of the ponding issues. As a result of the ponding, some areas of the insulation may be compressed. Staining from the ponding made overall condition of the membrane difficult to ascertain. The condition appeared to be, generally, good, with laps and splices in good condition. While the roofs are reasonably new, they should be consistently monitored for issues related to ponding. Re-evaluation of roof drain quantity and location, and roof slope and design may be required for effective roof drainage.

Limited portions of the roof were covered in standing seam metal and copper roofing. The roofing at these locations is in good condition, but should be monitored.

Sealants at fascia panels on the roof and at roof edges should be regularly monitored and replaced as needed. Several joints have experience sealant degradation and cracking and should be resealed.

Skylights were observed to be in good condition. Sealants should be monitored for stability and replaced as required.

Windows:

Windows at the exterior of the building are generally aluminum storefront systems with insulated glazing. Operable windows occur at many locations around the building. Condition of sealants and glazing should be monitored. Sealant that is cracked or failing in any other way should be replaced. All glazing units were observed to be in good condition with no signs of seal failure.

Exterior Doors:

Exterior doors are a mix of storefront and hollow metal systems. At main entry points, storefront systems are employed, each being of the age of their respective renovations. Doors near the Gymnasium entrance are older, but in good condition. New doors at the administration addition are in good condition. Hollow metal doors are present at the remainder of the exterior locations. Some of these doors are installed in frames that have both sidelites and transoms. Glazing condition and door condition at all hollow metal doors should be monitored. Rusting doors and frames should be replaced as required. Glazing can be replaced to improve overall energy efficiency of the system.

Doors at the mechanical room entrance have infill panels in the frames. These panels have paint bubbling and peeling issues, revealing a suspect asbestos panel behind.

Panels should be tested and either removed or properly encapsulated if suspect material is confirmed.

All exterior doors providing classroom, hallway, or other public area access are equipped with card readers and included in the security/monitoring system. Doors to mechanical areas and storage were not observed with these systems. Control is established solely through keys, at these locations.

**Interior Finishes, Fixtures & Equipment**

(See assessment tabulations for interior finish conditions).

Terrazzo, Vinyl Composition Tile, Quarry Tile and Ceramic Tile are the predominant floor finishes at WBHS. Other floor finishes include limited applications of sheet vinyl, and wood at the Gymnasium.

Interior wall finishes are generally painted concrete block and glazed ceramic wall tile. Office areas and built out areas have gypsum wall board partitions. Window treatments are typically vinyl roller shades. Gymnasium walls are a mix of painted block and exposed brick. The end walls of the gymnasium have glazed ceramic wall tile that has experienced some damage.

Ceilings are generally suspended acoustical tile (lay-in) with some gypsum wall board ceilings. Exposed, painted decking is present in the gymnasium area. Water damage is present in some of the suspended acoustic tile ceilings, other older tiles have begun to sag and deteriorate. Ceiling tile at the newer additions has serviceable life remaining. In the renovated areas, the ceilings have been lowered to accommodate new building systems. Future renovations to the remaining spaces will likely be able to accommodate this same lowering with minimal issues. New suspended acoustical tile ceilings are recommended as part of any renovations.

Most interior doors are wood and are original to their respective construction periods. Some doors exhibit wear and do not have accessible door hardware (older portions of the facility). All non-accessible, interior door hardware would be replaced during a substantial renovation. Some door frames would be replaced to achieve accessibility, or because of reconfigured spaces. Other door frames may be salvaged, patched, and painted. Corridor doors in older sections of the building have solid wood transoms over the doors. In the event smoke control or any sort of rating is required at these doors, they should be evaluated and replaced as required to achieve any required rating.

Marker boards and tack boards are present in classrooms. Most are in fair to good condition. Some would be replaced during renovations. Smart boards have been placed in rooms.

Casework (cabinets) condition varies across the facility. Painted casework, generally, needs to have new finishes applied. Some fixed wooden casework may need to be

refinished. Most casework is not accessible. Lockers are in good condition in most locations, and should be painted as required.

Bathroom materials and conditions all vary by construction and renovation date. High pressure laminate toilet partitions have sustained minor damage. Efforts to remove graffiti have resulted in further damage to the high-pressure laminate clad partitions. Grinders and wire brushes should be avoided when attempting to remove any graffiti. Once the laminate layer has been damaged, the substrate is subject to damage from moisture. According to staff members, a foul odor is present around bathrooms in the English Wing. These are gang bathrooms that receive heavy use. It is unlikely the presence of odors is due to dry P-traps. Maintenance staff regularly pours liquid into an opening in the area, which temporarily alleviates the issue. Testing activities have been relocated due to odors, in the past.

Loose furnishings are a mixture of tables and desks of varying ages. The flexibility required of 21st Century classrooms is enabled by flexible, movable furnishings. All furniture and equipment should be replaced during a substantial renovation to provide a uniform appearance, enhance student comfort, and to provide flexibility. Furnishings, fixtures, and equipment design should occur in tandem with building design to achieve proper coordination between building utilities and furniture types and locations. This includes library shelving and furnishings.

General school storage is scattered throughout the building and consumes spaces intended for other functions. As part of future renovation plans, general school storage should be planned in several strategic areas serving administration, faculty, and staff. Metal shelving units would be provided in dedicated general storage rooms.

## Accessibility

At several exterior doors, there are steps up, or down, into the building, which are not accessible. While these no longer serve as entrances due to security concerns, they should provide an accessible route for egress. Routes to paved play areas, play fields, and play equipment are not all accessible. As part of any substantial renovation all elements of the site and building entrances would be renovated to be accessible. Accessible play areas would be required as part of any substantial renovation and addition project.

Within the building, recently renovated areas are, generally, accessible but others are not, simply because of their age. Some restrooms are not accessible to the latest ADA standard, as the most recent renovation was performed under a previous version. Accessible urinals were not present in some Men's rooms. Minor changes may need to be incorporated into any future renovations. Casework should be added which incorporates accessible work stations and storage units; most casework provided only a single, 36" high countertop. Signage, throughout the facility, does not comply with the most recent ADA standard. Accessibility throughout the building would be achieved during any substantial renovation.

