Feasibility Study

BURLINGTON POLICE STATION

Burlington, MA

April 2, 2024

Kaestle Boos Associates, Inc.

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- EXECUTIVE SUMMARY -

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EXECUTIVE SUMMARY

In the Spring of 2023, the Town of Burlington, Massachusetts retained the design team led by Kaestle Boos Associates (KBA) of Foxborough, MA, to provide consulting and design services to evaluate the Burlington Police Departments existing facility and its capacity to meet the current and future needs of the department. Part of the evaluation of the facilities is to determine the feasibility of adding/renovating it or construction of all-new facility on or near the existing site to service the Town's Police departments needs for the next 40 years.

The design services included evaluating the functionality of the current facilities spaces, developing a space needs assessment, and developing preliminary design program for the facility. At the same time the Mechanical, Electrical, Plumbing & Fire Protection Engineers (M.E.P.) examined the local utilities and building conditions to propose alternative M.E.P. systems. The proposed design options, site development plans and mechanical, plumbing, and electrical systems are described further within the study.

The proposed facility design will meet all current Massachusetts State Building, Energy, Fire and Energy Codes & Massachusetts Architectural Access Board (MAAB) requirements. In addition, operational recommendations from National Fire Protection Association (NFPA) 1221 - Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems, will be incorporated into the recommended designs.

Within the existing police facility many of the operations and workspaces are extremely cramped by insufficient space. The original structure (Union School) is in excess of one hundred years old and has functionally outlived its useful service life for police operations.

Below are examples of non-compliant code or safety standards, conditions observed at the existing facilities. A complete list is included in the study report. These conditions expose the Police Department staff to safety hazards and the Town to liability.

1. Building Code:
   a. Structurally the facility does not meet current seismic (earthquake), lateral (wind) or gravity loading design and would likely suffer major damage in a seismic, high wind or heavy snow event, a situation in which demand for emergency response would peak.
   b. The building envelope does not meet the newly adopted Energy Stretch Code, which now includes additions/renovations to existing building.
   c. Only one means of egress (stair) from the second floor exists, while two are required by code to ensure safe exist route in case of fire.
   d. Existing stairs are not wide enough, rails are too short and lack balusters, risers are too tall, treads are too short and the stair is not enclosed in a fire rated enclosure.

2. Plumbing Code:
   a. Fixtures do not meet water conservation requirements
   b. Fixtures are not handicapped accessible (some locations).

3. HVAC Code:
   a. Air handling equipment has outlived its service life and must be replaced.
   b. Non-compliant amount of fresh air changes (insufficient ventilation per Code).

4. Electrical Code:
   a. Most systems (lighting, power, emergency lighting, and fire alarm) no longer meet code requirements or safety standards.
   b. Emergency generator is not code compliant and does not have sufficient capacity to support all building systems and must be replaced.

5. ADA/MAAB (handicapped accessibility)
   a. No elevator to upper or lower levels
   b. Stairs are not handicapped accessible and do not provide areas of refuge
   c. No public toilets. Public is forced to use existing staff toilet/shower/locker facilities which are not handicapped accessible (turning radius', reach limits, thresholds….)

All of these issues, and others identified in the 'Code Review' & "Existing Conditions Survey' sections of the study will need to be addressed in any addition/renovation or new construction recommendation.

Based on the Space Needs Assessment, with subsequent meetings with department staff, conceptual design solutions for the new facility were developed. To minimize the building's footprint a two-story plan with a basement was developed. Adjacencies established in the Space Needs Assessment served as the basis of each floors organization, with the basement housing training functions (firing range, fitness, simulator, archives and mechanical spaces) with the main level largely being utilized be patrol functions (detention and sallyport, male and female locker rooms, training room, and patrol office) leaving the upper level to administrative functions (command staff, detectives and dispatch uses).

This plan was used to complete a detailed site analysis on three Town owned sites recommend by the Town. Site 1 (Vinebrook) was determined not to be viable as nearly all of the site was either wetlands or in the FEMA Flood Zone; Site 2 (Land on access road to the High School) was also determined not to be viable due to only allowing a single site access requiring construction within the wetlands and additional land acquisition from Mount Hope Christian Center for secondary access and no street visibility; Site 3 (Existing Police site) was determined to be a viable site once the existing building is demolished, as it provides multiple points of access, has no wetlands, has current public visibility, minimal impact on current traffic flow and is relatively level. Information on the Preferred Design Option, including site layout, building layout, and a conceptual rendering, can be found in Section 6 of this report.

After analyzing the pro's and con's for each of the proposed sites, it was determined that Site 3 (existing Police site) is the only option. This report will make clear that the site is sufficiently sized to accommodate a new police station building of this size. However, given the building square footage and parking requirements, it was important to be efficient with the building footprint as it relates to the overall site plan.

After multiple design reviews/revisions with the police administration the Preferred Design Option was submitted to Miyakoda Consulting to develop a Construction Cost Estimate. The estimate served as the basis for developing an Opinion of Total Project Cost of forth six million, two hundred twenty two thousand and eight dollars ($46,222,800). Documentation for the estimate is presented in Section 6 of this report.

- CODE ANALYSIS -

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CODE ANALYSIS

APPLICABILITY

This analysis reviews the existing Burlington Police Department Headquarters Facility in Burlington, MA, with regard to the Massachusetts State Building Codes ("Code") for new construction. The 9th Edition of the Massachusetts State Building Code consists, in part, of the 2015 International Building Code (IBC) and the 2015 International Existing Building Code (IEBC) with Massachusetts Amendments to these codes.
Codes used in this analysis are:

International Building Code (IBC, 2015)
International Existing Building Code (IEBC, 2015)
International Energy Conservation Code (IECC, 2018)
Massachusetts State Building Code Amendments (780 CMR 9th Edition)
Architectural Access Board Rules and Regulations (AAB, 521 CMR, 2006)
International Plumbing Code (IPC 2015)

Code compliance with regard to mechanical systems, including electrical, plumbing, fire protection systems and site work are reviewed in separate sections of this study.

Upgrades and corrections to existing structures undergoing renovations are limited to specific items under the IEBC. During renovations, not all existing safety issues and non-compliant conditions are required to be corrected; typically only items within each renovated area are required to be corrected. However, non-compliant conditions at stairs and egress elements, fire rating separations, accessibility, and fire protection (sprinklers) are required to be corrected or provided as new as required by the IBC. Because the original building was constructed almost one hundred and thirty years ago, existing conditions which may be allowed to remain under the requirements of the IEBC may also be in conflict with current life safety codes and standards. Over time, since the original construction of these buildings, life safety standards have been improved in reaction to tragic events. *In order to evaluate life safety conditions in accordance with the most current intent of these codes, the current IBC and Fire Safety codes and regulations are used as a basis for judging compliance.*

Correcting existing conditions to comply with current Accessibility and Fire Protection requirements is required when the value of the work exceeds the cost or scope triggers stated in the AAB and the Fire Code.

Compliance with Massachusetts General Law M.G.L. Chapter 148 Section 26G is required in all existing buildings in which renovations will exceed 7,500 square feet in area *or* in which major alterations' are planned, as defined by the statute. Under these conditions, an existing building **must provide a full sprinkler fire suppression system if sufficient water flow and pressure is available.** A major alteration is defined as a reconfiguration of walls, doors, windows, mechanical systems, etc., which effectively makes installation of sprinkler systems easier and which affects more than 33% of the building area ***or*** more than 33% of the assessed value of the building. Buildings for which sufficient water flow and pressure *does not exist* are exempt, however, it is assumed that sufficient flow and pressure is available and all code discussions below are based on this building being fully sprinklered.

Also, according to this section of **M.G.L.**, any work performed, even if under separate contracts or building permits, within a 5 year period must be included in the aggregate construction cost to determine applicability of M.G.L. This includes site work and building renovations, whether done separately or together.

- Future Change Orders and other unanticipated costs could also trigger full compliance if the aggregate value exceeds the 33% limit.
- Cost of future building projects requested for permit within 5 years, before or after the permit date for this project, will be considered part of the project costs and may trigger compliance.

Accessibility in public buildings is regulated by 521 CMR, which is enforced by the Massachusetts Architectural Access Board (MA AAB) and the Building Inspector of the municipality. 521 CMR, as issued in 2006, is used for this review.

MA AAB 5.1 Definitions states:

"Public Buildings: A building privately or publicly financed that is open to and used by the public",

MA AAB 11.1 Commercial Buildings states:

"The design of commercial *buildings* shall comply with 521 CMR, except as specified or modified in 521 CMR 11.00. Commercial *buildings* are *public buildings* … as well as city and town … *facilities*."

The Police Facility is considered a public and commercial building and so is required to be accessible in accordance with 521 CMR.

Currently, the AAB regulates only areas and conditions accessed by the "public"; areas occupied solely by staff are not included in the regulation. Staff areas are included in the ADA Accessibility Guidelines as part of federal law, but these are not directly enforceable as part of the Building Code. However, in an effort to unify compliance requirements with the recently adopted IBC as the State Building Code, the AAB will be revising the regulation to include staff areas as well as public areas. In anticipation of the release of the revised AAB regulations, all discussions below regarding accessibility will include compliance of staff areas.

Applicability of the AAB Regulations for renovations of existing buildings is based on the value of the renovations as a percentage of the current assessed value of the building (100% valuation). According to AAB 3.3, partial compliance is required when the value of the renovations exceeds $100,000 and full compliance of the entire facility is required when the value of the renovations exceeds 30% of the assessed value of the building. An exception to this rule is for maintenance work on MEP systems, sprinkler systems, roofs, replacement windows, masonry repair, site utilities, landscaping, and septic system which in aggregate is less than $500,000.

As stated in AAB 3.3 (paraphrased):

"3.3 EXISTING BUILDINGS

All additions to, reconstruction, remodeling, and alterations or repairs of existing public buildings or facilities …shall be governed by all applicable subsections in 521 CMR.

3.3.1…,

a. if the work costs less than $100,000, then only the work being performed is required to comply with 521 CMR…,

b. if the work costs $100,000 or more, then the work being performed is required to comply with 521 CMR. In addition, an accessible public entrance and an accessible toilet room, telephone, drinking fountain (if toilets, telephones and drinking fountains are provided) shall also be provided in compliance with 521 CMR…,

3.3.2 If the work performed, including the exempted work, amounts to 30% or more of the full and fair cash value (see 521 CMR 5.00) of the building the entire building is required to comply with 521 CMR. "

Also, according to AAB 3.5, any work performed, even if under separate contracts or building permits, within a 3 year period must be included in the aggregate construction cost. This includes sitework and building renovations, whether done separately or together.

- Future Change Orders and other unanticipated costs could also trigger full compliance if the aggregate value exceeds the 30% limit.
- Cost of future building projects requested for permit within 3 years of the permit date for this project will be considered part of the project costs and may trigger compliance.

The building and site must be reviewed together and may affect compliance in areas not anticipated to be updated to comply.

- If a building's renovation cost exceeds 30% of the building assessed value, then the *entire building and site* must be made to comply;

Energy conservation, as required by the IECC for new construction, is not required for renovations to existing structures under the IEBC. However, per the Massachusetts amendments to the IECC, any existing building elements or alterations to the exterior building envelope, such as new windows or new roofing, must comply to the greatest degree possible. As stated in the Massachusetts amendments to the IECC per AA104 "*For alterations, renovations, additions or repairs of existing buildings in these municipalities, the energy efficiency requirements of 789 CMR 13.00 or Chapter 11 of CMR 51.00 shall be used as applicable based on the use and occupancy of the building".* Overall upgrade of the exterior envelope of this building is required so is reviewed as part of this study.

GENERAL INFORMATION

According to the Town of Burlington Assessors Department, the Police Headquarters Building is located at 45 Center Street; construction of the facility completed in **1897** and was added onto in 1923 and most recently in 1991. The area of the building is listed on the Assessor's Card as 24,000 total gross square feet (GSF).

The current assessed value of the Police Headquarters building (structure only) is $**2,925,300.**

- The threshold value of the cost trigger for accessibility (full compliance) is 30% of this value less the cost of permitted work within the last 3 years.
- The threshold value of the cost trigger for fire protection is 33% of this value less the cost of permitted work within the last 5 years.

This cost threshold is shown below. The cause of the renovation or the source of the funding is not relevant, only the total value of cost for renovations, including demolition. Any work within these time limits which exceed these cost triggers will require that the entire structure and site be modified to be compliant. Because each threshold is based on the aggregate value of recent work (requiring a building permit) over the most recent 3 or 5 years, respectively, these threshold values are dynamic and will change based on the aggregate value of recent projects over time. The values below are only a guide and should be recalculated when a new renovation project is considered.

COST THRESHOLDS FOR ACCESSIBILITY AND FIRE SUPPRESSION COMPLIANCE	
Assessed Value (Structure Only)	$**2,925,300**
30% Cost Trigger for Accessibility Compliance	**$877,590**
33% Cost Trigger for Fire Protection	**$965,349**

AGGREGATE TOTAL VALUE OF RECENTLY COMPLETED WORK		
Date	Description	Approximate Value
	None	
3 year aggregate total value for accessibility compliance		**$ 0.00**
5 year aggregate total value for fire protection compliance		**$ 0.00**

ACCESSIBILITY UPGRADE REQUIREMENT	
30% of Assessed Building Value	**$877,590**
Less the Aggregate Cost of Projects Completed in the Past 3 Years	**$ 0.00**
Current Value for Renovation Work to the Cost Trigger for Full Accessibility Compliance	**$877,590**

Fire Protection Upgrade Requirement	
33% of Assessed Building Value	**$ 965,349**
Less the Aggregate Cost of Projects Completed in the Past 5 Years	**$ 0.00**
Current Value for Renovation Work to the Cost Trigger for Full Fire Protection Compliance	**$ 965,349**

There are two building permits on file with the Inspectional Services Department dated within the last three years.

BUILDING CODE COMPLIANCE ANALYSIS (IEBC / 780 CMR - IBC)

Although the Police Headquarters Building would be regulated under the IEBC for the purposes of a renovation of the existing building, this analysis reviews compliance with regard to requirements of the new IBC. This is to ensure that existing conditions which do not meet the current intent for life safety, and which may be allowed to remain as part of a renovation under the IEBC, are identified for correction. In the discussion below, references to specific code sections are noted before each paragraph with parentheses.

(IEBC 101.4.2) Applicability: Under this definition, as a building that has been previously occupied prior to the issuance of the Code, this building is considered an existing building and regulated under the IEBC.

(IEBC 301.1.1) IEBC offers three methods for compliance analysis and four levels of work classification. For the purposes of this study, the *Work Area Compliance* method will be used and future renovations will be considered as an *Alteration Level 3* work classification.

(IEBC 901.2) Compliance: All new elements must comply with IBC.

**The following discussions regarding Type of Construction, Use Group Classification, and Height and Area Limitations are provided to document the existing facility classification only. These characteristics are not regulated by the IEBC and existing buildings are not required to be modified to comply as a result of renovations. Additions to an existing building, however, must conform to current limitations of allowable height and area and are regulated by the IBC. Determination of the allowable height and area of the existing structure provides guidance for the extent of any new additions that may be planned.*

(IBC Ch. 3 – Use and Occupancy)

(IBC 303.4) Primary Use Group:	Group B - Business
(IBC 304.1) Mixed Use Areas:	Group A-3 Assembly (Training Room)
(IBC 311.2) Mixed Use Areas:	Group S-1 Storage (Sallyport)
(IBC 308.5.5) Mixed Use Areas:	Group I-3 Institutional Condition 5 (Detention area/cells)

(IBC Ch. 5 – General Building Limitations)

Height and area limitations for the existing building are presented below to show the allowable area for the uses within the building and possible expansion of the existing building. As stated above, the aggregate area of any new additions and renovations that exceed 7,500 square feet or that exceed 33% of the assessed value of the existing building will require sprinklers to be installed throughout the new and existing structure. The allowable floor area calculations below include increases permitted for fire protection sprinkler system, and the increase for existing building frontage accessible to emergency vehicles. This allowable increase in area for accessible frontage may be affected by additions to the building.

According to information from the Burlington Assessing Department, the current building area is listed at 19,862 gross square feet (occupied space) for all floors combined. Storage uses and Assembly uses are believed to occupy less than 10% of the gross area of the relative floor levels and so are considered to be accessory to the Business Use on each floor.

(Table 503) Based on the presumption that any renovation or new construction for this building will require the installation of a new sprinkler system, the allowable height may be increased by one story and the allowable area may be increased by 400%. Additionally, as the building perimeter is accessible for fire and rescue vehicles from the road or parking areas on all sides of the building, the maximum allowable area may be increased by an additional 50% for this accessible frontage.

- The accessible street frontage combined with the allowable area increase for a sprinkler system will allow a total increase in area of 450% in addition to the limitations stated in Table 503. This total allowable area is shown in the last column of the table below.
- The total area of the building cannot exceed the allowable area used for the primary Business ("B") Use Group. Other uses within the mixed use building cannot exceed an area proportional to the percentage of the area that Use Group occupies in the building. Because this ratio of allowable areas between uses may vary based of differing layouts, it is impossible to provide an allowable area for all uses in every possible combination. As such, the allowable area for Use Group B is calculated as a baseline and further calculation will be required to confirm if future renovations are within Code requirements.

(Table 504.4 & 506.2) The allowable height and area for each Use Group under Type V-B (5-B) Construction is:

USE GROUP	**Total Allowable Height (+1 Story Increase for Sprinkler System**	**Allowable Area per Story Plus Increase for Sprinkler System and Accessible Perimeter**			
		Allowable Area (Table 506.2)	**Sprinkler System Area Increase (+400%)**	**Accessible Perimeter +50%**	**Total Allowable Area per Floor with Allowable Increases**
B	3 Stories	9,000 sf.	+ 36,000 sf.	+ 4,500 sf.	49,500 sf.

(IBC 506.2.4 & 508.4) Buildings with multiple Use Groups are called mixed-use buildings. Buildings are further classified as a 'separated' mixed use or a 'non-separated' mixed use. If classified as a 'separated' mixed-use building, the different use groups within the building must be separated by fire rated construction as required in Table 508.4. If classified as a 'non-separated' mixed-use building, then fire rated separations are not required BUT the most restrictive use group is used to calculate the allowable height and area. This building is assumed, based on field observations, to be a non-separated mixed-use building. (IBC 508.2.4 and Table 508.4) In table 508.2.4, rooms used for storage and assembly may be considered to be accessory to the primary Use Group if the aggregate area of these rooms is less than 10% of each floor area and smaller than the area allowed by Table 503. Spaces considered to be accessory to the primary use are not required to be separated from the primary use by fire rated partitions. This report assumes that all Storage and Assembly uses are considered to be accessory and so not separated.

IBC Ch. 6 – Types of Construction

(IBC Table 601) No information is provided by the Burlington Assessing Department with regard to the type of construction of the building. As observed in the field, the building is constructed of wood framed bearing walls supporting the Main and Upper floors, Attic and gable roof structures. The Upper Level floor is wood framed with joists and interior bearing walls. The attic and roof are framed with wood trusses spanning the width of the building and supporting wood floor joists and roof purlins.

As the existing construction system is assumed to be wood framed construction with non-fire rated structural members, this generally conforms to the requirements for Type V-B (Roman numeral 5 - B, unprotected)

construction in the current IBC. The structure does not appear to be protected with spray fireproofing or other rated construction. Interior partitions are believed to be a combination of non-load bearing stud / drywall construction and load bearing masonry. The Use Group is assumed to be Business(B) with accessory or mixed use areas for Assembly and Storage.

Type V-B Construction Type Min. Fire Resistance Rating Requirements (780 CMR Table 601)

Building Elements	Required Fire Resistance Rating (Hrs)
Primary Structural Frame (including columns, girders, and trusses)	0
Exterior Bearing Walls	0
Interior Bearing Walls	0
Exterior Non-Bearing Walls and Partitions (See Table 602)	0
Interior Non-Bearing Walls and Partitions	0
Floor Construction (including support beams and joist)	0
Roof Construction (including support beams and joist)	0

Table 601 establishes the required minimum fire rating of construction elements and is related to the allowable height and area discussed in Table 503 below. Type V-B (5-B) construction allows the building structural members to be unprotected (not fire rated). The tradeoff for not protecting the building structure is a reduction in the allowable height and area that can be built; essentially, the greater the fire protection of building structural elements, the larger the building height and area which is allowed.

(IBC Chapter 10 - Means of Egress)

Occupancy load in the existing facility is determined by the functions in each area of the building and not the primary use group. According to the IBC Table 1004.1.2, Business functions require an occupant load calculated at 100 GSF per person, Locker rooms are calculated at 50 GSF per person, and Mechanical/Storage areas are calculated at 300 GSF per person, and Assembly spaces are calculated at 5, 7, or 15 GSF per person dependent upon whether the persons are standing, sitting, or at tables. As the functions and areas for each may change over time, areas with lesser occupancy rates may be renovated for a use with a higher occupancy rate. This summary will not break out each function separately; as a preliminary determination of occupancy, a rate of 100 GSF per person will be used as an overall general occupancy rate for this building as this will be the predominant occupancy for any renovation of the building:

- 19,862 GSF (All Floors) / 100 sf. per occupant = 199 occupants on all floors

The egress capacity (0.3”/per occupant for non-sprinklered buildings) for a minimum 44-inch wide stairway is approximately 146 occupants.

IEBC 101.2.2.1 is an amendment by the State of Massachusetts and supersedes other less restrictive paragraphs in the IEBC. This amendment requires that all existing stairs comply with current requirements of the IBC with regard

to the quantity of exit ways on each floor, the width of all exit ways, fire rating, handrails, continuity, etc., to "provide safe and adequate means of egress".

- The existing egress stair in the building is not enclosed in required fire rated construction, does not have risers and treads of required dimensions, does not have railings and guards on both sides of the stair, does not have railings and guards with required height and spacing, does not have required rail extensions, and does not have fire rated doors which comply. All stair conditions must be corrected in accordance with current egress requirements as part of any renovation project.

(IEBC 803.2.1 Existing Vertical Openings)
All existing vertical openings connecting 2 or more floors must have an enclosure with a fire-resistive rating of 1 hour minimum with approved opening protectives.

- The stair connecting the basement, main, upper and attic levels is a vertical opening. This opening is not separated from adjacent areas by fire rated construction. This stair cannot be used as an exit in its current configuration..

(IBC Table 1017.1 Exit Access Travel Distance)

- The greatest travel distance to an exit enclosure occurs on the 2nd floor and is approximately 100 feet. This is far less than the allowable travel distance of 300 feet.

(IBC 1014.3) In buildings of a Business Use with a sprinkler system, the allowable length of a common path of travel is 100 feet.

- All locations appear to be compliant.

(IBC 1020.4) In buildings of a Business Use with a sprinkler system, the allowable length of a dead end corridor is 50 feet.

(IBC 1007.1.1) When multiple exits are required, the exits must be separated by a minimum distance equal to 1/2 of the longest diagonal distance of the floor plate.

- There are two non-compliant Exits from the main floor and upper floors. As a result separation distance is not applicable.

(IBC 1006.3.1) All stories are required to provide a minimum of 2 means of egress. As this building is classified as a Business B Use Group, a minimum of 2 means of egress must be provided.

ACCESSIBILITY CODE COMPLIANCE ANALYSIS (521 CMR AAB)

AAB 11 – Commercial Buildings (Municipal Facilities)

(521 CMR 11.1)
Public Areas, Toilet rooms, transaction counters and other work areas are required to be accessible.

- Accessible transaction counters at First Floor Public Lobby is not provided.
- Accessible male and female toilet rooms are provided for public use in the First Floor Lobby.

AAB 14 – Places of Assembly

(AAB 14.2) Places of assembly are not provided in the existing building.

AAB 19 – Recreational Facilities
(AAB 19.4) Locker rooms are provided for male and female staff and officers. These lockers and associated toilet rooms are not required to be accessible.

AAB 20 - Accessible Routes
(AAB 20.1) Accessible routes within the building generally comply with requirements for width, passing space, protruding objects, headroom, etc.

- Access to all floors is not provided for public and administrative staff. A compliant elevator is required to provide access to all floor levels and activities.
- Many doorways reviewed do not provide required clearance for accessibility.

(AAB 20.6.1) Objects projecting from walls with their leading edges between 27 inches and 80 inches above the finished floor must not protrude more than 4 inches into walks, halls, corridors, passageways or aisle and must not have sharp edges.

- There does not appear to be any non-compliant conditions.

(AAB 20.12) Areas of rescue assistance at stairways and means of egress are not required in accordance with Exception b. buildings or facilities having a supervised automatic sprinkler systems.

AAB 24.00 - Ramps
There are no ramps required on the exterior of the building.

AAB 25.00 – Entrances
(AAB 25.1) All public entrances to the building must be accessible and be on an accessible route.

- Access to the building from the exterior is compliant at the Ground Level public entrances.

AAB 26.00 – Doors and Doorways
(AAB 26.6 – Maneuvering Clearances)
Many doors in the building do not provide required pull and push clearances for accessible doors. In public areas or areas accessed by civilian staff, modify these doorways to provide accessible clearances.

(AAB 26.11 - Door Hardware)
Existing hardware throughout building is not compliant and replacement with lever-type hardware at all doors is recommended .

AAB 27.00 – Stairs
(AAB 27.3 – Nosings)
Stair nosings are required to be angled or radiused and not abrupt. Existing wood stair nosings at the connecting stair between the Main Level and the Upper Floor have a protruding lip at each tread.

- The stair treads need to be modified to comply. Modification of the treads with tread covers is necessary to reduce the abrupt nosing.

AAB 28.00 – Elevator

(AAB 28.1) Multistory buildings are required to be served by an elevator.

- The existing elevator does not meet the 'gurney' requirements of the code and must be replaced.

AAB 32.00 - Kitchens

(AAB 32.1) Commercial kitchens are not regulated by the AAB.

AAB 36.00 – Drinking Fountains

(AAB 36.1.1)

Code compliant drinking fountains are not provided within the building.

- Please refer to the plumbing section of this report for discussion about requirements for drinking fountains

AAB 41.00 – Signage

(AAB 41.00)

Room signage with braille must be provided at all 'permanent rooms and spaces' as well as code required egress signage.

- Compliant signage and Symbols of Accessibility are missing throughout the building. Where exit signs indicate an accessible route, if all routes are not accessible, these signs shall include the symbol of accessibility.

- EXISTING CONDITIONS ANALYSIS -

a. SUMMARY
b. LANDSCAPE/CIVIL
c. STRUCTURAL
d. ARCHITECTURAL
e. FIRE PROTECTION
f. PLUMBING
g. H.V.A.C
h. ELECTRICAL

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EXISTING CONDITIONS - SUMMARY

As part of the feasibility study, KBA examined the Burlington Police Department's (BPD) existing facility to determine its ability to meet the current and future needs of the department. The evaluation of the existing facility is to determine the feasibility of adding/renovating or the construction of an all-new facility to service the Town's police department's needs for the next 40 years.

The existing conditions report commenced with a visual field inspection of the BPD's current facility by architectural staff and structural, mechanical, electrical, plumbing & fire protection engineers. They examined the condition of the local utilities, building systems for compliance with current codes and whether they have reached their expected life span. Additionally, the individual reports note actions required to bring each system into code compliance.

The criteria for the facilities evaluation and recommendations are based on meeting all current Massachusetts State Buildings, Fire and Energy Codes & Massachusetts Architectural Access Board (MAAB) requirements. In addition, operational recommendations from National Fire Protection Association (NFPA) 1221 - Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems, will be incorporated into the recommended designs.

