

Preliminary Architectural Feasibility Report

For the

Blacksburg Police Department

Prepared for the

Town of Blacksburg Blacksburg, Virginia



THOMPSON & LITTON
Over fifty years of integrity, insight and innovation.

T&L Project No.:12402

June 26, 2014

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Table of Contents

Description	Section
Executive Summary	A
Need for Facility	B
Existing Site & Building	C
-Site	
-Building	
Proposed Facility	D
-Summary of Proposed Facility	
-Program of Spaces	
Sustainable Design	E
Technical Design Narrative	F
-Civil	
• General	
• Demolition	
• Earthwork	
• Access & Parking	
• Utilities	
• Stormwater Management	
-Structural	
• Codes and Standards	
• Existing Conditions	
• Anticipated Building and Parking Garage Structural Systems	
• Geotechnical and Foundations	
• Design Criteria	

-Architectural

- Roofing System
- Exterior Walls
- Skylights
- Exterior Doors & Windows
- Exterior Stairs & Railings
- Interior Partitions
- Interior Doors & Windows
- Finish Hardware
- Interior Floors
- Interior & Exterior Ceilings
- Toilet & Bath Accessories
- Casework
- Vertical Circulation
- Specialties

-Heating, Ventilation, & Air Conditioning (HVAC)

- Equipment/System Descriptions
- Exhaust fans
- Ductwork
- Air Distribution
- Piping systems
- Insulation
- Test and Balance:
- System and equipment identification:
- Control system:
- LEED and Commissioning

-Plumbing

- Waste Piping
- Domestic Water Service
- LEED Requirements
- Roof Drainage

-Fire Protection

-Electrical

- Power System
- Interior Lighting System
- Exterior Lighting System
- Telephone/Data/Radio Systems
- Fire Alarm
- CCTV System
- Security Systems
- Video Conferencing

Preliminary Code Assessment..... **G**

Cost Estimates..... **H**

-New Construction

-New Construction + Existing Building Reuse

Drawings..... **I**

-PR0 – Site – Aerial View

-PR1 – Aerial View with Floor Plan Overlay

-PR2 – Overall First Floor Plan

-PR3 – Conceptual Floor Plan – Level 1

-PR4 – Overall Second Floor Plan

-PR5 – Conceptual Floor Plan – Level 2

-PR6 – Conceptual Plan – Level 3 Parking & Roof Plan

-PR7 – Conceptual Building Elevations

-PR8 – Conceptual Perspective Views

-PR9 – Conceptual Perspective Views

Construction Challenges..... **J**

Conclusions & Recommendations..... **K**

Appendices

-Appendix A – LEED for New Construction v2009 Credit Checklist

A. EXECUTIVE SUMMARY

Thompson & Litton (T&L) was retained by the Town of Blacksburg (the Town) to develop a feasibility study for the renovations and possible expansion to the Blacksburg Police Department (BPD). The study consisted of an evaluation of existing conditions, a definition of needs, identification of constraints, and development of a conceptual design to meet the current and future needs of the Police Department.

- The existing building does not meet the current and projected needs of the Blacksburg Police Department.
- An expansion plan to increase the building from its current size of one-story, 12,000 SF to two-stories, 34,200 SF was developed to address deficiencies and plan for future growth; parameters for building expansion/renovations required that the BPD remain at its current downtown location.
- To accommodate on-site parking for the entire fleet of police vehicles, a three-story, 45,500 SF parking structure is needed.
- Renovations and expansion will incorporate design elements from the surrounding areas so that the building's architecture remains in context in both appearance and scale.
- Additional/adjacent property will need to be acquired to accommodate the square footage of the proposed facility.
- A change in zoning or would be required to expand the facility at its current location.
- Due to the scale of the building expansion, the police department will need to relocate to temporary quarters during construction.
- The proposed Police Department facility will be designed and constructed to achieve LEED Silver Certification.
- Estimated project cost for renovation of existing building and expansion is \$13,263,179; estimated project cost to demolish existing structure and build an entirely new facility is \$13,271,470.

B. NEED FOR FACILITY

The existing facility for the BPD, located on Clay Street, has served as headquarters since the early 1980's. As the Town has grown over the years, so has the Department. The Town has made adjustments and adapted the existing facility to work with the expanding Department; however the facility has been maximized and still falls far short of meeting the Department's current and projected needs. The BPD has nearly doubled in size since the early 1980's and inadequate space is causing significant hindrances in the daily operations, functionality, and tasks performed by the Department.



Existing Police Department

Initial site visits performed through the facility made apparent the critical need for expansion. Structurally, the building is in good condition. However, the spaces within the building are significantly inadequate for the current function and size of the department. Some examples of current inadequacies include, but are not limited to:

- The public meeting space has been converted to roll call and briefing space, as there is no other space in the building large enough to house a shift at one time. The police staff must pass from secure areas of the facility through the public lobby to get to the roll call room.
- There are two offices, each approximately 100 square feet, which house a total of eight shift supervisors. There are four shift supervisors using two desks in one office, and four shift supervisors using three desks in the other; this arrangement does not allow for private space needed for personnel counseling, disciplinary discussions, etc.

- A closet space within the facility has been converted to house two detective offices, one passing through the other, with a substandard width door to both.
- There are forty-nine, mostly half-size lockers, within the men's restroom/shower/locker room for a staff including sixty-seven men. There are sixteen half-size lockers within the women's restroom/shower/locker room for a staff including eighteen women.
- Police Officers do not have assigned desk space, lockers, and must share police vehicles across shifts; sworn officers do not have a space within the police department or police vehicle to store arms and equipment assigned to them; they must take their assigned arms home each night.
- There are fourteen parking spaces located to the west of the police facility, all of which are limited use to enable prisoner transfer and short term parking for police vehicles during a shift. Therefore, the fleet of fifty-seven police vehicles must be parked at an offsite Town lot located three miles to the south.
- Each officer must drive their personal vehicle to the remote lot, transfer their equipment to the police vehicle, and drive the police vehicle to the police facility prior to the start of their shift. This transfer can conservatively be estimated to take 15 minutes or more, which equates to a loss of 30 minutes per officer, per shift, per day.



The BPD has expressed the importance of keeping the police department in its current downtown location. In order to achieve this and function properly, the Town of Blacksburg and the BPD need to explore options to expand the police department facility and relocate fleet vehicle parking to the Clay Street location.

C. EXISTING SITE & BUILDING

SITE

The existing Blacksburg Police Department building is situated on Clay Street, SW near its intersection with Draper Road SW. The site is bounded to the north by Washington Street SW and properties owned by the Town of Blacksburg, to the south by Clay Street, to the east by a public park and walking trail, and to the west by multiple private properties. Existing improvements within the site include buildings, paved parking areas, concrete sidewalks, fences, potable water, sanitary sewer, storm sewer, electrical service, and all related appurtenances.

BUILDING

The existing facility was built in 1980 utilizing post and beam construction. Exterior finishes include a combination of split-face solid CMU, split-ribbed CMU, and precast concrete panels. In 1990, the facility underwent a building addition comprised of load bearing CMU walls. Exterior finishes of the addition are consistent with the original design of the building. The addition increased areas used for booking and holding cells, created a 750 SF meeting room, and new main entrance to the facility. The overall gross square area of the building is approximately 12,000 square feet.

Interior walls throughout the building range from painted CMU to metal stud framing with gypsum wall board on each side. Floor finishes include vinyl composition tile in corridors and booking facilities, ceramic tile in restrooms and locker rooms, and carpet tile in offices. Acoustical ceiling tile is predominantly used throughout the facility, with the exception of gypsum board in the locker rooms.

The roofing material is a single-ply roofing membrane. Mechanical equipment is located in various locations on the roof. A penthouse, which houses equipment for mechanical and electrical systems, is located on the roof as well. The exterior finish for the penthouse is insulated metal wall panels.

D. PROPOSED FACILITY

SUMMARY OF PROPOSED FACILITY

To meet current Police Department needs, the existing one-story, 12,000 SF building needs to be expanded both horizontally and vertically. The Town has emphasized a desire to provide a facility which is welcoming to the public, a safe haven for citizens after hours, and provides a public lobby and meeting spaces that can support the active and engaged community. In addition, the proposed two-story, 34,200 SF building will provide the police department adequate space for administrative offices, officer work stations, a secure booking area, locker facilities, training and fitness room, staff break areas, evidence storage, and an Emergency Operations Center. Second floor access will be provided by two stairs and two elevators.

A three-story, 45,500 SF parking structure addition will increase the police department's parking spaces to roughly seventy-four vehicles. Two staircases provide access and egress for each level of the parking deck.



Conceptual Rendering of Proposed Front Elevation of Police Department

The proposed facility will incorporate design elements from the surrounding historic and public areas so that the building remains in context in both appearance and scale. Building size and roof lines of the proposed facility will be consistent with adjacent buildings; an example includes the Blacksburg Public Library. Working within the vernacular context, materials will include brick veneer, sloped metal roofs, stone wall panels, and other materials common to Blacksburg. The building form will be transitional in nature, identifying both with the established context, and giving acknowledgement to the future.

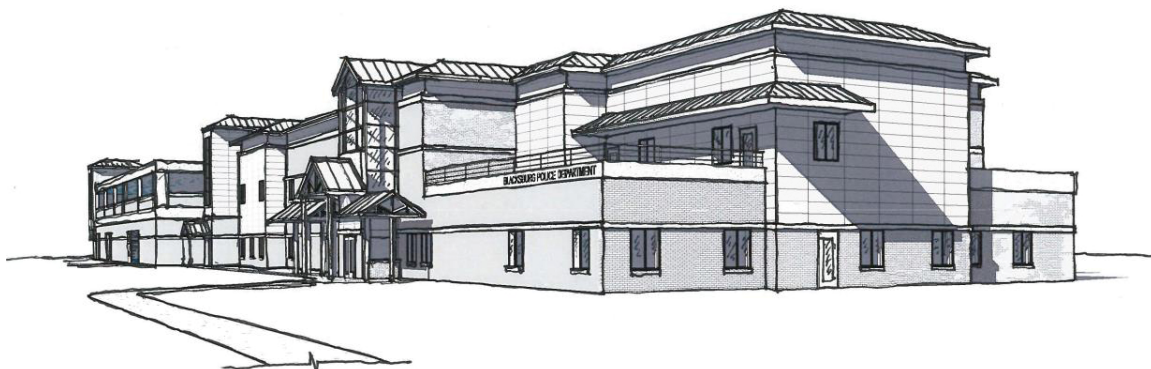


Building Perspective – Sketch of Proposed Main Entrance

To accommodate this size of facility and remain in the current downtown location, additional adjacent property will need to be acquired. In addition, the bicentennial trail between the Police Department and the Five Chimneys property will need to be relocated.