**Safety and Security**

This section addresses passive security measures, such as how entrances function, visibility within the building, etc.

Recent renovation work, undertaken by RCPS in 2014, involved the installation of secure entry vestibules at all schools. The vestibule at WBHS provides visibility from the office and control over the main entry. Door position sensors and locks are provided at all other exterior doors. Entry at these points is limited to staff members with appropriate keys/cards. Due to the nature of the renovations and additions to the school, the building is reasonably compartmentalized. Sight lines and distance are reasonably long in most areas of the building.

*End of William Byrd High School Architectural Narrative*

**STRUCTURAL**

During the Architectural investigation of the William Byrd High School, an issue was discovered warranting additional investigation from a structural standpoint.

**Vertical Crack Outside Mechanical Room**

Near the mechanical room at the center of the building, a vertical crack in the brick face was observed. This crack appeared at a small (+/- 12") offset in the brick. The crack appears approximately 4" off the corner of the wall at the offset. It is anticipated that this crack is the result of expansion of the brick along the face of the wall containing the crack. The offset corner creates a stiff point in the middle of the wall where the movement is resisted creating a slight rotation and crack on the brick face. Not shown in photos, this crack also occurs at a transition between two roof levels. The crack occurs up to the point of the lower roof level where movement restraint is present. Once the wall goes above the lower roof level, the restraint is no longer present and the wall is free to move without cracking. This crack should be sealed with flexible sealant to keep any excess moisture out of the wall system. The sealant needs to be flexible because it is anticipated that this joint will continue to open and close with temperature changes.

*End of William Byrd High School Structural Narrative*

## PLUMBING/FIRE PROTECTION

**Plumbing Fixtures**:

Water Closets: Water closets observed were floor mounted and wall mounted vitreous china with manual type flush valves. The age of the water closets is unknown.

Urinals: Urinals observed were wall mounted vitreous china with manual type flush valves. The age of the urinals is unknown.

Lavatories: Lavatories observed were wall mounted vitreous china with manual type faucets. The lavatories are from 2010 and seemed to be in good working condition. The lavatories are expected to have a useful life of 30 years.

Sinks: Classroom sinks observed were stainless steel with polished chrome gooseneck faucets and wrist blade handles. The age of the sinks is unknown.

Electric Water Coolers: The water coolers are wall mounted type and their ages are not known.

**Water Heaters**:

Domestic water heating is done by two gas-fired units which were installed in 2010. These are tank type water heaters by PVI with 2,010,000 Btu/hr input rates. The domestic water heaters are expected to have a useful life of 15 years.

**Piping**:

Water:3” and smaller is Copper with fiberglass insulation
3” and above is ductile iron pipe
Sanitary Piping: Cast iron and PVC
Storm Piping: Cast iron
Gas Piping: Black steel

**Domestic Water Entrance**:

The building is served by a 4" cold water line that is assumed to be from a municipal system. There is a check valve whose age is not known.

**Fire Protection**: The building has limited sprinkler zones serving mostly storage rooms.

**Recommendations**: None.

*End of William Byrd High School Plumbing/Fire Protection Narrative*

**MECHANICAL (HVAC)**

**Heating**:

Five gas-fired condensing boilers provide heat to the building through a hot water circulation system. Each boiler has an associated boiler circulation pump. Hot water is circulated to the building's heating coils with two base mounted pumps. Coils are located in rooftop air handler units and in fan coil units. The building's heating equipment was installed in 2010. The boilers are 6 years old and are expected to have a useful life expectancy of 30 years. The pumps are 6 years old and are expected to have a useful life expectancy of 25 years. The boilers and pumps seemed to be in good, working condition for their respective ages.

**Ventilation**: Ventilation is provided to the building by rooftop air handling units.

**Air Conditioning**:

The building is primarily cooled by two Trane water cooled chillers located in the main mechanical room. Condenser water is pumped to a cooling tower, which is used to reject heat from the chillers. Chilled water is then pumped to cooling coils located in air handler units and fan coils. The chillers are 4 years old and expected to have a useful life expectancy of 20 years. The chilled water pumps are 20 years old and are expected to have a useful life expectancy of 25 years. The cooling tower is 20 years old and is expected to have a useful life expectancy of 18 years. The chiller water system seemed to be in good condition for its respective age.

**Piping**:

There is hot water, chilled water, and condenser water piping, black steel, insulated. The majority of mechanical piping is believed to have been replaced in 2010 and is expected to have a 30 year useful life.

**Controls**:

The building automation controls are digital type (DDC) and are by Allerton Controls.

**Recommendations**:

The building appeared to be in good shape overall from a mechanical perspective. Replacing the cooling tower and chilled water distribution pumps should be considered in the near future.

*End of William Byrd High School Mechanical Narrative*

## ELECTRICAL

**Main Switch Gear**:

Main Switchboard: The main switchboard is a 4000 Amp, 3 phase, 4 wire, 208Y/120 volt Square D, service entrance rated switchboard located in a Nema 3R enclosure. The switchboard appears to be added in 2010, but back feeds an original 2500 amp Cutler Hammer switchboard that previously was the main electrical service and was installed in 1969.

Recommendation: The original switchboard has reached its expected useful life and will soon need to be replaced. Panelboards don't typically suddenly die so this is not an immediate concern, but as parts need to be replaced it would be best to keep the replacement of the switchboard in mind.

**Transformers**:

Transformers: None installed.

**Panelboards**:

Distribution and Branch Circuit Panelboards: The majority of panelboards are Square D; however, these panelboards appear to have no spare spaces or breakers. Most of the older panelboards have been replaced.

Recommendation: If renovations and additions occur, replace the panelboards and locate them in areas to minimize student access and to meet National Electrical Code working clearances. Expand as necessary to accommodate new or modified spaces. The newer panelboards may be reused. Additional panelboards could be added during a renovation to provide distributed power for the future as technology increases inside the classroom.