Below are examples of non-compliant code or safety standard, conditions observed at the existing facility. A complete list is included in the individual reports. These conditions expose the Police Department staff, visitors and detainees to safety hazards and the Town to liability.

1. Building Code:
   a. Structurally the facility does not meet current seismic (earthquake), lateral (wind) or gravity loading design and would likely suffer major damage in a seismic, high wind or heavy snow event, a situation in which demand for emergency response would peak.
   b. Existing stairs are not compliant: rails are too short, missing or not continuous, risers are too tall, treads are too short, and stairs are not enclosed in a fire rated enclosure.
   c. The building envelop does not meet the newly adopted Stretch Code, which now includes additions/renovations to existing building.

2. Fire Protection:
   a. Sprinkler heads are outdated and need to be replaced with quick response heads

3. Plumbing Code:
   a. Fixtures do not meet water conservation requirements.
   b. Fixtures are not handicapped accessible (some locations)

4. HVAC Code:
   a. Air handling equipment has outlived its service life and must be replaced.
   b. Ductwork is not in good condition nor insulated in many locations and should be replaced.
   c. The exhaust system equipment has outlived its service life and must be replaced.
   d. Boilers could remain as supplemental heat source in support of new high efficiency variably refrigerant flow (VRF) which will provide heating and cooling to the building.
   e. Firing Range has an exhaust system however it does not appear to be equipped with a make-up air system.
   f. Non-compliant amount of fresh air changes (insufficient ventilation per Code).

5. Electrical Code:

a. Most systems (lighting, power, emergency lighting, and fire alarm) no longer meet code requirements or safety standards.
b. Emergency generator is not code compliant and does not have sufficient capacity to support all building systems and must be replaced.
c. Fire alarm system is outdated and needs to be replaced with a modern addressable system.
d. Site lighting needs to be changed to LED fixtures in many locations.
e. Interior lighting needs to be changed to LED type fixtures with a lighting control system.
f. Telephone/Data racks must be located in a properly designed space and all old cabling (CAT-5E) should be replaced with modern CAT-6A cable.

6. ADA/MAAB (handicapped accessibility)
   a. The elevator does not conform the current elevator code with regard 'gurney' requirements.
   b. Stairs are not accessible and do not provide areas of refuge.
   c. Existing staff toilet/shower/locker facilities which are not handicapped accessible (turning radius', reach limits, thresholds….)
   d. Room signage with braille must be provided at all 'permanent rooms and spaces' as well as code required egress signage.

All of these issues, and others identified in the 'Code Review' & "Existing Conditions Survey' sections of the study will need to be addressed in any addition/renovation construction to the building.

While it was evident that the existing facility currently provides space for the BPD to operate, it does not meet the current codes or the operational requirements for a modern Police Station. In all cases, the building has functionally outlived its useful service life for modern police operations. It is our recommendation that the existing building be demolished, and a new code compliant facility be built that will support the current and future needs of the Burlington Police Department.

- EXISTING CONDITIONS ANALYSIS -

a. SUMMARY
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f. PLUMBING
g. H.V.A.C
h. ELECTRICAL

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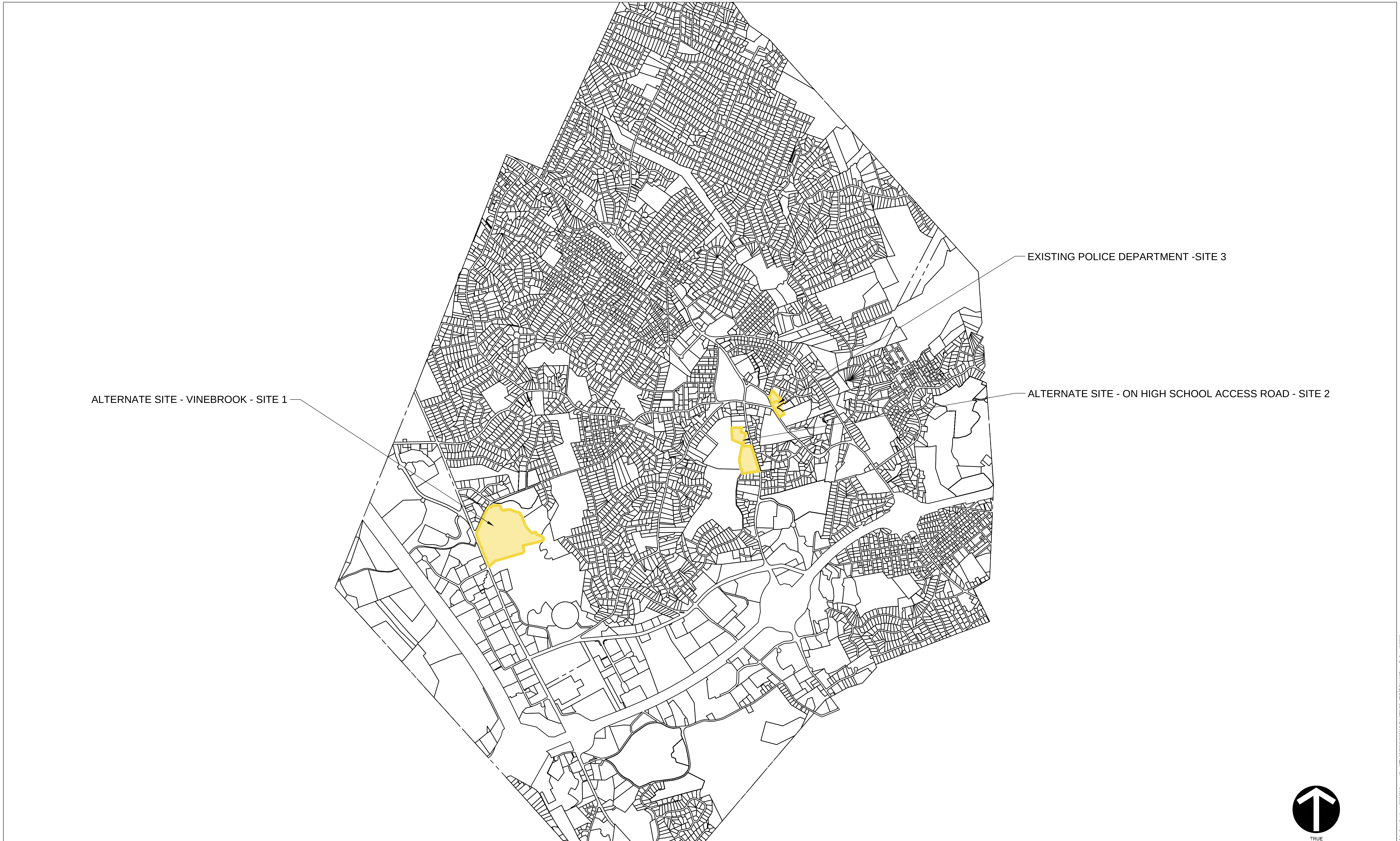
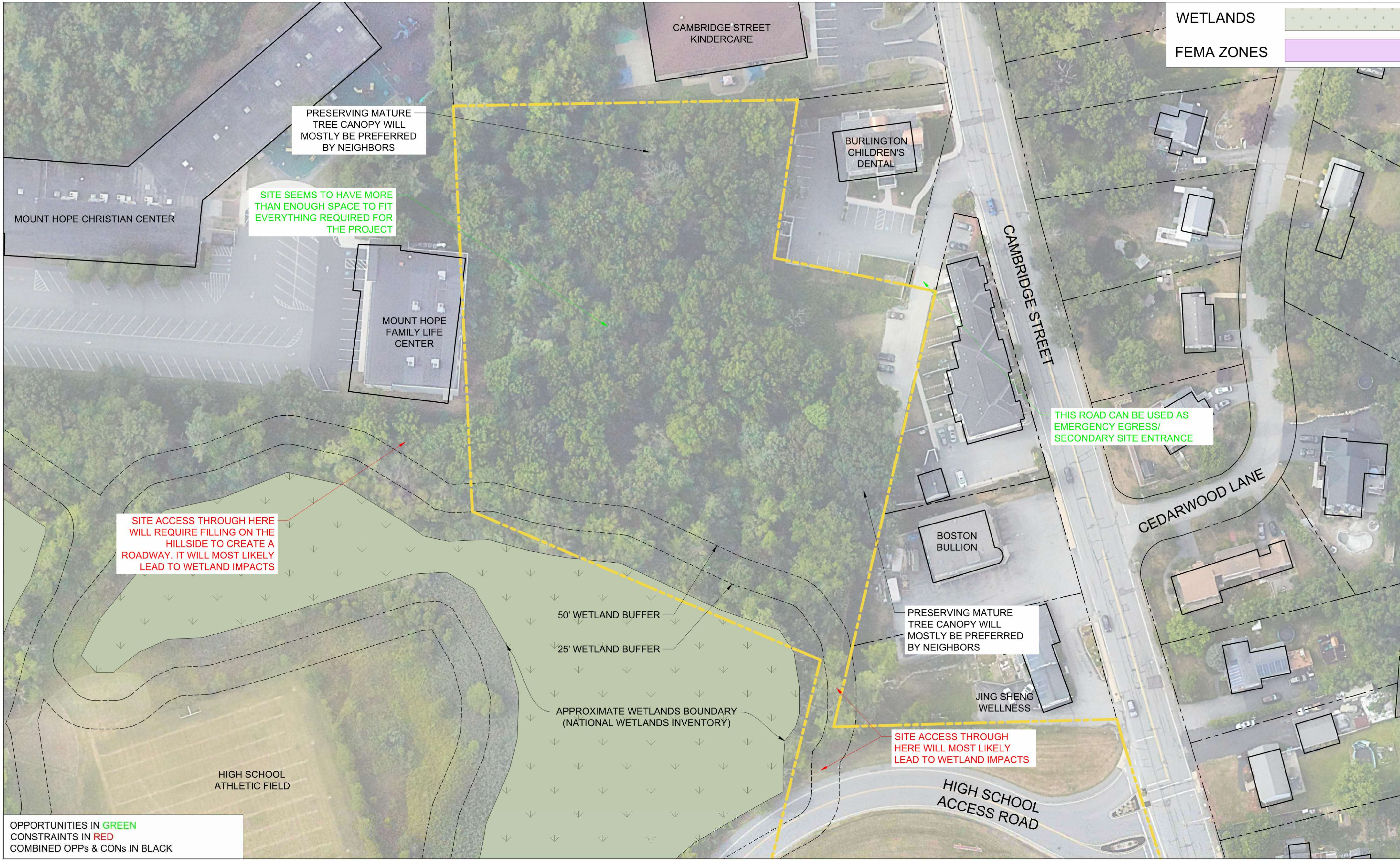


23000-01

BURLINGTON POLICE DEPARTMENT
BURLINGTON, MA
PROPOSED ALTERNATE SITE LOCATIONS

April 2, 2024

Kaestle Boos Associates, Inc.



23000-01

SCALE: 1/8" = 1'-0"

BURLINGTON POLICE DEPARTMENT

BURLINGTON, MA

OPPERTUNITIES AND CONSTRAINTE PLAN - HIGH SCHOOL ACCESS ROAD (SITE 1`)

April 2, 2024

Kaestle Boos Associates, Inc.

KBA

23000-01

SCALE: 1/8" = 1'-0"

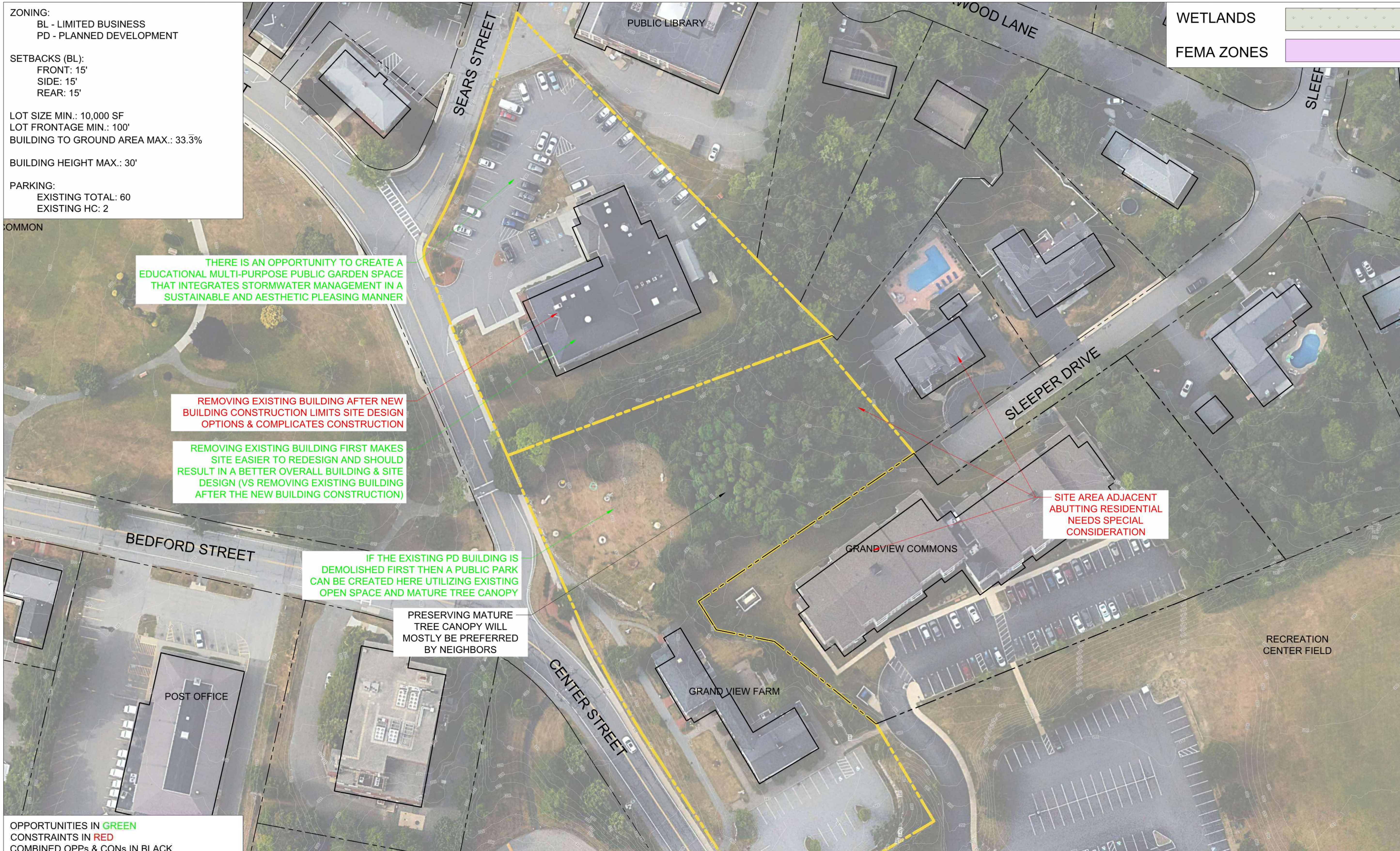
BURLINGTON POLICE DEPARTMENT

BURLINGTON, MA

OPPERTUNITIES AND CONSTRAINTE PLAN - VINEBROOK (SITE 2)

April 2, 2024

Kaestle Boos Associates, Inc.



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SCALE: 1/8" = 1'-0"

BURLINGTON POLICE DEPARTMENT

BURLINGTON, MA

OPPERTUNITIES AND CONSTRAINTE PLAN - EXISTING SITE (SITE 3)

April 2, 2024

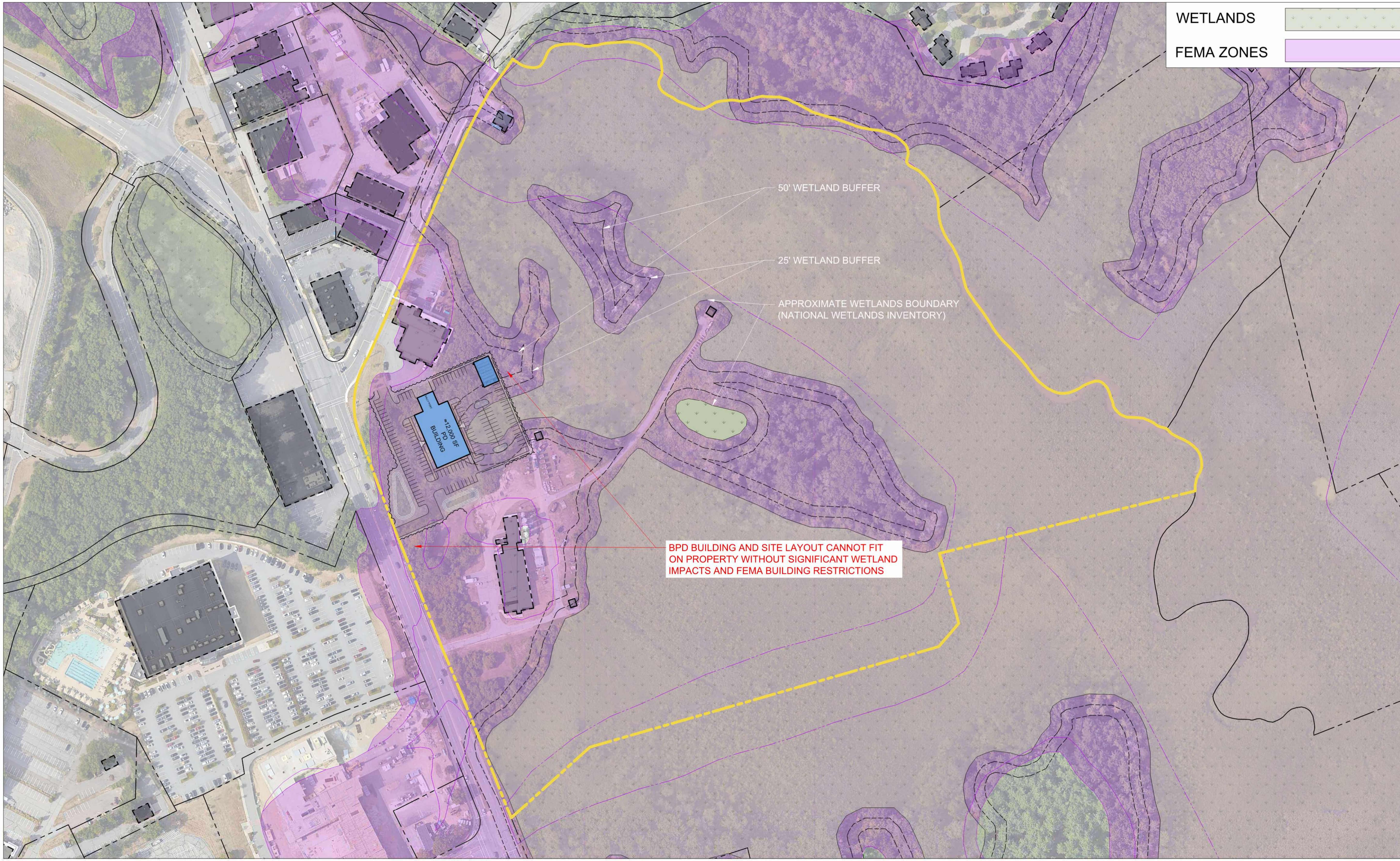
Kaestle Boos Associates, Inc.

23000-01

SCALE: 1/8" = 1'-0"

BURLINGTON POLICE DEPARTMENT
BURLINGTON, MA
12,000 SF BUILDING FOOTPRINT TEST FIT - HIGH SCHOOL ACCESS ROAD (SITE 1`)
April 2, 2024

Kaestle Boos Associates, Inc.



23000-01

BURLINGTON POLICE DEPARTMENT
BURLINGTON, MA
12,000 SF BUILDING FOOTPRINT TEST FIT - VINEBROOK (SITE 2)
April 2, 2024

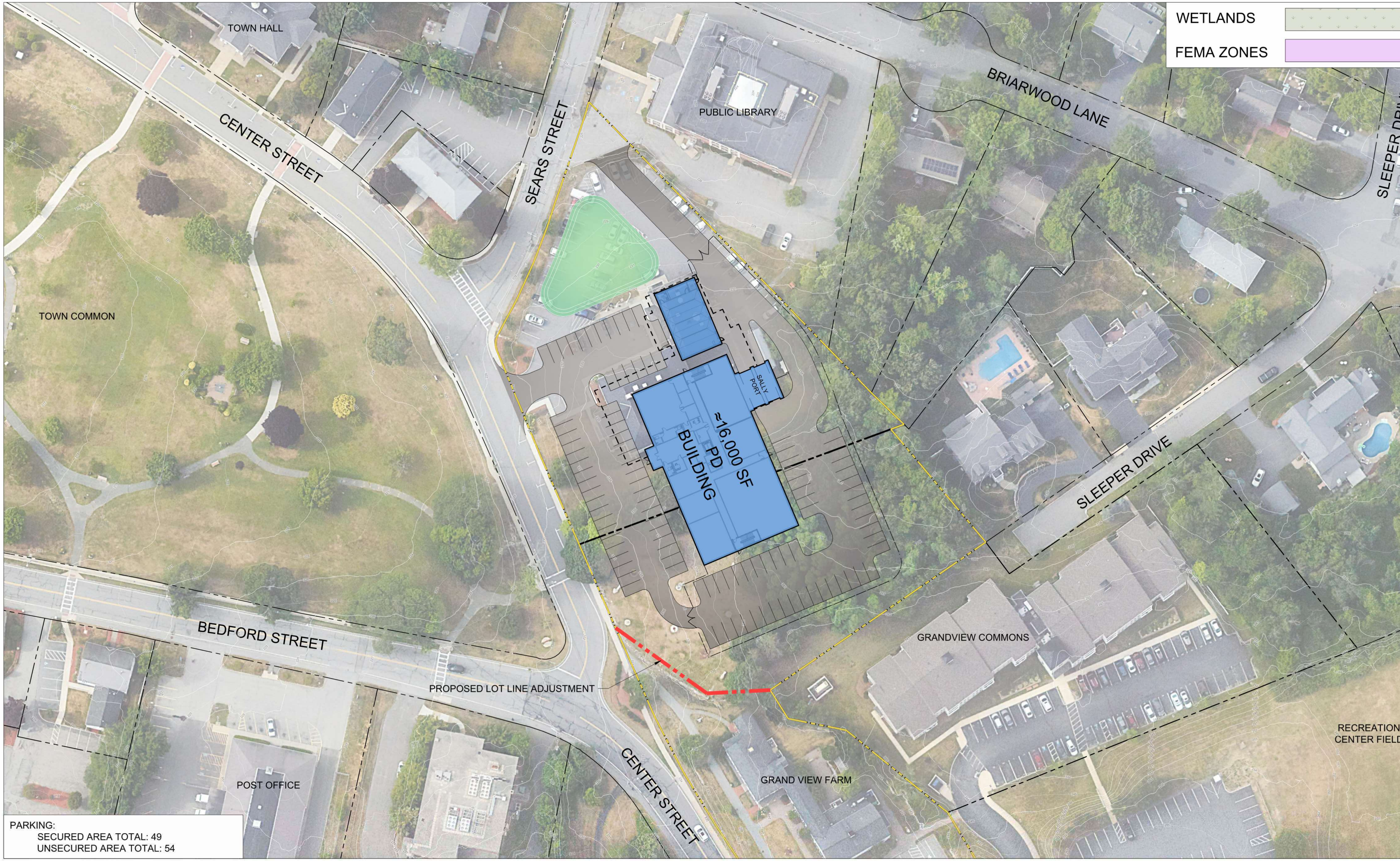
Kaestle Boos Associates, Inc.

23000-01

SCALE: 1/8" = 1'-0"

BURLINGTON POLICE DEPARTMENT
BURLINGTON, MA
12,000 SF BUILDING FOOTPRINT TEST FIT - EXISTING SITE (SITE 3)
April 2, 2024

Kaestle Boos Associates, Inc.



23000-01

SCALE: 1/8" = 1'-0"

BURLINGTON POLICE DEPARTMENT
BURLINGTON, MA
16,000 SF BUILDING FOOTPRINT TEST FIT - EXISTING SITE (SITE 3)
April 2, 2024

Kaestle Boos Associates, Inc.

- EXISTING CONDITIONS ANALYSIS -

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EXISTING CONDITIONS – STRUCTURAL

BACKGROUND AND OVERVIEW

It is Weston & Sampson Engineer's understanding that the existing Burlington Police Station is comprised of an original structure, constructed during the 1890s, and an addition portion constructed in 1991. The original structure is classified as a historical building per the Town of Burlington's (Town) historic commission. Limited existing architectural plans were obtained for the 1991 addition, dated February 25, 1991, issued by the Preservation Partnership, which includes a layout of the original structure.

The Massachusetts State Building Code is anticipated to be updated to the 10th edition in 2024, incorporating the 2021 version of the International Building Code (IBC), and International Existing Building Code (IEBC). Weston & Sampson incorporated the IBC 2021 version of the International Building Code and IEBC with the intent to comply with the future 10th Edition of the Massachusetts State Building Code.

SITE EVALUATION SUMMARY

Representatives of the Weston & Sampson structural team, Kevin Connolly and Sydni Clark, conducted a limited visual assessment of the current Burlington Police Department building on January 16, 2024. The visual assessment included, but was not limited to, observations of visible portions of structural walls, slabs, and floor or roof framing. Access to roof framing was provided in both the 1890 original portion of the building and the newer addition, located in the mezzanine and the attic areas, respectively. The roof framing in both locations were observed to be timber rafters supporting plywood decking. Portions of the foundation in the original building area were visible in the mechanical room and electrical room. The foundation of the original structure was a mortared stone foundation wall, whereas the foundation of the newer addition was cast in place concrete.

The overall structure was found to be in fair condition. There were no observed signs of stress on exposed framing members, nor significant deterioration observed during the site walkthrough.

PROJECT UNDERSTANDING & CODE REVIEW

It is the understanding of Weston & Sampson that significant renovations to the interior space of the current building would be required to meet the needs of the building and its staff, as well as comply with current building code requirements. The renovations may include, but are not necessarily limited to: significant mechanical, electrical, and plumbing upgrades; fire protection upgrades; removal of hazardous materials; replacement of existing roof materials; increasing building security and other information technology upgrades; addressing water infiltration and moisture issues; and reconfiguration of existing spaces including removing or modifying interior partition walls. The International Existing Building Code (IEBC) identifies three alteration levels for building projects. The proposed renovations for this building are assumed to fall under Alterations – Level 3 in which the work area exceeds 50% of the building area.

The police station is considered an essential facility and in accordance with the IBC and the American Society of Civil Engineers (ASCE-7) is required to be designed as a Risk Category IV building. The IEBC requirements for Alterations Level 3 with Massachusetts State Building Code (MSBC) amendments require unreinforced masonry bearing walls to be anchored to the walls at roof and floor levels, unreinforced masonry parapets be braced for seismic forces, and unreinforced masonry partitions and nonstructural walls in the work area and adjacent to egress paths be anchored, removed or altered to resist out-of-plane seismic forces. The existing masonry walls in the building are assumed to be unreinforced. Verification of wall reinforcement could be completed using non-destructive testing methods during the design phase.

