CAVE SPRING HIGH SCHOOL

ARCHITECTURAL

Cave Spring High School (CSHS) was built on Chaparral Drive in 1968. Classroom addition was added to the facility in 1970 and technology education and an auxiliary gymnasium were added in 1987, bringing total square footage to 162,100 SF. The science labs were renovated in 1998-1999. The building has since been renovated in 2008 with a new lobby separating the gymnasium from the auditorium. This previous renovation provided a new attendance office, concession stand and restroom upgrades that allows for handicap accessibility. As a result of the 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 partially equipped with a fire suppression system. The original part of the building is showing its age and finish materials are failing. After one passes through the renovated lobby space, one enters an old, tired and dirty facility. This facility shows signs of neglect, age, and failed finishes. Lack of natural light and ventilation gives this facility a need for renovation or replacement. Cost recommendations were not given due to the recent renovation study provided by another firm.

Exterior Finishes

Exterior Cladding:

Exterior wall material is, generally, brick with precast concrete. Brick was observed to be in good condition with some areas needing repointing of joints. 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.

The windows are operable aluminum windows with marble stool. Window sills should be monitored and resealed as sealant failure occurs. Maintenance has been neglected.

Roof:

Areas of the building were re-roofed during the building renovations. The building has a black 60 mil EPDM single ply roof membrane. In general, maintenance activities should be increased on the roof. Several roof 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 put in a bucket and left on the roof. Roof is holding water in many areas due to the lack of water getting to the drains.

Access penthouse on roof and noticed the valves are leaking badly. Lack of maintenance is evident throughout the field investigation. 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.

Windows:

Minimal amount of Windows located throughout the building, (Lack of natural light) existing windows are generally aluminum storefront systems with insulated glazing.

Operable windows occur at few 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 to poor condition with some 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 side lites 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 are painted hollow metal doors and frames with louver frame beside exterior hollow metal door. Doors need fresh coat of cleaning and painting.

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, Flexible Terrazzo and Vinyl Composition Tile are the predominant floor finishes at CSHS. Other floor finishes include limited applications of Quarry Tile flooring in kitchen and wood flooring at the Gymnasium. Wood flooring is very thin and in need of replacement.

Interior wall finishes are generally painted concrete block and glazed wall tile. Office areas and built out areas are painted block.

Ceilings are generally spline ceiling in office area and suspended acoustical tile (lay-in) with some gypsum wall board ceilings throughout the building. Exposed, painted roof decking is present in the gymnasium area. Water damage is present in some of the suspended acoustic tile ceilings and other older tiles have begun to sag and deteriorate. New suspended acoustical tile ceilings are recommended as part of any renovations. Ceiling tile at the newer additions has serviceable life remaining. The existing gymnasium ceiling appears to be to low causing flat balls when coming into contact with nail pops in the roof deck.

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. Existing doors and frames within the smoke control or fire 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 good to poor 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 fair to poor condition in most locations, and should be at minimum painted or replaced.

Toilet Room materials and conditions all vary by construction and renovation date. Typical toilet room has poured flooring or ceramic tile flooring with ceramic tile wainscot and painted concrete walls. The ceiling is painted gypsum wallboard. The doors are wood doors with hollow metal frames. Newer toilet rooms from previous renovations meet handicap accessibility and toilet rooms from original building construction will need to be upgraded to meet current handicap accessibility.

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.

Kitchen (food service) equipment is a mixture of equipment original to the building and equipment purchased as the building aged. To ensure maximum efficiency in terms of function and energy, new food service equipment should be provided during a substantial renovation. Significant energy savings can be achieved through more efficient kitchen hoods with energy recovery capabilities, and other equipment. The kitchen should be enlarged and rearranged to increase efficiency of function and serving capacity.

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 most areas are 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 CSHS provides visibility from the check-in 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 to the school, the

building is reasonably compartmentalized. Sight lines are poor in most areas of the building. A more transparent administration area should be considered as part of renovations and additions.

End of Cave Spring High School Architectural Narrative

PLUMBING/FIRE PROTECTION

Plumbing Fixtures:

Water Closets: Most water closets observed were wall mounted vitreous china with manual type flush valves. There were floor mounted water closets with manual flush valves. There were several water closets that were ADA compliant. The condition of the water closets ranged from fair to excellent.

Urinals: Urinals observed were wall mounted vitreous china with manual type flush valves. There were several ADA compliant urinals observed. The condition of the urinals and flush ranged from good to excellent.

Lavatories: There were several different lavatories observed as follows: wall mounted vitreous china or enamel cast iron with manual and metered type faucets; pedestal mounted vitreous china with metered and manual type faucets; and countertop underlay lavatories with metered mixing type faucets. There were several lavatories that appeared to be ADA compliant. Most lavatories observed did have hot water supply, but no ASSE 1970 mixing valves that are required by today's codes. The condition of lavatories ranged from good to excellent.

Sinks: Sinks observed were stainless steel with kitchen type faucets with swing spouts. The condition of the sinks ranged from good to excellent.

Showers: Showers are individual wall showers with individual handle controls and fixed heads. Condition of showers seemed to be fair. They are assumed to be original and past their useful life span.