**Cabling**:

Cabling: Much of the building wiring is original and new wiring has been added for the new panels. All visible wiring appears to be in conduit. Most of the wiring is past its rated useful life and should be replaced.

Recommendation: During a renovation, some new wiring may be salvageable, but because of the tedious process of identifying and preserving this wire, it is recommended that all wiring be replaced during renovations.

**Conduit/Raceway**:

Conduit/Raceway: The conduit and raceway above ceiling is still in good condition. There is not much surface raceway throughout the building, but it could potentially become dislodged from the wall creating a potential shock hazard.

Recommendation: All surface raceway should be evaluated regularly and securely reattached to the wall if it becomes loose. All raceway would be reused if the building were renovated. Conduit would be salvaged where practical.

**Light Fixtures**:

Light Fixtures: The light fixtures consist of primarily 2x4 parabolic fixtures with T8 lamps, some fluorescent indirect lighting and high bay fluorescent in the gym with T8 lamps. The T8 lamps are current technology, and meet the current needs of the school.

Recommendation: Some fixtures are newer and replacement of lamps and ballasts seems practical over the next few years. When the fixture itself needs to be replaced, the addition of LED lights should be considered.

**Lighting Controls**:

Lighting Controls: Lighting controls throughout the building consist of toggle switches controlling fixtures within an area, some classrooms have zoned switching. Corridor lighting is controlled through switch bank in the front office.

Recommendation: In the event of a renovation or addition, add automatic lighting controls to each room to comply with building energy codes. Consider providing additional control in the classroom areas for multiple scenes for different types of media. In large gathering areas, night lights need to be considered to be in compliance with current building codes.

**Public Address System**:

Public Address System: The public address system is currently a Valcom, class connection headend with integral clock system. Each classroom has a PA speaker, clock, and a push-to-talk button. Teachers and staff use the newer Cisco phone system for communications and announcements. The PA system is currently in the process of being upgraded.

Recommendation: The PA system is current technology and should be maintained to retain proper operation.

**Security System**:

Security System: Security system consists of electronic locks and motion sensors at exterior doors, keypads, and AI phone/Lobbyguard system at entrance. The current system meets the needs of the school and utilizes current technology.

Recommendation: Upgrade, expand, and reconfigure zones of the system as necessary if renovations and additions are pursued.

**Camera System**:

Camera System: A building wide IP based camera system is installed. It is current technology that meets the current needs of the school.

Recommendation: In renovations and additions, provide additional cameras and digital video recorders as required for additional areas with desired coverage.

**Data System**:

Data System: The Data system consists of newer Category 6 and 5e cable. The building is equipped with wireless internet through Cisco access points throughout. Teacher and student computers are provided with access to a local area network.

Recommendation: The current system meets the needs of the building and switches and patch panels could be reused in any renovation or new construction. Additional cooling should be added in main IT room to maintain optimal IT equipment temperatures.

**Fire Alarm System**:

Fire Alarm System: The fire alarm system is a Siemens Cerberus Pyrotronics fire alarm system. The system also has connected an area of Rescue near the guidance office. The current system devices consist of limited area manual pull stations, smoke detectors, and horn/strobe alarms; however, there are no alarm devices located in classrooms.

Recommendation: If renovations and additions are pursued, expand existing fire alarm system with audible and visual notification devices throughout the school and in classrooms.

**Generator**:

Generator: The existing generator is a Kohler 80 KW Natural gas generator that feeds 2 cutler hammer transfer switches. Emergency lights are connected to one transfer switch and standby power circuits are connected to the other.

Recommendation: Engage in a maintenance contract for the generator to maintain proper operation of life safety equipment.

**Site Lighting**:

Site Lighting: The site lighting consists of pole mounted lights for parking areas, wall packs around the building, exterior door canopy lighting, and ground based flood lights. These lamps are likely changed as lamps burn out; however, the ballasts and optics have likely not been changed and have exceeded their useful life.

Recommendation: As fixtures require replacement, consider LED alternatives. LED exterior lights provide instant on features which can provide additional energy savings through the light of the fixture.

**Classroom Media (TV, Projector, ETC)**:

Classroom Media: Classroom media typically consists of an Activeboard with attached projector, a teacher computer, printer, and a wall mounted phone. Laptop and iPad carts are also in use. Some classrooms contain a TV; however, TVs were not consistently present.

Recommendation: Periodic upgrade of equipment will maintain a strong inventory of new equipment and keep students aware of current technology.

**Phone System**:

Phone System: The phone system consists of a new Cisco IP phone system. Each classroom has a phone connected through the PA system. The system is operational.

Recommendation: It is possible to retain and expand the existing phone system through additions and renovations.

*End of William Byrd High School Electrical Narrative*

**CIVIL**

## Traffic Circulation

Buses: School is served by 36 regular buses. There is no dedicated bus loop, but the buses generally stack and drop off / pick up in the area between the high school and middle school.

Morning: Buses enter the site and drop off students at the cafeteria at the west side of the school. After dropping off, buses continue around the parking lot loop and proceed to the drop off area at the east side of the middle school and then exit the site. Conflicts can occur where buses are exiting after dropping off at the middle school and parents are entering the middle school drop off area.

Afternoon: All buses enter the site and stack up through the parking lot and bus area between the middle school and high school. Students exit both the middle school and high school and find their bus making it difficult to monitor student movements.

Recommendation: A separate centrally located bus loop with its own entrance and exit would be beneficial. Explore the possibility of creating an access drive for bus traffic to enter the site from the adjacent park area and access the existing bus area adjacent to the stadium. The bus area would need to be expanded and reconfigured to accommodate all bus traffic for both middle and high school students.

Cars: There is one main entrance for both middle school and high school. This creates a great deal of traffic entering and exiting the site. Seniors leave the high school early to clear some of the traffic before buses and other traffic exits the site. There is a dedicated parent drop off at the south side of the building.