The Town Comprehensive Plan supports “Civic” use at the current Zoning District (Old Town Residential); however it does not allow a large enough Floor Area Ratio to accommodate the amount of expansion needed. The Town Planning Director has suggested adding a “Civic Zoning District” for Town Facilities located in the downtown area.

Due to the scale of the building expansion, maintaining police operations within the facility during construction will be impractical; the police department will need to move to temporary quarters during construction.



Building Perspective – Sketch of Proposed Facility

PROGRAM OF SPACES

Room or Space Name	Area (SF)	Comments
"Fusion Center" - "Brain"		
Records Manager	280	Private, Adjacent to Public Entrance
File/Archive Storage Room	285	Adjacent to Admin. Copy/Supply/ Work Rm
Parking Enforcement		
Server/Communications Room	222	
Radio Control	115	
War Room	467	TV, surveillance, smart board, desktop computers. Adjacent to EOC. Private, secure.
Conference Room/Emergency Operations (EOC)	850	Smart board, TV's, Power & Data throughout, accessible by public for Citizen Academy
Break Room	181	
Sub Total	2,400	

Public Entrance		Main Floor Level
Reception		Customer service
Entrance Vestibule	162	
Lobby & Waiting Area	351	
Public Toilet Men	280	
Public Toilet Women	280	
Academy Room/Classroom	874	Room for Chief to Address entire staff, Public Media Access?
Citizens Counter	0	Space assigned to Reception
Intake Room	84	
Intake Room	72	Citizen Information and processing
Intake Room	72	Citizen Information and processing
Sub Total	2,175	



Aerial View with Conceptual Model

Police Administrative Operations

Main Floor Level. Adjacent to Fusion Center, Investigate spaces that can be shared

Chief of Police	200	
Captain's Office	170	
Captain's Office	150	
Lieutenant's Office	150	
Sergeant's Office	150	
Command Staff Conference Room	400	Seating for 16 persons, Secure, soundproof Needs Direct Access to Chief, & available to entire staff
Senior Administrative Assistant	185	
Administrative Reception, Personnel Files, Work Area	600	
Subtotal	2,005	

Criminal Investigations

Second Floor Level

Detective Stations	1,600	10 Detective Workstations
Narcotic Detective Station/Office	110	
Detective Sergeant Office	155	
Detective Lieutenant Office	170	
Suspect Interview Room 1	73	Adjacent to holding cells
Suspect Interview Room 2	81	Adjacent to holding cells
Observation Room	81	
Media Processing Room	145	
Office	120	
Office	120	
Work Area	470	Adjacent to ERT, shared multi-purpose room
Work Area	240	
General Storage	96	
Server/Communications/VCIN terminal	145	
Polygraph Room		Adjacent to Interview room
Sub Total	3,606	

Evidence

Second Floor Level

General Evidence Storage	550	Includes weapons safe, refrigerators, freezers
Drug Evidence Storage	190	
Large Scale Evidence	545	
Evidence Processing Lab	250	
Evidence Temporary Lockers	122	For Transferring Evidence from Patrol to Evidence Officer, After Hours Availability
Biological Drying Lockers		
Vehicle Processing Bay	800	Located on main level under parking deck addition
Sub Total	2,457	

Patrol

		Main Floor Level
Patrol Core	3,065	4 Supervisor Offices, 6 desks, 6 file cabinets, workstations, whiteboard/info center for each of 4 shifts
K9 Officer's Offices	240	1 office, Workstation area for 4, Storage for animal care supplies, (4x5 Kennel Size)
K9 Training Room	360	Ventilated, interior space
Bicycle & Motorcycle Bay	700	Bike Racks, large gear lockers, maintenance area
Armory	800	Divided into dispersion and secure areas
Property and Equipment Storage	265	Second Floor
Work / Copy	171	Shared with Fusion Center
Supply Storage - General Storage	164	
Storage	920	Located on Main Floor Level, under new parking deck structure.
Garage (2 Bays)	1,100	Located on Main Floor Level, under new parking deck structure.
Break Room	0	Located on Second Floor
	Sub Total	7,785

Emergency Response Team

		Second Floor Level
ERT Core	660	Meeting / De-briefing area, ERT Lieutenant's Office,
Men's Locker	230	Lockers for large tactical gear, access to outlets
Women's Locker	205	Lockers for large tactical gear, access to outlets
Storage Room	65	Ammo Storage
Weapons Rack	95	Lockable
	Sub Total	1,255

Crash Team

		Second Floor Level. Cross functional, shared space. Location not as significant
Office Suite	236	Offices and workstations, secure
	Sub Total	236

Booking

		Main Floor Level
Booking Area	365	Counter w/ sink, live scan equipment, ink prints
Breathalyzer	75	
Toilet Near Breathalyzer	80	
Holding Cell 1	70	Adjacent to work stations for officer
Holding Cell 2	65	Adjacent to work stations for officer
Group Holding A	215	
Video Magistrate	160	
Vehicular Sally port	435	
Supply Storage	180	Casework
	Sub Total	1,645

Community Outreach

Office - Community Outreach	150	
Office - Professional Standards	145	
Office - Crime Prevention	165	

Main Floor Level

Sub Total 460

Shared Facilities

Fitness Room	740	Second Floor Level
Men's Shower /Locker Room	480	Double stack lockers
Women's Shower / Locker Room	395	Double stack lockers
Men's Bunk Room	135	
Women's Bunk Room	135	
Staff Break Room	395	Second Floor Level
Men's Restroom	240	
Women's Restroom	240	

Sub Total 2,280

Building Support

Housekeeping	100	Includes Janitors Closets
Mech/Elec./Communications Rooms	1,000	Includes Server Closets
General Storage	560	
Elevator Machine Rooms	175	

Sub Total 1,835

Grand Total 28,139

Parking

Fleet Vehicles

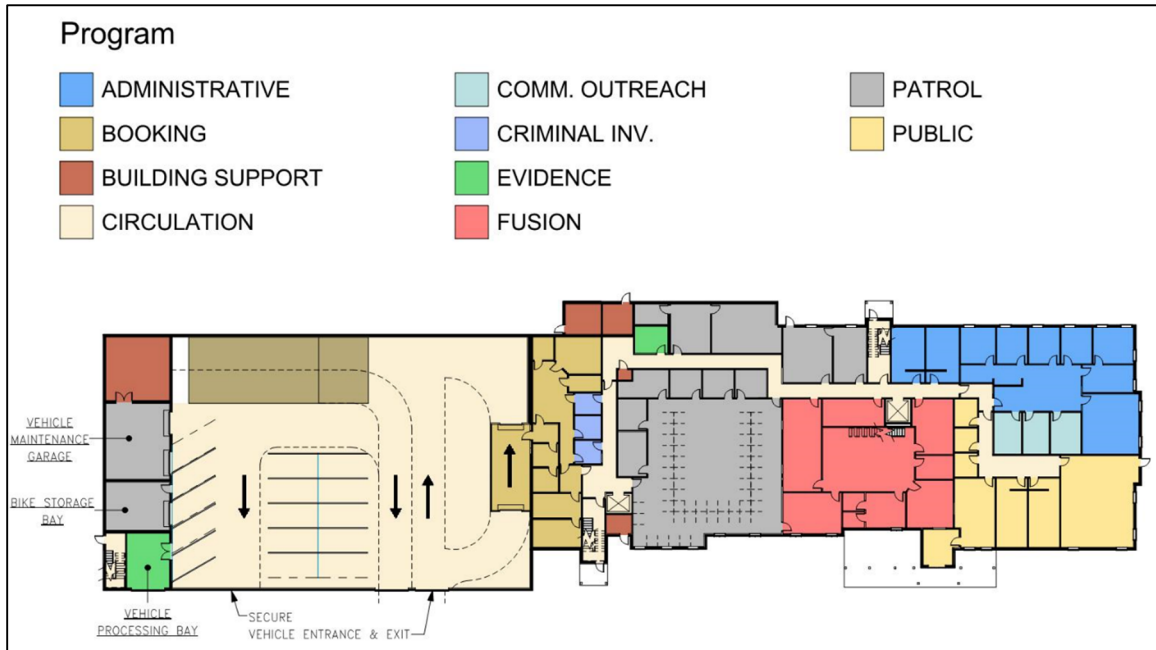
100 total spaces needed, 50 Patrol vehicles to be on one level to communicate with antenna

Personal Vehicles

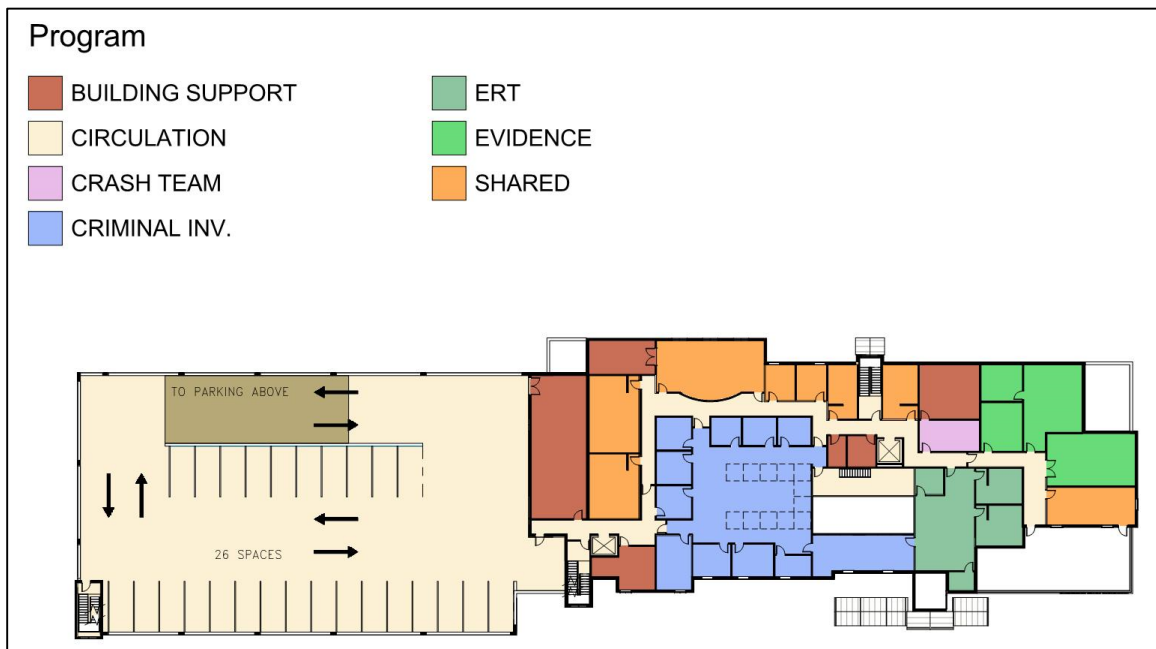
35 spaces needed

44,775

Grand Total 44,775



Conceptual Main Floor Plan



Conceptual Second Floor Plan

E. SUSTAINABLE DESIGN

The proposed Police Department facility will be designed and constructed to achieve LEED Silver Certification in accordance with *LEED for New Construction v2009*. Refer to Appendix A for a preliminary checklist of attempted credits.