Laboratory Fixtures: Sinks observed in the laboratory areas were chemical resistant type to match countertops. Supply faucets and gas fittings on laboratory sinks appear to be in good working order although 17 years old. There are emergency solenoid shut off switches located within the classrooms as required.

Emergency Fixtures: Emergency showers and eyewash observed appeared to be ADA compliant. It was not determined if they were supplied with tepid water. The condition of the emergency fixtures was good.

Electric Water Coolers: There were several different styles of water coolers noted within building. There were some original old porcelain drinking fountains from the original 1968 design still in use. There were some ADA compliant high/low models. The condition of the water coolers ranged from fair to excellent.

Water Heaters:

Domestic water is heated by a Patterson Kelley model PKW-20/9B electric water heater, 240 kW, 480V, 3 Phase with approximately 1400 gallons of storage (1968

model). Hot water is recirculated with three different return lines and three in-line pumps. There were some 30 gallon electric water heaters that served science labs (1999 models).

Piping:

Water: Copper
Sanitary Piping: Cast iron / PVC
Storm Piping: Cast iron / PVC
Gas Piping: Black steel
Sprinkler Piping: Black steel

Pipe Insulation:

Hot water, cold water, hot water return and horizontal storm drain piping is insulated with fiberglass insulation.

Water Entrance:

The building is served by a 6" cold water line that is assumed to be from a municipal system. There is no RPZ type backflow preventer or pressure reducing valve observed on the incoming service line. The 6" line manifolds with one 4", two 3" and one 2" domestic water feeds, and one 2 1/2" and one 2" sprinkler feeds. Pressure gage on the sprinkler feed indicates 100 psi pressure on the incoming service.

Kitchen:

The Kitchen is old type with direct waste connections and no floor sinks. No grease interceptor could be found. All kitchen equipment is electric.

Sprinklers:

There is some limited area sprinklers in the building that are feed off the domestic water riser. One riser is for the mechanical room, it was not determined what the other sprinkler riser feed, but it is assumed it is for storage rooms within the building.

Recommendations:

Water pressure in the building is too high; suggest adding an RPZ backflow preventer and a pressure reducing valve on domestic piping. Add a sprinkler system to the entire building.

End of Cave Spring High School Plumbing/Fire Protection Narrative

MECHANICAL (HVAC)

Heating:

The mechanical room contains one gas fired water boiler that was installed in 1985. There are also two electric hot water boilers that were installed in 1967 and 1970 respectively. The boilers provide heat to the building through a hot water circulation system. Hot water is circulated to the buildings heating coils with base mounted pumps. Coils are in some of the rooftop units, terminal units and unit heaters. The gas fired boiler, the electric boilers, and pumps have passed their expected useful life expectancy of 30 years, 15 years, and 20 years respectively. Some of the rooftop units have electric heat.

Ventilation:

Ventilation is provided to the building by rooftop air handling units. The kitchen hood and dishwasher have dedicated exhaust fans on the roof.

Air Conditioning:

The building is primarily cooled by an air-cooled chiller located on grade outside of the mechanical room. Chilled water is then pumped to cooling coils located in rooftop units, air handler units, and unit ventilators. The chiller is about 5 years old and has a useful life expectancy of 20 years. The air handler units in the penthouses on the roof were installed in 1970 are way past their expected useful life of 20 years. In addition to a rooftop unit the cafeteria is cooled by two Carrier split type systems that each have two remote condensing units on grade. These units were installed in 1985 and have passed their useful life expectancies of 18 years. The building is also cooled by DX units. Refer to the facility condition assessment for more detailed info on various ages of equipment.

Piping:

There is hot water and chilled water piping, black steel, insulated. About 80% of the piping is old and has passed the useful life point of 30 years. The insulation around the piping is torn and in some cases completely ripped off and leaving the piping exposed.

Controls:

The building's automation controls are the digital type (DDC) combined with some older pneumatic controls on the air handler units in the roof penthouses.

Recommendations:

One of the chilled water pumps has bad bearings and is very noisy. The mechanical piping needs to be replaced. Throughout the school there are multiple leaks above the ceiling which is damaging the ceiling tiles. It is assumed there is a lack of insulation on

piping above the ceiling. The A/C unit serving the kitchen is broke and has not been fixed. The air handler units in the roof penthouses need to be replaced soon as they are way past their expected useful life.

End of Cave Spring High School Mechanical Narrative

ELECTRICAL

Main Switch Gear:

Main Switch Gear: The main switch gear is a 2000 Amp, 3 phase, 4 wire, 480Y/277 volt GE QMR, service entrance rated main distribution panel (MDP). The existing panelboard is original to the building from 1956 and has exceeded its expected useful lifespan.

Recommendation: In the event of a substantial renovation or addition, replace existing switchboard and expand as necessary.

Transformers:

Transformers: The majority of the transformers are original 480/277V to 208/120V. They are currently all in good working condition; however, over time transformers become less energy efficient and most have exceeded their expected useful life.

Recommendation: If renovations and additions are pursued, replace the existing transformers.