Morning: Parents should be utilizing the drop off area in the mornings, but conflicts occur with parents exiting the drop off area and buses and middle school parents exiting the site. Some parents are dropping off students in the student parking area to avoid the drop off loop.

Afternoon: Same situation as the drop off in the morning.

Recommendation: With a separate bus entrance / exit, traffic patterns for car traffic could be reconfigured to move more smoothly.

Parking: 521 striped parking spaces are provided with 20 designated ADA spaces. Day to day parking is adequate for faculty / staff / visitors. Parking quantities meet Roanoke County requirements and State recommendations. Event parking is an issue with parents parking wherever possible. With the exception of big football games, parking for events is manageable.

Service: The service area on the west side of the school has adequate maneuvering area for all deliveries.

Fire Access: Fire apparatus have adequate access around the building.

Separation: Separation is poor due to crossing traffic patterns, no dedicated bus loop, one main entrance into campus, and two large schools sharing quite a few facilities.

Recommendation: See above.

Adjacent Roadways: Access into the site is from Route 24 which is a heavily travelled four lane divided highway. Traffic backup issues and safety issues are a major concern.

Recommendation: See above.

Pedestrian: Some students walk from the surrounding neighborhoods, and some walk down the shoulder of Route 24.

**ADA Accessibility**

Parking: There are 12 parking spaces at the main entrance, and 8 spaces at the football stadium designated as ADA parking with 6 designated as van accessible. There is an ADA area at the baseball field, but no designated parking spaces. There is no ADA parking for the softball field.

Recommendation: Provide a paved pad at the baseball field for designated ADA parking. Provide ADA parking spaces to serve the softball field.

Signage: Signage at the main entrance is code compliant and in good condition. At the football stadium there are 8 striped spaces and only 5 signs.

Recommendation: Provide three additional signs and van accessible signage.

Ramps: Curb ramps are appropriately located and in good condition. ADA ramp at the main entrance is code compliant and in good condition.

Access to all areas: There is no ADA access to the softball field. There is only ADA access to 2 of the tennis courts. There is only ADA access to the track level at the football field, no access to the elevated bleachers.

Recommendation: Provide an accessible route to the softball field. Provide an accessible route to all tennis courts. Provide a ramping system to the elevated bleachers.

## Parking Areas, Driveways, and Sidewalks

Asphalt Pavement: Mostly good condition with minor cracking. There are a few poor sections with alligator cracking and deterioration.

Recommendation: Repair and repave poor sections at parking lot entrance and adjacent to football field.

Asphalt Walks: Walks are in good to fair condition with some aging and minor cracking.

Concrete Pavement: Good condition.

Concrete Walks: Some older sidewalk sections are severely cracked and spalling.

Recommendation: Replace sections as necessary when cracking and deterioration become hazardous.

Stairs, Ramps, and Railings: Stairs are in good to fair condition depending upon age. Railings at stairs adjacent to softball field are loose, and do not meet code. Cheekwalls on one set of stairs at service area are damaged.

Recommendation: Repair cheekwalls at service area stairs. Replace railings at stairs adjacent to softball field with code compliant railings.

Concrete Curb and Gutter: Curbs are in good to fair condition depending upon age.

Concrete / Brick Pavers: Good condition.

Guardrail, Parking Bumpers, and Miscellaneous: Guardrail at baseball parking is rusted, damaged, and deteriorating.

Recommendation: Replace guardrail.

Fire Lane: Some fire lane signs are faded and illegible. Some sign posts are leaning, damaged, or rusted. There is an insufficient quantity of fire lane signs. Fire lane signs are not turned toward oncoming traffic.

Recommendation: Re-paint curbs and asphalt at fire lanes. Replace fire lane signs and provide additional signs as necessary. Ensure that fire lane signs are turned toward oncoming traffic.

## Utilities

Fire Lines and Hydrants: Sufficient fire hydrant coverage and spacing with three fire hydrants located around the school and one at the school entrance. Fire department

shutoff valve located at front of school. No paved fire lane around building, but fire truck access is present around three of four sides.

Domestic Water System: The water system is in good condition. Staff indicated no pressure or water discoloration issues. Water is provided to school via tap into public water main.

Sewer System: The sanitary sewer system consists of concrete manholes and pipes in fair condition. System is functional with proper invert shaping. Staff indicated no issues with stoppages, but observations show signs of stagnant waste.

Recommendation: Sewer system should be flushed to clear and prevent blockages.

Natural Gas System: Gas meter is located in a nook at the rear of the school and not prone to damage from vehicular traffic. The meter is in fair condition and functional, but shows signs of rust and deterioration.

Recommendation: Contact gas company to inspect condition of meter.

Electric: Electric service provided via overhead poles to school property. Service is taken underground to a transformer in a nook at the rear of the school and then into the building. The meter is mounted on the building beside the transformer. The transformer is safe from vehicular traffic.

Site Lighting: Large site lights illuminate school parking lots and bus loop and building mounted lights and small site lights illuminate sidewalks and entrances. Considering size of student parking lot, not enough lighting is provided to ensure safety and security.

Recommendation: Provide additional lighting in student parking.

**Grading and Drainage**

Storm Water System: Roof drains and down spouts are piped underground into the school storm water network. Runoff from the entire site is routed to the detention pond and bio retention areas at the entrance to the school property. All storm water inlets, manholes and pipes are in good condition, but filled with trash and sediment.

Recommendation: Underground piping system should be flushed and pipe outlets should be cleaned out and inspected for sediment, rocks and trash.

Detention / Retention Ponds: Detention pond is in good shape with outlet protection and sediment forebay. Forebay is filled with sediment and trash, but in good condition.

Recommendation: Provide general maintenance, remove sediment build up and clear trash and debris.

Stormwater Management BMPs: Bioretention areas as pretreatment to detention pond are in fair condition and functional, but need to be cleaned of sediment and debris.

Recommendation: Provide general maintenance and clear sediment and debris.

Slopes, Ponding, and other Drainage Issues: Minor erosion on northern sides of school and ponding at the rear of the school in the outdoor cafeteria area due to lack of positive drainage.