Team work is essential to developing and implementing a sustainable building program. Through experience, Thompson & Litton has learned that early involvement of all parties is the most cost-effective way of obtaining the maximum number of LEED credits. Sustainable design must be focused on early during the design phase.

Our sustainable activities during design include:

- Fostering an integrated, multidisciplinary and collaborative approach
- Defining sustainability goals
- Establishing roles and responsibilities
- Evaluating the site to identify constraints and sustainable opportunities
- Creating baselines for energy and water usage
- Discussing options for reducing building lifecycle costs with the Owner
- Evaluating a broad range of design ideas to maximize sustainable attributes. Many of these ideas will result in LEED credits. However, even those that do not benefit the LEED rating will be considered for inclusion in the project to ensure the most sustainable building possible.

Our design team will work with the Owner's staff to confirm the credits selected for achieving this project's LEED Silver Certification. When making such initial evaluations, we can help the Owner find the proper balance between cost and sustainability.

As the designer, we understand that we are responsible for helping achieve certain LEED credits during construction. Our proven sustainable construction processes help ensure that we attain those credits.

Our sustainable activities during constructions include:

- Tracking, compiling and submitting the documentation required to support LEED construction credits

- Reviewing submittals to ensure that all project materials and equipment comply with LEED requirements. We check submittals with the appropriate LEED reference guide section to eliminate any potential mistakes that would otherwise cost valuable LEED points.

Thompson & Litton is fully committed to the green movement. Our preliminary LEED scorecard confirms that we will provide the Town of Blacksburg a building that can achieve LEED Silver Certification. The team understands the tremendous impact the built environment has on our planet, and we're doing our part to propel and support the spirit of sustainable building.

F. TECHNICAL DESIGN NARRATIVE

CIVIL:

GENERAL

Site-related construction of the proposed facility will involve the relocation of existing utilities and installation of new utilities associated with the proposed additions. Site grading is anticipated to be minimal. However, there may be significant earthwork associated with the installation of new utilities and storm water controls.

DEMOLITION

The building on the parcel to the southwest of the Blacksburg Police Department will be demolished. Portions of the existing utilities will be demolished and/or abandoned including potable water, sanitary sewer, storm drains, and electrical lines. Additionally, demolition of fences, asphalt, curb and gutter, concrete pads and other appurtenances will be required. Trees and other landscaping will be cleared where required. Clearing and grubbing will be confined to the limits of disturbance for the site.

EARTHWORK

Significant grading is not anticipated to be required. Earthwork is anticipated to be primarily limited to installation of utilities, footings, and removal of excess material to facilitate installation of stormwater management features. A Geotechnical Report will be required to determine the extents of earthwork for

the building addition, parking structure, and any retaining walls. The Geotechnical Report will determine the maximum cut/fill slope angles, lift height for backfill material placement, and fill compaction density. Approximately eight (8) to ten (10) boreholes are anticipated.

Testing and acceptance will be performed by the Owner's testing laboratory. Surplus or unsuitable material will be removed and disposed of off-site should no satisfactory areas for disposal exist on-site. Unsuitable material will be replaced with select fill obtained from on- or off-site borrow sources, as necessary.

ACCESS & PARKING

T&L studied the nearby parking areas to determine if any of the surrounding area could serve as suitable parking for the BPD. These areas included:

- A) Intersection of Clay Street and Draper Road, lot beside current BPD. A concrete box culvert is located in this location, presenting additional construction costs and concerns. In addition, a parking structure would not be desirable at a prominent corner lot location of the Old Town Historic District.
- B) Current parking lot used for Blacksburg Public Library. Conflicts include maintaining public parking for the library while separating public and secure parking for the BPD. Street access and lot size did not lend itself for multi-story parking structure, and relocation of the Huckleberry Trail would be necessary.
- C) Commercial parking lot. This location is too far removed from the BPD, creating security concerns with after-hours pedestrian traffic.

It was determined that these areas were not suitable solutions to support the Police Department's current and future needs.



Parking Study

Clay Street, SW will continue to provide vehicular access to the site. New access roads will not be required. Since it was determined that nearby parking lots were not suitable for the Police Department's needs, the existing parking lot on the southwest side of the building will be replaced by a parking structure. The new parking structure will connect to Clay Street and designed to facilitate circulation, while restricting access to authorized vehicles only. The existing public parking in front of the building may be modified to implement sustainable design features.

Pedestrian access is provided by a walkway connected to the Huckleberry Trail, which is anticipated to remain. The existing bike racks in front of the building will be relocated to correspond to the new entrance location. Additionally, the parking structure will include a bicycle storage bay.

UTILITIES

Sanitary Sewer: Approximately 200 L.F. of the existing 8-inch sanitary sewer line running through the existing parking lot will be demolished or abandoned. The relocated/upgraded pipe and fittings will be SDR 35 PVC gravity sewer pipe. Manholes will be precast concrete with O-ring joints, concrete flow channels, and flexible manhole connections. New sanitary sewer laterals associated with the proposed additions will connect to the aforementioned sanitary sewer line.

Water: Approximately 200 L.F. of the existing 2-inch water line running through the existing parking lot will be demolished or abandoned. The relocated/upgraded pipe and fittings will be SIDR 18 PVC potable water pipe. Connection will be made in the vicinity of the existing water meter, which may require replacement. Testing and disinfecting of water mains will be provided in accordance with the Virginia Department of Health Waterworks Regulations.

Electric: The existing electrical lines, light poles, and associated appurtenances located within the existing parking lot will be demolished or relocated prior to construction of the proposed facilities. Electric service to the proposed additions is anticipated to originate from the existing building.

STORMWATER MANAGEMENT

Storm Drainage System: Storm sewer pipe will be corrugated polyethylene pipe meeting ASTM F667. Subsurface roof drains will be Schedule 40 PVC. All drop inlets, yard drains, manholes, and standard drainage items will be in accordance

with VDOT Road and Bridge Standards and Road and Bridge Specifications and be traffic-rated. It is assumed that all roof drainage will be collected at the downspouts and routed to either a storm water detention facility or a rainwater cistern. Existing storm drains located within the footprint of the building expansion and parking structure will be demolished / abandoned. All storm water associated with the proposed facility will ultimately be routed to the Town of Blacksburg storm sewer system.

Erosion & Sediment Control: An erosion and sediment control plan will be provided to minimize erosion and sediment transport during construction of the proposed facility. The plan is expected to utilize silt fence, inlet protection, a construction entrance, and other temporary measures, as necessary. All on-site surface drainage will be directed to these temporary controls prior to entering existing drainage ways.

Storm water Management: A storm water management plan will be provided to control/treat storm water runoff during the life of the facility. As a result of the new Virginia Stormwater Regulations that go into effect on July 1, 2014, the plan is expected to utilize underground storm water detention and Best Management Practices (BMPs) as listed in the Virginia Stormwater BMP Clearinghouse to meet new, more stringent water quality and quantity criteria. The plan is anticipated to incorporate a combination of practices such as rooftop disconnection, rainwater harvesting, permeable pavers, and urban bioretention.

STRUCTURAL:

The structural design for this project should provide a building system which will accommodate the program requirements for space layout, as well as with the architectural and building service needs, while meeting current code standards for load carrying capacity.

CODES & STANDARDS

Codes and standards that apply to the design of this building are:

- International Building Code 2009
- ASCE 7 Minimum Design Loads for Buildings and Other Structures
- ACI 318 Building Code Requirements for Reinforced Concrete
- ACI 530 Building Code Requirements for Masonry Structures
- American Institute of Steel Construction (AISC) with Commentary

- American Iron and Steel Institute (AISI) Specifications for the design of Cold-Formed Steel Structural Members
- American Welding Society (ANSI/AWS) D1.1 Structural Welding Code
- Steel Joist Institute (SJI) for open web Joists and Girders
- Steel Deck Institute (SDI) for Metal floor and roof Decks

EXISTING CONDITIONS

The original building on the site was constructed in 1980 with a major addition occurring in 1990. The original building and addition were constructed utilizing different structural systems. In the original building typical steel post and beam construction was utilized. The drawings for this portion of the building indicate that the building was initially designed to accommodate a second level in the future. The original building drawings indicate that column lines A, C and E have been sized to accommodate the second floor loading along with a future roof loading. Also, the original drawings indicate that the most of the columns are to terminate six inches above the top of the steel beams. This was a design attempt at aiding in any future vertical expansion of the building. The columns along the perimeter of the original building are incorporated into the CMU walls that comprise the façade of the building. The foundation for the original building is comprised of a series of 18" wide by 16" deep grade beams and a five inch slab-on-grade reinforced with welded wire mesh. Based on the original drawings these foundations were designed to have a maximum soil bearing capacity of 1,000 psf. This is likely due to unfavorable soils present on the site.

The addition to the building, constructed in 1990, consists of CMU bearing walls and bar joists for the roof. The foundation of the building is constructed utilizing strip footings under both the load bearing and non-load bearing walls. Unlike the original building the addition is not indicated to have been designed for any future vertical expansion. The perimeter walls of the addition consist of 12 inch reinforced CMU. The interior walls consist of reinforced CMU walls that range in thickness from 8 inches to 12 inches with a 2'-0" wide strip footing for support. The slab-on-grade consists of a 4 inch slab with welded wire mesh for reinforcement. The roof consists of bar joists with horizontal bracing and a 1-1/2" tall 22 gage roof decking.