Panelboards:

Distribution and Branch Circuit Panelboards: The majority of panelboards are original GE. Many of the panels have broken doors, hinges, or locks – some are currently being held shut by tape. Front lobby addition/renovation in 2007 was provided service through a new Square D panel in main mechanical room. Most of the original panels have no space or spares available and have exceeded their expected useful life.

Recommendation: If renovations and additions occur, replace the original 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.

Cabling:

Cabling: Much of the building wiring is original. Some new wiring in raceway has been added for the addition of receptacles. Most of the wiring is past its rated useful life and should be replaced. Exposed electrical wiring from various systems (data, telephone, power) can be seen in multiple areas throughout the building. The new 2007 front end renovation is provided through all new wiring.

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. All exposed wiring should

be enclosed in conduit or raceway to prevent electrical hazards. Retain and extend 2007 wiring as necessary.

Conduit/Raceway:

Conduit/Raceway: Surface raceway and conduit has been used throughout the building for any new receptacles, fire alarm, and all data to classrooms. Many classrooms and computer labs have a shortage of receptacles and so surge protectors are being utilized. This can lead to tripping, electrical, and fire hazards.

Recommendation: All surface raceway should be evaluated regularly and securely reattached to the wall if it becomes loose. All raceway would be replaced if the building were renovated. Conduit would be salvaged where practical. Additional receptacles should be added to classrooms and computer labs where needed, rather than through the use of surge protector strips.

Light Fixtures:

Light Fixtures: The light fixtures consist of primarily 2x4 flat lens fixtures with T8 lamps, 1x4 surface or pendent fixtures with T8 lamps, fluorescent can lighting, and some decorative fluorescent pendants. The T8 lamps are current technology, and meet the current needs of the school. Various emergency wall pack light fixtures are also utilized, many of which have exceeded their expected useful life. Lamps are likely changed as lamps burn out; however, many of the ballasts and optics have likely not been changed and have exceeded their useful life.

Recommendation: To accommodate a new addition or renovation, provide a new lighting design. Consider LED fixtures where practical. Retain all new lighting used for 2007 addition.

Lighting Controls:

Lighting Controls: Lighting controls throughout the building consist of toggle switches controlling fixtures within an area, most classrooms have zoned switching. Corridor lighting is controlled through visual pushbutton switch bank in the front office. New theater lighting dimmer panel added in auditorium mezzanine with 2007 addition/renovation.

Recommendation: In the event of a renovation or addition, add automatic lighting controls to each room to comply with building energy codes. Retain lighting controls and theater lighting controls from new addition/renovation.

Public Address System:

Public Address System: The public address system is a Rauland headend system with older speakers located throughout the school. Each classroom has an original PA block speaker. Teachers and staff use the Cisco phone system to call in to the PA for most communications and announcements. The current PA system has reached the end of its expected life and is in need of replacement.

Recommendation: The PA system has exceeded its useful lifespan and should be updated to a newer Valcom system as typical for the county for efficient 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 provided through raceway. 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.

Fire Alarm System:

Fire Alarm System: The fire alarm control panel is a Simplex 4010 fire alarm system that was updated to the building with the front entrance renovation. The current system consists of limited area manual pull stations, smoke detectors, and horn/strobe alarms. However, there are no alarm devices located in classrooms or bathrooms. Devices throughout the building consist of various manufacturers and have been added or

replaced during the buildings lifespan; most have reached or exceeded their expected useful life.

Recommendation: If renovations and additions are pursued, reuse fire alarm control panel and replace devices. Expand existing fire alarm system with audible and visual notification devices throughout the school and in classrooms. Reconfigure the existing system as necessary for renovations.

Generator:

Generator: No generator is installed to serve this building. Emergency lighting is provided by emergency battery units in the corridors, large rooms, and at exits.

Recommendation: For any renovations or addition, a new generator should be considered, sized to provide power for life safety features and other equipment that the school would like to operate.

Site Lighting:

Site Lighting: The site lighting consists of pole mounted lights for parking areas, wall packs around the building, and canopy lighting at exterior doors. The fixtures appear to be original to the building. Lamps are likely changed as lamps burn out; however, many of the ballasts and optics have likely not been changed and have exceeded their expected useful life. The site appears to be well covered with fixtures.

Recommendation: To accommodate a new addition or renovations, replace existing lighting fixtures around exit doors and areas of egress. Connect these lights to an emergency circuit. Provide new general site lighting to maximize energy efficiency and minimize light contamination on neighboring properties and to the sky.

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.

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. Phones are provided in all offices and classrooms as required to access outside lines. Push-to-talk buttons with the PA system are included in all classrooms, but the phone system is used for communication with the front office. The system is operational and meets the current needs of the school.

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

End of Cave Spring High School Electrical Narrative

CIVIL

Traffic Circulation

Buses: School is served by 15 regular buses, 3 special needs buses, and shuttles to Burton Center. There is a dedicated bus loop on the north side of the building. Special needs and Burton Center shuttles use the main entrance on the west side of the building.

Morning: Buses utilize the bus loop to drop off students. Special needs buses and Burton Center shuttles utilize the main entrance.

Afternoon: Same pattern as the morning. Buses line up along the sidewalk at the bus loop for pick up. The center of the bus lot is faculty parking, so buses use the outer edge.