**Site Features**

Vegetative Landscaping: Vegetation conditions range from poor to good. Most shrubs are in poor condition, while trees range from fair to good. Significant maintenance needed for pruning and mulching.

Recommendation: Prune trees in courtyard near gym to keep them off of building. One tree stump found and should be ground. Several shrubs appear dead and should be replaced.

Lawns: Generally fair condition around the building. Islands in parking lot have poor coverage. Area of ongoing construction for locker rooms will require extensive work to ensure adequate grass stand.

Recommendation: Convert islands in parking lot from any grass to include shrubs and mulch for ease of maintenance and aesthetics. Repair and reseed bare areas. Provide fencing and erosion control mat to protect seed in high traffic areas. Replace grass in parking lot islands with landscaping and mulch.

Fencing and Gates: Limited fencing for campus. General condition is fair. Fencing at athletic facilities covered under appropriate sections.

Signage: Good condition for existing signage generally. ADA signage not code compliant. Need additional fire lane signage. Minor damage to some signs. No directional signage provided. Some posts leaning due to lack of foundations.

Recommendation: Repair and/or replace damaged and leaning signage. Provide directional signage. Repair or replace damaged or leaning signs. Future signs should utilize 2"x2" square posts in sleeves with concrete foundations. Provide directional signage.

Flagpoles: Poles are in good condition.

Site Furnishings: Site furnishings are limited and are generally in fair condition.

Site Retaining Walls: One wall located at bus loop. Railing/Structure at top meets code.

## Physical Education

PE Fields: Two fields provided for MS and HS use. Turf condition in poor to fair condition due to use by multiple teams.

Recommendation: Available space limits the possibility of additional turf areas. Due to high usage, a synthetic turf should be considered for the stadium and new high quality turf with improved drainage provided in the PE Fields.

## Athletics

Tennis Courts: Asphalt courts showing signs of aging with cracking. Color and play surface are poor. Areas of ponding are evident.

Lighting: N/A

Bleachers / Stadium: Aluminum bleachers in good condition.

Accessory Structures: No accessory structures were observed. Fencing and court equipment were in fair condition.

Recommendation: Replace courts and fencing.

Track and Field Events: Track asphalt and markings are in good condition. Jump tracks and sand pits in poor to fair condition. High jump area is asphalt and in good condition. Throw event areas are in fair condition and do not have accompanying fencing.

Lighting: Refer to Competition Football Field.

Bleachers / Stadium: Refer to Competition Football Field.

Accessory Structures: Refer to Competition Football Field.

Recommendation: Track was repaved within last 10 years. Monitor for signs of failure and refresh markings as needed. One jump pit requires rebuilding and the second jump pit a complete overhaul. Provide covers to protect pits during out of season. Fencing for throw events, while desirable, is not necessary.

Competition Softball Field: Outfield turf is in excellent condition. Infield condition is in excellent condition. All fencing in excellent condition. Scoreboard in good condition. Foul poles are in good condition.

Lighting: Poles and luminaires in good condition.

Bleachers / Stadium: Aluminum bleachers are in good condition. Bleachers sit on gravel pads. ADA access not provided to bleachers

Accessory Structures: Pressbox/Concessions/Restroom facility of CMU construction provided and are in. Dugouts of CMU construction in good condition. Batting cage in fair condition. ADA access not provided.

Recommendation: Provide ADA access to Pressbox facility Monitor batting cage condition for eventual maintenance.

Competition Baseball Field: Facility could not be fully observed due to locked gates. Outfield turf appears to be in good condition. Infield appears to be in good condition. Field appears to have good drainage from stormwater runoff. All fencing in good condition. Scoreboard in good condition. Paved paths within fencing are provided but there is no ADA parking or path to the facility.

Lighting: Poles and luminaires in good condition.

Bleachers / Stadium: Aluminum bleachers are in good condition.

Accessory Structures: Pressbox/Concessions/Restroom facility of CMU construction. Additional indoor hitting facility observed and appears in good condition.

Recommendation: Provide two ADA parking spaces and a path to facility.

Competition Football Field: Turf is in poor condition due to high usage by both WBMS and WBHS teams. Fencing is in fair condition.

Lighting: Lighting system is in fair condition. Showing age.

Bleachers / Stadium: Home stands are concrete and in fair condition. Visitor stands are all aluminum in good condition. ADA seating is provided on home side is wood and in fair condition, but access is not code compliant.

Accessory Structures: Press box on home side stands is in good condition. Concessions/Restroom facility of CMU construction is provided and is in good condition.

Recommendation: Provide ADA code compliant signage and striping for existing parking near home field bleachers. Confirm that portable aluminum ramps observed are for ADA access to home stands. Due to high usage by both WBMS and WBHS teams, a synthetic turf should be considered for the stadium with improved drainage.

Competition Soccer Field: Refer to Competition Football Field.

Lighting: Refer to Competition Football Field.

Bleachers / Stadium: Refer to Competition Football Field.

Accessory Structures: Refer to Competition Football Field.

Recommendation: Refer to Competition Football Field.

*End of William Byrd High School Civil Narrative*

OWPR
ARCHITECTS AND ENGINEERS

# Notes

| | |
|---|---|
| **Project Name: RCPS Facilities Assessment** | **Comm. #: 1637** |

| | |
|---|---|
| **Subject: William Byrd High School** | **Total Pages:** |
| **Date: 9/13/2016** | **Location: Vinton, VA** |
| **Copies To:** | **Report Prepared By: AHW** |