ANTICIPATED BUILDING AND PARKING GARAGE STRUCTURAL SYSTEMS

The construction of the Blacksburg Police Station building is mainly anticipated to be steel frame. The building will be a two story building consisting of steel wide

flange beams and columns which will support floors consisting of concrete fill over steel decks. The floor framing will consist of a composite steel beams and joists with shear studs. The building will have a 4" thick concrete slab-on-grade with 4" thick #57 aggregate. Roof systems will be a steel frame consisting of wide flanged steel girders with open web steel joists supporting steel roof deck. A typical floor framing bay would consist of W24 girders ranging from 55-76 lbs per foot with approximately 32 shear studs. The intermediate floor beams will be spaced at 5'-0" center to center maximum and are estimated to be W14x22 or W16x26 with approximately 12-20 shear studs. The columns used for the building will range in size from approximately W10x30 to W10x54. The floor slabs will be approximately 5" thick with a 2"-22 gage composite metal deck. The estimated roof framing will consist of mainly W21x44 girders and have bar joists spaced at 4'-0" maximum. The roof deck is estimated to be a 1.5"-22 gage wide rib metal roof deck.

Lateral load resisting systems will likely be achieved by providing reinforced masonry shear walls at stairs and elevators. With the building being used as an essential facility the use of X-bracing in conjunction with the reinforced masonry shear walls is likely. The walls would be 8" masonry walls with the first floor wall being reinforced with #5@16" and the remainder of the wall reinforced with #5@32".

The exterior walls will consist of 6", 16 gage metal studs spaced at 16" on center for the first floor walls. The corners which are within 15 feet from the edge will have 6", 14 gage studs for the first floors.

The parking garage will be constructed utilizing a combination of cast-in-place concrete walls around the lower level perimeter of the structure. The elevated floor levels for the parking garage will be constructed utilizing precast prestressed inverted tees and double tees. The interior columns will be constructed utilizing cast-in-place concrete columns.

GEOTECHNICAL AND FOUNDATIONS

A geotechnical investigation has not been performed at this time. Based upon the existing building drawings, an allowable bearing pressure of 1,000 pounds per square foot is assumed. The use of shallow spread footings at columns and strip footings at the building perimeter is assumed at this time. A typical exterior wall strip footing will be 2'-6" wide x 12" thick. Interior footings will be approximately 10'-0"x 10'-0"x24" thick and exterior footings will be approximately 9'-0"x 9'-0"x18" thick. It is anticipated that the masonry walls and elevator walls will have a substantial thickness in order to account for overturning. Undercutting of the foundation is expected, but cannot be quantified at this time.

The parking garage foundation will be supported on augered concrete caissons for the interior columns with pile caps. The perimeter walls will be supported on a strip footing with caissons spaced at approximately 10'-0" on center. The caissons are assumed to be needed down to bedrock or competent weather rock.

DESIGN CRITERIA

The structural systems in the facility shall be designed to meet the requirements of the 2009 International Building Code (IBC). The following minimum requirements should be anticipated:

Occupancy Category

Category IV – All buildings and other structures designated as essential facilities.

Wind Loads

Wind Velocity	90 mph, (3 second Gust)
Exposure Type	"B"
Wind Importance Factor, I_w	1.15 (Occupancy Category IV)

Seismic Loads (Site Characteristics Are Assumed At This Time)

Short Period Mapped Acceleration	$S_s = 0.239g$
Long Period Mapped Acceleration	$S_1 = 0.083g$
Site Class	E
Seismic Design Category	D
Seismic Importance Factor, I_e	1.5 (Occupancy Category IV)

Roof Loads

Roof Snow	Estimated Roof Snow load = 30 psf
Snow Importance Factor, I_s	1.2 (Occupancy Category IV)

Floor Live Loads

Minimum floor live loads as required by occupancy per ASCE 7.

Vibration Performance

The floor structure of the building will be designed to provide occupant comfort in accordance Design Guide 11 "Floor Vibration Due to Human Activity"

ARCHITECTURAL:

ROOFING SYSTEM

The roof will consist of a combination of membrane roofing, metal roofing, and garden roofing.

All membrane roofing will be a fully adhered, single-ply, white Thermoplastic polyolefin (TPO) system. The membrane will be 60-mil thick and installed over tapered insulation with a minimum 1/4-inch per foot slope.

All metal roofing will be mechanically seamed 24-GA (0.028-inch) standing-seam metal roof similar to UNA-CLAD UC-3 as manufactured by Firestone. Panel widths shall be 20-inches with a 1½-inch seam height.

All areas of garden roof will be a modular garden roof system similar to the LiveRoof Standard System as manufactured/produced by LiveRoof Hybrid Green Roofs. Garden modules will 1'x2' rectangles with a soil depth of 4 ¼". Plant material will consist of ground cover, water conserving accent plants, and hardy spring blooming bulbs.

Roof r-value requirements will be met by using layered rigid polyisocyanurate insulation. The cumulative thermal value will equal R-20.

Roof drainage at membrane and garden roof areas will be accomplished using interior roof drains. Overflow scuppers will also be provided at the roof perimeter as required per the building code. Drainage of metal roofs will be accomplished using prefinished aluminum gutters. Each metal roof will also be equipped with snow guards at all overhangs. In all cases, stormwater will be tied into an underground stormwater management system.

EXTERIOR WALLS

All Exterior walls will be constructed of 6-inch non-load-bearing cold-formed metal stud framing clad with a combination of brick veneer and fiber cement

panels. All walls will have 1/2-inch OSB wall sheathing and weather-resistive barrier on the exterior, 5/8-inch gypsum wallboard on the interior and 6-inch (R-19) foil-faced, glass-fiber blanket insulation in the wall cavity.

Veneers:

- Brick: 3-5/8"W x 2-1/4"H x 7-5/8"L face brick with 3/8" colored mortar joints.
- Fiber Cement Panels: 18" x 6'-0" wood fiber reinforced panels similar to the Illumination Series as manufactured by Nichiha Fiber Cement Products.

SKYLIGHTS

Skylights will be aluminum-framed pyramid skylights similar to the Pinnacle 300 Series as manufactured by Wasco Products. Framing members will be constructed of extruded aluminum alloy with a 2-coat fluoropolymer system. All glazing will be 1-1/8" insulated glazing consisting of a 1/4" clear tempered exterior lite, 1/2" sealed air space, and 3/8" clear laminated safety glass interior lite.

EXTERIOR DOORS & WINDOWS

Exterior doors, other than utility doors, will be medium stile aluminum doors similar to the Tubelite Standard Medium Stile Entrance System. All exterior utility doors will be 1³/₄-inch, 16-GA (0.053-inch) insulated and galvanized hollow metal in 16-GA (0.053-inch) galvanized hollow metal frames.

All Exterior windows will be constructed of 4¹/₂" deep thermally-broken aluminum storefront similar to 14000 Series Storefront Framing as manufactured by Tubelite.

All aluminum storefront and opening components will have a 2-coat fluoropolymer finish system.

All exterior glazing will be tinted 1-inch insulated low-E type.

INTERIOR PARTITIONS

With the few exceptions noted below, all interior partitions will be constructed of 3 5/8-inch, 25-GA metal studs at 16-inches on-center with 5/8-inch Type 'X' gypsum wallboard on all exposed faces and 3 5/8-inch sound batt insulation in the wall cavity for the full height of the wall. Gypsum wallboard will extend a minimum of 6-inches above finished ceiling.

- Walls behind plumbing fixtures: Construct as noted above with 6-inch, 20-GA metal studs in lieu of the 3 5/8" studs.
- The ammo storage, armory distribution, and secure armory will be constructed of 8-inch CMU with 7/8" furring channels and 5/8-inch Type 'X' gypsum wallboard on all exposed faces.
- All storage areas within the parking garage will be constructed of 8-inch CMU.

All gypsum walls will receive a Level 4 finish and will be painted with two (2) coats of semi-gloss interior latex acrylic paint over a primer.

INTERIOR DOORS, WINDOWS, & FRAMES

All interior doors will be 1 3/4-inch solid core wood doors with a rotary cut white birch veneer. Doors will be finished with a factory applied water-based stain finish. Interior window and door frames will be constructed of factory primed 16-GA (0.053-inch) hollow metal. Frames will receive two (2) coats of gloss interior latex acrylic paint.

Glazing for all interior doors and windows will be 1/4-inch tempered, clear float glass.

FINISH HARDWARE

All interior hardware will be commercial, grade 1, key-latched sets with ADA compliant lever type cylindrical hardware. Panic hardware will be provided on exterior doors, excluding utility doors. The finish of all interior hardware will be satin chrome. Electronic access hardware will be provided as required by Owner.

INTERIOR FLOORS

Interior floor finishes will be a combination of the following:

- Carpet Tile (Office and assembly spaces): 24-inch x 24-inch commercial grade, multi-level pattern loop carpet tile.
- Entrance Carpet Tile (Vestibules): 24-inch x 24-inch entrance grade, needlebond directional course carpet tile.
- Resilient Floor Tile (Circulation and storage spaces): 12-inch x 12-inch x 1/8-inch thick, through pattern vinyl composition tile (VCT).
- Porcelain Tile (Restroom and booking): Various sized porcelain tile in thin set application. Tile will be installed with 3/16-inch joints and grouted with Power Grout (Floridatile), epoxy grout, or Architect approved equal.
- Epoxy (Locker rooms): Abrasion-, impact-, and chemical-resistant, industrial-aggregate-filled resinous-based, monolithic flooring system.
- Wallbase:
 - 4-inch rubber cove base at VCT and unfinished concrete.
 - 4-inch rubber straight base at carpet.
 - 4-inch ceramic cove base at ceramic tile.
 - 4-inch epoxy base at epoxy.

INTERIOR & EXTERIOR CEILINGS

All exterior ceilings and soffit will be 0.032-inch roll formed aluminum soffit panels similar to UNA-CLAD UC-750 as manufactured by Firestone. Panels will have a 2-coat fluorocarbon resin finish.

Interior ceilings will be a combination of the following:

- Gypsum Ceiling: ½-inch gypsum board suspended on a manufactured drywall grid system and will receive a spray-textured finish with one (1) coat of flat interior latex acrylic paint over a primer.
- Acoustic Ceiling Tile: Type III, square lay-in mineral fiber acoustical ceiling tiles (24-inch x 24-inch). Tiles will be seated in a 15/16-inch suspension system.