Cars: There is one entrance and exit for pick up and drop off as well as student parking.

Morning: Parents dropping students off enter the student parking lot, loop around the south end, and drop students off adjacent to the main entrance. They are not allowed to utilize the drop off at the main entrance as it is reserved for the special needs buses and Burton Center shuttles.

Afternoon: In the same fashion, parents enter the student parking lot, loop around and wait for their student to exit the building. Staff indicated that the process is slow, but seems to run smoothly.

Parking: 456 striped parking spaces are provided with 14 designated ADA spaces. Day to day parking is adequate for faculty / staff / visitors / students. Parking quantities meet Roanoke County requirements and State recommendations. Event parking is also adequate, although the soccer / lacrosse field is relatively remote with only parking for ADA and officials.

Service: Service is located on the east side of the building and is accessed from the bus loop. Maneuvering is very tight, particularly for larger trucks.

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

Separation: Buses, faculty parking, and service share space, but it is not an issue due to scheduling. The main parking lot with one entrance can be an issue with traffic backing up on campus. There is a bus parking / fueling area at the south end of the main parking area. The main parking area is shared by parent drop off/pick up, buses, student drivers, and faculty. While not ideal, there have been no major issues reported.

Adjacent Roadways: The adjacent roadway is a two lane subdivision street with moderate traffic flow. Sight distance is good at the exits.

Pedestrian: There are a few students who walk to school from the adjoining neighborhoods, but not many.

ADA Accessibility

Parking: Ten spaces at the main entrance and four spaces at the competition soccer field are designated as ADA parking. None are designated as van accessible. At the main entrance, all spaces are large enough to be van accessible. At the soccer field, two spaces have an aisle big enough to be van accessible. At the main entrance, there is no designated path or crosswalk from the ADA spaces to the front door.

Recommendation: Add several "van accessible" designations to the signage at both locations.

Signage: Signs are in fair to good condition. No van accessible signs.

Ramps: Curb ramps only, in fair condition.

Recommendation: Replace curb ramps when sidewalks and curbs are replaced.

Access to all areas: There is no ADA parking adjacent to the softball field, baseball field, or track. There is no ADA path to the concessions / restroom building at the baseball field / track area.

Recommendation: Stripe ADA parking at the softball field and the baseball / track area and add signage. Provide ADA accessible path to the concessions / restroom building at the baseball / track area.

Parking Areas, Driveways, and Sidewalks

Asphalt Pavement: Asphalt pavement is aged, in poor condition with alligator cracking throughout.

Recommendation: Repair areas with alligator cracking (subgrade deficiencies) mill and overlay all asphalt areas including the bus parking area.

Asphalt Walks: Asphalt walks are in fair condition with some cracking at the softball field area and baseball/track area.

Recommendation: Monitor asphalt walk for future repair / replacement.

Concrete Pavement: Concrete pavement areas are in generally poor condition with moderate to severe cracking.

Recommendation: Replace concrete pavement areas.

Concrete Walks: Some newer areas are ok, but most concrete walks are aged and in poor condition with moderate to severe cracking and spalling.

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

Stairs, Ramps, and Railings: Concrete stairs are aged, but in fair condition. Curb ramps only, in poor to fair condition. Generally railings are old, some are damaged and bent. Some do not meet current code requirements. Service area has stairs with no railings.

Recommendation: Replace non-code compliant railings. Repair and repaint damaged railings. Replace curb ramps.

Concrete Curb and Gutter: Generally poor condition, aged with many broken areas.

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

Concrete / Brick Pavers: Good condition. Located at main entrance only.

Guardrail, Parking Bumpers, and Miscellaneous: Guardrail to soccer field is generally in good condition with one section that is undermined and loose. Pipe gates are aged, and in fair to poor condition.

Recommendation: Repair and repaint pipe gates to extend useful life. Repair loose guardrail.

Fire Lane: Paint on curbs and asphalt is good. Some fire lane signs are faded and illegible. 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: Poor fire hydrant coverage with no spacing. No fire hydrant on site, but one across the road in front of the church. No paved fire lane around building or fire department connection, but fire truck access is present around half of the building.

Recommendation: Consider planning for adding a hydrant for fire protection coverage.

Domestic Water System: The water system is in fair condition. Staff indicated no pressure or water discoloration issues. Water is provided to school via tap into public water main. The water meter is located in a vault next to Chaparral Drive to the northeast.

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 at the rear of the school and not located in a vehicular traffic area. 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 at the rear of the school and then into the building. The meter is mounted on the building and the transformer is safe from vehicular traffic.

Site Lighting: Large lights illuminate the perimeter of the student parking lot and faculty parking lot and building mounted lights illuminate sidewalks and entrances. Lighting is insufficient for safety and security.

Recommendation: Increase site lighting in student parking lot.

Grading and Drainage

Storm Water System: Roof drains and downspouts are piped underground into the storm water network. Runoff from the building and the site drains to the detention pond to the south. There is major erosion behind school due to concentrated flow. There is accumulation of sediment in many structures and sediment has completely clogged trench drains at the rear of the school.

Recommendation: Underground piping system and trench drains should be flushed and pipe outlets should be cleaned out and inspected for sediment. Provide rip rap for channel along rear of school to dissipate energy from concentrated flow.