Considering structural work required from proposed renovations by other disciplines, the resulting work would be considered a "substantial structural alteration" by the IEBC. This would require the building to be evaluated for wind and seismic loading listed in the current edition of the International Building Code (IBC 2021). The mortared stone foundations in the original building area are assumed to be unreinforced, and it is likely that the original construction would fail in a lateral demand analysis. Consequently, substantial structural retrofitting of the building will likely be required to comply with the existing building code criteria to meet seismic demand. Other areas of the building that may need to be upgraded or reinforced include the roof diaphragm connections, and roof gravity load carrying members. The roof diaphragm connections in the original building portion will likely need upgrades for current IBC

wind load criteria. The gravity load carrying members in the original portion will likely not meet current snow loading requirements, which would require reinforcement of existing members, or providing additional load carrying members. Any other additional roof loading, including new MEP rooftop equipment or suspended elements, would have to be evaluated as part of the analysis.
Multiple areas of water damage were identified by the police chief during the visual assessment. Other areas were identified by the chief as not weather-tight, such as loose windows and improperly sealed exterior penetrations. Some of the moisture damaged locations were observed to have been previously repaired with new flooring and/or hard ceilings. Any moisture deterioration or damage to elements behind floors and ceilings which were not accessible to view and would need further investigation to determine the condition of structural framing. Minor repairs, such as holes in the roof deck, gypsum wall cracking, and basement slab fractures would need to be addressed during the renovation.

SUMMARY OF ANTICIPATED STRUCTURAL SCOPE OF SERVICES
A summary of potential structural scope is listed below:

1. Bracing of unreinforced masonry bearing walls at roof and floor levels.
2. Removal, anchorage or alteration of unreinforced masonry partition and non-structural walls for out-of-place seismic forces.
3. Evaluation of building for lateral seismic and wind loading. It is likely that the building foundations would need reinforcing to meet lateral demands. Additional bracing for the building frame may also be required.
4. Upgrade of, or addition to, existing roof diaphragm connections in original portion of the building to meet lateral demands and wind uplift requirements.
5. Reinforcement or addition of roof gravity load carrying members in original building portion.

There is potential for some structural repairs not listed above that may be required once the scope of work has been defined and the structural analysis has been completed. Not included as part of this scope of services is an opinion of probable cost associated with the structural repairs. A cost opinion can be generated by Weston & Sampson during the design phase.

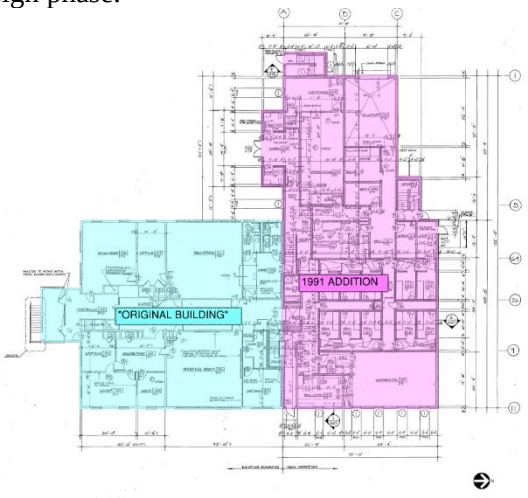

Photo 1: Building Key plan from 1991 Renovations

Photo 2: Mortared Stone Foundation Wall in Original Building

Photo 3: Mortared Stone Foundation Sawcut for Opening to Addition

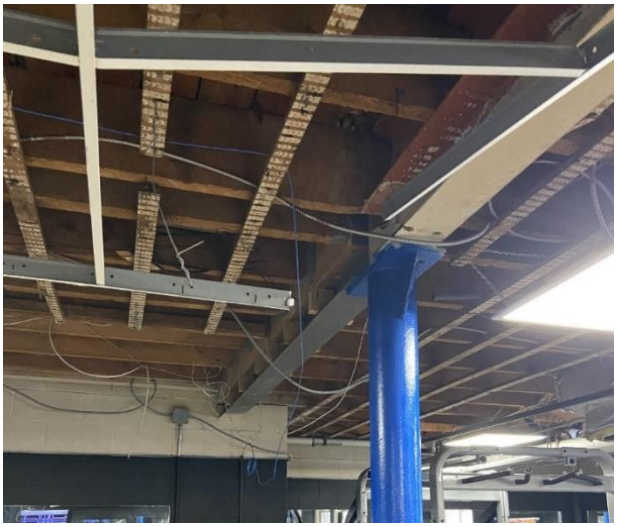

Photo 4: Floor Framing in Original Building as Seen from the Gym

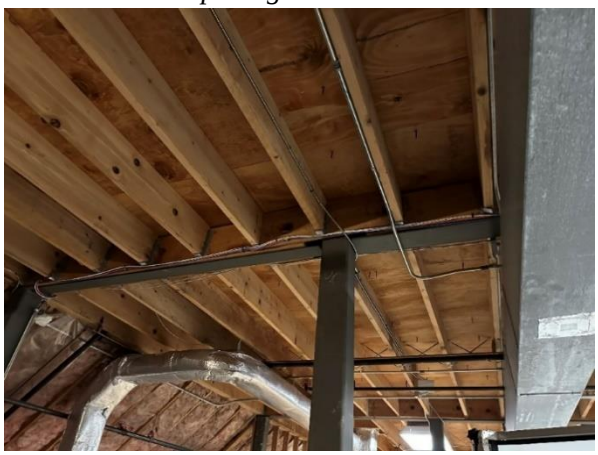

Photo 5: Roof Framing in 1991 Addition as Seen from the Mezzanine

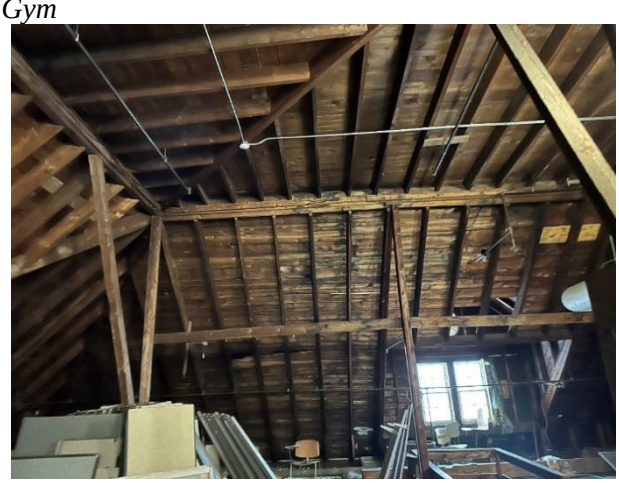

Photo 6: Roof framing of Original Structure as Seen from the Attic

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- EXISTING CONDITIONS ANALYSIS -

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EXISTING CONDITIONS - FIRE PROTECTION

The building is currently protected with an automatic sprinkler system. The system was installed as part of the 1992 building renovations and addition.

The fire service is 6-inch in size and includes a 6-inch reduced pressure backflow preventer and 6-inch wet alarm valve. The fire distribution main is 6-inch.

Piping is black steel with coupling or threaded joints depending on pipe size. In general piping appears to be in good condition. The building system is separated into multiple zones. Each sprinkler zone is controlled by a supervised shutoff valve and flow switch.

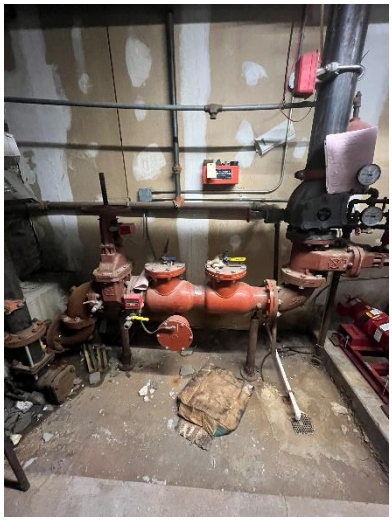
There is a free-standing Siamese Fire department connection (FDC). An electric bell is provided on the foundation wall adjacent to the FDC.

Recessed fire hose cabinets are provided on each floor.

Sprinkler heads are semi-recessed in the finished ceiling areas. Upright brass heads are provided in areas with no ceilings. Institutional type heads are provided in cell areas.

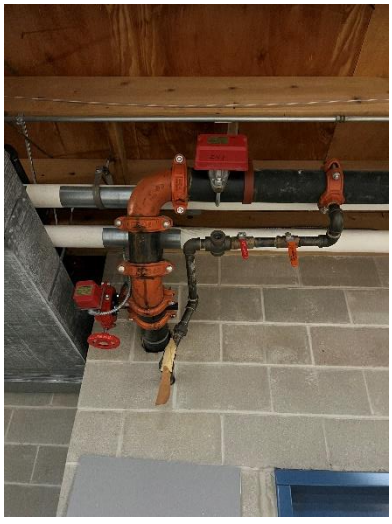
The unheated attic of the original building appears to be protected with a glycol system to prevent freezing.

The existing firing range does not appear to be adequately protected. Only a single row of sprinkler heads is provided in the space.



Fire service & backflow preventer

Fire Department Connection

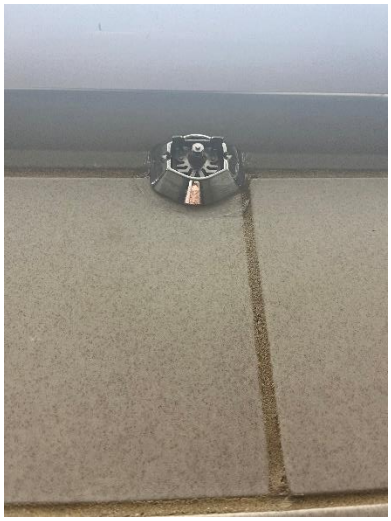


Sprinkler zone control valve assembly

Fire hose connection

Typical upright sprinkler

Semi-recessed pendent head



Institutional type sprinkler

Recommendations

- In major renovation, sprinkler systems can be modified to provide protection. Due to the age of sprinkler heads, we would recommend replacing all heads with quick response type sprinklers.
- Replace existing glycol sprinkler system in unheated attic with a dry type sprinkler system.
- Remove existing fire hose cabinets and replace them with 2-1/2" Fire Department valves.

- EXISTING CONDITIONS ANALYSIS -

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EXISTING CONDITIONS – PLUMBING

Presently, the plumbing systems serving the building are cold water, hot water, sanitary, waste and vent system, and natural gas. Municipal sewer and municipal water service the building.

The plumbing systems have been updated as part of the 1992 building renovation and addition project.
The plumbing fixtures are in fair condition.

Cast iron is used for sanitary drainage. Where visible, the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper. In general, the drainage piping can be reused where adequately sized for the intended new use.

Rainwater from sloped roof areas is collected by exterior gutters and downspouts. There does not appear to be interior rain leaders.

FIXTURES

The water closets are wall hung vitreous china with manually operated flush valves. Urinals are wall hung vitreous china with manually operated flush valves. In general lavatories are counter mounted with either manual faucets or metering type faucets.

Cell fixtures are stainless steel toilet/sink combination units. Fixtures are flushed remotely.

Electric water coolers are wall hung, with stainless steel bowls. A bottle filler is provided at the main level administration area.

Custodial sinks are generally floor mounted mop receptors with wall mounted faucets. The faucets are equipped with vacuum breakers.

Locker room showers have pressure balanced concealed shower valves with standard shower heads and shower pans.

The booking area has a wall mounted scullery sink with wall mounted faucet.

Wall hung water closet

Wall hung urinals

Typical lavatory

Cell fixture

Cell fixture remote flushing

Electric water cooler

Custodial sink

Booking area sink

WATER SYSTEMS

The main domestic water service is located in the basement. The service is 6-inch in size and reduces to a 1-1/2" water meter.

Piping, where exposed, appears to be copper with sweat joints. The majority of the piping is insulated.

There is a 1-inch reduced pressure backflow preventer provided for HVAC system make-up water. The assembly is not readily accessible for maintenance and is showing signs of corrosion.

Domestic hot water is generated through a tank type natural gas fired water heater. The water heater has a natural gas input of 199,999 BTUH and 100-gallon storage capacity. The hot water systems are recirculated. There is a thermostatic mixing valve on the systems to prevent scalding. The heating system appears to be in good condition.

Domestic water service

Domestic water meter

Domestic water heater
Backflow preventer – HVAC make-up

Thermostatic mixing valve

GAS

An elevated pressure natural gas service is supplied to the building. The exterior gas meter is located adjacent to the mechanical room.

Gas piping is black steel with threaded joints and fittings. Natural gas is provided to the heating boilers and the domestic water heater.

Gas piping appears to be in good condition.

DRAINAGE SYSTEMS

Cast iron is used for sanitary drainage. Where visible, the cast iron pipe appears to be in good condition. Smaller pipe sizes appear to be copper.

Sallyport floor drain is connected to an exterior oil water separator. The separator is vented up through the roof of the building.

In general, the cast iron drainage piping can be reused even in a major renovation where adequately sized for the intended new use.

RECOMMENDATIONS

Provide new high efficiency low flow plumbing fixtures.

Provide accessible fixtures where required. Provide accessible cell fixtures.

Replace existing backflow preventer for HVAC make-up water system and located in accessible location to facilitate testing and maintenance.

- EXISTING CONDITIONS ANALYSIS -

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EXISTING CONDITIONS – H.V.A.C.

EXECUTIVE SUMMARY

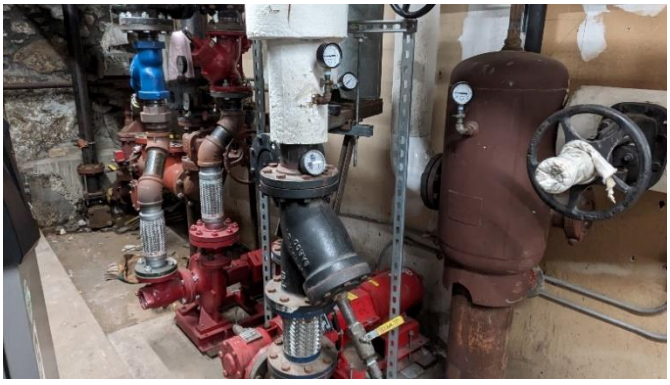
Presently, the HVAC Systems serving the Burlington Police Department consists of a natural gas-fired hot water boiler plant and various indoor air handling units. The building is heated by hot water terminal heating equipment, consisting of mostly unit heaters and fintube radiators. The building is equipped with a Building Automation System by Alerton, which controls the HVAC equipment automatically.

Most of the HVAC systems throughout the building have served past their anticipated life expectancy and are recommended for replacement.

HEATING SYSTEM

The building is heated by (3) high efficiency gas-fired condensing boilers manufactured by Lochinvar, model FTXL. The boilers appear to have been installed relatively recently and are in good condition. The boilers produce hot water which is distributed to heating terminal units and indoor air handling units located throughout the building. (2) Bell & Gossett pumps set up in a primary/standby configuration distribute the hot water throughout the building. The pumps and associated expansion tank and air separator appear to be quite old and look to be beyond their service life.

Existing Boiler Plant



Existing Expansion Tank and Valves

Most of the piping mains observed in the mechanical room are insulated but appeared to be damaged in some locations. In some instances, the piping branches to air handling units were uninsulated.

AIR CONDITIONING

Most of the building is air conditioned by several indoor air handling units that are located throughout the building. The air handling units have hot water coils and DX coils which heat or cool the air depending on the season. One of the air handling units was reported by a staff member to consistently leak in during the cooling season, indicating that there is an issue with the drainage of the condensation that is produced during the cooling process.

Typical Indoor Air Handling Unit

The DX coils are paired with air-cooled condensing units which are mostly located outdoors on the roof. However, there are a few air-cooled condensing units that are located in an attic space. It's typically not advisable to mount air-cooled condensing units indoors. The condensers need fresh air as a means of heat rejection, enclosing them in the attic can starve the condensers of the air they need, reducing their efficiency. Furthermore, the heat rejected by the condensers will heat up the attic, which creates additional cooling load on the spaces below the attic, causing the air conditioning units to work harder.

Outdoor Condensing Unit

Indoor Condensing Units

In roof mounted condensing units use R-22 refrigerant and appear to be beyond their life expectancy of 15 years. R-22 has also been phased out, which makes for a costly repair of these systems.

The indoor condensing units look to be in fair condition and utilize R-410A refrigerant. The tag on these condensing units indicate they were manufactured in 2017, with a life expectancy of 20 years they still have plenty of life in them. However, R-410A is also beginning to be phased out, so repairs of these systems may become costly in a couple of years.

HEATING AND VENTILATION

Entryways and stairwells are typically heated by wall mounted unit heaters. The remainder of spaces are typically heated by fintube radiators located along the exterior perimeter. The unit heaters appear to be in either good or fair condition. Unit heaters have a life expectancy of about 20 years, so depending on when they were installed, they may be at or nearing their recommended service life.

Unit Heater

Fintube Radiator

Ventilation is brought into the building through the air handling units described under the Air Conditioning section. The air handling units operate year-round to provide ventilation air to the building. In general, it appears that the outside air ducts are typically insulated, but the supply and return air ducts were often observed to be uninsulated. There is likely no energy recovery section in the existing units which may explain the lack of supply/return duct insulation. However, it would still be more efficient to insulate at least the supply duct so that none of the energy used to heat or cool the air is wasted.

There are several exhaust fans that serve various areas of the building. The fans appear to be in fair condition. With a life expectancy of 20 years, the fans may be nearing the end of their recommend service life depending on when they were installed.

It was also observed that the firing range is equipped with an exhaust system, but no source of makeup air was found. This can lead to pressure issues when the firing range exhaust system is running.

Exhaust Fan

CONTROLS

The building is equipped with a Building Automation System (BAS) by Alerton. The BAS monitors and controls major pieces of equipment, and monitors space temperatures which control space terminal heating/cooling equipment. The workstation with access to the BAS was not available at the time of our site visit. However, the BAS likely has the air handling units, associated condensing units, and any terminal units connected to it.

RECOMMENDATIONS:

Based on our findings as summarized above, the following recommendations are made with regards to HVAC system upgrades:

- Replace all indoor air handling units with all new units equipped with energy recovery, sand heating/cooling section, which will provide tempered ventilation to all occupied spaces.
- Replace all ductwork and provide all new supply and return ductwork with insulation on both duct systems.
- Provide a new, high efficiency, heat recovery Variable Refrigerant Flow (VRF) system to provide heating and cooling throughout the building.
- The existing boilers are still in good condition and could remain to provide supplemental heat on extremely cold days, or could be used as a backup source of heat in the event of a VRF condenser failure.
- Replace the existing pumps and associated accessories as they are nearing/beyond their anticipated life expectancy.
- Replace the existing exhaust systems with new fans and duct distribution systems to ensure the exhaust rates meet the code required exhaust rates.
- Provide a source of makeup air for the firing range when the exhaust fan serving this space is on.

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EXECUTIVE SUMMARY – ELECTRICAL

In general, the electrical infrastructure is adequately sized for the existing police station and has been well maintained. The equipment is in acceptable condition to accommodate minor renovations to the existing building, however, would not be recommended for reuse in any type of new construction application and the size and scope of the renovations would need to be analyzed to confirm viability with the existing electrical system.

The existing emergency power system is not code compliant. The onsite emergency generator system is not configured correctly to meet current life safety codes and needs to be reconfigured to separate life safety and optional standby loads.

The existing fire alarm system is obsolete and in poor condition. The entire system should be replaced with a new addressable system with all new detection and notification devices.

ELECTRICAL DISTRIBUTION SYSTEM

Three phase primary power runs overhead from Center Street and then underground to a fenced in utility pad mounted transformer on the property. The utility company is Eversource. The secondary service entrance conductors travel underground to the main electrical room in the basement where they are terminated by a 1200 Amp main breaker in a GE switchboard. The service is rated at 1200 amperes at 120/208 volt, 3 phase, 4 wire. The switchboard contains the CT cabinet which feeds a dual meter socket adjacent to the switchboard in the main electrical room. Only one of the meter sockets is populated. The meter number is 08504708.

Power is distributed via distribution sections in the switchboard and emergency and non-emergency power distribution panels to branch circuit panel boards throughout the building. Distribution panels and equipment are manufactured by GE.

The power distribution equipment is in fair condition. There are available spaces in the distribution panels and most of the branch circuit panel boards in the building are not full. Based on the scope and scale of the renovations it would be feasible to reuse the existing electrical distribution equipment.

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- SPACE NEEDS -

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POLICE STATION
SPACE NEEDS ASSESSMENT
APRIL 10, 2023 UPDATED MAY 11, 2023

Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Shared Areas							
Public							get dispatch out; records and OIC interface
Vestibule	13.2	0	1	80 sf	80 sf		
Lobby/Waiting	13.1	8	1	400 sf	400 sf		6 seats
Public Toilets	7.2	0	3	70 sf	210 sf		to accommodate training
Public Interview	5.2	3	2	90 sf	180 sf		2 total interview rooms including permit interview; 1 safe room
Firearm permit interview	5.2	2	1	60 sf	60 sf		
Desk Officer	1.2	1	1	120 sf	120 sf		yes; video phone after hours
Public Total:						**1050 sf**	
Dispatch Center							can be (but does not need to be) off the lobby but not with interface; must be able to be locked down; no sound transmission
Communications Positions	4.2	5	1	875 sf	875 sf		would like 4-5 for future growth incl. extra station during storms and includes addition of Fire Department
Supervisor's Office	1.1	1	1	100 sf	100 sf		
Lockers	8.1	6	1	15 sf	15 sf		
Unisex Toilet	7.1	1	1	65 sf	65 sf		communications (microphone, phone, radio)
Break Room/area	13.3	1	1	80 sf	80 sf		
Equipment Room	7.5	1	1	240 sf	240 sf		
E-911 Equipment Room	6.3	1	1	40 sf	40 sf		
Communications Center Total:						**1415 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
APRIL 10, 2023 UPDATED MAY 11, 2023

Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Information Technology Support							State takes care of dispatch/911 equip
IT Director Office	1.2	1	1	120 sf	120 sf		
Testing/Burn-in/Parts area	6.5	1	1	80 sf	80 sf		
Computer Network Equipment Room	6.7	1	1	120 sf	120 sf		
IDF Closets	6.2	1	2	25 sf	50 sf		
IT Storage	1.5	1	1	175 sf	175 sf		
IT Support Total:						**545 sf**	
Large Meeting/Training Classroom/EOC							no additional antennas anticipated (town is adding 3)
Lg. Training Classroom/ Community Mtg./EOC	3.2	50	1	1250 sf	1250 sf		access without coming into the PD areas with plenty of bathrooms; do RAD training
Police Training Prop Storage	6.5	0	1	80 sf	80 sf		
Misc. Training Prop Storage	6.3	0	1	40 sf	40 sf		
Table and Chair Storage	6.7	0	1	120 sf	120 sf		
Kitchenette	6.5	0	1	80 sf	80 sf		
Live Fire Range	12.1	5	1	2000 sf	2000 sf		4 lanes (min; more if possible- try for 5)
Office	6.6	1	1	100 sf	100 sf		
Cleaning station	6.6	0	1	100 sf	100 sf		officer firing weapon with discharge
Weapons storage	6.6	0	1	100 sf	100 sf		temporary storage
Control Room	6.6	0	1	100 sf	100 sf		
Ready Room	6.9	0	1	200 sf	200 sf		width of range x 10'
Armory	6.4	0	1	60 sf	60 sf		3 armorers - consolidate into firing range area; 1 workstation; ionic bath incl.; swat bags storage (4 officers assigned to swat- maybe lockers in Armory
Armor's work space	6.6	1	1	100 sf	100 sf		
Weapons Cleaning	6.6	0	1	100 sf	100 sf		1/mo. Ea. Officer is responsible to clean their own weapon
Simulation training room	14.8	0	1	1000 sf	1000 sf		existing system
Training Facilities Total:						**5430 sf**	
Wellness Facilities							

POLICE STATION
SPACE NEEDS ASSESSMENT
APRIL 10, 2023 UPDATED MAY 11, 2023

Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Wellness Center	14.7	0	1	800 sf	800 sf		Turf alley for sled run, treadmill, rowers, similar to what they have for equip now; 10' clg min.
De-esculation training room	14	0	1	200 sf	200 sf		combine with Wellness
Equipment Storage	6.5	0	1	80 sf	80 sf		
Wellness Center Total:						**1080 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
APRIL 10, 2023 UPDATED MAY 11, 2023

Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Police Areas							
Command/Admin/Support Areas							
Command/Administration/Support Services							
Visitor waiting	6.1	4	1	60 sf	60 sf		3 to 4 people - 2-4 legal files
Work/File Room	6.8	0	1	150 sf	150 sf		
Suite 1:							
Chief's Office	1.8	1	1	250 sf	250 sf		add chief's bathroom with shower with storage/closet; sofa; small meeting for 2-4; modular u-desk so chief can rearrange furniture
Secure Files Area	6.2	0	1	25 sf	25 sf		can either be in Chief's office or in locked file room within suite - 4 lateral, 3 high
Chief's Bathroom	7.2	1	1	70 sf	70 sf		with shower
Conference Room	3.2	12	1	300 sf	300 sf		
Administrative Assistant's Office	1.3	1	1	130 sf	130 sf		can be in waiting area; high counter/reception desk
Deputy Chief's Office	1.6	1	1	200 sf	200 sf		with meeting table
Captain's Office	1.5	1	2	175 sf	350 sf		
Toilet	7.2	0	2	85 sf	170 sf		
Suite 2:							
Mental Health Clinician + Recovery Coach	2.3	2	1	180 sf	180 sf		shared office (2 desks); as long as they can access interview rooms
Lieutenant's Office (Supp. Serv & Training)	1.4	1	1	150 sf	150 sf		
Training Unit's Office	1.3	1	1	130 sf	130 sf		Sgt. And another person to share
Crime Analyst's Office	1.3	1	1	130 sf	130 sf		future growth
Detail Office	2.3	1	1	90 sf	90 sf		
Coffee Area	6.2	0	1	25 sf	25 sf		
Department Supplies	6.3	0	1	40 sf	40 sf		
Staff Mail	6.1	0	1	15 sf	15 sf		6 mailboxes
Department Administration Total:						**2465 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
APRIL 10, 2023 UPDATED MAY 11, 2023

Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Operations Unit							All on same floor
Patrol Administration							
Patrol Lieutenant's Office	1.3	1	3	130 sf	390 sf		3 separate offices
shared meeting area	3.6	1	1	50 sf	50 sf		meeting table within suite
Storage	6.5	0	1	80 sf	80 sf		
Patrol Sergeant's Office	2.2	6	1	450 sf	450 sf		6 desks with copy area; add meeting table if possible; squad room; close proximity to report writing area
Patrol Storage Room	6.5	0	1	80 sf	80 sf		
Patrol Administration Total:						**1050 sf**	
Patrol Facilities							
Roll Call (Squad) Room	3.1	20	1	400 sf	400 sf		radar unit may go out but no other equip issued
Radio Charge/Checkout	6.5	0	1	80 sf	80 sf		Tasers, Keys, cameras, radios? Will be individually issued (don't have storage needs) radio charging station in roll call (provide mini charging station)
Report Preparation	3.4	4	1	140 sf	140 sf		space for manuals - separate room; provide charging stations?
Library	3.1	0	1	20 sf	20 sf		include in report writing
Patrol Facilities Total:						**640 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
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Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Traffic Unit							
Traffic Lieutenant's Office	1.4	1	1	150 sf	150 sf		
Traffic Unit Workspace	2.3	3	1	270 sf	270 sf		
Traffic Lieutenant's Office	2.2	1	1	75 sf	75 sf		
Traffic Unit Work Space	2.2	3	1	225 sf	225 sf		
Storage Room	6.2	0	1	25 sf	25 sf		
Traffic Unit Total:						**745 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
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Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Detective Unit							
Evidence and Property							Adjacent to detectives & Court
Evidence Receiving	6.4	0	1	60 sf	60 sf		Inc. Desk, bag/box storage; one end of report writing
Evidence Processing Room	6.7	0	1	120 sf	120 sf		incl Pass through, Drying + Computer workstation & office space
Evidence Processing Laboratory	6.7	0	1	120 sf	120 sf		drying chamber, small venting hood (circulating) finger printing officer to have access (adjacent to evidence; evidence officer doesn't process)
Evidence Office	1.2	1	1	120 sf	120 sf		(for future use)
Evidence Storage	14.3	0	1	400 sf	400 sf		
Drug Storage (vented)	6.2	0	1	25 sf	25 sf		
Weapons Storage	6.3	0	1	40 sf	40 sf		
Valuables Storage	6.2	0	1	25 sf	25 sf		Safe
Large evidence storage	6.6	0	1	100 sf	100 sf		
Mezzanine storage	6.9	0	1	200 sf	200 sf		Currently separate caged area
Evidence and Property Total:						**1010 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
APRIL 10, 2023 UPDATED MAY 11, 2023

Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Investigative Unit							
Det. Lieutenant's Office	1.4	1	1	150 sf	150 sf		is the OIC
Det. Sergeant's Office	1.3	1	1	130 sf	130 sf		
Criminal Detectives Work Space	2.3	5	1	450 sf	450 sf		within this suite/shared office); include meeting table
Vice & Narcotics Work Space	2.3	2	1	180 sf	180 sf		can all be in same office
Juvenile Detective Workspace	2.3	1	1	90 sf	90 sf		can all be in same office
Domestic Violence Det. Wrksp	2.3	1	1	90 sf	90 sf		can all be in same office
Tech. Services Detective Wrksp	2.3	1	1	90 sf	90 sf		can all be in same office
School Resource Officers Workspace	2.3	2	1	180 sf	180 sf		can all be in same office - not there often
Evidence Detective Workspace	2.3	1	1	90 sf	90 sf		with court officer -share
Court Officers Workspace	2.3	2	1	180 sf	180 sf		with evidence officer - share
Interview Rooms	5.3	2	2	100 sf	200 sf		
Video Evidence Evaluiation (Cyber Crimes)	1.9	2	1	275 sf	275 sf		account for technology investigation; close to evidence; ith workspace; digital storage, forensic laptop; connection to storage, power/data/network connection; same security as evidence
Equipment Storage (Incl. SRO's)	6.3	0	1	40 sf	40 sf		
Investigative Division Total:						**2145 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
APRIL 10, 2023 UPDATED MAY 11, 2023

Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Services Unit							
Records/Data Processing							Off lobby
Public Information Counter	6.3	0	1	40 sf	40 sf		
Clerical Office	1.1	1	1	100 sf	100 sf		
File Area	6.8	0	1	150 sf	150 sf		can be located remotely
Photocopy	6.1	0	1	15 sf	15 sf		
Department Supplies	6.1	0	1	15 sf	15 sf		
Archives	14.3	0	1	400 sf	400 sf		can be located remotely
Records/Data Processing Total:						**720 sf**	
Staff Facilities							authorized currently for 69 sworn officers; include 4-5 lockers for gender neutral take from male locker room
Male Staff Locker Room	8.5	75	1	1350 sf	1350 sf		currently have 61 male sworn
Male PT/Seasonal Staff Locker Room add-on	8.2	0	1	0 sf	0 sf		
Male Toilets	7.5	0	1	240 sf	240 sf		
Male Showers	9.1	4	1	120 sf	120 sf		
Female Locker Room	8.5	20	1	360 sf	360 sf		currently have 7 female sworn
Female Seasonal Staff Locker Room	8.2	0	1	0 sf	0 sf		
Female Toilets	7.3	0	1	160 sf	160 sf		
Female Showers	9.1	2	1	60 sf	60 sf		
Gender Fluid locker/bath	8.5	5	1	90 sf	90 sf		
Swat Gear	6.7	1	1	120 sf	120 sf		Racks for 12 swat bags & long guns
Break Room	3.2	6	1	150 sf	150 sf		
Miscellaneous Toilets	7.2	0	2	70 sf	140 sf		
Recovery Room	6.4	1	1	75 sf	75 sf		Bunks, chair, sink/UC fridge (for nursing function)
Union Office	1.2	1	2	120 sf	240 sf		
Staff Facilities Total:						**3105 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
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Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Facility Maintenance							
Custodial Closets	6.2	0	5	25 sf	125 sf		
Equipment Storage	6.4	0	1	60 sf	60 sf		
Custodial Workshop	6.6	0	1	100 sf	100 sf		
Facility Maintenance Total:						**285 sf**	
Detention Facility							
Sally Port							include space for motorcycle maint. - small toolbox
Vehicle Sally Port Bay	11.1	0	2	480 sf	960 sf		drive through 1 side locked with chain link fence
Vehicle Supply Storage	6.4	0	1	60 sf	60 sf		cleaning/vaccuum,snow brushes, (tires, windshield washers are kept at DPW)
Sally Port Total						**1020 sf**	
Prisoner Processing							
Processing Area	13.5	3	1	360 sf	360 sf		process 1 at a time, but set up 2 stations
Temporary Holding	5.1	4	1	100 sf	100 sf		
Breathalyzer	5.2	2	1	60 sf	60 sf		
Prisoner Toilet/Shower (Decon)	7.2	0	1	70 sf	70 sf		
Prisoner Property Lockers	8.1	6	1	15 sf	15 sf		
Custodial	6.2	0	1	25 sf	25 sf		
Interrogation Room	5.1	3	1	75 sf	75 sf		
Non-Status Offender Holding Area	10.1	1	1	60 sf	60 sf		can double with interview room locked at lobby side and unlocked at department side
Matron	13.3	1	1	80 sf	80 sf		
Prisioner/Bondsman interface	5.1	2	1	50 sf	50 sf		printer; confirm personal property return
Prisoner Release Vestibule (man lock)	13.1	0	1	50 sf	50 sf		
Prisoner Processing Total:						**945 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
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Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Detention							
Isolation Cells	10.2	1	4	120 sf	480 sf		3-4 male, 1-2 female, 1 juvi, 1 HC
Handicapped Cell	10.3	1	1	150 sf	150 sf		
Padded Cell (MH)	10.1	1	1	60 sf	60 sf		nice to have
Detention Total:						**690 sf**	
General Storage							
General Storage Room	14.1	0	1	250 sf	250 sf		
Supplies Storage	6.7	0	1	120 sf	120 sf		
Custodial Storage	6.6	0	1	100 sf	100 sf		
Honorguard Storage	6.4	0	1	60 sf	60 sf		
Quartermaster Storage	6.7	0	1	120 sf	120 sf		humidity controlled
General Storage Total:						**650 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
APRIL 10, 2023 UPDATED MAY 11, 2023

Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Building Support Facilities							
Vertical Circulation							
Stairs		0	2	400 sf	800 sf		
Elevator		0	1	80 sf	80 sf		
Elevator Machine Room		0	1	60 sf	60 sf		
Vertical Circulation Total:						**940 sf**	
Building Services							
Laundry (DeCon)	6.5	0	1	80 sf	80 sf		Near detention
Mechanical Room	14.1	0	1	390 sf	390 sf		
Sprinkler Equipment	6.7	0	1	120 sf	120 sf		
Electrical Room	6.9	0	1	200 sf	200 sf		
Emergency Electrical Room	6.5	0	1	80 sf	80 sf		
Emergency Generator		0	0	500 sf	0 sf		Outside
Building Services Total:						**870 sf**	
Net to Gross Adjustment							
Total Net Area						26,800 sf	
Net to Gross Adjustment (Net Area x 0.4)						10,720 sf	
Gross Area Total:						**37,520 sf**	

POLICE STATION
SPACE NEEDS ASSESSMENT
APRIL 10, 2023 UPDATED MAY 11, 2023

Area/Room Title	Rm. Type	Occupants	No.of Rms.	Rm. Area	Subtotal	Total	Interview Notes
Auxiliary Storage/Maintenance Facility (Heated and Unheated							would like 2-story garage; 1st flr personal cars & public, upper levels cruisers
Found Property Storage	14.1	0	1	250 sf	250 sf		
All-Terrain Vehicle/Trailer Storage	14	0	1	200 sf	200 sf		May want to start ATV unit
Mobile Command Vehicle	14.7	0	1	800 sf	800 sf		needs to be plugged in
Bicycle Storage & repair	6.1	0	6	15 sf	90 sf		
Motorcycle Storage	6.3	0	2	40 sf	80 sf		
Traffic/Light Trailer Storage	6.4	0	3	60 sf	180 sf		may get grant for larger trailer
Workshop	14.1	0	1	250 sf	250 sf		
Tire/parts Storage	6.7	0	2	120 sf	240 sf		
Cruiser Storage	11.3	0	0	300 sf	0 sf		2/3's of total cruisers (30+1pickup) under solar panels
Vehicle Storage Total:						**2090 sf**	

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- CONCEPTUAL DESIGN -

a. CONCEPTUAL SITE PLAN
b. CONCEPTUAL FLOOR PLANS
c. CONCEPTUAL EXTERIOR RENDERINGS
d. CONCEPTUAL SYSTEM NARRATIVES

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PARKING:
SECURED: 66
PUBLIC: 10

23000-01

BURLINGTON POLICE STATION

BURLINGTON, MA

CONCEPTUAL LAYOUT - SITE PLAN

April 2, 2024

SCALE: 1/8" = 1'-0"

Kaestle Boos Associates, Inc.

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COLOR LEGEND

- BUILDING SUPPORT
- CIRCULATION
- POLICE DEPARTMENT
- POLICE STAFF SUPPORT
- SHARED/ COMMON

23000-01

0' 4' 8' 16'

SCALE: 1/8" = 1'-0"

BURLINGTON POLICE STATION

BURLINGTON, MA

CONCEPTUAL LAYOUT - BASEMENT LEVEL

April 2, 2024

Kaestle Boos Associates, Inc.

23000-01

0' 4' 8' 16'

SCALE: 1/8" = 1'-0"

BURLINGTON POLICE STATION

BURLINGTON, MA

CONCEPTUAL LAYOUT - MAIN LEVEL

April 2, 2024

Kaestle Boos Associates, Inc.

23000-01

BURLINGTON POLICE STATION

BURLINGTON, MA

CONCEPTUAL LAYOUT - SECOND LEVEL

April 2, 2024

Kaestle Boos Associates, Inc.

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- CONCEPTUAL DESIGN -

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* This image is conceptual in nature. As such it may be modified based on further input from the community

BURLINGTON POLICE STATION

BURLINGTON, MA

CONCEPTUAL LAYOUT - EXTERIOR RENDERING 1

April 2, 2024

Kaestle Boos Associates, Inc.

* This image is conceptual in nature. As such it may be modified based on further input from the community

BURLINGTON POLICE STATION
BURLINGTON, MA
CONCEPTUAL LAYOUT - EXTERIOR RENDERING 2
April 2, 2024

Kaestle Boos Associates, Inc.

- CONCEPTUAL DESIGN -

a. CONCEPTUAL SITE PLAN
b. CONCEPTUAL FLOOR PLANS
c. CONCEPTUAL EXTERIOR RENDERINGS
d. CONCEPTUAL SYSTEM NARRATIVES

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CONCEPTUAL SYSTEM NARRATIVES

LANDSCAPE/CIVIL

Selective Site Demolition
Install erosion control measures and safety fencing as required. Obtain Dig-Safe authorization. Conform to requirements of local utilities for discontinuance of existing utilities, if any. Remove existing pavements, utilities, drainage systems, sewer systems and other items as noted to be removed to permit construction. Provide protection for items noted to remain. Relocate existing monuments, statues and memorial signage.

Site Clearing
Install erosion control measures as needed, to include temporary diversion trenches, silt sacks in existing catch basins on and off-site, hay bales and straw waddles and snow fence to protect wetland areas. Conform to requirements of local Conservation Commission, if any. Clear and grub any vegetation, roots or stumps. Provide protection for vegetated areas to remain, areas which are to be cleared and remain un-stabilized for more than 90 days shall be covered or planted as a means of temporary stabilization.

Earth Moving
Perform excavation, grading, filling, backfilling, compacting and preparing grades for entire project, general and trench excavation and backfill for foundation, drainage basins, compensatory storage areas, sewer system, water utilities gas and other utilities, below grade-tanks, concrete slabs-on-grade and other site improvements. Provide structural fill under footings, concrete floors and slabs, crushed stone for storm water control, construction of storm water detention facilities. Provide and install sand bedding materials for buried utilities and provide and install concrete encasement of buried utilities, as required. General and rough grading to obtain finished grades; removal of unsatisfactory soils and their replacement. Ledge, rock and boulder removal, if any.

Erosion and Sedimentation Control
Conform to requirements of local Conservation Commission, if any. Install stone entry to prevent tracking onto adjacent roadways. Contractor is responsible for filing and obtaining NPDES permit prior to the initiation of any site disturbance.

Site Improvements
Provide 40’ flag poles, granite & steel bollards for access control. All fencing is to be 4’ or 8’ high PVC coated black vinyl chain linked fence. Ornamental fence to be 4’ high industrial grade. Steel picket fence with automatic sliding cantilevered gates and controls.

Asphalt Paving
Complete preparation of sub-grade; installation and preparation of gravel base course; installation of hot-mix asphalt pavement; asphalt curbing (cape cod-type), application of pavement markings. Areas subject to heavy truck traffic, such as driveways in front of sallyport bays shall receive heavy duty pavement.

Concrete Paving
Complete the preparation of the sub-grade, installation and preparation of gravel base course, installation of cement concrete pavement, jointing and finishing. Provide as part of the site package, the painted, welded steel handicap ramp railings from park lot to front door.

Segmental Block Retaining Walls (if needed)
Prepare sub-grade, install segmental block walls, with porous back-up and sub-surface drainage.

Stone Curbs
Prepare grades and install granite curbs at parking area at all driveway flares with Center Street.

Wood Guide Rail Fences
Installation of highway quality wood rails for traffic safety and control.

Common Work Results for Utilities
Basic requirements for piping materials and methods. Contractor to install, excavate, utility pipe/ conduit installation, concrete encasement, as needed and backfilling to within 10 ft. from Building. Utility systems to be installed includes domestic water service and separate fire line more than 10 off the building face. Install gas and buried electrical and communications conduits.

Sewer System
The sewer system shall be in conformance with the Town of Burlington Department of Public Works Street Opening / Utility Connection Rules & Regulations. Prior to construction, the Contractor must obtain a Utility / Street Opening Permit through the Engineering Department. Only licensed Utility Contractors will be issued a permit. Although there is an existing sewer system on site, it is assumed that a complete replacement will be required to within 10 feet of the building's foundation. A cleanout is required 10 feet from the foundation. Sewer pipe shall be 6-inch (min.) PVC SDR 35. Precast sewer manholes shall be coated with a waterproofing agent or similar. Manhole castings shall be American made and Neenah Foundry R-1720, East Jordan Iron Works 00211211 (frame) and 00211044CO1 (cover), or approved equal. Prior to operation, the Contractor shall dewater and test the sewer (pipe and manholes) for leakage in accordance with the Rules & Regulations.

Site Utilities
The domestic and fire protection water services shall be in conformance with the Town of Burlington Department of Public Works Street Opening / Utility Connection Rules & Regulations. Prior to construction, the Contractor must obtain a Utility / Street Opening Permit through the Engineering Department. Only licensed Utility Contractors will be issued a permit. Although there is an existing water system on site, it is assumed that a complete replacement will be required to within 10 feet of the building's foundation. All new water services shall be 1-inch (min.) copper. A direct tap corporation adaptor (Pack Joint Coupling Ford C16-33 or approved equal) may be used to connect to the existing water main. All water service corporations, curb-stops, and fittings shall be Mueller or approved equal. The fire protection system must be protected with an approved backflow device.
Coordinate with the local gas utility company for the extension of natural gas from Main Street to the building. Provide trenching, bedding, concrete encasement and backfilling for all buried electrical, communications, CATV and related utilities.

Coordinate with Electrical and related trades. All below grade electrical and communications conduits shall be sealed to prevent water penetration.

Subsurface Soil Conditions
The USDA Natural Resources Conservation Service Web Soil Survey was reviewed for the site. The site is identified as Urban Land (602 grey, in the image below), which is most likely fill and, therefore, has a wide variety of conditions and properties, with no assumed hydrologic soil group provided. Adjacent to the site are soils classified as Paxton-Urban Land Complex, 3-15% slopes (622C blue, in the image below), with a typical soil profile of fine sandy loam and hydrologic soil group of C. Test pits are recommended to field verify the subsurface soil conditions.

Storm Water Drainage System
A new closed drainage system will be required and shall be in conformance with the Town of Burlington Department of Public Works Street Opening / Utility Connection Rules & Regulations. The system will include precast concrete catchment structures, treatment structures, and piping. All drain lines shall be Reinforced Concrete Pipe Class IV. Catch basin castings shall be American made and Neenah Foundry 3589-A, or approved equal, and manhole castings shall be as noted in Sewer System above. Water quality treatment structures shall be Stormceptor hydrodynamic separators manufactured by Rinker Materials.

The proposed conceptual design approximates an additional 17,000(+/-) square feet of impervious area that must be mitigated with stormwater infiltration best management practices. Utilizing available online soil data, and absent subsurface investigations to verify actual field conditions, it is anticipated that the stormwater can be managed with surface infiltration basin(s) with precast concrete outlet device(s) that connect to the municipal system on either Center Street or Sears Street.

Roof Runoff
Roof runoff shall be collected in a subsurface perimeter piping system comprised of Sch 40 PVC pipe, with cleanouts at 100 foot intervals and at all bends, that discharges into the new closed drainage system.

Subdrainage
Install drainage system Sch 40 PVC with cleanouts at 100' intervals and at all bends. It shall be provided at the perimeter of the building and discharge to site drainage system.

Site Lighting
All site and pedestrian lighting are to be LED and dark sky compliant.

ARCHITECTURE

General
The new Burlington Police Station building is sited to face Center Street, a roadway that helps define the Town common. This presents the public 'face' of the building to the street and provides both direct access to Center Street for both the Police and primary access for the public to the Police Station. Police staff will enter the building from a the rear of the building. Staff parking is available behind the building at grade from a secured parking area with access controlled sliding gates.

The publicly accessed spaces, such as the main Lobby and Community Room, are located on the front of the building. This provides easy and efficient access for the public. Secure police functions, such as the detention area, are located at the rear of the building away from direct public view and access.

Construction Exterior
The building is two stories above grade and a partial lower level that is accessible from the two stairs and elevator. The construction type will be 2B and consist of a steel skeletal frame. The framing system allows areas of glass for daylighting and views. The exterior skin is a combination of materials: cementitious siding, PVC trim, fiberglass double hung windows and aluminum curtain wall, backed up by light gauge steel studs (office areas) and 8" cmu (detention/sallyport areas). Building envelope (exterior walls and roof) will conform to the

current State of Massachusetts stretch energy code requirements. Exterior doors and frames will be fiberglass or aluminum in curtain wall frames.

Construction Interior
Interior walls will be full height 6" metal studs at 16" o.c. with gypsum wall board on both sides. Ceilings will be suspended 2'x4' acoustical type and security 2'x4' or steel plank in the detention areas.

Roofing
Slope roofing consisting of architectural asphalt shingles on 1 layer of breathable synthetic underlayment on vented nail base composite deck consisting of 3/4" plywood on 1.5"x2"x3' max. Wood spacers @ 12" o.c. on 3-1/2" rigid polyisocynurate insulation (R-30) on separate layer of 1" rigid iso insulation on vapor retarder on sloped wood deck. All roofing will be specified for a 30 year warranty.

Interior Finishes
Interior finishes will be specified to be durable and sustainable. Paint and sealers for walls, ceilings, and floors will comply with LEED VOC limitations. Walls will be finished with durable materials like painted concrete blocks in the detention area and abuse resistant drywall throughout the office spaces. Refer to attached finishes floor plans for limits of specific finishes.

FIRE PROTECTION
The following is the Fire Protection system narrative, which defines the scope of work and capacities of the Fire Protection system, as well as, the Basis of Design.

1. **Codes**
   A. All work installed under Section 210000 shall comply with the MA Building Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. **Design Intent**
   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Fire Protection work and all items incidental thereto, including commissioning and testing.

3. **General**
   A. In accordance with the provisions of the Massachusetts General Law, a commercial building of greater than 7,500 s.f. must be protected with an automatic sprinkler system.

4. **Description**
   A. The new building will be served by a new 6- inch fire service, double check valve assembly, wet alarm valve complete with electric bell, and fire department connection meeting local thread standards.
   B. The system will be a combined standpipe/sprinkler system with control valve assemblies to limit the sprinkler area controlled to less than 52,000 s.f. as required by NFPA 13-2013. A total of four (4) sprinkler zones will be provided: Basement Level, Main Level, Detention Area, and Upper Level.

C. Control valve assemblies shall consist of a supervised shutoff valve, check valve, flow switch and test connection with drain. Standpipes meeting the requirements of NFPA 14-2013 shall be provided in the egress stairwells and in the Stage area.
D. All areas of the building, including all finished and unfinished spaces, combustible concealed spaces, all electrical rooms and closets will be sprinklered.
E. All sprinkler heads will be quick response, pendent in hung ceiling areas and upright in unfinished areas.
F. Fire department valves and cabinets will be provided in each egress stairwell.

5. Basis of Design

A. The mechanical rooms and storage rooms are considered Ordinary Hazard Group 1. Sallyport is considered Ordinary Hazard Group 2. All other areas are considered light hazard.
B. Required Design Densities:
Light Hazard Areas = 0.10 GPM over 1,500 s.f.
Ordinary Hazard Group 1 = 0.15 GPM over 1,500 s.f.
Ordinary Hazard Group 2 = 0.20 GPM over 1,500 s.f.
C. Sprinkler spacing (max.):
Light Hazard Areas = 225 s.f.
Ordinary Hazard Areas = 130 s.f.
D. A hydrant flow test must be performed to confirm the Municipal water supply capacity.

6. Double Check Valve Assembly

A. Double check valve assembly shall be MA State approved, U.L./F.M. approved, with iron body bronze mounted construction complete with supervised OS & Y gate valves and test cocks. Furnish two spare sets of gaskets and repair kits.
B. Double check valve detector assembly shall be of one of the following:
1. Watts Series 757-OSY
2. Wilkins 350A-OSY
3. Conbraco Series 4S-100
4. Or equal

7. Piping

A. Sprinkler piping 1-1/2 in. and smaller shall be ASTM A-53, Schedule 40 black steel pipe. Sprinkler/standpipe piping 2 in. and larger shall be ASTM A-135, Schedule 10 black steel pipe.

8. Fittings

A. Fittings on fire service piping, 2 in. and larger, shall be Victaulic Fire Lock Ductile Iron Fittings conforming to ASTM A-536 with integral grooved shoulder and back stop lugs and grooved ends for use with Style 009-EZ or Style 005 couplings. Branch line fittings shall be welded or shall be Victaulic 920/920N Mechanical Tees. Schedule 10 pipe shall be roll grooved. Schedule 40 pipe, where used with mechanical couplings, shall be roll grooved and shall be threaded where used with screwed fittings. Fittings for threaded piping shall be malleable iron screwed sprinkler fittings.

9. Joints

A. Threaded pipe joints shall have an approved thread compound applied on male threads only. Teflon tape shall be used for threads on sprinkler heads. Joints on piping, 2 in. and larger, shall be made up with Victaulic, or equal, Fire Lock Style 005, rigid coupling of ductile iron and pressure responsive gasket system for wet sprinkler system as recommended by manufacturer.

10. Sprinklers

A. All sprinklers to be used on this project shall be Quick Response type.
B. Furnish spare heads of each type installed located in a cabinet along with special sprinkler wrenches. The number of spares and location of cabinet shall be in complete accord with NFPA 13-2013.
C. Sprinklers shall be manufactured by Tyco, Victaulic, Viking, or equal.
D. Upright sprinkler heads in areas with no ceilings shall be Tyco Model "TY-FRB" Quick Response, upright natural brass finish heads. Include heavy duty sprinkler guards in all mechanical rooms and storage rooms.
E. Sidewall heads shall be Tyco Model "TY-FRB" Quick Response with white polyester head and escutcheon.
F. Pendent wet sprinkler heads shall be Tyco Model "TY-FRB" Quick Response recessed adjustable escutcheon, white polyester finish.
G. Concealed heads shall be Tyco Model "RFII" Quick Response concealed type, 1-1/2 inch adjustment white cover plate. In special areas, as may be noted on the Drawings, provide alternate cover plate finishes.
H. Use of flexible stainless steel hose with fittings for fire protection service that connect sprinklers to branch lines in suspended ceilings is acceptable. Flexible hoses shall be UL/FM approved and shall comply with NFPA 13 standards. Hose assemblies shall be type 304 stainless steel with minimum 1-inch true-bore internal hose diameter. Ceiling bracket shall be galvanized steel and include multi-port style self-securing integrated snap-on clip ends that attach directly to the ceiling with tamper resistant screws.

PLUMBING

The following is the Plumbing system narrative, which defines the scope of work and capacities of the Plumbing system as well as the Basis of Design.

1. Codes

A. All work installed under Section 220000 shall comply with the MA Building Code, MA Plumbing Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. Design Intent

A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Plumbing work and all items incidental thereto, including commissioning and testing.

3. General

A. The Plumbing Systems that will serve the project are cold water, hot water, tempered water, sanitary waste and vent system, garage waste system, and storm drain system.
B. The building will be serviced by Municipal water and Municipal sewer system.
C. All Plumbing in the building will conform to Accessibility Codes and to Water Conserving sections of the Plumbing Code.

4. Drainage System

A. Soil, Waste, and Vent piping system is provided to connect to all fixtures and equipment. The system runs from 10 feet outside the building and terminates with stack vents through the roof.
B. A separate Garage Waste System starting with connection to an exterior concrete gas/oil separator running through the Sallyport garage floor drains and terminating with a vent terminal through the roof. The exterior gas/oil separator shall be provided by Division 22.

C. Storm Drainage system is provided to drain all flat roofs with roof drains piped through the building to a point 10 feet outside the building.
D. Drainage system piping will be service weight cast iron piping; hub and spigot with gaskets for below grade; no hub with gaskets, bands and clamps for above grade 2 in. and larger. Waste and vent piping 1-1/2 in. and smaller will be type 'L' copper.

5. Water System

A. A new 2-inch domestic water service from the municipal water system will be provided. A meter and backflow preventer will be provided.
B. Cold water distribution main is provided. Non-freeze wall hydrants with integral back flow preventers are provided along the exterior of the building.
C. Domestic hot water heating will be provided with a tank type electric water heater; 36 kW element with 250 gallons of storage. System is to be equipped with thermostatically controlled mixing devices to control water temperature to the fixtures. A pump will re-circulate hot water from the piping system. The water temperature will be 120 deg. to serve general use fixtures.
D. Water piping will be type 'L' copper with wrot copper sweat fittings, silver solder or press-fit system. All piping will be insulated with 1 in. thick high-density fiberglass.
E. Tepid (70 deg. F – 90 deg. F) water will be provided to the emergency shower/eyewash fixtures in Science Classrooms as required by code.