TOILET & BATH ACCESSORIES

The following accessories are based on products offered by American Specialties, Inc. and are to have a No. 4 satin stainless steel finish. Restrooms and custodial spaces throughout the new facility will be typically equipped as follows:

- Restrooms:
 - One (1) 18-inch, one (1) 42-inch, and one (1) 36-inch stainless steel grab bar at each accessible toilet.
 - One (1) 24-inch by 36-inch channel frame mirror above each sink.
 - One (1) coat/robe hook for each toilet.
 - One (1) surface-mounted sanitary napkin disposal at each women's toilet.
 - One (1) semi-recessed paper towel dispenser/waste receptacle at each restroom.
 - One (1) liquid soap dispenser at each sink.
 - One (1) toilet tissue dispenser at each toilet.

- Custodial Spaces with a Sink:
 - One (1) 36-inch mop and broom holder.

CASEWORK

Casework will be premium grade, flush overlay style, and plastic laminate clad. All casework will be required to be AWI Certified.

VERTICAL CIRCULATION

Interior stairs will be constructed of concrete-filled metal pan treads with closed risers. Treads will be surfaced with raised-round slip-resistant vinyl tread/riser covers.

The stair system will utilize a 1 1/2-inch diameter steel pipe handrail and guardrail finished with two (2) coats of gloss interior latex acrylic paint over primer.

Elevators will be 2500 lb. capacity, holeless, beside-the-car, single-acting, dual cylinder type with a rated speed of 75 – 80 fpm. Cars will be equipped with

stainless steel doors, plastic-laminate-clad side and rear walls, a luminous ceiling, and floor finished with raised-round slip-resistant vinyl sheet covering.

SPECIALTIES

- Exterior Sun Control Devices:

Factory engineered and fabricated by Mapes or similar provider. Each unit will be constructed of 4-inch "Z" style blades and extruded perimeter components on three (3) sides. All components are to be fabricated from anodized, extruded aluminum.

- Exterior Canopies:

Factory engineered and fabricated from anodized, extruded aluminum. All canopies are to be similar to the Extruded Super Lumideck as manufactured by Mapes.

- Overhead Coiling Doors:

Constructed of 20 gage galvanized steel, insulated, 2-inch interlocking slats. All doors will be electronically controlled and equipped with locking hardware.

- Toilet Compartments:

Solid phenolic overhead braced type similar to the DuraLine Series as manufactured by Bobrick.

- Lockers:

Knocked-down athletic lockers constructed of 0.060-inch steel sheet with vented panel doors similar to the Vanguard Series as manufactured by Penco.

HEATING, VENTILATION, & AIR CONDITIONING (HVAC):

EQUIPMENT/SYSTEM DESCRIPTIONS

Heating and cooling will be provided primarily by two (2) 50-ton rooftop units, one for each floor. The rooftop units will use natural gas as a heat source and each rooftop will have an energy recovery wheel. The rooftop units will supply pretreated air to variable air volume boxes. The variable air volume boxes along the building perimeter will have electric resistance reheat. There will be approximately 25 variable air volume boxes on each floor. Ductless split systems will provide cooling to the server and elevator equipment rooms and will be controlled by a thermostat. The mechanical control system should be compatible to the Johnson Control – MetasysH.

EXHAUST FANS

Exhaust will be provided to the restrooms, janitor's closets, the first floor parking area, and other rooms as required according to ASHRAE-62.1 and IMC-2009 Table 403 and ducted to the outdoors.

DUCTWORK

Ductwork will be specified to be constructed and supported in accordance with the latest SMACNA standards. Ductwork will be constructed of galvanized sheet metal and will be sized based on a pressure drop of 0.08" to 0.10" per 100 feet.

AIR DISTRIBUTION

All air distribution devices will be specified to be constructed steel and to be factory painted white. Ceiling supply diffusers will be specified with louver face and directional throw patterns. Supply air devices will be specified with an opposed blade damper for balancing. Return and exhaust grilles will be specified with eggcrate design. Air distribution devices located in a sheetrock ceiling will be specified with a plaster frame for mounting. All air distribution devices will be selected to provide an NC level of 30 or less. Exterior louvers will be specified with drainable fixed blades, constructed of aluminum with color as directed by the Architect.

PIPING SYSTEMS

Refrigerant piping will be Type L ACR copper and will be sized by the equipment manufacturer based on system capacity, pipe length, fittings and accessories. Pipe exposed in mechanical rooms and at exterior will be straight tubing routed parallel and perpendicular to building construction. Concealed pipe will be coil type to minimize fittings. The condensate drain piping system will be specified as type "M" copper with soldered fittings. Hangers will be clevis type or trapeze constructed of unistrut. Gas piping will be A53 black steel.

INSULATION

Refrigerant piping will be insulated with 1" closed cell insulation. Condensate piping will be insulated with 1" closed cell insulation. Rectangular supply and return ductwork will be specified as 2" rigid fiberglass board with vapor barrier foil facing where exposed in mechanical rooms. Rectangular supply and return ductwork will be specified with 2" fiberglass wrap with vapor barrier foil facing where concealed in ceiling plenums. Round supply and return ductwork will be specified with 2" fiberglass wrap with vapor barrier foil facing. Flex duct will be specified for runouts to air distribution devices and will have a maximum length of five (5) feet.

TEST AND BALANCE

All HVAC systems will be tested and balanced in accordance with NABB or AABC. The T&B contractor shall be a subcontractor of the mechanical contractor and shall be certified with 10-years of experience. All air devices will be specified to balance within 10 percent of the indicated cfm. Fans and the rooftop unit supply, return and outside air will be specified to balance within 10 percent of the indicated cfm.

SYSTEM AND EQUIPMENT IDENTIFICATION

Refrigerant piping systems will be labeled at 10 ft intervals with tags as manufactured by Seton. In addition to tags arrows-on-a-roll to indicate flow direction shall be installed at each end of tags, the full circumference of the pipe with overlap. All equipment will be identified as labeled on the plans with green bake-lite tags with white appearing letters. Tags will be secured with a minimum of two screws.

CONTROL SYSTEM

A complete controls package will be specified and shall consist of a computer system to give the current status of each rooftop unit and each VAV box. The controls shall also be capable of night setback where applicable, reducing HVAC equipment operation during unoccupied hours.

LEED AND COMMISSIONING

The HVAC systems will meet the requirements of ASHRAE 62.1 and ASHRAE 90.1 for LEED certification as well as the International Mechanical Code.

PLUMBING:

WASTE PIPING:

The plumbing for this project will be similar to a typical office building. The upstairs bathrooms and fixtures will be routed from the second floor down to the first floor through thickened walls or chases. This waste will then be collected with the first floor waste lines and routed out of the building until it can be connected to the main sewer system outside of the building. The layout of this building will require that the waste exit the building in two different area.

DOMESTIC WATER SERVICE:

The domestic water service for this building will come in at two locations. The first will be a small service that will serve the vehicle maintenance area and the second will be the main water service for the offices. Each of these water services will be installed with a backflow preventer and a pressure reducer. The preliminary design will have approximately three (3) high efficiency water heaters.

LEED REQUIREMENTS:

The intent of project is to provide fixtures that will reduce the domestic water consumption by 20 percent to 30 percent from a typical building of the same size. To achieve this reduction we will be installing low flush toilets that will require 1.28 gallons per flush compared to the typical 1.6 gallons per flush. The urinals for the men's restrooms will have a flush valve that will require 0.125 gallons per flush compared to the typical 1 gallon per flush. All lavatories will be

installed with sensor operated faucets and a 0.5 gallon per minute flow rate. The showers will also be installed with low flow shower heads.

ROOF DRAINAGE:

The proposed roof will require a primary and secondary roof drain system. The primary roof drain system will collect all the storm water in to network of pipes and routed down to the first floor. The storm water will then be routed outside of the building until it can be connected to the storm water piping network. A secondary roof drain system will be required unless overflow scuppers are provided.

FIRE PROTECTION:

This building will be built with a sprinkler system. There will be a wet pipe system for all of the office areas and a dry pipe system for the parking garage. This wet pipe system will have a main riser pipe that will be located within a sprinkler room within the building. The dry pipe system will have a separate riser pipe and a compressor for pressurizing the pipe.

ELECTRICAL:

The electrical design and installation will be in accordance with NFPA 70, 2008 edition. The fire alarm design and installation will be in accordance with NFPA 72, 2009 edition. For user safety or in wet or damp locations ground-fault receptacles will be provided. The building will be electrically designed for a "essential facility" requiring seismic bracing for all electrical systems.

POWER SYSTEM

The estimated service size at 277/480V, 3-phase is 800Amps.

The main electrical room on the first level will house the service entrance switchboard with surge protective device and distribution panels. Additional panels would be located in remote electrical closets on the second floor. Dry-type, transformers will be located in the electrical rooms to provide 120/208Volts 3-phase power. The IT/Server room would have a dedicated panel with surge protections and UPS backup.

A separate 2-hour, fire-rated electrical room located adjacent to the main electrical room will house the emergency power system which will serve the legally required loads, stand-by loads and owner's optional stand-by loads. An Emergency Operations Center (EOC) will be served from the emergency and stand-by systems.

An estimated 500KW emergency generator with a weather-proof enclosure and critical-grade muffler will be pad-mounted behind the building within the protected perimeter to power the entire building. A sub-base fuel tank would provide 72 hours of backup power. An exerciser would regularly run the building generator under load each week. All of the existing building electrical system is currently on the emergency generator, this should follow with any new facility.

The emergency loads (NEC Article 700) are emergency egress lighting, the fire alarm system and EOC lighting, receptacles, and associated equipment. Stand-by loads (NEC Article 701) will consist of power to the accessible means of egress elevator and associated machine room ventilation. An Optional Stand-by load (NEC Article 702) will be provided for the Owner for miscellaneous building equipment including information technology systems and the remainder of the building loads.

INTERIOR LIGHTING SYSTEM

Interior lighting will consist of recessed linear energy efficient fluorescent fixtures. Glare control lenses will be provided in areas where computers are in use. Main entrance lights and general public will be more decorative in nature with can lights and pendants. All switches will be specification grade-rated 20 Amps, 120/277 Volts. Automatic occupancy sensors will be utilized in areas not deemed to create a security issue.

Lighting controllability will be provided for a minimum of 90 percent of building occupants in compliance with LEED requirements. Conference rooms and the dispatch room will have multiple lighting level options for compliance with LEED requirements

Watts per square foot will be in accordance with ASHRAE 90.1 and 2009 energy codes.