Detention / Retention Ponds: Detention pond at rear of property completely overgrown with trees. Eroded channel through pond to outlet.

Recommendation: Provide outlet protection into detention pond to prevent erosion and maintain pond free of trees and shrubs.

Slopes, Ponding, and other Drainage Issues: Runoff from adjacent neighborhood and faculty parking lot drain towards school causing ponding and flooding issues. Library in school, which is depressed from finished floor, floods during any significant rain event.

Recommendation: Consider planning for storm water redesign to prevent library from flooding.

Site Features

Vegetative Landscaping: Vegetation, including trees and shrubs, are healthy.

Recommendation: Continue general maintenance of pruning and mulching. .

Lawns: Generally fair condition. Many bare areas and islands in need of maintenance.

Recommendation: Repair and reseed bare areas. Scarify existing surface prior to reseeding and provide fence and erosion control mat until grass firmly established

Fencing and Gates: Fencing around campus is generally in fair to poor condition. Areas noted where bollards and cable at entrances, pole gates, and damage to bus yard fence. Fencing at athletic facilities is covered under appropriate sections.

Recommendation: Equipment has reached end of service life. Recommend to replace or remove.

Signage: Overall condition is fair. ADA signage not code compliant. No directional signage provided for parent/student/staff/service areas. Inadequate fire lane signage at staff parking. Poles are fair with significant age, some are leaning or without foundations.

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

Flagpoles: Good condition.

Site Furnishings: Mostly newer benches and trash cans. Life span of smaller metal benches with CSHS logo will have shorter lifespan due to plexi-glass covers prone to damage. Picnic tables outside of cafeteria are in good condition.

Awnings / Canopies: Main entrance canopy is in good condition. Canopy at staff parking lot in fair condition.

Recommendation: Canopy at staff parking lot should be monitored as it will require replacement before end of building life.

Site Retaining Walls: Short segmental block wall in pedestrian path at student parking is in poor condition. Failing ends and capstones observed. Four foot concrete wall near staff parking does not meet code compliance for top railing.

Recommendation: Repair segmental block wall with construction adhesive to lock in blocks. Provide code compliant railing for wall at staff parking.

Accessory Structures: Picnic pavilion provided as part of pump house on hill. Structurally the building is in good condition, but amenities are in fair condition. Small administration building of wood construction with vinyl siding in fair condition in bus yard.

Recommendation: Provide routine maintenance for structures.

Physical Education

Practice / PE Fields: One field provided within traditional track limits. Secondary practice field noted outside of track area. Turf for both are in fair condition due to bare spots and uneven surfaces. Good drainage system noted for track/practice area.

Athletics

Tennis Courts: Asphalt courts have some cracking. Recommend filling/sealing cracks in next resurfacing. Color and play surface are in good condition.

Lighting: Lighting system utilizes wood poles and are in fair condition.

Bleachers / Stadium: No spectator facilities were observed.

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

Recommendation: Recommend filling/sealing cracks as part of next resurfacing. Plan for replacement of lighting system with modern metal poles and upgraded luminaires.

Track and Field Events: Track is asphalt base with a black latex surface coat. Track and markings are in good condition. Jump Tracks and High Jump areas match track conditions. Vinyl CLF in good condition. Protective coverings for foot traffic/cleats were noted.

Lighting: None.

Bleachers: Several sets of wood bleachers are in good condition.

Accessory Structures: Small storage structures with wood framing and vinyl siding in good condition. Wood pavilion for track judges in good condition. Storage building of CMU construction in good condition.

Recommendation: Continue resurfacing latex to avoid a complete track rebuild. Latex should typically be top coated in seven to ten years after original installation.

Competition Softball Field: Outfield turf is in good condition. Infield condition is in excellent condition. Field has good drainage from stormwater runoff. All fencing in excellent condition. Scoreboard in excellent condition. Foul poles in good condition.

Lighting: None.

Bleachers / Stadium: Aluminum bleachers are in good condition. ADA access is available but not to bleachers.

Accessory Structures: Pressbox/Concessions/Restroom facility of CMU construction in excellent condition. Dugouts are in excellent condition. Batting cages are in good condition.

Competition Baseball Field: Outfield turf is in good condition. Infield condition is in fair condition due to aggregate and clumps of clay soils. No drainage problems from stormwater runoff observed. All fencing in good condition. Scoreboard in good condition. Foul poles in good condition.

Lighting: None.

Bleachers / Stadium: Aluminum bleachers are in good condition. ADA access is not to code.

Accessory Structures: Pressbox/Concessions/Restroom facility of CMU construction in good condition. Dugouts are in poor condition and are open to field. Batting cage is in fair condition. Storage building of CMU construction in fair condition, but roof repairs needed.

Recommendation: Repair/Rebuild dugouts to provide protective enclosure from game play. Provide ADA access to one set of bleachers.

Competition Football Field: School utilizes a shared synthetic turf field and facilities with CSMS, HVMS, and HVHS for competitions. Refer to Shared Athletic Complex identified on Cave Spring Middle School assessment.

Recommendation: Refer to shared athletic complex identified on Cave Spring Middle School assessment.