6. Fixtures

A. Furnish and install all fixtures, including supports, connections, fittings, and any incidentals to make a complete installation.
B. Fixtures shall bear the manufacturer's guaranteed label trademark indicating first quality. All acid resisting enameled ware shall bear the manufacturer's symbol signifying acid resisting material.
C. Vitreous china and acid resisting enameled fixtures, including stops, supplies and traps shall be of one manufacturer by Kohler, American Standard, or Eljer, or equal. Supports shall be Zurn, Smith, Josam, or equal. All fixtures shall be white. Faucets shall be Speakman, Chicago, or equal.
D. Fixtures shall be as scheduled on drawings.
    1. Water Closet: High efficiency toilet, 1.28 gallon per flush, wall hung, vitreous china, siphon jet. Manually operated 1.28 gallon per flush-flush valve.
    2. Penal Combi Toilet: Acorn Model 1418-FA-AL/AR-2-BP-4-1.6GPF-M-PBH-SPS-SW, suicide skirt, 18" wide lav/toilet, penal fixture combination, fabricated of type 304, #14 gage Stainless steel, seamless welded construction. Fixture is supplied with domestic hot and cold water.
    3. Penal Combi ADA Toilet: Acorn Model No. 1432-ADA-AL/AR-2-DMS-4-1.6GPF-PBH-SPS-SW with rear spud, floor mounted wall outlet blowout jet stainless steel institutional water closet less grab bar, elongated bowl, integral stainless-steel seat, suicide skirt, seamless construction, complete with vandal proof mounting hardware. Fixture is supplied with domestic hot and cold water.
    4. Urinal: High efficiency 0.13 gallon per flush urinal, wall hung, vitreous china. Manually operated 0.13 gallon per flush-flush valve.
    5. Lavatory: Wall hung/countertop ADA lavatory with 0.5 GPM metering mixing faucet.
    6. Sink: MAAB/ADA stainless steel countertop sink with gooseneck faucet and 0.5 GPM aerator.
    7. Fountain: Barrier free hi-low wall mounted electric water cooler, stainless steel basin with bottle filling stations.
    8. Janitor Sink: 24 x 24 x 10 Terrazo mop receptor Stern-Williams or equal.

9. : Aquatic Bath Model 48-ACS acrylic shower stall or Aquatic Bath 6036-BSFCMA barrier free acrylic shower stall with integral soap shelf and seat. Center drain location and slip resistant, textured bottom. Symmons Safetymix shower trim, concealed pressure balanced shower valve with lever handle, integral checkstops, factory pre-set temperature limit stops, 2.5 GPM flow restrictor.
10. Detention Area Hose Bibb: Acorn Series 8109 hot and cold water hose bibb, cast bronze valve body, vacuum breaker, screw driver stops, recessed stainless steel mounting box with locking door.

7. Drains

A. Drains are cast iron, caulked outlets, nickaloy strainers, and in waterproofed areas and roofs shall have galvanized iron clamping rings with 6 lb. lead flashings to bond 9 in. in all directions. Drains shall be Smith, Zurn, Josam, or equal.

8. Valves

A. Locate all valves so as to isolate all parts of the system. Shutoff valves 3 in. and smaller shall be ball valves, solder end or screwed, Apollo, or equal.

9. Insulation

A. All water piping shall be insulated with snap-on fiberglass insulation Type ASJ-SSL, equal to Johns Manville Micro-Lok HP.

10. Cleanouts

A. Cleanouts shall be full size up to 4 in. threaded bronze plugs located as indicated on the drawings and/or where required in soil and waste pipes.

11. Access Doors

A. Furnish access doors for access to all concealed parts of the plumbing system that require accessibility. Coordinate types and locations with the Architect.

H.V.A.C

The following is the HVAC Systems narrative, which defines the proposed scope of work and capacities of the HVAC Systems, as well as the Basis of Design.

1. Codes

All work installed under Section 230000 shall comply with the Massachusetts State Building Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. Design Intent

All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Mechanical work and all items incidental thereto, including commissioning and testing.

3. Mechanical System Life Cycle Analysis

As part of the schematic design phase, a building energy model will be prepared and a life cycle cost analysis shall be performed to determine the most cost-effective HVAC system for the building in terms of overall life cycle cost that factor in first, operating, maintenance and replacement costs of different HVAC system options. The following options are proposed to be studied in comparison to Baseline Code HVAC systems.

4. Baseline (Fossil Fuel Free – Electric Heating) HVAC System

The following HVAC system represents the ASHRAE 90.1-2019 Electric Heating Baseline System consisting of the following features.

A. Air Handling Systems: Multiple air handling units shall be provided to serve the different building zones as described below. AHUs could be either roof mounted packed direct expansion (DX) electric cooling and heat pump units or indoor units equipped with split air- cooled heat pump condensing units located on the roof. All air handling units shall be equipped with supply air fans with VFDs, supplemental electric heating, DX heat pump cooling/heating sections, and MERV-14 filters. Energy recovery ventilation shall be provided for AHUs with large outdoor air requirements in which energy recovery is code required. AHUs shall be capable of variable air volume operation and shall deliver heated air-conditioned supply air (with percentage of outdoor ventilation air meeting the minimum ventilation code requirements) to the building areas via an insulated overhead galvanized sheetmetal ductwork distribution system equipped with terminal VAV (variable air volume) boxes with electric heating coils. A combination of electric resistance type radiation, radiant panels, convectors and unit heaters shall be provided for heating only areas. It is estimated that HVAC air handling equipment with the following capacities shall be required:

1) The Police Station Administration areas, Training/Meeting Room, and Office areas shall be served by air handling unit systems with a combined capacity of approximately 30,000 CFM.
2) The Processing and Cell Block area shall be provided with an energy recovery air handling unit, with an estimated capacity of 2,000 CFM.
3) The air handling units (AHUs) will be provided with MERV 14 filters, DX cooling coils, supply and exhaust fans with variable frequency drives, supplemental electric heating, and energy recovery wheels (where code required). The units will provide conditioned supply air to each space through a fiberglass-insulated galvanized sheet-metal distribution system. Return air from each space will be returned through a separate galvanized sheet-metal return air system back to the air handling units where it will be filtered, heated or air conditioned and re-circulated to the supply airstream.
4) The AHUs' supply air distribution system will consist of overhead insulated galvanized sheetmetal distribution system equipped with variable air volume terminal boxes with electric reheat coils and sound attenuators. The VAV boxes will vary the supply airflow based on the zones' temperature and ventilation requirements. CO2 demand ventilation controls shall be provided for AHU systems where code required (such as large meeting rooms with high anticipated occupant densities).

B. Sallyport:

1) The Sallyport area of the building shall be provided with electric unit heaters. The Sallyport shall be provided with a vehicle source-capture exhaust system and general exhaust air systems with gas monitoring controls.

C. Supplemental Air Conditioning Systems:

1) The IT Head End Server Room shall be equipped with a dedicated split heat pump AC system that will provide the cooling needs for the space. It is estimated that two (2) 3 ton computer room AC units shall be required to serve the IT Head End Room.
2) Elevator machine room shall be served by a 1.5 ton ductless split AC unit.

D. Exhaust Systems: Building general, custodial closets, utility room and specialty exhaust air systems shall be provided.

E. Automatic Temperature Controls (DDC): Automatic Temperature Controls will be of the low-voltage direct digital control (DDC) design for the operation of all HVAC equipment, input sensors, and valve/damper actuators. A central communication network will be provided for the monitoring of all space temperatures, system set points, and overall control for the entire HVAC system. A central front-end workstation PC will also be provided as a user interface for access to the entire automatic temperature control (ATC) system. The ATC control system shall be web accessible and shall be capable of being integrated into a Town Wide building energy management system.

5. HVAC System - Option 1 – Air Source Hydronic Heat Pump & Fan Coil Unit System

A. Summary: Under this option, an air source heat recovery chiller shall be provided, which will provide heating hot water and chilled water throughout the building. Occupied spaces shall be heated/cooled by space mounted fan coil units. Ventilation air will be provided by roof- mounted air handling units that shall be ducted to each fan coil unit through a central distribution system to deliver 100% outside air to each space. Hot water and chilled water shall be distributed by end suction pumps equipped with VFDs. Automatic temperature controls will be of the direct digital low-voltage type communicating with all HVAC equipment.

B. Heating and Cooling Plants:
   1) A modular air source heat recovery chiller plant shall be provided, which shall be capable of providing hot and chilled water simultaneously. It is estimated that the plant shall consist of six (6) 30-ton modules for a total plant load of 180 tons. One module shall be redundant. The hot and chilled water systems will include propylene glycol at a concentration of approximately 30% by weight to prevent freezing.
   2) A maximum of 130°F heating hot water will be distributed to rooftop units and terminal heating equipment throughout the building through a fiberglass-insulated steel/copper distribution system by primary and standby pad-mounted pumps equipped with variable frequency drives. The supply water temperature shall be adjusted downward based on outdoor air temperature.
   3) A backup electric boiler shall be provided, which shall operate only upon a failure of the air source heat pump chiller. It is estimated that the boiler shall be sized for 300 kW.
   4) Chilled water will be distributed to the various rooftop air handling units at 44°F (adj.) through a fiberglass insulated copper distribution system, which will include primary and standby pad-mounted circulator pumps. A compensated chilled water loop shall be provided to distribute chilled water throughout the building to the various fan coil units at 55°F through a fiberglass insulated copper distribution system. The compensated chilled water loop shall include primary and standby pad-mounted circulator pumps equipped with variable frequency drives.

C. Ventilation System:
   1) The central ventilation system will include air handling units of the 100% outside air design. The air handling units will be provided with MERV 14 filters, chilled water cooling coils with modulating control valve, hot water heating coils with modulating control valve, supply and exhaust fan with variable frequency drives, total energy recovery wheel, and a hot water re-heat coil for dehumidification reheat purposes. The units will provide ventilation air to each induction unit through a fiberglass insulated galvanized sheet-metal distribution system. 100% of the supply air to each space will be returned through a separate galvanized sheet-metal return air system back to the air handling units where it will pass through an energy recovery wheel which will transfer heat from the exhaust air stream to the outside air intake

stream for pre-heating and vice-versa for pre-cooling. It is estimated that units with the following capacities shall be required:

a. The Police Station Administration areas, Training/Meeting Room, and Office areas shall be served by a rooftop air handling unit (RTU-1) with an estimated capacity of 12,000 CFM, 391 MBH heating and 50 tons cooling.
b. The Processing and Cell Block area shall be provided with an energy recovery air handling unit, with an estimated capacity of 2,000 CFM, 55 MBH heating and 10 tons cooling.

The RTUs' supply air distribution system will consist of overhead insulated galvanized sheetmetal distribution system. Densely occupied spaces shall be provided with variable air volume (VAV) boxes with sound attenuators. The VAV boxes will vary the supply airflow based on the zones' ventilation requirements.

D. Toilet and Shower Rooms
1) Toilet areas and shower areas will be ducted to the return ductwork of the associated RTU, where it will pass through the energy recovery wheel before it is exhausted to the outdoors. Aluminum exhaust ductwork and grilles will be provided for shower areas.
2) Perimeter ceiling-mounted hot water radiant panels will provide supplemental heating.

E. Supplemental Air Conditioning Systems:
1) Under this option, Electrical Rooms and IDF/MDF/Server rooms shall be served by ducted fan coil units equipped with hot water and chilled water coils, which will provide the cooling needs for the space. It is estimated that (5) 18 MBH fan coil units shall be required to serve the Electrical rooms and Server room.
2) The elevator machine room shall be served by an 18 MBH ducted fan coil unit.

F. Exhaust Systems: Exhaust air fans systems shall be provided for custodial closets, locker room, toilet room, utility room and specialty exhaust air systems. A commercial kitchen exhaust air fan system shall be provided for the kitchen.

G. Sallyport:
1) The Sallyport area of the building shall be provided with hot water unit heaters. The Sallyport shall be provided with a vehicle source-capture exhaust system and general exhaust air systems with gas monitoring controls.

H. Automatic Temperature Controls (DDC): Automatic Temperature Controls will be of the low-voltage direct digital control (DDC) design for the operation of all HVAC equipment, input sensors, and valve/damper actuators. A central communication network will be provided for the monitoring of all space temperatures, system set points, and overall control for the entire HVAC system. A central front-end workstation PC will also be provided as a user interface for access to the entire automatic temperature control (ATC) system. The ATC control system shall be web accessible and shall be capable of being integrated into a Town Wide building energy management system.

6. HVAC System Option 2 – Air Source VRF (Variable Refrigerant Flow) System

A. Summary:
1) Under this option, a high-efficiency Air Source Variable Refrigerant Flow (VRF) heat recovery system shall provide simultaneous heating and cooling capabilities to all regularly

occupied spaces via a combination of ducted, ductless wall and/or ductless ceiling cassette type VRF terminal heating and cooling units. Air conditioning will be generated by outdoor roof or grade mounted heat recovery type air source heat pump condensing units that shall be connected to the VRF indoor heating and cooling units. The outdoor VRF heat pump condensing units will be sized and located according to terminal equipment zones capacity requirements and VRF system piping length limitations.

2) It is estimated that a combined total capacity for the outdoor air-cooled heat recovery heat pump condensing unit shall be approximately 80 tons to serve the terminal indoor VRF units.
3) Ventilation shall be provided to building areas via dedicated outdoor air systems (DOAS) air handling units as described below. Rooftop air handling units shall be provided with packaged heat pump units heating/cooling section.
4) Heating for entryways, stairwells and storage rooms will be generated by a combination of electric resistance type unit heaters, radiant panels and fin tube radiation.

B. Ventilation System: The ventilation system shall include rooftop air handling units of the 100% outside air dedicated outdoor air system (DOAS) design. The DOAS units shall be provided with MERV 14 filters, packaged heat pump cooling/heating coil, supply and exhaust fans with variable frequency drives or EC motors, supplemental electric heating coils, total energy recovery wheel, and hot gas re-heat coil for dehumidification reheat. The DOAS units shall provide ventilation air to each occupied building area through a fiberglass insulated galvanized sheet-metal distribution system. Airflow from each space will be returned through a separate galvanized sheet-metal return air system back to the air handling units where it will pass through an energy recovery wheel which will transfer heat from the exhaust air stream to the outside air intake stream for preheating or vice-versa for pre- cooling. Densely occupied spaces such as the training room shall be provided with variable air volume terminal boxes equipped with CO2 demand ventilation controls that will control the amount of ventilation airflow to the space. The units will operate at reduced capacity during the unoccupied periods if unoccupied space set points are not maintained. It is estimated that units with the following capacities shall be required:
   1) The Police Station Administration areas, Training/Meeting Room, and Office areas shall be served by a rooftop air handling unit (RTU-1) with an estimated capacity of 12,000 CFM, 391 MBH heating and 50 tons cooling.
   2) The Processing and Cell Block area shall be provided with an energy recovery air handling unit, with an estimated capacity of 2,000 CFM, 55 MBH heating and 10 tons cooling.

The RTUs' supply air distribution system will consist of overhead insulated galvanized sheetmetal distribution system. Densely occupied spaces shall be provided with variable air volume (VAV) boxes with sound attenuators. The VAV boxes will vary the supply airflow based on the zones' ventilation requirements.

C. Locker, Toilet, Shower Rooms:
   1) Toilet areas and shower areas will be ducted to the return ductwork of the associated RTU, where it will pass through the energy recovery wheel before it is exhausted to the outdoors. Aluminum exhaust ductwork and grilles will be provided for shower areas.
   2) Perimeter ceiling-mounted electric radiant panels will provide supplemental heating.

D. Supplemental Air Conditioning Systems:
   1) Under this option, Electrical Rooms and IDF/MDF/Server rooms shall be served by dedicated ductless split AC systems which will provide the cooling needs for the space. It is estimated that (5) 18 MBH DCUs shall be required to serve the Electrical rooms and Server room.
   2) The elevator machine room shall be served by an 18 MBH ductless split AC system.

E. Exhaust Systems: Exhaust air fans systems shall be provided for custodial closets, utility room and specialty exhaust air systems. A commercial kitchen exhaust air fan system shall be provided for the kitchen.

F. Sallyport:
   1) The Sallyport area of the building shall be provided with VRF evaporators to provide heating. The Sallyport shall be provided with a vehicle source-capture exhaust system and general exhaust air systems with gas monitoring controls.

G. Automatic Temperature Controls (DDC): Automatic Temperature Controls will be of the low-voltage direct digital control (DDC) design for the operation of all HVAC equipment, input sensors, and valve/damper actuators. A central communication network will be provided for the monitoring of all space temperatures, system set points, and overall control for the entire HVAC system. A central front-end workstation PC will also be provided as a user interface for access to the entire automatic temperature control (ATC) system. The ATC control system shall be web accessible and shall be capable of being integrated into a Town Wide building energy management system.

7. HVAC System – Option 3 – Ground Source VRF System

Summary: The building HVAC distribution system for this option shall be similar to Option 2 VRF system, with the following differences:

A. Heating and Cooling Plant: The Option 2 high efficiency air source outdoor heat pump condenser units described above shall be replaced with groundwater source cooled heat recovery heat pump equipment.

B. Groundwater source heat pump heating/cooling rooftop units shall be provided in lieu of the air source heat pump rooftop units described above.

C. The air source heat recovery VRF condensing units described above shall be replaced by groundwater source heat recovery condensing units of the same capacity. Ground water shall be distributed between the wellfield and water source VRF heat pump units, and refrigerant piping shall be distributed between the water source VRF heat pumps and the indoor VRF air handling equipment.

D. A groundwater source heat pump water heater shall be added, which will provide heating hot water to radiant panels, unit heaters, and the hot water radiant floor heating system.

E. All electric resistance heating equipment described in option 2 shall be replaced with heating hot water equipment (radiant panels, radiant floor heating in Apparatus bay, unit heaters, etc.)

F. Ground source water shall be distributed to the RTUs, the groundwater source heat pump water heater, and VRF heat pump equipment from a closed loop geothermal well field. Ground source water shall be distributed to the equipment via a (2) groundwater pumps system piped in a primary/standby configuration. All pumps shall be equipped with variable speed drives or EC motors. Ground water source side hydronic accessories including expansion tank, filter and an air separator shall be provided. The equipment shall be located in a mechanical room located on the first floor level.

G. The ground source well field shall consist of approximately twenty-five (25) 650 ft deep vertical close loop wells constructed of quad-loop HDPX piping. Lateral piping shall be constructed of HDPE piping. Each well shall require a capacity of approximately 4 tons each. Well field quantity and depths are estimates only. Actual well field quantity, depth and capacity of wells shall be determined by Ground Source Wellfield Consultant.

8. Testing, Adjustment, and Balancing Requirements

A. The mechanical contractor shall provide testing of the following systems with the owner and owner's representative present:
   1) Air Source or Geothermal plant system
   2) Geothermal, Air Source, or VRF heat pump condensing unit plant system
   3) Hot water booster heat exchanger system
   4) Indoor Air Handling Units
   5) Terminal heating and cooling devices
   6) Automatic temperature control and building energy management system

B. Testing reports shall be submitted to the engineer for review and approval before providing to the owner.

9. Operation Manuals and Maintenance Manuals

When the project is completed, the mechanical contractor shall provide operation and maintenance manuals to the owner.

10. Record Drawings and Control Documents

When the project is completed, an as-built set of drawings, showing all mechanical system requirements from the contract and addendum items will be provided to the owner.

11. Commissioning

The project shall be commissioned per the project Commissioning Agent's (CxA) specifications.

ELECTRICAL

The following is the Electrical Systems narrative, which defines the scope of work and capacities of the Power and Lighting systems, as well as the Basis of Design.

1. Codes

All work installed under Section 26 00 00 shall comply with the Massachusetts State Building Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. Design Intent

All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Electrical work and all items incidental thereto, including commissioning and testing.

Energy Efficiency: Lighting system shall be designed and installed in accordance with IECC 2020 requirements.

A. Power Distribution:

1) Electrical power will be brought into the site via underground medium voltage cables from the utility company network. A pad mounted step-down transformer will be located at grade adjacent to the building. Service entrance and distribution switchgear will be located in the electrical room along with lighting and power distribution panels. The service capacity will be sized for 1,000 amperes at 277/480V, 3Ø, 4 wire.
2) A 450kW, 562.5kVA, 277/480V, 3Ø, 4W diesel fired emergency generator will be provided and include automatic starting and safety controls. The unit will be housed outdoors on a concrete pad. The generator will include three (3) service breakers: one (1) for life safety equipment, one (1) for optional standby equipment, and one (1) for the load bank.
3) The generator will be sized for 100% of all lighting and power loads, including air conditioning and heating.
4) The emergency power distribution system will consist of two automatic transfer switches, one 100 ampere for life safety equipment and one 1000 ampere for optional stand-by systems. A separate system of distribution panels and conduit systems will be provided for each level of emergency power as required by code. A kirk key interlock system will be provided for a roll up back-up generator. A manual transfer switch with kirk key interlock will also be provided for a temporary roll up generator on the life safety system for maintenance of the permanent generator.
5) A centralized uninterruptible power supply (UPS) sized at 15 KVA with 8 minutes of battery back-up will be located in the Head End Room and will back up all critical communications equipment including dispatch and report writing receptacles.

B. Interior Lighting System:

1) General Offices and Meeting Room lighting fixtures will consist of recessed 2'x4' LED luminaries with dimming drivers. The fixtures will be wired for automatic dimming where natural day light is available and also for multi-level switching.
2) Corridors and other functional lighting fixtures will consist of acrylic recessed direct fixtures with LED lamps and electronic drivers.
3) Lighting in Cells will be vandal proof fixtures corner mounted LED. Each Cell will be separately switched. Selected fixtures in Cell areas will have integral emergency ballasts for instant lighting upon power failure.
4) Lighting in the Communications Dispatch Center will be indirect dimmable LED with consideration of LED dimmable down lights over each position.
5) Storage, mechanical, apparatus, etc. will be LED industrial fixtures with acrylic lens.
6) Exit signs will be of the energy efficient, long life LED type.
7) All fixtures will be dimmable LED type.
8) Each area will be locally switched and designed for multi-level controls. Each office space and toilet rooms will have an occupancy sensor to turn lights off when unoccupied. Daylight dimming sensors will be installed in each space with daylight contribution for automatic dimming of light fixtures.
9) The entire facility will be controlled with an automatic lighting control system for programming lights on & off.

C. Site Lighting System:

1) Fixtures for area lighting will be pole mounted LED luminaries in the parking area. The exterior lighting will be connected to the automatic lighting control system for photocell on and timed off operation.
2) Building perimeter fixtures will be wall mounted LED sconces over exterior doors.
3) All fixtures will be of the cut-off type.

D. Lighting Controls:

1) Interior lighting will be controlled by a networked lighting control system (NLCS) utilizing distributed load controllers (switching and dimming) actuated by signals from occupancy/vacancy sensors, daylight sensors, keypads, touchscreens, and auxiliary override inputs from the fire alarm, security, building management (BMS), and emergency power systems; BACnet/IP or contact closure output interfaces will be utilized from each system. Timed schedules following daily facility schedules with overrides will be employed for initial control of all common areas. Lighting will be fed from normal or life safety source panels; refer to item C below.
2) Exterior lighting will be controlled by a networked lighting control system (NLCS) utilizing distributed load controllers or centralized panels (switching+dimming) actuated by signals from occupancy sensors, daylight sensors, keypads, touchscreens, and auxiliary override inputs from the fire alarm, security, building management, and emergency power systems; BACnet/IP or contact closure output interfaces will be utilized from each system. Pole-mounted area lighting will be provided with wireless load controller nodes integrated into each fixture allowing for individual or zoned control. Timed control following dusk-to-dawn schedules with overrides will be employed for initial control of all exterior lighting. Lighting will be fed from normal or life safety source panels; refer to item C below.
3) Designated emergency and egress lighting will be wired to life safety source panels and be controlled by the NLCS when normal utility source power is available and brought to full “ON” through system control UL924 listed by-pass functions when normal utility source power is lost. Emergency exit signage shall be uncontrolled and remain “ON” constantly.

E. Wiring Devices:

1) Offices will generally have one (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.
2) Corridors will have a cleaning receptacle at approximately 30-40 foot intervals.
3) Exterior weatherproof receptacles will be installed at exterior doors.
4) A system of computer grade panelboards will double neutrals and surge protective devices will be provided for receptacle circuits.
5) A system of computer grade panelboards with double neutrals and transient voltage surge suppressors will be provided for receptacle circuits.
6) Receptacles in Garage and Sallyport spaces will be GFI type weatherproof covers mounted at 48 inches above floor.
7) Automatic control of receptacles based on occupancy will be provided for at least 50% of the receptacles installed in private offices, open offices, conference rooms, rooms used

primarily for printing and/or copying functions, break rooms, and individual workstations. Controlled receptacles will be marked per NEC 406.3 (E).

F. Fire Alarm System:

1) A fire alarm and detection system will be provided with 60 hour battery back-up. The system will be of the addressable type, where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms.
2) Smoke detectors will be provided in open areas, corridors, stairwells and other egress ways. Elevator recall will be provided.
3) The sprinkler system will be supervised for water flow and tampering with valves.
4) Horn/strobes will be provided in egress ways, assembly spaces, open areas and other large spaces. Strobe only units will be provided in single toilets and conference rooms.
5) Manual pull stations will be provided at exit discharge personnel doors.
6) The system will be connected to automatically report alarms to the fire department.

G. Distributed Antennae System (DAS):

1) A public safety radio distributed antenna system (DAS) which consists of bi-directional amplifiers (BDA), donor antennas, coverage antennas, coax cable, coax connectors, splitters, combiners and couplers. These devices will be used as part of a system for in-building public safety 2-way radio system communication.

H. Renewable Energy System Provisions:

1) The base project will include Electrical provisions for a roof mounted renewable energy system for a grid connected photovoltaic PV system intended to reduce the facilities demand for power.

I. Level 2 AC Dual Electric Vehicle Charging Equipment (EVSE):

1) Provide three (3) EVSE stations fed with 40 ampere feeders back to the building for charging electric vehicles. Two protective bollards will be installed at each charging station. In addition to the (3) stations, 10% of parking spaces shall be EVSE ready which is defined as a 40 Amper circuit to within 6’ of the charger.

J. Metering:

1) Measurement devices shall be installed to monitor the electrical energy use for each of the following separately:
    a. Total electrical energy
    b. Sub-metering in accordance with ASHRAE 90.1 para. 8.4.3

2) Recording and Reporting:
    a. The electrical energy usage for all loads listed above shall be recorded a minimum of every 15 minutes and reported at least hourly, daily, monthly, and annually. The system shall be capable of maintaining all data collected for a minimum of 36 months.

K. Lightning Protection System:

1) A system of lightning protection devices will be provided.
2) The lightning protection equipment will include air terminals, conductors, conduits, fasteners, connectors and ground rods.
3) The lightning protection system will be provided with a UL master label certificate.

3. Testing Requirements

A. The Electrical Contractor shall provide testing of the following systems with the Owner and Owner's Representative present:

1) Lighting and power panels for correct phase balance.
2) Emergency generator.
3) Lighting control system (interior and exterior).
4) Distributed Antennae System.
5) Fire alarm system.
6) Lightning Protection System.
7) Uninterruptible Power System, UPS.

B. Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

4. Operation Manuals and Maintenance Manuals

A. When the project is complete, the Electrical Contractor shall provide operation and maintenance manuals to the Owner. Final affidavits will not be issued until Operation and Maintenance Manuals are issued.

5. Record Drawings and Control Documents

A. When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items will be provided to the Owner.

SECURITY

A. Purpose

The purpose of this document is to define specific security, access control and surveillance requirements for the exterior and interior of the proposed Burlington Police Department. These requirements should be aligned with the existing Burlington Police Department standards.

B. Site Perimeter

Fencing

Perimeter fencing around the police station will encompass the entire site with vehicle control barriers to designate public and private areas of the site. A radio-frequency identification RFID system will be utilized to control the vehicular gate operators to allow private parking of patrol and personal vehicles.

Surveillance

Perimeter surveillance will include high resolution, lowlight and infrared fixed cameras, including 180 and 360 degree cameras in concert with video analytics, including motion detection, to establish a virtual perimeter and monitor activity within the site. Surveillance will be used to cover

the vehicular entrances of the site, visitor and employee parking areas, main and exit only doors. Cameras will be aesthetically mounted to light poles, if required, and the facility, where permitted, in order to provide maximum coverage of the perimeter. All exterior building cameras will be power over Ethernet (PoE), specified for the environment in which they are located and will include lightening and surge protection. All PoE power supplies will be on UPS and emergency power. Pole mounted cameras, if required, will be powered from independent 120VAC power supplies mounted in a NEMA enclosure at the base of the pole.