With the complete building being on the emergency generator, all lights will be operable under loss of power for emergency egress.

EXTERIOR LIGHTING SYSTEM

Site lighting for parking lot and sidewalks will be post top full cut-off LED fixtures and be supplemented with building mounted LED lights to provide perimeter security lighting.

Garage lighting will consist of surface-mounted LED, surface-mounted garage fixtures. On the top level similar post top LED fixtures used on grade will be used.

All site lighting will be controlled through a lighting contactor with manual-off-automatic control. Automatic control will be provided by time clock and photocell.

TELEPHONE/DATA/RADIO SYSTEM

A dedicated IT room will be provided on the first floor to house services for both telephone and data equipment including service surge protection. The room will also house CCTV equipment racks, security panels, and fire alarm panel. The room will have a dedicated AC unit with a redundant backup system for reliability. A UPS system and panel will be provided in this room to power local equipment and the dispatch center.

A dedicated Radio Room will be provided on the first level to house primary radio equipment racks. The room will have a dedicated AC unit with a redundant backup system for reliability.

A secondary radio room will be provided on the roof for secondary radio equipment racks and connections for antennas. The room will have a dedicated AC unit with a redundant backup system for reliability.

Both wired telephone/data and wireless connections will be provided throughout the building.

A dedicated closet will be provided for the detective's area server with no outside connections. Server will provide both camera recording and voice recordings from the interview room.

FIRE ALARM

An addressable fire alarm system will be provided throughout the building with an annunciator panel located at the main lobby entrance. A digital alarm transmitter shall provide alarm, supervisory or trouble signal to local fire department. Horns and visual strobes will be provided to notify occupants. Manual pull stations will be located at all exterior doors and additional spaces within the building as required by code. The fire protection/alarm system should be compatible to SimplexGrinnell.

CCTV SYSTEM

A complete building CCTV system will be provided with monitoring within the dispatch room and head-end equipment located in the IT room. Cameras will be located on the exterior of the building and parking areas providing surveillance of the site and the building entrances. Indoor cameras will monitor corridors, building entrances, public areas, interview rooms and other areas requiring security surveillance.

SECURITY SYSTEMS

Card Readers with door security hardware will be provided on all exterior doors and multiple inside doors separating the police department from the general public areas. Head-end equipment is located in the IT room. Alarms will be monitored in the dispatch room.

VIDEO CONFERENCING

Video conferencing will be provided in the general public area Academy Room to allow linking to remote sites for video conferencing. Equipment associated with video conferencing will be located in a portable rack within the room. Lighting, cameras, speakers, and LCD monitors will be provided to support the video conferencing.

G. PRELIMINARY CODE ASSESSMENT

Applicable Codes and Standards:

- Virginia Uniform Statewide Building Code (VUSBC), 2009 Edition Effective March 1, 2011
- 2010 ADA Standards for Accessible Design
- ICC/ANSI A117.1-2003 Accessible and Usable Buildings and Facilities

Construction Classification:

- Construction Type: IIB
- Building is to be fully sprinklered per NFPA 13

Occupancy:

- Description: Mixed-Use; Separated
- Occupancy Classifications: B – Business, S-2 – Storage

Allowable Height & Area:

(Calculated Areas include sprinkler increase)

- Max Height: 4 Stories (75-feet)
- Max Area: 92,000 SF/Level (B), 104,000 SF/Level (S-2)

Area Summary:

Level 1 – Police Department	18,400	SF
Level 2 – Police Department	15,800	SF
Subtotal – Police Department	34,200	SF
Level 1 – Parking Structure	14,400	SF
Level 2 – Parking Structure	15,150	SF
Level 3 – Parking Structure	16,000	SF
Subtotal – Parking Structure	45,550	SF
Police Department	34,200	SF
Parking Structure	45,550	SF
Total Area	79,750	SF

Maximum Travel Distances:

- Max Common Path of Travel: 100-feet
- Max Exit Access Travel Distance: 300-feet (B), 400-feet (S-2)
- Max Dead Ends: 50-feet

Fire-Resistance Rating Requirements for Building Elements:

- Primary Structural Frame: 0 HR
- Bearing Walls – Exterior: 0 HR
- Bearing Walls – Interior: 0 HR
- Nonbearing Walls & Partitions – Exterior: 0 HR
- Nonbearing Walls & Partition – Interior: 0 HR
- Floor Construction & Secondary Members: 0 HR
- Roof Construction & Secondary Members: 0 HR
- Business – Storage Fire Barrier Separation: 1 HR
- Corridors: 0 HR

H. COST ESTIMATES

Blacksburg Police Department New Construction Preliminary Order of Magnitude Project Cost Estimate

Hard Costs:

	Building	\$6,327,000	34,200 sf @	\$185 /sf
	Parking Structure	\$1,820,000	45,500 sf @	\$40 /sf
	Site Development	\$891,750	lump sum	
	Building Demolition	\$60,000	12,000 sf @	\$5 /sf
^4	Temporary Upfit	\$1,020,000	12,000 sf @	\$85 /sf
^1	FF&E	\$268,800	33,600 sf @	\$8 /sf
^2	A/V	\$25,000	lump sum	
	subtotal	\$10,412,550		
	Design Contingency	\$520,628	5%	
	subtotal	<u>\$10,933,178</u>		

Soft Costs:

	Property Purchase	\$300,000	lump sum	
	Moving Expense	\$25,000	lump sum	
	Temporary Facility Lease	\$288,000	18 months @ \$16,000 /month	
^3	Related Fees	\$1,093,318	10%	
	subtotal	<u>\$1,706,318</u>		

Project Subtotal Cost (Hard + Soft)	\$12,639,495	
Construction Contingency	<u>\$631,975</u>	5%

Total Estimated Project Cost \$13,271,470

- ^1 Loose Fixtures, Furniture, & Equipment
- ^2 Audio Visual display and presentation equipment for assembly spaces
- ^3 Estimate for A/E, construction testing & inspections, permits, etc.
- ^4 Upfit includes stud wall partitions, interior doors, door hardware, ceilings, and MEP upfit. Cheaper alternatives are possible at the Owner's discretion of needed amenities.
- ^5 Assumed industrial size building shell.

Above figures do not include specialty computer or phone equipment for communications.

Blacksburg Police Department
 New Construction + Existing Building Reuse
Preliminary Order of Magnitude Project Cost Estimate

Hard Costs:

Building (New Construction)	\$4,107,000	22,200 sf @	\$185 /sf
Building (Renovation)	\$1,620,000	12,000 sf @	\$135 /sf
Parking Structure	\$1,820,000	45,500 sf @	\$40 /sf
Site Development	\$891,750	lump sum	
^6 Temporary Upfit	\$1,020,000	12,000 sf @	\$85 /sf
^1 FF&E	\$268,800	33,600 sf @	\$8 /sf
^2 A/V	\$25,000	lump sum	
subtotal	\$9,752,550		
^4 Reuse Factor	\$405,000	25%	
Design Contingency	\$487,628	5%	
subtotal	\$10,645,178		

Soft Costs:

Property Purchase	\$300,000	lump sum	
Moving Expense	\$25,000	lump sum	
^7 Temporary Facility Lease	\$384,000	24 months @	\$16,000 /month
^3 ^5 Related Fees	\$1,277,421	12%	
subtotal	\$1,986,421		

Project Subtotal Cost (Hard + Soft)	\$12,631,599	
Construction Contingency	\$631,580	5%

Total Estimated Project Cost \$13,263,179

- ^1 Loose Fixtures, Furniture, & Equipment
- ^2 Audio Visual display and presentation equipment for assembly spaces
- ^3 Estimate for A/E, construction testing & inspections, permits, etc.
- ^4 Includes selective demolition, support shoring, unknown conditions, increased construction time, phased labor, structural remediation to add additional level, and structural upgrades to meet VUSBC Essential Facility requirements
- ^5 Includes additional site visits and coordination time during CA Phase
- ^6 Upfit includes stud wall partitions, interior doors, door hardware, ceilings, and MEP upfit. Cheaper alternatives are possible at the Owner's discretion of needed amenities.
- ^7 Assumed industrial size building shell.

Above figures do not include specialty computer or phone equipment for communications.

I. DRAWINGS

- PR0 – Site – Aerial View
- PR1 – Aerial View with Floor Plan Overlay
- PR2 – Overall First Floor Plan
- PR3 – Conceptual Floor Plan – Level 1
- PR4 – Overall Second Floor Plan
- PR5 – Conceptual Floor Plan – Level 2
- PR6 – Conceptual Plan – Level 3 Parking & Roof Plan
- PR7 – Conceptual Building Elevations
- PR8 – Conceptual Perspective Views
- PR9 – Conceptual Perspective Views