Competition Soccer Field: Interior access not available due to fencing and locks. Turf appears in good condition with areas of wear observed in front of goals. Drainage appears adequate. Scoreboard in good condition. CLF fencing in good condition.

Lighting: Lighting system appears in good condition.

Bleachers / Stadium: Bleachers appear in good condition.

Accessory Structures: Storage/Concessions/Restroom facility of CMU construction is provided. Condition appears good.

End of Cave Spring High School Civil Narrative

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Notes

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

Subject: Cave Spring High School	**Total Pages:**
Date: 9/22/2016	**Location: Roanoke, Virginia**
Copies To:	**Report Prepared By: JFH**

General:

The Facility was constructed in 1968 on Chaparral Drive and was the first total electric and air conditioned school in Roanoke County at the time. Classroom additions were added to the facility in 1970 and Technology education and auxiliary gymnasium were added in 1987. The science labs were renovated in 1998-1999. In 2008 a total renovation of the lobby separating the gymnasium from the auditorium was completed. The previous renovation provided a new attendance office, concession stand and restroom upgrades. The previous renovation provided a secure entrance and meets the building accessibility requirements. The existing building is brick, block and precast structure that is not sprinkled. The existing building has a flat EPDM membrane roof with a Chiller unit penthouse.

Entry Vestibule:

VCT (replicate terrazzo)
Barrel Vault perforated suspended ceiling.
Walls Laminated Wall Panels and Alum Storefront.
The Main Entrance Vestibule meets security and accessibility requirements.

Main Office:

The flooring is Terrazzo and Carpeted
The walls are CMU.
The ceiling is Tongue and Groove Acoustic ceiling.
The Doors are Wood with Hollow Metal Frame.
Wood doors are equipped with Knobs. (hardware need replacing)
Wood Casework

Corridor:

The flooring is terrazzo.
The walls are glazed white tile.
The ceiling is SATC.
(Corridor is dirty and walls stained)

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Notes

Mechanical Room:
- Concrete floors
- CMU Walls, Exposed
- Concrete Ceiling
- HM doors and frame
- (Chiller units on the Roof)

Stairs:
- Terrazzo treads with slip resistance strips,
- Tubular handrails
- Glazed Tile Wainscot Wall and Plaster Above
- Suspended Acoustic Tile Ceiling (SATC)
- HM Frame wood Doors
- Aluminum Railing

Basement Level Toilet Room:
- Glazed Wainscot/CMU Walls
- Terrazzo Flooring
- Marble Partitions
- Floor MTD Flush Valve Water Closet

Lower Level Weight Room:
- Rubber Mat Flooring
- CMU Walls
- Exposed Ceiling
- (No Air Flow)

Lower Level:
- Poor Ventilation (dirty and stale)
- (Staff complains about Ventilation, Health Issue Concerns)
- (Complaints about insects, Cockroaches)

Technology Annex (Basement):
- VCT Flooring
- CMU Walls
- SATC Ceiling
- HM Frame and Wood Doors
- (Door Hardware needs replacing)

Gymnasium:
- Height concerns (nail pops from roof)
- Wood Floor (Very Thin)
- Exposed Painted Ceiling Structure
- Painted CMU Walls
- HM Frames
- Wood Interior Doors, HM Exterior Doors

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Notes

Basement Corridor:
Terrazzo floor
Glazed White Tile Walls, CMU above
GWB Ceiling

Media Center:
- Carpeted Flooring
- Painted CMU Walls
- 24x24 SATC
- Corridor Ramps down to Media Room approx. 16”
- Media Room has no natural light

Men Toilet:
- Wall Hung Flush Valve Water Closet
- ADA Accessible
- (Old and dirty)

Typical Lower Level Classroom:
- Newer
- Vinyl Composition Tile (VCT)
- Suspended Acoustic Tile Ceiling (SATC)
- Concrete Masonry Unit (CMU) Wall

Typical Upper Level Classroom:
- Older
- Tongue and groove Acoustic Ceiling
- Painted CMU Walls
- Terrazzo Flooring
- HM Frame and Wood Doors

Room 309:
- Plastic Laminate Casework w/Soapstone Countertop
- Terrazzo Flooring
- Painted CMU Walls
- 24x24 SATC
- Ceiling Leakage

Kitchen:
- Tile Flooring
- Painted CMU Walls
- GWB Ceiling
- HM Frames with Wood Doors with old hardware
- (Not in good shape)
- Heat and AC do not work in the Kitchen
- Broken Freezer
- No Fryer so therefore do not use grease interceptor
- Exhaust Fan needed for the Kitchen Toilet
- Power issues middle of kitchen floor (trip hazard and shortages)

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Notes

Cafeteria:

Terrazzo flooring (Cracked badly)
Glazed Tile Wainscot and Painted CMU above
Old Tongue and groove Acoustic ceiling
Acoustical Sound boards attached to CMU up high
HM Frame and Wood Interior Doors
HM Frame and HM Exterior Doors (Need Weather Seals)

Roof:

The flat roof is covered with EPDM membrane.
Water Ponding throughout roof
Roof Maintenance Required
Leak Repairs are needed for the Air Handler Unit in the Roof Penthouse.