**General:**

The building was partially renovated and had an addition in 2010.
Building generally meets the requirements of the Accessibility standard in effect at the time of design (2004 ADA). Many of the features are no longer compliant based on newer standards (i.e. signage heights and reach ranges). No low urinal was present in some bathrooms. Casework was, generally, all 36" to countertop.
Corridor walls are a mix of materials. Glazed ceramic tile wainscot exists in some areas with a rubber base. SATC ceilings. In renovated areas, the ceilings have been lowered (assumed for accommodation of new HVAC systems)
Renovated bathrooms have printed surface ceramic tiles at floors and walls.
Newer toilet partitions are high pressure laminate. Some have been damaged by students. Efforts by staff to deal with damage have involved using a grinder/sander to remove graffiti. These efforts have cut into the surface of the partition. Aside from removing any profanity or other distasteful graffiti, the efforts to rectify the situation have worsened the condition of the panels.
Water spotting on SATC existed at many locations throughout the school (examples outside of rooms 246 and 247).
Staff complained of a sewage smell in the English wing of the school. We were told that maintenance personnel "pour water into a hole in the wall" to deal with the smell. This is a well-used wing with two gang bathrooms. P-Trap should not be going dry with consistent usage.
Locker rooms and athletic hallway are in decent shape aside from typical lack of ventilation. There are stored athletic equipment items in the exit corridors that could obstruct egress.
Rooms and finishes in newly constructed and renovated areas, typically, in good condition. Access to most spaces was limited as classrooms were occupied.

**Gymnasium:**

Exposed steel deck over open web steel joists.
Mix of painted block and exposed brick at long walls. End walls have a glazed tile covering that is damaged in some places.
Existing podium drinking fountain is non-functional and housing is damaged.

Board gym floor finish in good condition. Maple boards are lightly damaged or separating in limited areas.
Renovation work was taking place in the locker room/bathroom areas attached to the gymnasium. No inspection of the area was performed.

**Roof:**

Two types of roof membranes were present. A white, reinforced membrane and a black EPDM membrane. Limited areas of the roof were copper, in good condition, and standing seam, in good condition.
Ponding is present at most areas of the roof. Roof drains are poorly maintained with debris blocking many. Strainer baskets are often missing. Many are plastic which has suffered from UV Degradation. Efforts have been made to clean debris off some drains, but the debris was piled beside the drain and will end up back on it. Remove debris from roof.
White membrane is in fair to good condition. Staining from vast areas of ponding makes overall condition difficult to ascertain. Most laps and splices seemed to be in good condition.
The roof slope at areas with the white membrane is minimal. While not measured, it is estimated that the slope is less than 1/8" per foot. Ponding has compressed insulation below the membrane, exacerbating the problem.
Joint sealants are in need of replacement at a variety of locations. Joints should be raked clean and redone.

**Exterior:**

Mortar joints in brick at Chiller enclosure are popping out due to rusting of embedded steel items. These pop-outs occur at intervals of 24" or approximately 18.25".
Mortar has degraded/fallen out of joints at chimney.
There is a large, vertical crack extending full building height near the gas service entrance.
Mortar joints near covered walkway need to be repointed. There is a large arc on the face of the building that is in need of this treatment. Minimal cracking was visible, and no other cause for this arc shape could be found.
Precast over entry signage is heavily stained at the top. Staining is extending down onto the brick and approaching the signage lettering.

**Windows and doors:**

Most exterior windows appear to be aluminum storefront with insulated glazing.
Door frames are hollow metal. Exterior doors are hollow metal.
Skylights on roof appear to be in good condition.
At exterior doors to boiler room, there appear to be suspect transite panels installed in the HM framing above the doors. Paint on the panels was bubbling and peeling revealing a fibrous material behind. No further investigation was performed to verify material.

**William Byrd High School Architectural Condition Assessment**

Reference Building Owners and Managers Association International (BOMA)

Preventative Maintenance Guidebook

| System/Components | Condition Category | Expected Useful Life | Current Age | Expected Life Remaining | Notes |
|---|---|---|---|---|---|
| **Architectural** | | | | | |
| Brick | 4 | Life | 47 | Life | |
| CMU walls | 5 | Life | 47 | Life | |
| EIFS | 4 | 10 | 22 | 0 | |
| Wood trim | 5 | 15 | 47 | 0 | |
| Interior doors | 2 | 20 | 47 | 0 | |
| Exterior doors | 4 | 50 | 47 | 3 | |
| Door hardware | 1 | 7 | 47 | 0 | |
| Door hardware at Renovated areas | 5 | 7 | 6 | 1 | |
| Electronic door hardware | 2 | 5 | 6 | 0 | |
| Terrazzo | 5 | 50 | 47 | 3 | |
| Vinyl floor tile | 4 | 12 | 6 | 6 | |
| Ceramic/Porcelain floor tile | 5 | 50 | 47 | 3 | |
| Quarry floor tile | 5 | 50 | 47 | 3 | |
| Wood gym floor | 4 | 10 | 22 | 0 | |
| Other wood floors | 4 | 10 | 47 | 0 | |
| Exposed concrete floors | 4 | 50 | 47 | 3 | |
| Exterior windows | 4 | 30 | 22 | 8 | |
| Interior windows | 4 | 30 | 6 | 24 | |
| Roof (Including flashings, coping, etc.) White Membrane | 3 | 20 | 6 | 14 | |
| Roof (Including flashings, coping, etc.) Black EPDM | 2 | 20 | 22 | 0 | |
| Suspended acoustical tile ceilings (lay-in) | 3 | 25 | 22 | 3 | |
| Suspended acoustical tile ceilings (lay-in) at Renovated Areas | 4 | 25 | 6 | 19 | |
| Plaster/GWB ceilings | 4 | 30 | 22 | 8 | |
| Sound control panels (wall and ceiling) | 5 | N/A | 22 | | |
| Ceiling/exposed structure finish (paint) | 2 | 5 | 22 | 0 | |
| Interior wall finishes (paint) | 2 | 5 | 6 | 0 | |
| Marker boards or chalk boards | 4 | N/A | 6 | | |
| Tack boards | 5 | N/A | 6 | | |
| Projection screens | 5 | N/A | 6 | | |
| Casework | 4 | N/A | 6 | | |
| Window treatments | 5 | N/A | 6 | | |
| Toilet partitions | 4 | 20 | 6 | 14 | |
| Toilet accessories | 5 | N/A | 6 | | |
| Interior railings | 5 | 30 | 22 | 8 | |
| Exterior railings | 5 | 30 | 22 | 8 | |
| | | | | | |
| | | | | | |
| **Condition Categories** | | | | | |
| **1 Immediate replacement required, life saftey concern** | | | | | |
| **2 System has reached it's useful life** | | | | | |
| **3 Major repair or modifications required, useful life remaining** | | | | | |
| **4 Minor repair required** | | | | | |
| **5 General maintenance required** | | | | | |