The benefit of utilizing a PoE solution not only supplies low voltage power rather than high voltage power to these devices, but more importantly provides the means to control power to the device. Central control of the PoE devices allows for devices to be turned on or off based on a predetermined schedule, a sensor, or an event, such as motion detection. The result can be reduced consumption of power to devices, reduced power usage and a greener building. In addition, PoE reduces the use of materials, eliminating the need to provide a power cable to the device.

C. Building Perimeter

The proposed facility has entry doors for visitors and employees, all of which will be controlled by a card reader, door position switch(es) and monitored by surveillance both on the interior and exterior. The visitor entry door and Prisoner Release, will include two-way audio and video communication with dispatch through the use of a video intercom system whereby a visitor would request access into the facility if the exterior door is locked and secure. Master intercom stations, mounted at the desks inside the Dispatch, will be programmed with the functionality to electronically unlock the door exterior if access is granted.

All exterior doors not used for normal entry, but for emergency egress only, will be equipped with hardware only on the interior side of the door, door position switches and audible alarms. Alarms will be generated for unauthorized access and can be silent alarms, generated only on the access control workstation, and/or audible alarms for local annunciation.

D. Building Interior

Access Control

All controlled and monitored doors will communicate with access control panels mounted in a climate-controlled room inside the facility. This location will also house the PoE switches that power the cameras and the video management system server. These panels will transmit the access control data to an access control system, controlled through a workstation, located in Dispatch and, if required, other locations in the facility. The system will have the capability to receive and acknowledge various types of facility alarm conditions to include door-propped-open and door-forced open. For ease in identifying the locations of alarms, all events will be displayed on a facility map indicating the specific location and type of alarm.

Through the access control system and associated door controlling equipment, Dispatch will have the capability to unlock electronically controlled doors as well as lockdown the facility, rendering all card access doors only to be operated by pre-authorized credentials. These panels will also include a fire alarm module to support a connection with the fire alarm system.

The access control system database will be linked to the human resource database, which will

allow new employee data to be passed to the system for pre-population of card holder data, which will allow personnel to quickly create a new access control credentials. Access control credentials will be produced with badging software within, or integrated with, the access control system and allow for multi-colored badges with a photograph and permit full user design of style, logo, fonts and data placement. The system will be part of, or integrated with, the access control system in order to permit tracking of individual badge usage, activation/deactivation of badges at any time or based upon user defined rule sets, and provide both standard and custom reporting capability.

Single authentication card access will be employed at the following locations (see diagram for specific locations and in/out readers):

A. Vestibules
B. Interview Rooms
C. Dispatch
D. IT Storage
E. Testing Area
F. Network Room
G. Lt. Office
H. Workspaces
I. Union
J. Lt. Office
K. Chief
L. Captain Office
M. Deputy Chief
N. Dispatch
O. Patrol Sergeants
P. Patrol Admin
Q. Report Writing
R. Weapons Cleaning
S. Elevator
T. Training Unit
U. Traffic
V. Detail Officer
W. Crime Analyst's Office
X. Training Unit Office
Y. IT Director Office
Z. Stairwells
AA. Union
BB. Admin Assistant
CC. Prisoner Release
DD. Bondsman
EE. Matron
FF. Ready Room
GG. Processing/ Detention
HH. Archives
II. Building Services
JJ. Facilities Management
KK. Meeting
LL. Evidence Lab
MM. Evidence Storage
NN. Records
OO. Mental Health
PP. Mechanical
QQ. Shooting Range
RR. Simulation
SS. Wellness
TT. Supervisor Office
UU. Video Evidence Evaluation
VV. Evidence Detective and Court Officer
WW. Criminal Detectives
XX. Det. Lt. Office
YY. Det. Sergeant Office
ZZ. Captain Office

Dual authentication card access will be employed at the following locations (see diagram for specific locations and in/out readers):

A. Armory
B. Meeting/Kitchenette
C. Interview
D. Sallyport
E. Detention

Video Management System
The video management system will be capable of recording and storing all video, including the exterior cameras, for a minimum of 30 days at high definition resolution. The video management system will transmit video to a video management workstation located in Dispatch, and/or at alternate locations, where live viewing will be permitted of any camera image. All cameras will be capable of transmitting in color and exterior cameras will have low light capability where needed (based upon lighting design and configuration). Software for motion based as well as object based and/or forensic video detection will be used in order to provide discrimination of unwanted versus normal events. Interior cameras will be powered via PoE.

Surveillance cameras will be vandal resistant, include infrared illumination and employed at entry doors from the exterior and interior doors leading from public spaces into private spaces. Cell cameras will be vandal resistant, anti-ligature and will utilize audio analytics to trigger an alarm when a decibel threshold is exceeded. Interview Room cameras will have visibility of the rooms' door and include an integrated microphone for audio recording. Interview Room cameras will require recording at 30 frames per second for matching up seamlessly with the recorded audio. All other cameras will require a maximum of 15 frames per second.

Electronic Control Equipment
Each desk in Dispatch will have a workstation for the access control system and the video management system, a master video intercom, lockdown button and duress button. Each desk will also include a door controller keypad with override buttons for the Sallyport overhead doors, Cell Doors, Lobby doors and other doors requiring electronic override. Although functionality through the access control system can be used for this purpose, a programmed keypad will allow easy access to override typically overridden doors. Additionally, an area in Dispatch will be used to badge employees and will include the badging camera and ID printer.

At the front in Dispatch, large screen monitors will continuously run video feeds from the interior and exterior cameras as well as live television, including local news and weather. These monitors will be in addition to the workstations and monitors at each Dispatch desk that will be used to enlarge single views and review transactions from the access control system.

Speakers and Volume Control
IP speakers will be distributed throughout the facility for integration into the radio system amplifier. Audio control of these speakers will be provided in specific offices and conference rooms. See attached diagrams for speaker locations and areas with volume control.

Two-Way Intercom Communication
Each cell will include audio only communication with Dispatch through master intercom stations. The cell intercoms will be recessed in the wall, anti-ligature and vandal resistant.

E. Infrastructure
Below are the various power, network and conduit requirements for the access control and video assessment systems:

Network:

A. A network connection would be required for each access control panel location. This is typically in the form of a network jack located within the security equipment enclosure.
B. Category cabling will be required for each camera, routed back to a network switch inside a secure closet.
C. Two network connections would be required for each video server recorder; the final configuration for recorders will vary depending on the number of cameras. For most designs, a network switch is installed in one or more of the security equipment racks for the purpose of connecting video servers and mass storage devices.
D. Coordination of IT elements such as data drops, IP addresses and VLAN configuration, if desired, will be conducted well in advance of system deployment and will be closely monitored throughout the system installation.
E. A network connection would be required for each access control, video management, and visitor management workstation.
F. Rack mounted equipment will be installed in a 7 foot server cabinet with locking system.

Power and Fire Alarm:

Power for security devices, as outlined below, should not be shared with any circuit supplying non-security related equipment.

A. Provide one 120VAC 20 Amp UPS circuit and Fire Alarm connection for each access control panel location.
B. Provide one 120VAC 20 Amp UPS circuit for each door to receive an electrified panic hardware device. This circuit may be shared with other security devices.
C. Provide one 120VAC 20 Amp UPS circuit and Fire Alarm connection for each door to receive any type of delayed egress device. This circuit may be shared with other security devices.
D. Provide one 120VAC 20 Amp UPS circuit and Fire Alarm connection for each set of interlocked controlled doors. This circuit may be shared with other security devices.
E. Provide 120VAC UPS power for each pole mounted exterior camera. This circuit may be shared with other security devices.
F. Five 120VAC 20 amp UPS circuits would be required for the security desk.
G. Six 120VAC 20 amp UPS circuits would be required to support the security desk monitors.
H. A rack mounted managed Uninterruptible Power Supply (UPS) with have adequate power to support at least 4 hours of outage in the event of a power loss for all rack-mounted equipment.

Conduit:

A. One 1” conduit would be required for each card reader location. Conduit should be run from the card reader location to the nearest IT closet or cable tray.
B. One ¾” conduit would be required for the following devices and would be run to the nearest IT closet or cable tray:
    1. Video assessment camera
    2. Monitored doors without a card reader
    3. Intercom

TECHNOLOGY

The following is the Technology system narrative which defines scope of work, as well as, basis of design:

1. The Technology system design at Burlington Police Station is designed with Category 6A cable and intended for 10G bps to the workstation. The voice wiring will be capable of VOIP.

2. Technology Components:

Installation and integration of multiple technology components are as follows:

A. Cabling for Voice, Data, and Video Technologies
B. Data Electronics for LAN/WAN Data Infrastructure (not included as part of scope)
C. Data Electronics for Internet Access (not included as part of scope)
D. Data Network Computer Hardware (not included as part of scope)
E. Data Network Software (not included as part of scope)
F. Computer Peripherals (not included as part of scope)

3. Data System:

The data system is designed for a 10 Gig Ethernet (Category 6A cable) with 10G Base-T connection to the workstation. The high-speed data transmission will allow users to retrieve data from the internet and local area network almost instantly. The data system has been designed for users to accomplish:

A. Internet access through a wireless Ian and hard-wired data drops.
B. Applications for word processing, spreadsheet, and alike through a central applications server.
C. Printing of documents from any user computer connected to network printers.
D. Wireless access for employees at the facility.

4. Telephone System:

The telephone system will utilize Category 6A cable similar to the data system. The infrastructure will be designed to accommodate Voice-Over-IP.

5. Cable-TV System:

The Cable-TV system will comprise of a coaxial cable drops at each location. The system will be bi-directional type, which allows for both receiving and transmitting broadband signals.

6. Sound System:

The facility will have a paging/sound system. The system will have inputs from the phone system and paging module.

The paging system will be provided with eight (8) zones.

Volume controls will be provided in private office areas.

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Conceptual Structural Narrative

TO:	Kevin Witzell, MCPPO (Kaestle Boos Associate Inc.)
FROM:	Kevin Connolly, P.E. & Henok Bekele, P.E.
DATE:	02/29/2024
SUBJECT:	Schematic Structural Design Narrative for Burlington Police Department

Introduction:

The Burlington Police Department's new headquarter will be situated at 45 Center Street, Burlington, Massachusetts, bordered by Center Street to the west and Sears Street to the north. The proposed building will be fully dedicated to accommodating the Police Department's operations, spanning approximately 16,000 square feet. Comprising two stories with a gabled roof and a basement level, the structure features a sallyport on its eastern side. Two stairwells, positioned at the north and south ends, provide access to the building. In addition, the building has a single elevator that extends from the basement floor to the second-floor level.

The basement floor hosts various facilities including a mechanical room, shooting range, wellness room, simulation room, storage areas, circulation spaces, and other shared amenities. On the first floor, there are meeting rooms, additional storage areas, offices, locker rooms, circulation spaces, and other shared spaces. The second floor encompasses offices, conference rooms, circulation spaces, and other shared amenities. Adjacent to the building, external parking lots are situated on the east and north sides, providing parking space.

Structural System:

Given the building type, size, and economic considerations, the most appropriate structural solution comprises a combination of steel framing for the above-grade portions and cast-in-place concrete for the below-grade levels. For the proposed structure, steel-framed superstructure offers better performance, cost, and expedited construction timelines. For the below-grade level, a cast-in-place concrete structure provides a suitable option, offering durability, performance, and watertightness. Reinforced concrete sub-structure provides a robust foundation wall and basement structure capable

of withstanding various environmental factors and supporting the weight of the above-grade portions effectively.

Lateral Force Resisting System:

The structure's vertical lateral force resisting system will be designed to withstand both seismic and wind forces by providing a combination of braced frames and moment frames in each direction. According to the 780 CMR 10th edition, both the braced and moment frame systems can be designated and designed as "System Not Specifically Detailed for Seismic Resistance." Braced frames will typically comprise W12 or W14 columns, W16 beams, and HSS braces, with brace configurations including chevrons, X-braces or diagonal braces, chosen based on architectural considerations. Moment frames will typically consist of W12 or W14 columns and W16 or W18 beams.

The load path for lateral forces will involve the transfer of seismic and wind lateral loads through the floor diaphragm and connectors to the vertical lateral force resisting system, which will be either the braced frame or the moment frame. The first and second-floor diaphragms will be constructed from composite metal deck, comprising concrete fill on metal deck, connected to the steel framing with welded headed studs. This composite construction will create a rigid diaphragm, facilitating the transfer of lateral loads based on the stiffness of the vertical lateral resisting systems. To ensure effective composite action of the concrete metal deck, embedded conduits should not be placed in the concrete slab.

The roof diaphragm, on the other hand, will be constructed from metal deck. Due to its in-plane stiffness, the metal deck will behave as a flexible diaphragm, and lateral load transfer will be analyzed based on deformed simple beam analysis.

Gravity Force Resisting System:

The structure will support various gravity loads, including dead load, live load, snow load, vertical wind and seismic load, and equipment loads, which will be supported by a system of interconnected structural elements. These elements, including the roof metal deck, roof steel trusses, composite slab deck, steel beams, steel columns, concrete foundation walls, concrete slab-on-grade, and concrete footings, serve as integral components in the load-bearing mechanism. The gravity load path involves transferring vertical loads from the roof deck or composite deck to beams, then to columns, and further to foundation walls and footings, distributing them to the bearing soil.

Roof Construction:

The roof will be constructed as a gabled structure and will consist of 1 ½ inches x 18 gauge galvanized steel roof deck, supported by steel trusses. The truss construction will incorporate either HSS (Hollow Structural Sections), double angles, or wide flange shapes. Infill beams will be added to provide additional bracing for the trusses. In addition to the loads mandated by building codes, the design of the roof system will also consider potential future photovoltaic (PV) panels.

First Floor & Second Floor Construction:

As part of sustainable design practices, consideration will be given to the use of lightweight concrete on metal deck for the composite floor system. The composite slab deck will consist of 3 ¼'' lightweight concrete (LWC) with 6x6-W2.1xW2.1 welded wire fabric placed on 3''x18 gauge metal deck, totaling 6 ¼'' in thickness, spanning between wide flange steel beams. Beam spacing will be determined to prevent the need for shoring of the composite deck. The floor beams will be wide flange shape with typical spacing at 8 ft center to center. Columns will typically consist of W10 or HSS tubes. To ensure composite action between the floor concrete deck and supporting beams, ¾'' diameter x 4'' welded head stud shear connectors will be employed.

Basement Floor Construction:

The basement slab-on-grade will typically be constructed with a 6-inch-thick cast-in-place concrete, reinforced with 6x6-W4.0X4.0 welded wire fabric. The final size and type of the slab-on-grade will be determined upon receipt of the geotechnical investigation report. Below the slab, there will be a polyethylene vapor barrier, rigid insulation, and a minimum of 12 inches of compacted crushed stone bedding for drainage. Isolation joints will be incorporated at slab-to-wall and column joints, as well as at intervals of no more than 20 feet along the slab length.

Along the perimeter of the basement floor, a 16-inch concrete foundation wall will be constructed to provide support against earth and hydrostatic pressure. The design of the foundation wall will use the coefficient of at-rest soil pressure, assuming pin support at the first-floor level.

The requirement for a foundation drainage system and/or waterproofing depends on factors such as site grading and groundwater levels. This determination will be made following the geotechnical investigation report.

Foundations:

At the time of preparing this report, the geotechnical analysis of the area is not available. Typically, the foundation wall will be supported on a continuous reinforced concrete footing. Additionally, it is anticipated that steel columns will be supported by shallow reinforced concrete isolated footings. Strap footings will be employed at the foundation of braced columns, where strap beams will connect the two columns. The specific type and dimensions of the foundation will be determined based on recommendations from the geotechnical report. All information provided herein should be regarded as assumptions until the geotechnical analysis is available.

Steel Connections:

Structural connections will encompass typical double angle shear connections, shear plate connections, moment connections, and bearing connections. These connections will utilize bolts and welding for their assembly. The design of the connections will be delegated items.

Seismic Expansion Joint:

The proposed building is anticipated not to require a seismic expansion joint. However, the final decision on whether one is necessary will follow a comprehensive lateral evaluation of the building.

Special Structural Considerations:

Per ASCE 7-16, the seismic evaluation of the proposed building involves consideration of horizontal structural irregularity due to the angled L-shaped configuration of the proposed building. Moreover, the seismic evaluation will consider vertical structural irregularity due to the proposed building setbacks where certain sections of the building do not have second floor level.

Sustainable Design Considerations:

Light weight concrete on metal deck will be considered as part of sustainable design considerations.

Exterior Walls:

Per architectural considerations, the exterior skin will be a combination of materials including brick, metal panels and aluminum curtain wall, backed up by light gauge steel studs at office areas and 8" cmu at detention/sallyport areas. To support brick veneer, continuous hot dipped galvanized steel relieving angles may be provided at second floor level.

Structural Design Applicable Building Codes and Standards:

The structural analysis and design of the proposed building will be based on the following building codes and standards:

- IBC 2021 "International Building Code"
- 780 CMR "Massachusetts Amendments, 10th Edition"
- ASCE 7-16 "Minimum Design Loads for Buildings and Other Structures"
- AISC 360-16 "American Institute of Steel Construction"
- ACI 318-14 "Building Code Requirements for Structural Concrete"
- TMS 402/602-16 "Building Code Requirements & Specification for Masonry Structures"
- AWS D1.1/D1.1M "Structural Welding Code - Steel"
- SDI "Steel Deck Institute – Latest Edition"

Design Load Criteria

- Building Occupancy: Police department
- Building Risk Category: IV

Gravity Loads:

- Dead Loads:
  - Actual Weight of Building Components
  - Floor Hung Ceiling/Mech./Misc/Finishes: 15 psf
  - Roof Hung Ceiling/Mech./Misc./Finishes: 20 psf
  - Future Photovoltaic (PV) Panel: 8 psf

- Perimeter Façade Load: 25 psf

- Uniformly distributed Live Loads:
  - Office Plus Partition: 65 psf
  - Assembly Areas, First Floor Corridor, Stairs: 100 psf
  - Second Floor Corridor: 80 psf
  - Mechanical Areas, Storage: 150 psf
  - Roof: 20 psf
- Unbalanced Live Loading

  Unbalanced live loading criteria shall be applied in situations where such loading results in greater demands on members or connections compared to balanced load conditions.
- Live Load Reduction

  Live load reduction will be considered per ASCE 7-16 requirements.
- Concentrated Live Loads

  Floors will be designed to accommodate either the uniformly distributed live loads specified or the concentrated loads listed below, whichever results in higher stress levels. The concentrated load will be positioned to generate the maximum stress condition in the structural members.
  - Stair treads: 300 lbs
  - Office: 2000 lbs
  - Guardrails, Handrails & Parapets: 200 lbs vertically or horizontally

  For actual conditions generating concentrated loads exceeding those tabulated above, the structural components must be designed to withstand the higher loads.
- Impact Load

  Impact loads will be accounted for by increasing the elevator load in accordance with the manufacturer's recommendations. Additionally, any mechanical equipment subject to vibration will have its load increased based on manufacturer guidelines for impact.
- Snow Load:
  - Ground Snow Load, Pg: 50 psf
  - Min. Flat Roof Snow Load, Pf: 30 psf
  - Snow drift resulting from building setbacks and changes in geometry will be calculated and incorporated into the design process.

Lateral Loads:

- Wind Load:
  - Design Wind Speed: 131 mph
  - Minimum downward Wind pressure: 16 psf
- Seismic Load:
  - Short Period Spectral Response Acceleration, Ss: 0.314
  - 1.0 Sec. Spectral Response Acceleration, S1: 0.071
  - Site Class: D (Assumed)
  - Risk Category: IV
  - Importance Factors: 1.5
  - Sds: 0.324

- Sd1: 0.113
- Long Period, $T_{L:}$ 6
- Seismic Design Category: C
- Lateral Load Resisting System: Combination of Steel Bracing & Moment Frames which will be designed as "Not Specifically Detailed for Seismic Resistance." Per 780 CMR.
- Response Modification Factor (R): 3.0
- System Overstrength Factor (W0): 3.0
- Deflection Amplification Factor (Cd): 3.0

- Soil Loads

  During the preparation of this report, a geotechnical investigation report was not available. Geotechnical parameters, including but not limited to lateral earth pressure coefficients, allowable soil bearing pressure, seismic soil site class, sliding soil coefficient, groundwater level, and frost depth, will be obtained from a geotechnical investigation of the proposed building area.

Load combinations:

Load and Resistance Factor Design (LRFD):

The strength design of the structures will adhere to the LRFD load combinations specified by either IBC 2021 or ASCE 7-16. The structural strength will be determined based on the appropriate critical combination of factored loads.

Allowable Service Design (ASD):

The serviceability requirements of the structural elements will be determined based on the critical ASD (Allowable Stress Design) load combination specified by either IBC 2021 or ASCE 7-16.

Deflection Requirements:

- The maximum deflection limit requirements of the structural elements will be determined according to IBC 2021, Table 1604.3.
- The wind load deflection of the proposed building shall not exceed 1/400 of the total building height under service level wind loads for a 50-year return period event.
- Façade deflection criteria will be established in collaboration with facade consultants.

Material Specifications

- Structural Steel
  - Rolled wide flange shapes shall conform to ASTM A992, Grade 50.
  - Hollow structural tubes shall conform to ASTM A500 GR. C, minimum yield strength 46 ksi.
  - All connection materials and base plates shall conform to ASTM A572.
  - Steel plates, angles and channels shall conform to ASTM A36.
  - Anchor rods shall conform to ASTM F1554, Gr. 55, unless otherwise noted on drawings.

- Bolted connection shall conform to A325 or A490, type N bolts, except slip-critical bolts shall be used at lateral brace beam connections, and prestressed bolts shall be used at beams that support equipment vibrations.
- Headed shear stud shall conform to ASTM A108.
- All welded connections shall be made by approved certified welders and shall conform to AWS D1.1 E70XX.
- Structural steel shapes, plates and connections exposed to weather shall be hot-dipped galvanized.

- Steel Metal Deck
  - Roof deck shall be 1 ½" x 18-gauge conforming to hot-dipped galvanized ASTM A653 SS G90 with coating class G60.
  - Composite slab deck shall be 3" x 18-gauge composite metal deck conforming to ASTM A653 SS GR50 with coating class G60.

- Concrete

  All concrete shall have a minimum 28-day compressive strength as stated below:
  - Concrete slab on metal deck: 4000 psi (Light weight concrete)
  - Footings, Foundation wall, Interior Slab-On-Grade: 4000 psi (Normal weight concrete)
  - Exterior slabs, equipment pads, exterior curbs: 5000 psi (Normal weight concrete)
  - Non-shrink grout: 5000 psi
  - Portland Cement shall conform to ASTM C150, Type I or II

- Concrete Reinforcing
  - All reinforcing bars, ties and stirrups shall be ASTM A615 Grade 60 deformed bars.
  - Welded wire fabric shall conform to ASTM A185, flat sheets.
  - Reinforcing steel shall be uncoated and deformed.

- Reinforced Masonry

  The proposed building will have reinforced masonry in the detention and sallyport area. The masonry material strength shall be as follows:
  - Masonry blocks shall have a minimum of 1500 psi compressive strength.
  - Concrete masonry units shall conform to ASTM C-90 or C-145 grade N-1.
  - Mortar shall conform to ASTM C-270, type M OR S.
  - Grout shall conform to ASTM C-476 fine or coarse with a minimum compressive strength of 3000 psi.
  - Reinforcing bars shall conform to ASTM A 615 Grade 60 deformed bars. Typically, for non-bearing walls, (1) #5@24'' O.C. vertical and (2) #5@48'' O.C. horizontal will be used. All cells with reinforcement bar will be grouted.

Preliminary Opinion of Probable Construction Costs

The preliminary opinion of probable constructions costs for the proposed building is as follows:

Preliminary Cost Estimate		
Description	*Quantity*	*Notes*
Steel Framing	+/- 315 Tons	▪ Assuming 13 psf Steel * Three Levels ▪ Provide 10% Allowance for Connections, Plates, Welds, and Bolts.
Steel Beam Penetrations	Reinforced 10 Per Floor Unreinforced 5 Per Floor	Assume 75% Shop Fabricated & 25% in the Field Installed
6'' Thick Concrete Slab	6x6-W4.0XW4.0 WWF	Basement Level Area, First Floor Outside Basement Area
3 ¼'' LWC on 3''x18 Ga. Composite Deck	TBD	First Floor Area & Second Floor Area
1 ½'' X 18 Ga. Roof Deck	TBD	Gabled Roof Area
8''x12'' Concrete Curbs	+/- 4 PLF	At Base of Masonry Partitions
16''x4'-0'' Thick Concrete Grade Beam	+/- 45 PLF Rebar	
16'' Thick Concrete Foundation Wall	+/- 10 PSF Rebar	Around Perimeter of the Basement Floor. Outside Face of the Wall will have Troweled-on Bituminous Mastic
Isolated Column Concrete Footings	TBD	Typically, Footings within basement area will be Located at 12'' below top of Slab, and at a minimum of 4'-0'' Below Grade Level Outside of Basement Area.
Concrete Pilasters/Piers	TBD	At Perimeter Columns and at Columns outside of the Basement Area.
14''x 3'-0'' Cont. Concrete Footing	+/- 10 PLF	At Foundation Wall
Strap Beams	TBD	Between Footings of Braced Frame Columns
Elevator Pit Concrete Walls and Slabs	+/- 5 PSF	

Additional structural quantities that should be considered includes but not limited to the following:
Elevator Guiderail, Hoist Beam, Slab Edge Plates, SOG Vapor Barrier, Openings in Slab, Miscellaneous Metals.

- COST ESTIMATE -

a. OPINION OF PROBABLE COST

b. CONSTRUCTION COST ESTIMATE

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Burlington Police Department

Preliminary Level Opinion of Probable Cost

April 2, 2024

Description			Subtotal	Totals	Comments
CM Construction Cost					
Existing Building Demolition	35,657	sf	$357,000		
Outbuilding	2,100	sf	$840,000		
New Building	36,406	sf	$21,334,000		Preferred Air Source VRF System
	38,506	sf			
Direct Construction Cost SubTotal:				**$22,531,000**	
CM Mark-ups:					
Design Estimating Contingency	15.0%		$3,380,000		
General Conditions	9.00%		$2,332,000		
Insurance	1.40%		$395,000		
Perfomance and Payment Bond	1.00%		$286,000		
Building Permit			$0		
Builder's Risk (NIC)			$0		
Overhead & Profit	3.0%		$777,000		
Escalation (to summer 2025 Bid)	10.67%		$3,169,000		
SubTotal:				**$10,339,000**	
Owner's Construction Contingency	5%		$1,127,000		
Probable Total Construction Cost:				**$33,997,000**	
Equipment Costs					
Audio Visual Equipment	Allow.		$528,000		
Furnishings, Furniture	Allow.		$481,000		
Firing Range HVAC Equip	Allow.		$610,000		Relocated 4 lanes & add 1 new lane
Loose Equipment	Allow.		$173,000		
IT Equipment					
Network Equipment	Allow.		$135,000		
Computer Equipment	Allow.		$200,000		
Telephone Equipment	Allow.		$109,000		
Communications Equipment	Allow.		$220,000		
Communications Tower	Allow.		$139,000		
Communications Consoles (5)	Allow.		$200,000		
Security / Access Control	Allow.		$905,000		
				$3,700,000	
Equipment Contingency	5.0%		$184,900		
Total Probable Cost of Equipping:				**$3,884,900**	
Owner's Indirect Cost Contingency					
Basic A/E Fee			$3,400,000		
Basic Project Manager Fee			$1,700,000		
Reimbursables/Add Service	Allow.		$100,000		
Structural Peer Review			$18,000		
Utility Backcharges	Allow.		$50,000		
Moving	Allow.		$50,000		
Reproduction / Miscellaneous			$25,000		
Legal / Advertising			$15,000		
Owner’s Indirect Cost Contingency	Allow.		$150,000		
Temp station (Trailers)	Allow.		$2,000,000		Trailer farm on Town Property
Material Testing			$75,000		
				$7,583,000	
Owner's Indirect Contingency	5%		$757,900		
Probable Owner's Indirect Costs:				**$8,340,900**	
Total Project Cost:				**$46,222,800**	

Notes: *Mark-ups and Owner's Costs rounded to nearest thousand*
This Probable Cost is based on Construction Cost Estimate

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- COST ESTIMATE -

a. OPINION OF PROBABLE COST

b. CONSTRUCTION COST ESTIMATE

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Burlington Police Station

Burlington, MA

Project #23000-01

March 22, 2024

Schematic Estimate

Architect:

Kaestle Boos Associates, Inc.