Conclusion:

The facility is in very poor shape! The facility is in need of replacement or at least a complete renovation. The existing main entrance was the latest renovation and that area is in good shape however look directly past that and the rest of the building is in need of major improvements.

Cave Spring 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	5	Life	48 years	Life	
Precast concrete	3	35 years	48 years	0 years	
CMU walls	5	Life	48 years	Life	
Wood trim	2	15 years	48 years	0 years	
Interior doors	2	20 years	48 years	0 years	
Exterior doors	3	50 years	48 years	2 years	
Door hardware	2	7 years	48 years	0 years	
Electronic door hardware, Security Entrance	5	5 years	2 years	3 years	Security Entrance completed 2014
Terrazzo	3	50 years	48 years	2 years	
Vinyl floor tile	2	12 years	48 years	0 years	
Ceramic/Porcelain floor tile	3	50 years	48 years	2 years	
Wood gym floor	2	10 years	29 years	0 years	
Other wood floors	2	10 years	29 years	0 years	
Exposed concrete floors	3	50 years	48 years	2 years	
Curtain Wall, Storefront	3	50 years	48 years	2 years	
Exterior windows	2	30 years	48 years	0 years	
Interior windows	2	30 years	48 years	0 years	
Roof (Including flashings, coping, etc.)	4	20 years	8 years	12 years	
Suspended acoustical tile ceilings (lay-in)	2	25 years	48 years	0 years	
Interlocking tile ceilings (spline)	2	20 years	48 years	0 years	
Plaster/GWB ceilings	5	30 years	48 years	0 years	
Sound control panels (wall and ceiling)	4	N/A	N/A	N/A	
Ceiling/exposed structure finish (paint)	2	5 years	48 years	N/A	Whole building needs cleaning and paint
Interior wall finishes (paint)	2	5 years	48 years	N/A	Whole building needs cleaning and paint
Marker boards, chalk boards, tack boards, projection screens	2	N/A	48 years	N/A	
Casework	2	N/A	48 years	N/A	
Window treatments	2	N/A	48 years	N/A	
Toilet partitions	2	20 years	48 years	0 years	
Toilet accessories	2	N/A	48 years	N/A	Replace as required
Exterior railing, Interior railings	2	30 years	48 years	0 years	
Sprinkler/No Sprinkler	1	N/A	N/A	N/A	Partial Sprinkled off of domestic
School sign	2	25 years	48 years	0 years	Not ADA Code compliant
ADA Code compliant	2	N/A	48 years	N/A	Not ADA Code compliant
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					

Cave Spring 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					
Electric boiler (1967)	2	15 years	49 years	0 years	
Electric boiler (1970)	2	15 years	46 years	0 years	
Gas fired boiler (1985)	2	30 years	31 years	0 years	
Chiller or Cooling tower	5	20 years	5 years	15 years	
Mechanical piping	2	30 years	31 years	0 years	80% of piping is old
Refrigerant piping	4	30 years	10 years	20 years	Some of the refrigerant piping is newer
Duct	2	30 years	31 years	0 years	80% of ductwork is old
Outdoor air units	N/A				
Terminal units	N/A				
Packaged units (2012)	5	18 years	4 years	14 years	
Packaged units (2008)	5	18 years	8 years	10 years	
Packaged units (1997)	2	18 years	19 years	0 years	
Packaged units (1985)	2	18 years	31 years	0 years	
Controls	4	20 years	8 years	12 years	
Exhaust fans	2	25 years	31 years	0 years	
Plumbing					
Plumbing fixtures and controls - 40%	3	30 years	17 years	13 years	
Plumbing fixtures and controls - 35 %	2	30 years	48 years	0 years	
Plumbing fixtures and controls - 25%	5	30 years	8 years	22 years	
Floor drains	2	30 years	48 years	0 years	
Water heaters	2	15 years	48 years	0 years	
Pumps	2	15 years	48 years	0 years	
Potable water piping & valves	2	30 years	48 years	0 years	
Sprinkler system	2	30 years	48 years	0 years	
Back-flow preventer	2	30 years	48 years	0 years	
Service line & meter (size appropriate)	2	30 years	48 years	0 years	
Wall and yard hydrants	2	15 years	48 years	0 years	
Eye wash stations	5	20 years	17 years	3 years	
Emergency showers	5	20 years	17 years	3 years	
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					

Cave Spring 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	60	-20	2	
Transformers	30	60	-30	2	
Panelboards - Original	30	60	-30	2	$70,000 - Cost to replace panels with broken hinges and locks
Panelboards - 2007 Addition	30	9	21	5	
Cabling	40	60	-20	2	
Cabling - 2007 Addition	40	9	31	5	
Conduit/raceway	40	60	-20	2	
Conduit/raceway - 2007 Addition	40	9	31	5	
Light fixtures	20	60	-40	2	
Light fixtures - 2007 Addition	20	9	11	5	
Lighting controls	30	60	-30	2	
Public address system	30	60	-30	2	
Security system	10	2	8	5	
Camera system	10	5	5	5	
Data system	15	5	10	5	
Fire alarm system - Control panel	30	9	21	5	
Fire alarm system - Devices	30	60	-30	2	
Site lighting	20	60	-40	2	
Classroom media systems (TV, projector, etc.)	10	5	5	5	
Phone system	10	5	5	5	