**William Byrd High School Mechanical Plumbing Condition Assessment**

Reference Building Owners and Managers Association International (BOMA)

Preventative Maintenance Guidebook

| System/Components | Condition Category | Expected Useful Life | Current Age | Expected Life Remaining | Notes |
|---|---|---|---|---|---|
| **Mechanical** | | | | | |
| Condensing Boilers | 5 | 15 years | 6 years | 9 years | |
| Chillers | 5 | 20 years | 4 years | 16 years | |
| Cooling tower | 2 | 18 years | 20 years | 0 years | |
| Mechanical piping | 5 | 30 years | 6 years | 24 years | |
| Refrigerant piping | 5 | 30 years | 6 years | 24 years | |
| Duct | 5 | 30 years | 6 years | 24 years | |
| Outdoor air units | N/A | | | | |
| Terminal units | 5 | 20 years | 6 years | 14 years | |
| Package units | 5 | 20 years | 6 years | 14 years | |
| Controls | 5 | 20 years | 6 years | 14 years | |
| Exhaust fans | 5 | 25 years | 6 years | 19 years | |
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| **Plumbing** | | | | | |
| Plumbing fixtures and controls (Lavitories) | 5 | 30 years | 6 years | 24 years | Age of sinks, water closets, urinals and water coolers is unknown. |
| Floor drains | 5 | 30 years | 20 years | 10 years | |
| Water heaters | 5 | 15 years | 6 years | 9 years | |
| Pumps | 2 | 15 years | 20 years | 0 years | |
| Potable water piping & valves | 5 | 30 years | 20 years | 10 years | |
| Sprinkler system (Limited) | 5 | 30 years | 20 years | 10 years | |
| Back-flow preventer | 5 | 30 years | 20 years | 10 years | |
| Service line & meter (size appropriate) | 5 | 30 years | 20 years | 10 years | |
| Wall and yard hydrants | N/A | | | | |
| Eye wash stations | N/A | | | | |
| Emergency showers | N/A | | | | |
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| **Condition Categories** | | | | | |
| **1 Immediate replacement required, life saftey concern** | | | | | |
| **2 System has reached it's useful life** | | | | | |
| **3 Major repair or modifications required, useful life remaining** | | | | | |
| **4 Minor repair required** | | | | | |
| **5 General maintenance required** | | | | | |

**William Byrd High School Electrical Condition Assessment**

Reference Building Owners and Managers Association International (BOMA)

Preventative Maintenance Guidebook

| System/Components | Average Useful Life | Current Age | Expected Life Remaining | Condition Category | Notes |
|---|---|---|---|---|---|
| **Electrical** | | | | | |
| Main switch gear | 40 | 7 | 7 | 5 | |
| Panelboards | 30 | 23 | 7 | 5 | |
| Cabling | 40 | 7 | 7 | 5 | |
| Conduit/raceway | 40 | 7 | 7 | 5 | |
| Light fixtures | 20 | 7 | 7 | 5 | |
| Lighting controls | 30 | 7 | 7 | 5 | |
| Public address system - Headend | 30 | 7 | 7 | 5 | |
| Public address system - Devices | 30 | 7 | 7 | 5 | |
| Security system | 10 | 5 | 5 | 5 | |
| Camera system | 10 | 5 | 5 | 5 | |
| Data system | 15 | 5 | 7 | 5 | |
| Fire alarm system - Headend | 30 | 7 | 7 | 5 | |
| Fire alarm system - Devices | 30 | 7 | 7 | 5 | |
| Site lighting | 20 | 7 | 7 | 2 | |
| Classroom media systems (TV, projector, etc.) | 10 | 5 | 5 | 5 | |
| Phone system | 10 | 5 | 5 | 5 | |
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| **Condition Categories** | | | | | |
| **1 Immediate replacement required, life safety concern** | | | | | |
| **2 System has reached it's useful life** | | | | | |
| **3 Major repair or modifications required, useful life remaining** | | | | | |
| **4 Minor repair required** | | | | | |
| **5 General maintenance required** | | | | | |

**William Byrd High School Civil Condition Assessment**

Reference Building Owners and Managers Association International (BOMA)