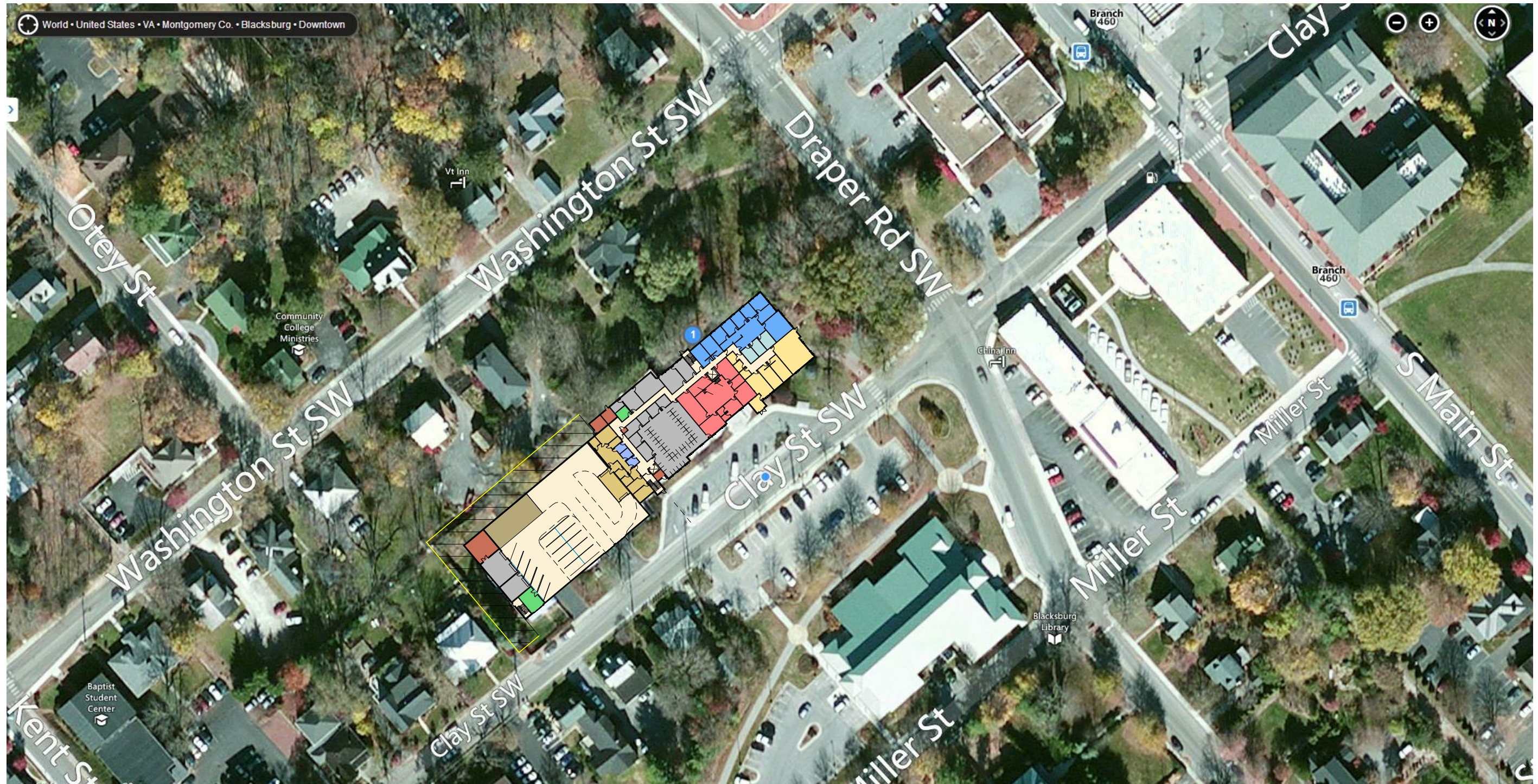


SITE – AERIAL VIEW

BLACKSBURG POLICE DEPARTMENT

Blacksburg, Virginia





AERIAL VIEW WITH FLOOR PLAN OVERLAY

BLACKSBURG POLICE DEPARTMENT

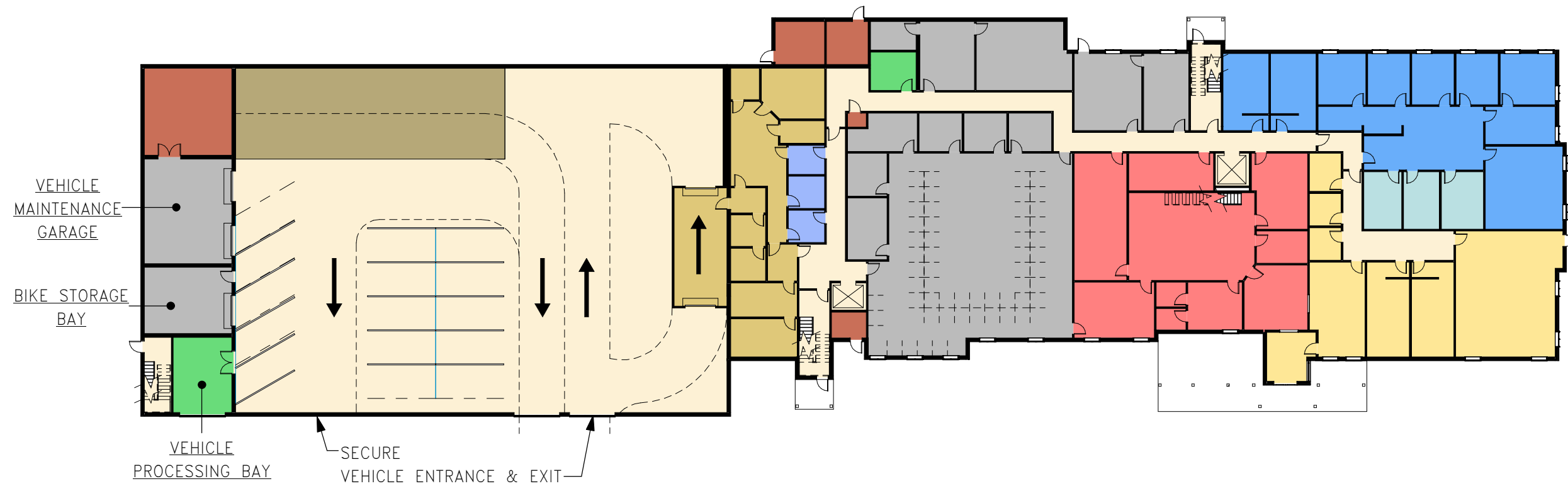
Blacksburg, Virginia

Blacksburg TOWN OF
a special place



Program

- ADMINISTRATIVE
- COMM. OUTREACH
- PATROL
- BOOKING
- CRIMINAL INV.
- PUBLIC
- BUILDING SUPPORT
- EVIDENCE
- FUSION
- CIRCULATION



OVERALL FIRST FLOOR PLAN

1/32" = 1'-0"

BLACKSBURG POLICE DEPARTMENT

Blacksburg, Virginia

Blacksburg TOWN OF
a special place



PR2



CONCEPTUAL FLOOR PLAN – LEVEL 1

1/16" = 1'-0"

0 8' 16' 32'



SCALE: 1/16" = 1'-0"

BLACKSBURG POLICE DEPARTMENT

Blacksburg, Virginia

Blacksburg TOWN OF
a special place



THOMPSON & LITTON

PR3

Program

- BUILDING SUPPORT
- CIRCULATION
- CRASH TEAM
- CRIMINAL INV.
- ERT
- EVIDENCE
- SHARED



OVERALL SECOND FLOOR PLAN

1/32" = 1'-0"

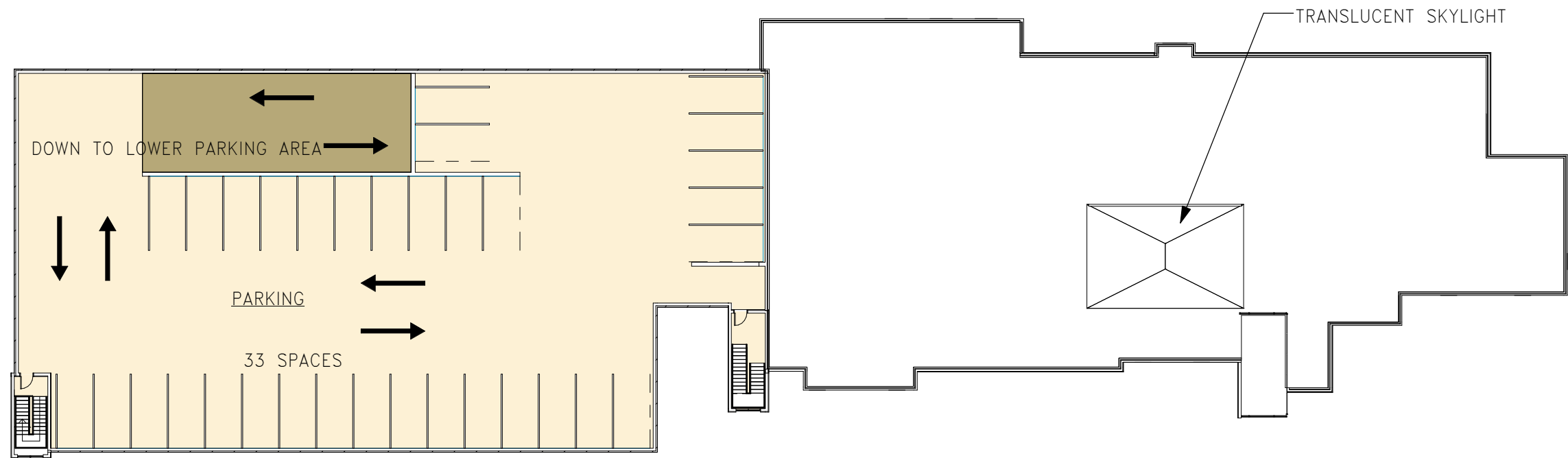
BLACKSBURG POLICE DEPARTMENT

Blacksburg, Virginia

TOWN OF
Blacksburg
a special place



PR4



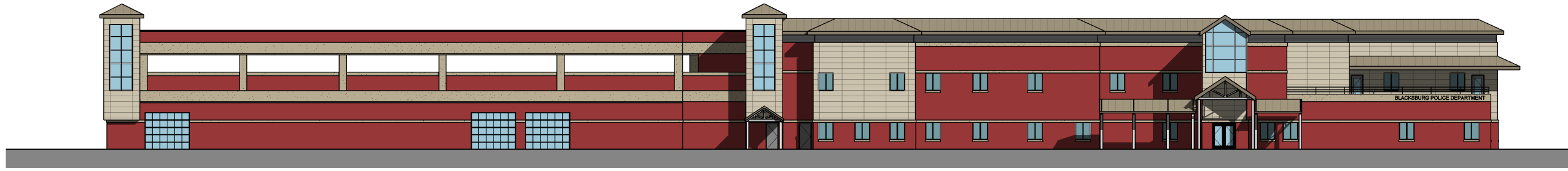
CONCEPTUAL PLAN – LEVEL 3 PARKING & ROOF PLAN

1/32" = 1'-0"