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

Cave Spring 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	15 years	Unknown	0-5 years	
Asphalt walks	3	20 years	Unknown	5-10 years	
Concrete pavement	2	30 years	48 years	0 years	
Concrete walks	2/3	30 years	9-48 years	0-25 years	
Stairs	3	30 years	48 years	10-15 years	
Ramps	2/3	30 years	48 years	0 years	
Railings	2/3	15 years	48 years	5-10 years	
Concrete curb and gutter	2	30 years	48 years	0 years	
Concrete / Brick Pavers	5	30 years	9 years	21 years	
Guardrail, Parking Bumpers, Misc.	2/3	Varies	Varies	15 years	
Fire lane	4	Varies by Material	Varies	0-5 years	
Fire lines and hydrants	3	40 years	Unknown	0 years	
Domestic Water system	4	40 years	48 years	0 years	
Sewer system	4	40 years	48 years	0 years	
Natural Gas system	4	40 years	48 years	0 years	
Electrical System	5	25 years	Unknown	10-15 years	
Exterior Lighting	4	25 years	Unknown	0-5 years	
Storm water system	3	40 years	48 years	0 years	
Detention / Retention ponds	3	Life	48 years	0 years	
Stormwater Management BMP's	N/A	N/A	N/A	N/A	
Surface drainage and grading	2	N/A	N/A	N/A	
Vegetative landsaping	5	Life	48 years	Varies	
Lawns	4	Life	48 years	Life	
Fencing and gates	3	20 years	9-48 years	N/A	
Signage	4	10 years	Unknown	2+ years	
Flagpoles	5	50 years	9 years	41 years	
Site furnishings	5	15 years	Unknown	8+ years	
Awnings / Canopies	4/5	50 years	9+ years	10+ years	
Site retaining walls	4	50 years	48+ years	10+ years	
Accessory structures	5	50 years	Unknown	10+ years	
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					

Cave Spring 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	5+ years	
Lighting	4	25 years	Unknown	5+ years	
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	4 years	6 years	
Lighting	N/A	N/A	N/A	N/A	
Bleachers	5	25 years	Unknown	10+ years	
Accessory structures	5	50 years	Unknown	30+ years	
Competition fields (Softball)	5	25 years	Unknown	20+ years	
Lighting	N/A	N/A	N/A	N/A	
Bleachers / Stadium	5	25 years	Unknown	20+ years	
Accessory structures	5	50 years	Unknown	30+ years	
Competition fields (Baseball)	5	25 years	Unknown	20+ years	
Lighting	N/A	N/A	N/A	N/A	
Bleachers / Stadium	5	25 years	Unknown	20+ years	
Accessory structures	4	50 years	Unknown	30+ years	
Competition fields (Football)	N/A	N/A	N/A	N/A	Shared Synthetic Turf Field at CSMS
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 (Soccer)	5	Life	Unknown	20+ years	
Lighting	5	25 years	Unknown	20+ years	
Bleachers / Stadium	5	25 years	Unknown	20+ years	
Accessory structures	5	50 years	Unknown	45+ years	
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 **Cave Spring High School**
Client Name Roanoke County Schools

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Quantity	Description	Unit	Cost / unit	Total w/ OH&P
	ARCHITECTURAL			
	CIVIL			
200	Pavement restriping	LF	$0.20	$48.00
8	ADA signage	EA	$500.00	$4,800.00
4	Concrete curb ramps	EA	$1,000.00	$4,800.00
265,000	Mill and overlay asphalt pavement	SF	$1.00	$318,000.00
1,300	Replace concrete pavement	SF	$7.00	$10,920.00
100	Replace handrails	LF	$50.00	$6,000.00
	Directional signage	EA	$1,500.00	$0.00
10	Fire lane signage	EA	$500.00	$6,000.00
1,000	Repaint curbs and fire lanes	LF	$0.10	$120.00
8	Install site lighting	EA	$5,000.00	$48,000.00
2	Provide outlet protection	EA	$200.00	$480.00
1	8" Sprinkler System	EA	$30,000.00	$36,000.00
950	10' Chain Link Fence with 3 strand barb wire	LF	$50.00	$57,000.00
120	4' Handrail on retaining wall	LF	$80.00	$11,520.00
	MECHANICAL / PLUMBING			
162,100	HVAC renovations	SF	$22.00	$3,566,200.00
1	Add RPZ Backflow Preventer	EA	$4,000.00	$4,000.00
1	Add Pressure reducing valve	EA	$3,000.00	$3,000.00
162,100	Add Sprinkler System - includes ceiling modifications	SF	$6.00	$972,600.00
1	Replace Domestic Water Heaters	EA	$75,000.00	$75,000.00
3	Replace Domestic Hot Water Circulation Pumps	EA	$3,000.00	$9,000.00
	ELECTRICAL			
10	Replace panels with broken locks and hinges	EA	$7,000.00	$70,000.00
162,100	Electrical Renovation	SF	$15.00	$2,431,500.00
	TOTAL Budgetary Cost			**$7,634,988**