416 Slater Road

New Britain, CT 06053

Phone: 860-229-0361 | Fax: 860-229-5303

Email: kba@kba-architects.com | Web: www.kba-architects.com

Cost Estimator:

Miyakoda Consulting Inc.

PO Box 120731

Boston, MA 02111

(617) 799-5832

Burlington Police Station

Burlington, MA

Introduction

Basis For The Estimate:

1. The project consists of a new Police for Burlington, MA
2. This project will be built in 1 phase.

Project Particulars:

1. The Burlington Police Station Estimate is based on drawings by Kaestle Boos Associates, Inc.

Assumptions:

1. The project will be publicly bid amongst GC builders. This project will be bid with no less than four General Contractos bidding the project.
2. Our costs assume that there will be competitive bidding in all trades and sub-trades i.e. at least three bids per trade or sub-
3. Unit rates are based on current dollars (prevailing wage rates)
4. Design Contingency is an allowance for unforeseen design issues, design detail development and specification clarifications
5. General Conditions and Requirements value covers Construction Manager's site office overhead and on-site supervision
6. Fee markup is calculated on a percentage of direct construction costs.
7. Escalation included
8. Assume Construction to Begin June 2025

Exclusions within the Estimate:

1. Design fees and other soft costs
2. Interest expense
3. Owner's project administration
4. Construction of temporary facilities
5. Printing and advertising
6. Specialties, loose furnishings, fixtures and equipment beyond what is noted
7. Site or existing condition surveys and investigations
8. Hazardous materials survey, report and abatement
9. Demolition of existing building(s)

Burlington Police Station

Burlington, MA

Main Summary

38,206 GSF

DESCRIPTION			TOTAL	COST/SF
Building Demolition			$540,000	
Abatement			NIC	
Substation Building		36,406 GSF	$18,868,348	$518.28
Sitework			$2,227,018	
Auxiliary Building		1,800 GSF	$990,000	$550.00
Trade Cost Subtotal		38,206 GSF	**$22,625,366**	**$592.19**
Design Contingency	15.00%		$3,393,805	$88.83
Trade Cost Total			**$26,019,171**	**$681.02**
Mark-ups (on Direct Trade Costs Subtotal)				
General Conditions and Requirements	9.00%	$26,019,171	$2,341,725	$61.29
Insurance	1.40%	$28,360,896	$397,053	$10.39
Bonds	1.00%	$28,757,949	$287,579	$7.53
Permit		$29,045,528	NIC	
Fee	3.00%	$29,045,528	$871,366	$22.81
Estimate Construction Cost Subtotal			**$29,916,894**	**$783.04**
Escalation To The Midpoint of Construction **Assume Construction to Begin June 2025**	10.67%	$29,916,894	$3,192,133	$83.55
ECC Total, including Escalation			**$33,109,027**	**$866.59**

Burlington Police Station

Burlington, MA

Building Summary - Substation

36,406 GSF

ELEMENT	TOTAL	Total/GSF
02 26 00 Hazardous Material Assessment	NIC	
02-EXISTING CONDITIONS	**$0**	**$0.00**
03 00 00 Cast-In-Place Concrete	$2,759,263	$75.79
03-CONCRETE TOTAL	**$2,759,263**	**$75.79**
04 00 00 Masonry	$865,700	$23.78
04-MASONRY TOTAL	**$865,700**	**$23.78**
05 10 00 Structural Steel Framing	$1,793,000	$49.25
05 30 00 Metal Decking	$299,991	$8.24
05 40 00 Cold Formed Metal Framing	$0	$0.00
05 50 00 Metal Fabrications	$292,117	$8.02
05-METALS TOTAL	**$2,385,108**	**$65.51**
06 10 00 Rough Carpentry	$125,390	$3.44
06 20 00 Finish Carpentry	$92,000	$2.53
Base plates TOTAL	**$217,390**	**$5.97**
07 10 00 Dampproofing and Waterproofing	$114,935	$3.16
07 20 00 Insulation	$384,971	$10.57
07 40 00 Roofing and Siding Panels	$509,960	$14.01
07 46 00 Siding	$537,696	$14.77
07 80 00 Firestopping & Fireproofing	$27,305	$0.75
07 92 00 Joint Sealants	$91,015	$2.50
07-THERMAL AND MOISTURE TOTAL	**$1,665,881**	**$45.76**
08 10 00 Doors & Frames	$103,475	$2.84
08 31 00 Access Doors & Panels	$1,500	$0.04
08 33 23 Coiling and Overhead Doors	$72,000	$1.98
08 34 53 Security Doors and Frames	$82,500	$2.27
08 34 63 Detention Doors and Frames	$91,500	$2.51
08 41 13 Aluminum Framed Entrances	$167,560	$4.60
08 50 00 Aluminum Windows	$770,500	$21.16
08 70 00 Finish Hardware	$118,750	$3.26
08 80 00 Glazing	$50,000	$1.37
08 90 00 Louvers and Vents	$5,000	$0.14
08-DOORS AND WINDOWS TOTAL	**$1,462,785**	**$40.18**

Burlington Police Station

Burlington, MA

Building Summary - Substation

36,406 GSF

ELEMENT	TOTAL	Total/GSF
09 21 00 Plaster and Gypsum Board Assemblies	$1,207,758	$33.17
09 30 00 Tile	$272,405	$7.48
09 51 00 Accoustical Ceilings	$246,518	$6.77
09 57 53 Security Ceiling Assemblies	$79,560	$2.19
09 65 00 Resilient Flooring	$246,490	$6.77
09 67 23 Resinous Flooring	$78,704	$2.16
09 68 00 Carpeting	$32,760	$0.90
09 90 00 Painting	$213,838	$5.87
09-FINISHES TOTAL	**$2,378,032**	**$65.32**
10 00 00 Specialties	$50,000	$1.37
10 12 00 Display Cases	$27,305	$0.75
10 14 00 Signage	$30,945	$0.85
10 21 00 Compartments	$0	
10 23 13 Corner Guards	$75,000	$2.06
10 28 13 Toilet Accessories	$17,900	$0.49
10 44 00 Fire Protection Specialies	$3,034	$0.08
10 51 00 Lockers	$193,800	$5.32
10 56 13 Metal Storage Shelving	$15,000	$0.41
10 56 26 Mobile Storage Units	$153,000	$4.20
10-SPECIALTIES TOTAL	**$565,983**	**$3.40**
11 10 00 Equipment	$100,000	$2.75
11-EQUIPMENT TOTAL	**$100,000**	**$2.75**
12 20 00 Window Treatments	$73,968	$2.03
12 30 00 Casework	$364,060	$10.00
12 48 13 Entrance Floor Mats	$6,055	$0.17
12-FURNISHINGS TOTAL	**$444,083**	**$12.20**
13 34 00 Fabricated Engineered Structures	NIC	
13-SPECIAL CONSTRUCTION TOTAL	**$0**	**$0.00**
14 20 00 Elevators	$225,000	$6.18
14-CONVEYING DEVICES TOTAL	**$225,000**	**$6.18**
21 00 00 Fire Protection	$262,718	$7.22

Burlington Police Station

Burlington, MA

Building Summary - Substation

36,406 GSF

ELEMENT	TOTAL	Total/GSF
22 00 00 Plumbing	$638,920	$17.55
23 00 00 HVAC	$2,337,580	$64.21
21, 22, 23 - MECHANICAL TOTAL	**$3,239,218**	**$88.97**
26 00 00 Electrical	$2,270,687	$62.37
26-ELECTRICAL TOTAL	**$2,270,687**	**$62.37**
31 00 00 Earthwork	$289,217	$7.94
31-EARTHWORK TOTAL	**$289,217**	**$7.94**
BUILDING DIRECT COST TOTAL	**$18,868,348**	**$518.28**

DETAIL ESTIMATE - SUBSTATION

36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
10	**03-CONCRETE**				
11					
12	***03 00 00 Cast-In-Place Concrete***				
13	*Continuous footings*	*630*	*lf*		
14	Concrete; material	**49**	CY	$150.00	$7,350
15	Concrete; place	**49**	CY	$100.00	$4,900
16	Reinforcement	**3,185**	LB	$2.50	$7,963
17	Keyways	**630**	LF	$3.50	$2,205
18	Formwork	**1,260**	SF	$22.00	$27,720
19					
20	*Spread footings*	*37*	*ea*		
21	Concrete; material	**104**	CY	$150.00	$15,600
22	Concrete; place	**104**	CY	$100.00	$10,400
23	Reinforcement	**7,800**	LB	$2.50	$19,500
24	Formwork	**1,776**	SF	$25.00	$44,400
25					
26	*Concrete pier*	*17*	*ea*		
27	Concrete; material	**5**	CY	$150.00	$750
28	Concrete; place	**5**	CY	$100.00	$500
29	Reinforcement	**1,000**	LB	$2.50	$2,500
30	Formwork	**380**	SF	$35.00	$13,300
31					
32	*Foundation/basement walls*	*630*	*lf*		
33	Concrete; material	**373**	CY	$150.00	$56,000
34	Concrete; place	**373**	CY	$100.00	$37,333
35	Reinforcement	**56,000**	LB	$2.50	$140,000
36	Formwork	**20,160**	SF	$20.00	$403,200
37					
38	*Slab on Grade*	*13,999*	*sf*		
39	Concrete; material	**272**	CY	$160.00	$43,520
40	Concrete; place & finish	**13,999**	SF	$2.85	$39,897
41	WWF	**13,999**	SF	$1.15	$16,099
42	Barrier One	**272**	CY	$75.00	$20,400
43					
44	*Slab on Grade #2; 8" thick*	*1,116*	*sf*		
45	Concrete; material	**29**	CY	$160.00	$4,640
46	Concrete; place & finish	**1,116**	SF	$2.85	$3,181
47	WWF	**1,116**	SF	$1.15	$1,283
48	Barrier One	**29**	CY	$75.00	$2,175
49					
50	*Upper Level*	*21,291*	*sf*		
51	Concrete; material	**294**	CY	$2.85	$838
52	Concrete; place & finish	**21,291**	SF	$1.15	$24,485
53	WWF	**21,291**	SF	$75.00	$1,596,825

DETAIL ESTIMATE - SUBSTATION

36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
54					
55	*Miscellaneous*				
56	Elevator pit	**1**	EA	$8,500.00	$8,500
57	Concrete to metal pan stairs	**6**	FLT	$5,000.00	$30,000
58	Cell bunks	**6**	EA	$5,000.00	$30,000
59	Slab isolation joints, allow	**1**	LS	$5,000.00	$5,000
60	Keyway and waterstops	**1**	LS	$1,600.00	$1,600
61	Sonotube	**2**	EA	$850.00	$1,700
62	Allow for concrete pads and bases	**1**	LS	$3,500.00	$3,500
63	Miscellaneous concrete conditions, slump test, etc.	**1**	LS	$132,000.00	$132,000
64	***03 00 00 Cast-In-Place Concrete Total***				**$2,759,263**
65					
66					
67	***Exterior***				
	Calsium Silicate Product	*1,500*	*sf*		
69	Fiber Cement exterior veneer	*9,066*	*sf*		
70	Curtainwall	*881*	*sf*		
71	Aluminum Windows	*6,164*	*sf*		
72	Overhead doors	*440*	*sf*		
73					
74	***Total***	***18,051***	***sf***		
75					
76	***04-MASONRY***				
77					
78	***04 00 00 Masonry***				
79	12" CMU backup wall	**5,700**	SF	$28.00	$159,600
80	8" CMU partitions	**9,285**	SF	$24.00	$222,840
81	12" CMU partitions	**13,500**	SF	$26.00	$351,000
82	Calsium Silicate Product	**1,500**	SF	$75.00	$112,500
83	CMU surrounding columns	**760**	SF	$26.00	$19,760
84	***04 00 00 Masonry Total***				**$865,700**
85					
86					
87	***05-METALS***				
88					
89	***05 10 00 Structural Steel Framing***				
90	WF structural steel	**273**	TNS	$6,500.00	$1,774,500
91	Base plates	**37**	EA	$500.00	$18,500
92	***05 10 00 Structural Steel Framing Total***				**$1,793,000**
93					
94	***05 30 00 Metal Decking***				
95	Metal floor deck	**26,686**	SF	$6.75	$180,131
96	Metal roof deck	**18,440**	SF	$6.50	$119,860
97	***05 30 00 Metal Decking Total***				**$299,991**

DETAIL ESTIMATE - SUBSTATION
36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
98					
99	***05 40 00 Cold Formed Metal Framing***				
100	Metal framing system				Included in section 09
101	***05 40 00 Cold Formed Metal Framing Total***				**$0**
102					
103	***05 50 00 Metal Fabrications***				
104	Egress stairs	**6**	FLT	$25,000.00	$150,000
105	Elevator sills	**3**	EA	$2,500.00	$7,500
106	Hoist beam	**1**	EA	$7,500.00	$7,500
107	Misc. metals in exterior closure	**18,051**	SF	$2.00	$36,102
108	Miscellaneous metals; TBD	**36,406**	GSF	$2.50	$91,015
109	***05 50 00 Metal Fabrications Total***				**$292,117**
110					
111					
112	***06-WOOD AND PLASTICS***				
113					
114	***06 10 00 Rough Carpentry***				
115	Install doors and frames	**125**	EA	$275.00	$34,375
116	Rough carpentry / blocking	**36,406**	SF	$2.50	$91,015
117	***06 10 00 Rough Carpentry Total***				**$125,390**
118					
119	***06 20 00 Finish Carpentry***				
120	Window shutters (Quantity provided)	**35**	SETS	$1,200.00	$42,000
121	Adjustable shelving, built-in counters - storage & maintenance	**1**	AL	$50,000.00	$50,000
122	***06 20 00 Finish Carpentry Total***				**$92,000**
123					
124					
125	***07-THERMAL AND MOISTURE***				
126					
127	***07 10 00 Dampproofing and Waterproofing***				
128	Waterproof foundation/basement walls	**10,425**	SF	$7.50	$78,188
129	Vapor barrier under slab	**14,699**	SF	$2.50	$36,747
130	***07 10 00 Dampproofing and Waterproofing Total***				**$114,935**
131					
132	***07 20 00 Insulation***				
133	Rigid insulation under slab on grade	**14,699**	SF	$3.85	$56,591
134	Rigid insulation to foundation walls	**8,220**	SF	$4.65	$38,223
135	Spray foam to stud cavity	**3,366**	SF	$5.25	$17,672
136	Nailable insulation to roof	**18,440**	SF	$9.00	$165,960
137	Air/vapor barrier behind exterior veneer	**9,066**	SF	$7.50	$67,995
138	Rigid insulation at exterior walls	**9,066**	SF	$4.25	$38,531
139	***07 20 00 Insulation Total***				**$384,971**
140					
141	***07 40 00 Roofing and Siding Panels***				

DETAIL ESTIMATE - SUBSTATION
36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
142	Roof type 1; 30 yrs asphalt shingles system	**18,440**	SF	$22.00	$405,680
143	Aluminum gutter	**240**	LF	$42.00	$10,080
144	Aluminum downspout	**450**	LF	$32.00	$14,400
145	Tab snow guards	**1**	LS	$60,000.00	$60,000
146	Soffit and fascia	**360**	LF	$55.00	$19,800
147	***07 40 00 Roofing and Siding Panels Total***				**$509,960**
148					
149	***07 46 00 Siding***				
150	Fiber Cement exterior veneer	**9,066**	SF	$56.00	$507,696
151	Fascia & trim	**600**	SF	$50.00	$30,000
152	***07 46 00 Siding Total***				**$537,696**
153					
154	***07 80 00 Firestopping & Fireproofing***				
155	Through floor penetration firestopping	**36,406**	SF	$0.75	$27,305
156	***07 80 00 Firestopping & Fireproofing Total***				**$27,305**
157					
158	***07 92 00 Joint Sealants***				
159	Caulking and sealants	**36,406**	SF	$2.50	$91,015
160	***07 92 00 Joint Sealants Total***				**$91,015**
161					
162					
163	***08-DOORS AND WINDOWS***				
164					
165	***08 10 00 Doors & Frames***				
166	Exterior Fiberglass doors and frames (hardware included)	**5**	EA	$2,800.00	$14,000
167	Interior Door frame	**109**	EA	$350.00	$38,150
168	Ditto; pair doors	**8**	EA	$400.00	$3,200
169	Interior doors	**109**	EA	$385.00	$41,965
170	Ditto; pair	**8**	PR	$770.00	$6,160
171	***08 10 00 Doors & Frames Total***				**$103,475**
172					
173	***08 31 00 Access Doors & Panels***				
174	Allow for access doors	**1**	AL	$1,500.00	$1,500
175	***08 31 00 Access Doors & Panels Total***				**$1,500**
176					
177	***08 33 23 Coiling and Overhead Doors***				
178	Overhead doors 11' W	**4**	EA	$18,000.00	$72,000
179	***08 33 23 Coiling and Overhead DoorsTotal***				**$72,000**
180					
181	***08 34 53 Security Doors and Frames***				
182	Security doors, frames and hardware	**11**	EA	$7,500.00	$82,500
183	***08 34 53 Security Doors and FramesTotal***				**$82,500**
184					

DETAIL ESTIMATE - SUBSTATION
36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
185	08 34 63 Detention Doors and Frames				
186	Holding cell doors	**7**	EA	$7,500.00	$52,500
187	Holding cell plumbing chase access	**6**	EA	$6,500.00	$39,000
188	***08 34 63 Detention Doors and FramesTotal***				**$91,500**
189					
190	***08 41 13 Aluminum Framed Entrances***				
191	Exterior Aluminum doors	**1**	EA	$3,800.00	$3,800
192	Ditto; pair	**1**	PR	$7,600.00	$7,600
193	Interior Aluminum doors	**2**	EA	$3,800.00	$7,600
194	Ditto; pair	**1**	PR	$7,600.00	$7,600
195	Curtainwall	**881**	SF	$160.00	$140,960
196	***08 41 13 Aluminum Framed EntrancesTotal***				**$167,560**
197					
198	***08 50 00 Aluminum Windows***				
199	Aluminum Windows	**6,164**	SF	$125.00	$770,500
200	***08 50 00 Aluminum WindowsTotal***				**$770,500**
201					
202	***08 70 00 Finish Hardware***				
203	Finish hardware	**125**	EA	$950.00	$118,750
204	***08 70 00 Finish HardwareTotal***				**$118,750**
205					
206	***08 80 00 Glazing***				
207	Allow for interior glazing	**1**	LS	$50,000.00	$50,000
208	***08 80 00 Glazing Total***				**$50,000**
209					
210	***08 90 00 Louvers and Vents***				
211	Elevator vent	**1**	EA	$5,000.00	$5,000
212	***08 90 00 Louvers and VentsTotal***				**$5,000**
213					
214					
215	***09-FINISHES***				
216					
217	***09 21 00 Plaster and Gypsum Board Assemblies***				
218	Light gage metal framing including Gypsum Sheathing	**3,366**	SF	$28.00	$94,248
219	Interior of exterior walls	**3,366**	SF	$4.35	$14,642
220	Standard drywall partitions	**49,148**	SF	$15.00	$737,220
221	Plumbing walls	**16,383**	SF	$18.00	$294,894
222	Premium for chase/plumbing walls	**1**	LS	$20,000.00	$20,000
223	GWB ceilings	**653**	SF	$18.00	$11,754
224	Allow for soffits	**1**	LS	$35,000.00	$35,000
225	***09 21 00 Plaster and Gypsum Board Assemblies Total***				**$1,207,758**
226					
227	***09 30 00 Tile***				
228	Porcelain tile flooring	**2,747**	SF	$35.00	$96,145

DETAIL ESTIMATE - SUBSTATION
36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
229	Tile Base	**727**	LF	$30.00	$21,810
230	Tile walls	**4,320**	SF	$35.00	$151,200
231	Threshold	**13**	EA	$250.00	$3,250
232	***09 30 00 Tile Total***				**$272,405**
233					
234	***09 51 00 Accoustical Ceilings***				
235	Acoustical ceilings	**32,869**	SF	$7.50	$246,518
236	***09 51 00 Accoustical Ceilings Total***				**$246,518**
237					
238	***09 57 53 Security Ceiling Assemblies***				
239	Metal security plank ceiling system at detention area	**1,768**	SF	$45.00	$79,560
240	***09 57 53 Security Ceiling Assemblies Total***				**$79,560**
241					
242	***09 65 00 Resilient Flooring***				
243	Luxury Vinyl Tile Flooring	**4,680**	SF	$12.00	$56,160
244	Athletic flooring	**1,986**	SF	$25.00	$49,650
245	Static dissipative flooring	**1,472**	SF	$15.00	$22,080
246	Rubber Flooring	**5,190**	SF	$15.00	$77,850
247	Treads & risers	**900**	LFR	$17.50	$15,750
248	Rubber base	**1**	LS	$25,000.00	$25,000
249	***09 65 00 Resilient Flooring Total***				**$246,490**
250					
251	***09 67 23 Resinous Flooring***				
252	Poured Resin Flooring & Base	**4,919**	SF	$16.00	$78,704
253	***09 67 23 Resinous Flooring Total***				**$78,704**
254					
255	***09 68 00 Carpeting***				
256	Carpet	8853	SF	$7.00	$32,760
257	***09 68 00 Carpeting Total***				**$32,760**
258					
259	***09 90 00 Painting***				
260	Painting walls	**134,428**	SF	$1.00	$134,428
261	Paint GWB ceilings	**653**	SF	$1.75	$1,143
262	Sealed concrete flooring	**1,472**	SF	$2.00	$2,944
263	Paint exposed ceilings >12' H	**1,116**	SF	$2.25	$2,511
264	Miscellaneous painting	**36,406**	SF	$2.00	$72,812
265	***09 90 00 Painting Total***				**$213,838**
266					
267					
268	***10-SPECIALTIES***				
269					
270	***10 00 00 Specialties***				
271	Miscellaneous specialties	**1**	LS	$50,000.00	$50,000
272	***10 00 00 Specialties Total***				**$50,000**

DETAIL ESTIMATE - SUBSTATION

36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
273					
274	***10 12 00 Display Cases***				
275	Allow for display cases	**36,406**	SF	$0.75	$27,305
276	***10 12 00 Display Cases Total***				**$27,305**
277					
278	***10 14 00 Signage***				
279	Allow for signage	**36,406**	SF	$0.85	$30,945
280	***10 14 00 Signage Total***				**$30,945**
281					
282	***10 21 00 Compartments***				
283	Included with toilet accessories				$0
284	***10 21 00 Compartments Total***				**$0**
285					
286	***10 23 13 Corner Guards***				
287	Wall protection	**2,000**	SF	$35.00	$70,000
288	Allow for corner guards	**1**	LS	$5,000.00	$5,000
289	***10 23 13 Corner Guards Total***				**$75,000**
290					
291	**10 28 13 Toilet Accessories**				
292	Private toilet room	**7**	RMS	$700.00	$4,900
293	Private toilet room w/shower	**2**	RM	$1,200.00	$2,400
294	Double Stall toilet room w/shower	**2**	RMS	$5,000.00	$10,000
295	Janitor closet equipment	**2**	EA	$300.00	$600
296	***10 28 13 Toilet Accessories Total***				**$17,900**
297					
298	***10 44 00 Fire Protection Specialies***				
299	Fire extinguishers	**12**	EA	$250.00	$3,034
300	***10 44 00 Fire Protection Specialies Total***				**$3,034**
301					
302	**10 51 00 Lockers**				
303	Personal duty lockers	**100**	EA	$1,800.00	$180,000
304	Pistol Lockers	**6**	EA	$1,800.00	$10,800
305	Athletic Lockers	**6**	EA	$500.00	$3,000
306	***10 51 00 Lockers Total***				**$193,800**
307					
308	***10 56 13 Metal Storage Shelving***				
309	Metal shelving	**1**	LS	$15,000.00	$15,000
310	***10 56 13 Metal Storage Shelving Total***				**$15,000**
311					
312	***10 56 26 Mobile Storage Units***				
313	Compact shelving	**51**	EA	$3,000.00	$153,000
314	***10 56 26 Mobile Storage Units Total***				**$153,000**
315					
316					

	Element/Description	Quantity	Unit	Rate	Total
317	***11-EQUIPMENT***				
318					
319	**11 10 00 Equipment**				
320	Range equipment				Owners Equipment
321	Cell equipment	**1**	AL	$50,000.00	$50,000
322	Allow for residential appliances	**1**	AL	$50,000.00	$50,000
323	***11 10 00 Equipment Total***				**$100,000**
324					
325					
326	***12-FURNISHINGS***				
327					
328	12 20 00 Window Treatments				
329	Window treatment (to windows only. Provided by the arch)	**6,164**	SF	$12.00	$73,968
330	***12 20 00 Window Treatments Total***				**$73,968**
331					
332	12 30 00 Casework				
333	Miscellaneous casework	**36,406**	SF	$10.00	$364,060
334	***12 30 00 Casework Total***				**$364,060**
335					
336	12 48 13 Entrance Floor Mats				
337	Mat	**173**	SF	$35.00	$6,055
338	***12 48 13 Entrance Floor Mats Total***				**$6,055**
339					
340					
341	***13-SPECIAL CONSTRUCTION***				
342					
343	***13 34 00 Fabricated Engineered Structures***				
344	No work shown in this section				
345	***13 34 00 Fabricated Engineered Structures Total***				**NIC**
346					
347					
348	***14-CONVEYING DEVICES***				
349					
350	***14 20 00 Elevators***				
351	Elevator; 3 stops	**1**	EA	$225,000.00	$225,000
352	***14 20 00 Elevators Total***				**$225,000**
353					
354					
355	***21, 22, 23 - MECHANICAL***				
356					
357	***21 00 00 Fire Protection***				
358	Service from Site				
359	6" Fire Service w/ Ftgs, Blocks, Sleeves, Excavation	**1**	LS	$3,145.00	$3,145