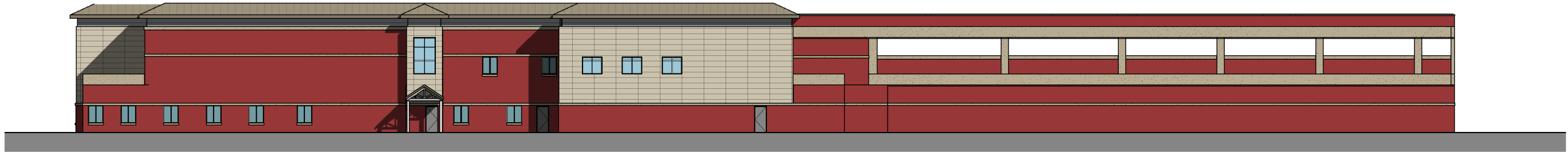
BLACKSBURG POLICE DEPARTMENT

Blacksburg, Virginia





OVERALL FRONT ELEVATION



OVERALL REAR ELEVATION



ENLARGED FRONT ELEVATION

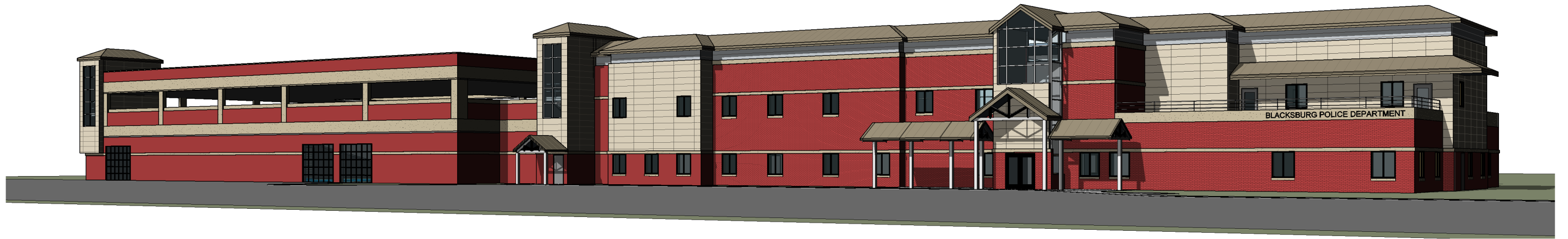
BLACKSBURG POLICE DEPARTMENT

Blacksburg, Virginia

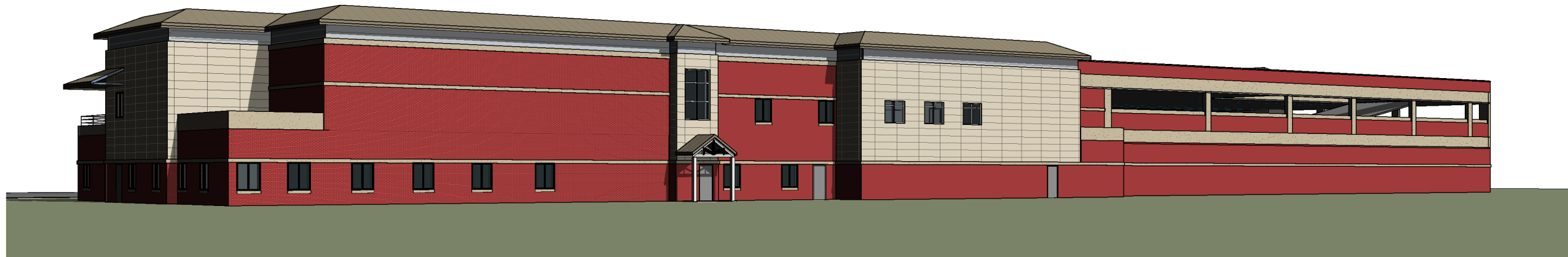
Blacksburg TOWN OF
a special place



PR7



BUILDING PERSPECTIVE



BUILDING PERSPECTIVE

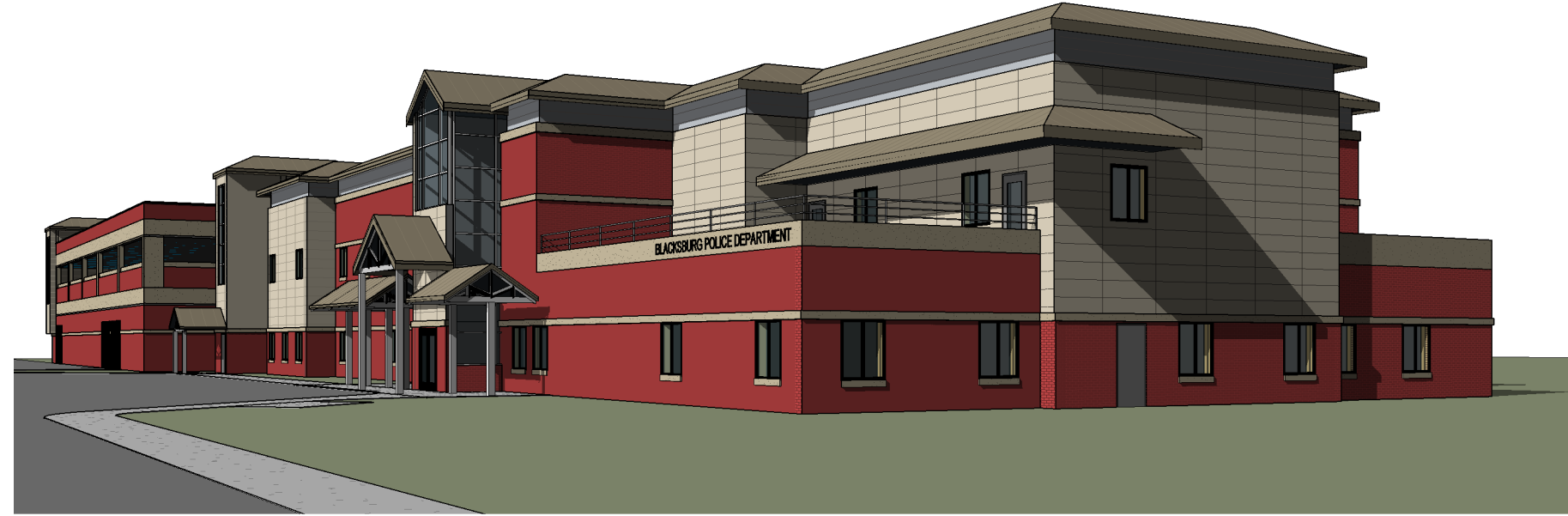
BLACKSBURG POLICE DEPARTMENT

Blacksburg, Virginia

Blacksburg TOWN OF
a special place



PR8



BUILDING PERSPECTIVE



BUILDING PERSPECTIVE

BLACKSBURG POLICE DEPARTMENT

Blacksburg, Virginia



J. CONSTRUCTION CHALLENGES

- The feasibility of the project hinges on the ability to purchase the adjacent property. There isn't enough area to accommodate the size of facility needed without the additional acreage.
- Unknown soil and rock conditions are always a possible issue. Remediation of unsuitable soil conditions and/or rock removal would be a necessity as building relocation on the site is not an option given the site constraints.
- The building consumes a major portion of the total site area. This said, staging and storage areas for construction materials as well as parking for construction workers during construction will be a challenge.
- Site constraints may force the temporary closing of certain roads during particular construction phases to permit utility tie-in and/or crane access to all portions of the structure.
- Site constraints will force scaffolding, construction work and general foot traffic to be in close proximity to adjacent homes. Consideration and extra care will have to be taken to ensure neighbor safety and approval for the duration of construction.
- The projects proximity to a residential area may limit acceptable work hours to control noise and disturbances during the evening hours.

K. CONCLUSIONS & RECOMMENDATIONS

The Blacksburg Police Department provides many services that the community depends upon. The existing facility has been maximized and still falls short of meeting the Department's current and projected needs. Therefore, it is recommended that a new police department structure as indicated within this report be constructed to provide the resources necessary to continue to serve the people of Blacksburg.

APPENDICES

-Appendix A – LEED for New Construction v2009 Credit Checklist

LEED for New Construction v2009 Credit Checklist

Appendix A



LEED for New Construction v2009

Registered Project Checklist

BLACKSBURG POLICE DEPARTMENT

T&L PROJECT NO.: 12402

6 8 12 Sustainable Sites Possible Points: 26

Y	N	?	Prereq	Description	Points
Y			1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
	5		Credit 2	Development Density and Community Connectivity	5
	1		Credit 3	Brownfield Redevelopment	1
		6	Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
		2	Credit 4.4	Alternative Transportation—Parking Capacity	2
	1		Credit 5.1	Site Development—Protect or Restore Habitat	1
	1		Credit 5.2	Site Development—Maximize Open Space	1
		1	Credit 6.1	Stormwater Design—Quantity Control	1
		1	Credit 6.2	Stormwater Design—Quality Control	1
		1	Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
	1		Credit 8	Light Pollution Reduction	1

6 1 3 Water Efficiency Possible Points: 10

Y	N	?	Prereq	Description	Points
4			1	Water Use Reduction—20% Reduction	
		2	Credit 1	Water Efficient Landscaping	2 to 4
	2		Credit 2	Innovative Wastewater Technologies	2
2	1	1	Credit 3	Water Use Reduction	2 to 4

7 22 6 Energy and Atmosphere Possible Points: 35

Y	N	?	Prereq	Description	Points
Y			1	Fundamental Commissioning of Building Energy Systems	
Y			2	Minimum Energy Performance	
Y			3	Fundamental Refrigerant Management	
3	15	1	Credit 1	Optimize Energy Performance	1 to 19
	7		Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
		2	Credit 4	Enhanced Refrigerant Management	2
		3	Credit 5	Measurement and Verification	3
2			Credit 6	Green Power	2

7 7 Materials and Resources Possible Points: 14

Y	N	?	Prereq	Description	Points
	3		1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
	1		1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			2	Construction Waste Management	1 to 2
	2		3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	N	?	Credit	Description	Points
2			4	Recycled Content	1 to 2
2			5	Regional Materials	1 to 2
	1		6	Rapidly Renewable Materials	1
1			7	Certified Wood	1

11 1 3 Indoor Environmental Quality Possible Points: 15

Y	N	?	Prereq	Description	Points
Y			1	Minimum Indoor Air Quality Performance	
Y			2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
	1		Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
1			Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
		1	Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
1			Credit 7.2	Thermal Comfort—Verification	1
		1	Credit 8.1	Daylight and Views—Daylight	1
		1	Credit 8.2	Daylight and Views—Views	1

1 5 Innovation and Design Process Possible Points: 6

Y	N	?	Credit	Description	Points
		1	1.1	Innovation in Design: Educational Outreach	1
		1	1.2	Innovation in Design: Green Housekeeping	1
		1	1.3	Innovation in Design: Use of Energy Star Appliances	1
		1	1.4	Innovation in Design: Biodiesel Generator	1
		1	1.5	Innovation in Design: Specific Title	1
1			2	LEED Accredited Professional	1

4 Regional Priority Credits Possible Points: 4

Y	N	?	Credit	Description	Points
	1		1.1	Regional Priority: Specific Credit	1
	1		1.2	Regional Priority: Specific Credit	1
	1		1.3	Regional Priority: Specific Credit	1
	1		1.4	Regional Priority: Specific Credit	1

38 43 29 Total Possible Points: 110

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