Preventative Maintenance Guidebook

| System/Components | Condition Category | Expected Useful Life | Current Age | Expected Life Remaining | Notes |
|---|---|---|---|---|---|
| **Civil** | | | | | |
| Asphalt pavement | 2/4 | 15 years | 7+ years | 5-8 years | |
| Asphalt walks | 4 | 20 years | 7+ years | 10-13 years | |
| Concrete pavement | 5 | 30 years | 7 years | 23 years | |
| Concrete walks | 2/5 | 30 years | 7-49 years | 0-23 years | |
| Stairs | 4 | 30 years | 7-49 years | 0-23 years | |
| Ramps | 5 | 30 years | 7 years | 23 years | |
| Railings | 1/2/5 | 15 years | 7+ years | 5-8 years | |
| Concrete curb and gutter | 4/5 | 30 years | 7-49 years | 0-23 years | |
| Concrete / Brick Pavers | 5 | 30 years | 7 years | 23 years | |
| Guardrail, Parking Bumpers, Misc. | 3/5 | Varies | Unknown | 0-10 years | |
| Fire lane | 4 | Varies by Material | 7 years | 8 years | |
| Fire lines and hydrants | 5 | 40 years | Unknown | 20-25 years | |
| Domestic Water system | 4 | 40 years | 49 years | 0 years | |
| Sewer system | 4 | 40 years | 49 years | 0 years | |
| Natural Gas system | 4 | 40 years | Unknown | 0-5 years | |
| Electrical System | 5 | 25 years | Unknown | 10-15 years | |
| Exterior Lighting | 4 | 25 years | 28 years | 12 years | |
| Storm water system | 4 | 40 years | 28 years | 12v | |
| Detention / Retention ponds | N/A | Life | Unknown | 20-25 years | |
| Stormwater Management BMP's | N/A | Varies by BMP | Unknown | 20-25 years | |
| Surface drainage and grading | 4 | N/A | N/A | N/A | |
| Vegetative landscaping | 3 | Life | 7+ years | Varies | |
| Lawns | 4 | Life | 0+ years | Life | |
| Fencing and gates | 5 | 20 years | Unknown | 5+ years | |
| Signage | 4 | 10 years | Unknown | 5+ years | |
| Flagpoles | 5 | 50 years | 7 years | 43 years | |
| Site furnishings | 5 | 15 years | Unknown | 5+ years | |
| Awnings / Canopies | N/A | N/A | N/A | N/A | |
| Site retaining walls | 5 | 50 years | Unknown | 20+ years | |
| Accessory structures | N/A | N/A | N/A | N/A | |
| Practice/PE fields | 5 | Life | Unknown | Life | |
| | | | | | |
| | | | | | |
| **Condition Categories** | | | | | |
| **1 Immediate replacement required, life saftey concern** | | | | | |
| **2 System has reached it's useful life** | | | | | |
| **3 Major repair or modifications required, useful life remaining** | | | | | |
| **4 Minor repair required** | | | | | |
| **5 General maintenance required** | | | | | |
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**William Byrd High School Civil Condition Assessment**

Reference Building Owners and Managers Association International (BOMA)

Preventative Maintenance Guidebook

| System/Components | Condition Category | Expected Useful Life | Current Age | Expected Life Remaining | Notes |
|---|---|---|---|---|---|
| **Civil** | | | | | |
| Competition fields (Tennis) | 4 | 10 years | Unknown | 3+ years | |
| Lighting | N/A | N/A | N/A | N/A | |
| Bleachers / Stadium | N/A | N/A | N/A | N/A | |
| Accessory structures | N/A | N/A | N/A | N/A | |
| Competition Fields (Track) | 5 | 10 years | 6 years | 4 years | |
| Lighting | N/A | N/A | N/A | N/A | |
| Bleachers | N/A | N/A | N/A | N/A | |
| Accessory structures | N/A | N/A | N/A | N/A | |
| Competition fields (Softball) | 5 | 25 years | Unknown | Life | |
| Lighting | 5 | 25 years | Unknown | 20+ years | |
| Bleachers / Stadium | 5 | 25 years | Unknown | 20+ years | |
| Accessory structures | 5 | 50 years | Unknown | 30+ years | |
| Competition fields (Baseball) | 5 | 25 years | Unknown | Life | |
| Lighting | 5 | 25 years | Unknown | 20+ years | |
| Bleachers / Stadium | 5 | 25 years | Unknown | 20+ years | |
| Accessory structures | 5 | 50 years | Unknown | 10+ years | |
| Competition fields (Football) | 3 | 25 years | Unknown | Life | |
| Lighting | 5 | 25 years | Unknown | 10+ years | |
| Bleachers / Stadium | 5 | 25 years | Unknown | 15+ years | |
| Accessory structures | 5 | 50 years | Unknown | 20+ years | |
| Competition fields (Soccer) | N/A | N/A | N/A | N/A | |
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| **Condition Categories** | | | | | |
| **1 Immediate replacement required, life saftey concern** | | | | | |
| **2 System has reached it's useful life** | | | | | |
| **3 Major repair or modifications required, useful life remaining** | | | | | |
| **4 Minor repair required** | | | | | |
| **5 General maintenance required** | | | | | |

# Budgetary Cost Estimate

Estimate Date 12/7/2016
Facility Name **William Byrd High School**
Client Name Roanoke County Schools

OWPR ARCHITECTS AND ENGINEERS

| Quantity | Description | Unit | Cost / unit | Total w/ OH&P |
|---|---|---|---|---|
| | **ARCHITECTURAL** | | | |
| 250 | New Interior signage-adhesive back/braille | EA | $42.00 | $12,600.00 |
| | ADA compliant | | | |
| | | | | |
| 24,950 | Remove Existing Roof | SF | $2.25 | $67,365.00 |
| | | | | |
| 24,950 | Single-ply EPDM Roof Membrane | SF | $7.00 | $209,580.00 |
| | | | | |
| 60 | Interior doors | EA | $1,400.00 | $100,800.00 |
| | | | | |
| 200 | Door Hardware | EA | $800.00 | $192,000.00 |
| | | | | |
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| | | | | |
| | **CIVIL** | | | |
| 2,000 | Asphalt pavement (baseball) | SF | $3.00 | $7,200.00 |
| 8,000 | Asphalt pavement (softball) | SF | $3.00 | $28,800.00 |
| 1 | ADA ramp at football stadium | LS | $10,000.00 | $12,000.00 |
| 20,000 | Mill and overlay asphalt pavement | SF | $1.00 | $24,000.00 |
| 17 | Fire lane signage | EA | $500.00 | $10,200.00 |
| 1,700 | Repaint curbs and fire lanes | LF | $0.10 | $204.00 |
| 8 | Directional signage | EA | $1,500.00 | $14,400.00 |
| 50 | Replace handrails | LF | $50.00 | $3,000.00 |
| 100 | Replace metal guardrail | LF | $20.00 | $2,400.00 |
| 8 | Install site lighting | EA | $5,000.00 | $48,000.00 |
| 1 | Replace tennis courts (inc. fence & equip) | LS | $80,000.00 | $96,000.00 |
| 1 | New Access road to Middle/High School | LS | $1,500,000.00 | $1,800,000.00 |
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| | **MECHANICAL / PLUMBING** | | | |
| 1 | Replace domestic hot water circulation pumps | EA | $3,000.00 | $3,000.00 |
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| | **TOTAL Budgetary Cost** | | | **$2,631,549** |