DETAIL ESTIMATE - SUBSTATION
36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
360					
361	Bulk Mains and Riser Piping				
362	Bulk Mains and Riser Piping	**36,406**	LF	$2.50	$91,015
363	Valving Specialties at Entrance	**1**	LS	$7,712.00	$7,712
364	Siamese Fire Department Connection w/ Valving	**1**	LS	$3,163.00	$3,163
365	Floor Control Valves	**4**	EA	$2,685.00	$10,740
366	Fire Hose Valves	**6**	EA	$294.41	$1,766
367					
368	Sprinkler Heads and Branch Piping				
369	165 Degree Sprinkler Heads w/ Branch Piping	**317**	EA	$415.00	$131,378
370					
371	Miscellaneous				
372	Coordination Drawings, Hydraulic Calculations, As Builts, Etc.	**1**	LS	$8,400.00	$8,400
373	Spare Head Cabinets	**3**	EA	$462.00	$1,386
374	Valve Tags, Pipe Identification	**1**	LS	$2,163.00	$2,163
375	Seismic Retraints, Certification	**1**	LS	$1,850.00	$1,850
376	***21 00 00 Fire Protection Total***				**$262,718**
377					
378					
379	***22 00 00 Plumbing***				
380	Storm Piping				
381	Roof Drains w/ Piping, Insulation, Etc.	**36,406**	SF	$2.80	$101,937
382					
383	Sanitary Waste and Vent Piping				
384	Sanitary Waste and Vent Piping	**46**	FIX	$2,400.00	$110,400
385	Floor Drains w/ Piping	**19**	LF	$1,875.00	$35,625
386	Garage Waste System	**1**	ALLOW	$14,000.00	$14,000
387					
388	Domestic Water Piping				
389	Domestic Water Piping	**46**	FIX	$2,800.00	$128,800
390	Non Freeze Wall Hydrants w/ Piping	**4**	EA	$1,700.00	$6,800
391					
392	Plumbing Fixtures and Equipment				
393	Wall Hung Water Closets w/ Carriers	**13**	EA	$1,764.00	$22,932
394	Wall Hung Lavatories w/ Carriers	**13**	EA	$1,357.00	$17,641
395	Mop Receptors	**3**	EA	$1,296.00	$3,888
396	Prison Fixtures	**6**	EA	$3,985.00	$23,910
397	Kitchen Sinks	**2**	EA	$1,220.70	$2,441
398	Shower Modules	**5**	EA	$3,196.00	$15,980
399	Wall Hung Urinals w/ Carriers	**1**	EA	$1,592.00	$1,592
400	Drinking Fountains	**3**	EA	$3,196.00	$9,588
401	Oil Water Separator	**1**	EA	$6,800.00	$6,800
402	Electric Water Heaters 36 KW, 250 Gallon	**1**	EA	$35,420.00	$35,420
403	Hot Water Mixing Valve	**1**	EA	$9,800.00	$9,800

	Element/Description	Quantity	Unit	Rate	Total
404	Hot Water Recirculation Pumps	**1**	EA	$845.00	$845
405	Hot Water Expansion Tanks	**1**	EA	$2,185.00	$2,185
406	Elevator Sump Pump w/ Oil Leak Detection	**1**	EA	$5,600.00	$5,600
407	Commercial Kitchen Allowance	**1**	LS	$15,450.00	$15,450
408					
409	Miscellaneous				
410	Coordination Drawings, As Builts, Submittals, O&M's	**1**	LS	$18,450.00	$46,750
411	Rigging, Hoisting, and Scaffolding	**1**	LS	$6,800.00	$6,800
412	Flushing and Sanitizing	**1**	LS	$5,936.00	$5,936
413	Valve Tags, Pipe Identification	**1**	LS	$7,800.00	$7,800
414	***22 00 00 Plumbing Total***				**$638,920**
415					
416					
417	***23 00 00 HVAC***				
418	Sheetmetal				
419	Galvanized Ductwork	**32,765**	LBS	$15.90	$520,970
420	Aluminum Ductwork	**360**	LBS	$18.90	$6,804
421	Black Iron Ductwork	**500**	LBS	$24.60	$12,300
422					
423	Sheetmetal Accessories				
424	Sheetmetal Accessories	**1**	LS	$208,388.00	$208,388
425					
426	Insulation				
427	2" Thk Fiberglass Duct Wrap	**20,163**	SF	$6.40	$129,045
428	Fire Proof Insulation	**200**	SF	$23.90	$4,780
429					
430	Refrigerant Piping				
431	Refrigerant Piping for Supplemental Units	**36,406**	SF	$2.80	$101,937
432					
433	Air Conditioning Condensate Piping				
434	Air Conditioning Condensate Piping	**36,406**	SF	$2.20	$80,093
435					
436	Equipment				
437	Packaged Rooftop Heat Pump 30,000 CFM w/ Heat Recovery	**1**	EA	$436,125.00	$436,125
438	Packaged Rooftop Heat Pump 2,000 CFM w/ Heat Recovery	**1**	EA	$29,850.00	$29,850
439	Variable Volume Boxes w/ Electric Coils	**36,406**	SF	$4.80	$174,749
440	Supplemental Split Heat Pumps 3 Ton	**2**	EA	$8,975.00	$17,950
441	Supplemental Split Heat Pumps 1.5 Ton	**1**	EA	$6,312.00	$6,312
442	Etc.)	**36,406**	SF	$2.20	$80,093
443	Commercial Kitchen Hood w/ Fan	**1**	LS	$29,850.00	$29,850
444	Exhaust Fans	**36,406**	SF	$3.10	$112,859
445					
446	Automatic Temperature Controls				
447	DDC Temperature Controls	**36,406**	SF	$7.50	$273,045

DETAIL ESTIMATE - SUBSTATION
36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
448					
449	Miscellaneous				
450	Coordination Drawings, Submittals, As Builts, O&M's	1	LS	$41,250.00	$41,250
451	Rigging,Hoisting, and Scaffolding	1	LS	$39,450.00	$39,450
452	Valve Tags, Pipe Identification	1	LS	$11,230.00	$11,230
453	Seismic Restraint , Certification	1	LS	$8,500.00	$8,500
454	Testing and Balancing	1	LS	$12,000.00	$12,000
455	***23 00 00 HVAC Total***				**$2,337,580**
456					
457					
458	***26-ELECTRICAL***				
459					
460	***26 00 00 Electrical***				
461	1. Light Fixtures				
462	Light Fixtures	36,406	SF	$12.00	$436,872
463					
464	2. Branch Circuitry				
465	Branch Circuitry	36,406	SF	$6.00	$218,436
466	Lighting Control Devices	36,406	SF	$2.00	$72,812
467	Power Wiring Devices	36,406	SF	$2.50	$91,015
468					
469	3. Power Circuitry				
470	Motor Feeders	36,406	SF	$2.50	$91,015
471	Power Distribution Feeders	36,406	SF	$4.00	$145,624
472					
473	Lightning Protection/Grounding System	1	LS	$50,820.00	$50,820
474	Service Grounding	1	LS	$5,082.00	$5,082
475					
476	4. Power Equipment				
477	225 Amp Panel Board	10	EA	$7,577.02	$75,770
478	75 Kva Transformer	5	EA	$12,208.90	$61,045
479	1000 Amp Main Switchboard, CT Cabt	1	LS	$61,226.00	$61,226
480	Utility Meter Pan	1	EA	$834.90	$835
481	Lighting Control Panel	1	EA	$6,824.40	$6,824
482	SPD @ MDB	1	EA	$2,952.40	$2,952
483	SPD @ Panel	6	EA	$1,246.30	$7,478
484	Electronic Submeterig	1	LS	$17,424.00	$17,424
485	400 Amp Disconnect (future PV)	1	EA	$5,469.20	$5,469
486					
487	450Kw Diesel Generator, WP	1	LS	$167,827.00	$167,827
488	EG Remote Annunicator	1	LS	$1,766.60	$1,767
489	100 Amp Encl Ckt Brkr	1	EA	$1,796.85	$1,797
490	1000 Amp Encl Ckt Brkr	1	EA	$11,697.68	$11,698
491	1000 Amp EM Gen Docking Station	1	EA	$13,824.25	$13,824

DETAIL ESTIMATE - SUBSTATION
36,406 GSF

	Element/Description	Quantity	Unit	Rate	Total
492	Autotransfer Sw 100A	**1**	EA	$7,307.19	$7,307
493	Autotransfer Sw 1000A	**1**	EA	$35,937.00	$35,937
494	18KW/15KVA UPS, batteries	**1**	LS	$26,039.20	$26,039
495					
496	Motor Disconnects	**36,406**	SF	$1.50	$54,609
497					
498	5. Special Systems				
499	Fire Alarm System	**36,406**	SF	$4.00	$145,624
500	Telecommunications, TV System	**36,406**	SF	$6.00	$218,436
501	BDA/DAS Systems	**1**	LS	$60,000.00	$60,000
502	Security Access Control System	**36,406**	SF	$5.00	By Owner
503	Security CCTV System	**36,406**	SF	$5.00	By Owner
504	Paging/Sound System	**36,406**	SF	$1.50	By Owner
505	Zetron System Roughin Allowance	**36,406**	SF	$0.25	NIC
506	AOR System, 2-Way Comm Allowance	**36,406**	SF	$0.40	$14,562
507	A/V System Roughin Allowance	**36,406**	SF	$0.20	$7,281
508					
509	Temp Power and Lighting	**1**	LS	$51,425.00	$51,425
510	Startup, Testing, Commissioning	**1**	LS	$30,250.00	$30,250
511					
512	*Option 1 Additional:*				
513	2" Emt, 4 3/0	**400**	LF	$69.27	$27,709
514	3" Emt, 4 350Mcm	**200**	LF	$105.02	$21,003
515					
516	200 Amp Disconnect CH	**4**	EA	$3,121.80	$12,487
517	800 Amp Disconnect, Elect Blr	**1**	EA	$10,406.00	$10,406
518					
519	***26 00 00 Electrical Total***				**$2,270,687**
520					
521					
522	***31-EARTHWORK***				
523					
524	***31 00 00 Earthwork***				
525	*Slab-on-Grade*	*36,406*	*sf*		
526	Fine grade gravel for slab on grade	**15,115**	SF	$1.50	$22,673
527	Excavation	**11,068**	CY	$15.00	$166,020
528	Structural fill	**742**	CY	$28.00	$20,776
529	Gravel below slab	**1,112**	CY	$35.00	$38,934
530	Perimeter drainage	**693**	LF	$22.00	$15,246
531	*Exterior strip footings*	*630*	*LF*		
532	Excavation	**525**	CY	$16.00	$8,400
533	Remove soil	**103**	CY	$8.00	$821
534	Backfill with imported fill	**422**	CY	$25.00	$10,558
535	*Spread footings and Piers*	*54*	*LF*		

Burlington Police Station

Burlington, MA

DETAIL ESTIMATE - SUBSTATION

36,406 GSF

	Element/Description	*Quantity*	*Unit*	*Rate*	*Total*
536	Excavation	*164*	CY	$16.00	$2,624
537	Remove soil	**55**	CY	$8.00	$440
538	Backfill with imported fill	**109**	CY	$25.00	$2,725
539	***31 00 00 Earthwork Total***				**$289,217**
540					
541					
542					
543					
544					
545					
546					
547					
548					
549					
550					
551					
552	***DIRECT COST SUBTOTAL***				**$18,868,348**
553					

Burlington Police Station

Burlington, MA

Sitework Summary

ELEMENT	TOTAL
02 4113 Selective Site Demolition	$75,000
02-EXISTING CONDITIONS	**$75,000**
31 10 00 Site Clearing	$120,183
31 20 00 Earth Moving	$263,327
31 25 00 Erosion and Sedimentation Control	$43,375
31-EARTHWORK	**$426,885**
32 00 00 Exterior Improvements	$162,500
32 00 00 Paving	$287,665
32 31 13 Fences and Gates	$25,800
32 90 00 Plants	$160,999
32-EXTERIOR IMPROVEMENTS	**$636,964**
33 10 00 Water Distribution	$56,145
33 30 00 Sanitary Sewerage	$87,870
33 40 00 Storm Drainage	$519,705
33 50 00 Gas Service	$10,000
33 70 00 Electrical Utilities	$414,449
33-UTILITIES	**$1,088,169**
SITEWORK DIRECT COST TOTAL	**$2,227,018**

Burlington Police Station

Burlington, MA

Detail and Summary - Sitework

	Description/Element	Quantity	Unit	Rate	Total
9	**02-EXISTING CONDITIONS**				
10					
11	***02 4113 Selective Site Demolition***				
12	Cutting and patching	**1**	LS	$15,000.00	$15,000
13	Site protection	**1**	LS	$10,000.00	$10,000
14	Miscellaneous demolition	**1**	LS	$50,000.00	$50,000
15	***02 4113 Selective Site Demolition Total***				**$75,000**
16					
17	**31-EARTHWORK**				
18					
19	***31 10 00 Site Clearing***				
20	Clearing & grubbing	**3**	ACRE	$2,500.00	$7,500
21	Allow for rock removal	**1**	LS	$35,000.00	$35,000
22	Construction fence	**1,426**	LF	$17.50	$24,955
23	Double construction gate	**2**	EA	$2,500.00	$5,000
24	Construction entrance	**3,144**	SF	$12.00	$37,728
25	Wash down/re-fueling	**2,500**	SF	$3.00	$7,500
26	Temp signs	**1**	LS	$2,500.00	$2,500
27	***31 10 00 Site Clearing Total***				**$120,183**
28					
29	***31 20 00 Earth Moving***				
30	Strip topsoil, disposal	**2,276**	CY	$10.00	$22,760
31	Asphalt pavement cut and fill	**3,203**	CY	$15.00	$48,045
32	Concrete pavement cut and fill	**526**	CY	$15.00	$7,890
33	Filter fabric	**9,910**	SF	$5.00	$49,550
34	Gravel base	**1,493**	CY	$38.00	$56,734
35	Site grade cut and fill	**2,070**	CY	$13.50	$27,945
36	Rough and fine grade for new surfacing	**40,322**	SF	$1.25	$50,403
37	***31 20 00 Earth Moving Total***				**$263,327**
38					
39	***31 25 00 Erosion and Sedimentation Control***				
40	Erosion control	**1,070**	LF	$12.50	$13,375
41	Dewatering	**1**	LS	$25,000.00	$25,000
42	Compost sox	**1**	LS	$5,000.00	$5,000
43	***31 25 00 Erosion and Sedimentation Control Total***				**$43,375**
44					
45					
46	**32-EXTERIOR IMPROVEMENTS**				
47					
48	***32 00 00 Exterior Improvements***				
49	Traffic signs	**1**	LS	$2,500.00	$2,500
50	Site sign	**1**	EA	$10,000.00	$10,000

Burlington Police Station

Burlington, MA

Detail and Summary - Sitework

	Description/Element	Quantity	Unit	Rate	Total
51	Misc. site improvement other than above	**1**	AL	$150,000.00	$150,000
52	***32 00 00 Exterior Improvements Total***				**$162,500**
53					
54	***32 00 00 Paving***				
55	*Asphalt Paving*				
56	Paving	**34,240**	SF	$3.25	$111,280
57	Concrete apron	**350**	SF	$15.00	$5,250
58	Parking space	**73**	EA	$35.00	$2,555
59	HC parking space	**3**	EA	$150.00	$450
60	Misc. marking, epoxy painted pavement markings	**1**	LS	$500.00	$500
61	*Concrete Paving*				
62	Concrete sidewalks	**5,684**	SF	$15.00	$85,260
63	Stairs	**48**	LFR	$150.00	$7,200
64	Allow for pads	**1**	LS	$10,000.00	$10,000
65	Accessible curb cut	**1**	LS	$1,000.00	$1,000
66	*Curbs*				
67	Curbs	**1,426**	LF	$45.00	$64,170
68	***32 00 00 Paving Total***				**$287,665**
69					
70	***32 31 13 Fences and Gates***				
71	Allow dumpster pad enclosure fence	**40**	LF	$75.00	$3,000
72	Allow for double gate at Dumpster	**1**	PR	$1,800.00	$1,800
73	Allow for railings at ramps	**60**	LF	$350.00	$21,000
74	***32 31 13 Fences and Gates Total***				**$25,800**
75					
76	***32 90 00 Plants***				
77	*32 91 01 Topsoil*				
78	*32 92 20 Turf and Grasses*				
79	*32 93 00 Plants*				
80	Respread top soil	**2,276**	CY	$12.00	$27,312
81	Mulch/surfacing w/weed/separation fabric	**1**	LS	$3,000.00	$3,000
82					
83	Deciduous Trees	**18**	EA	$1,200.00	$21,600
84	Evergreen Trees	**45**	EA	$950.00	$42,750
85	Shrubs	**1**	LS	$25,000.00	$25,000
86	Maintenance	**1**	LS	$5,000.00	$5,000
87	Lawns	**66,068**	SF	$0.55	$36,337
88	***32 90 00 Plants Total***				**$160,999**
89					
90					
91	***33-UTILITIES***				
92					

Burlington Police Station

Burlington, MA

Detail and Summary - Sitework

	Description/Element	Quantity	Unit	Rate	Total
93	***33 10 00 Water Distribution***				
94	Water Piping				
95	8" Ductile Iron Pipe	**200**	LF	$98.45	$19,690
96	6" Ductile Iron Pipe	**25**	LF	$77.75	$1,944
97	Mechanical Joint Fittings	**4**	EA	$984.63	$3,939
98	Wet Taps	**1**	EA	$6,175.00	$6,175
99	Thrust Blocks	**5**	EA	$895.00	$4,475
100	Curb Cocks w/ Boxes	**3**	EA	$2,778.00	$8,334
101	Excavation, Bedding and Backfill	**248**	LF	$31.00	$7,688
102					
103	Miscellaneous				
104	Identification Tape	**1**	LS	$350.00	$350
105	Coordination Drawings, Submittals	**1**	LS	$1,300.00	$1,300
106	Flushing and Sanitization	**1**	LS	$250.00	$250
107	Rigging and Hoisting	**1**	LS	$2,000.00	$2,000
108	***33 10 00 Water Distribution Total***				$56,145
109					
110	***33 30 00 Sanitary Sewerage***				
111	4" SDR 35 Pipe	**150**	LF	$11.70	$1,755
112	2" SDR 35 Pipe	**75**	LF	9.8	$735
113	4" Perforated PVC Pipe	**210**	LF	10.45	$2,195
114	5,000 Gallon Tank	**1**	EA	9745	$9,745
115	Sanitary Manhole	**1**	EA	6145	$6,145
116	1,500 Gallon Septic Tanks	**2**	EA	8645	$17,290
117	Pump Station w/ Pumps, Piping	**1**	LS	16450	$16,450
118	Junction Boxes	**4**	EA	285	$1,140
119	Geo Textile	**5,000**	SF	$1.25	$6,250
120	Gravel	**170**	YDS	$32.00	$5,440
121	Trench Excavation, Bedding, and Backfill	**225**	FT	$31.00	$6,975
122	Leach Field Excavation	**200**	YDS	$30.00	$6,000
123					
124	Miscellaneous				
125	Identification Tape	**1**	LS	$700.00	$700
126	Coordination Drawings, Submittals	**1**	LS	$2,500.00	$2,500
127	Flushing and Sanitization	**1**	LS	$550.00	$550
128	Rigging and Hoisting	**1**	LS	$4,000.00	$4,000
129	***33 30 00 Sanitary Sewerage Total***				$87,870
130					
131	***33 40 00 Storm Drainage***				
132	24" HDPE Pipe	**20**	LF	$125.27	$2,505
133	12" HDPE Pipe	**250**	LF	$64.03	$16,008
134	10" HDPE Pipe	**20**	LF	$52.84	$1,057

Burlington Police Station

Burlington, MA

Detail and Summary - Sitework

	Description/Element	Quantity	Unit	Rate	Total
135	Drainage Manholes	**4**	EA	$5,875.00	$23,500
136	Catch Basins	**6**	EA	$5,175.00	$31,050
137	Outlet Control Structures	**2**	EA	$8,475.00	$16,950
138	Water Quality Units	**1**	EA	$9,185.00	$9,185
139	Infiltration Chambers	**125**	EA	$2,485.00	$310,625
140	Geo Textile	**10,000**	SF	$1.25	$12,500
141	Gravel	**900**	YDS	$32.00	$28,800
142	Trench Excavation, Bedding, and Backfill	**275**	FT	$31.00	$8,525
143	Infiltration Area Excavation	**900**	YDS	$30.00	$27,000
144					
145	Miscellaneous				
146	Identification Tape	**1**	LS	$3,000.00	$3,000
147	Coordination Drawings, Submittals	**1**	LS	$10,000.00	$10,000
148	Flushing and Sanitization	**1**	LS	$2,500.00	$2,500
149	Rigging and Hoisting	**1**	LS	$16,500.00	$16,500
150	***33 40 00 Storm Drainage Total***				$519,705
151					
152	***33 50 00 Gas Service***				
153	Gas	**1**	AL	$10,000.00	$10,000
154	***33 50 00 Gas Service Total***				$10,000
155					
156	***33 70 00 Electrical Utilities***				
157	1. Site Lighting				
158	Type SL1 Light Pole w/ 1-Fixt	**14**	EA	$4,549.60	$63,694
159	Type SL2 Light Pole w/ 1-Fixt	**2**	EA	$4,549.60	$9,099
160	Type SL5 Uplight	**4**	EA	$629.20	$2,517
161	Flagpole Light	**3**	EA	$629.20	$1,888
162	1" PVC, 3#8, #10 UG	**1,890**	LF	$15.77	$29,801
163	#10 Wire in Poles	**1,440**	LF	$1.69	$2,439
164	30" Quazite Pullbox	**4**	EA	$3,484.80	$13,939
165	Site Lighting Controls	**1**	LS	$4,549.60	$4,550
166					
167	EV Charging Stations:				
168	EV Charging Station	**3**	EA	$5,904.80	$17,714
169	EV Fiberglass Pullbox (future)	**10**	EA	$2,008.60	$20,086
170	1" PVC, 3#8, #10 UG	**2,600**	LF	$15.77	$40,996
171					
172	Site Utilities				
173	Utility Pole Riser	**1**	LS	$4,549.60	$4,550
174	4" PVC CDT UG (Pri)	**400**	LF	$24.44	$9,777
175	Utility Transformer Pad	**1**	LS	$4,549.60	$4,550
176	4" PVC, 4 350 Mcm UG (Sec)	**300**	LF	$90.46	$27,138

Burlington Police Station

Burlington, MA

Detail and Summary - Sitework

	Description/Element	Quantity	Unit	Rate	Total
177	4" PVC CDT UG (Spare)	**100**	LF	$30.64	$3,064
178	4" PVC, 4 350 Mcm UG (EG)	**300**	LF	$90.46	$27,138
179	4" PVC CDT UG (EG Spare)	**100**	LF	$30.64	$3,064
180	2" PVC, 4#2 (EG) UG	**100**	LF	$33.33	$3,333
181	1" PVC, EG Controls, 120v, UG	**300**	LF	$14.32	$4,295
182					
183	Site Security				
184	Access Control, Gates, etc	**1**	LS	$25,000.00	$25,000
	CCTV Cameras, Pole Mtd	**1**	LS	$40,000.00	$40,000
186					
187	Telecommunications:				
188	Telecomm Utility Riser	**1**	LS	$4,549.60	$4,550
189	4" PVC (Tel,empty)	**1,200**	LF	$24.44	$29,330
190	1 1/4" Innderduct	**900**	LF	$4.48	$4,029
191					
192	Temp Power	**1**	LS	$6,534.00	$6,534
193	Misc Site Demo	**1**	LS	$5,324.00	$5,324
194	Misc Eqpt Rentals	**1**	LS	$6,050.00	$6,050
195	***33 70 00 Electrical Utilities Total***				$414,449
196					
197					
198	**DIRECT SITEWORK SUBTOTAL**				$2,227,018
199					
200					
201					
202					
203					
204					
205					
206					
207					
208					
209					
210					
211					
212					
213					
214					

Burlinaton Police Station

Burlington, MA

Alternate Summary

ELEMENT	TOTAL
Base: Fossil Fuel Free - Electric Heating	**$32,318,813**
Option 1: Air Source Hydronic Heat Pump & Fan Cooil Unit Systems	**$34,027,047**
Option 2: Air Source VRF System	**$32,667,849**
Option 3: Ground Source VRF System	**$35,072,617**

Burlington Police Station

Burlington, MA

Alternates

11,130 GSF

	ELEMENT			TOTAL	Total/GSF
10	**Base: Fossil Fuel Free - Electric Heating**				
11					
12	**02- 14 ARCHITECTURAL & STRUCTURAL**				
13					
14	02-14 Architectural & Structural				
15	Architectural & Structural				$13,069,226
16					
17					
18	**21 & 22 FIRE PROTECTION & PLUMBING**				$901,638
19					
20	**23 00 00 H.V.A.C.**				
21					
22	Sheetmetal				
23	Galvanized Ductwork	**32,765**	LBS	$15.90	$520,970
24	Aluminum Ductwork	**360**	LBS	$18.90	$6,804
25	Black Iron Ductwork	**500**	LBS	$24.60	$12,300
26					
27	Sheetmetal Accessories				
28	Sheetmetal Accessories	**1**	LS	$208,388.00	$208,388
29					
30	Insulation				
31	2" Thk Fiberglass Duct Wrap	**20,163**	SF	$6.40	$129,045
32	Fire Proof Insulation	**200**	SF	$23.90	$4,780
33					
34	Refrigerant Piping				
35	Refrigerant Piping for Supplemental Units	**36,406**	SF	$2.80	$101,937
36					
37	Air Conditioning Condensate Piping				
38	Air Conditioning Condensate Piping	**36,406**	SF	$2.20	$80,093
39					
40	Equipment				
41	Packaged Rooftop Heat Pump 30,000 CFM w/ Heat Recovery	**1**	EA	$436,125.00	$436,125
42	Packaged Rooftop Heat Pump 2,000 CFM w/ Heat Recovery	**1**	EA	$29,850.00	$29,850
43	Variable Volume Boxes w/ Electric Coils	**36,406**	SF	$4.80	$174,749
44	Supplemental Split Heat Pumps 3 Ton	**2**	EA	$8,975.00	$17,950
45	Supplemental Split Heat Pumps 1.5 Ton	**1**	EA	$6,312.00	$6,312
46	Electric Supplemental Heating (Unit Heaters, Radiant Panels,	**36,406**	SF	$2.20	$80,093
47	Commercial Kitchen Hood w/ Fan	**1**	LS	$29,850.00	$29,850
48	Exhaust Fans	**36,406**	SF	$3.10	$112,859
49					
50	Automatic Temperature Controls				
51	DDC Temperature Controls	**36,406**	SF	$7.50	$273,045
52					
53	Miscellaneous				
54	Coordination Drawings, Submittals, As Builts, O&M's	**1**	LS	$41,250.00	$41,250
55	Rigging,Hoisting, and Scaffolding	**1**	LS	$39,450.00	$39,450
56	Valve Tags, Pipe Identification	**1**	LS	$11,230.00	$11,230
57	Seismic Restraint , Certification	**1**	LS	$8,500.00	$8,500
58	Testing and Balancing	**1**	LS	$12,000.00	$12,000
59					

Burlington Police Station

Burlington, MA

Alternates

11,130 GSF

	ELEMENT			TOTAL	Total/GSF
60	**23 00 00 H.V.A.C. Total**				**$2,337,580**
61					
62					
63	**26 ELECTRICAL (BASE)**				$2,270,687
64					
65					
66	**32 - SITEWORK (BUILDING)**				$289,217
67					
68	**BUILDING SUBTOTAL**				**$18,868,348**
69					
70					
71	**31 SITEWORK**				
72					
73	Base				**$2,227,018**
74					
75	**31 SITEWORK Total**				**$2,227,018**
76					
77					
78	**SITEWORK SUBTOTAL**				**$2,227,018**
79					
80	Auxiliary Building				$990,000
81					
82	**BUILDING AND SITEWORK TOTAL (BASE)**				**$22,085,366**
83					
84	Design Contingency	15.00%	$22,085,366		$3,312,805
85					
86					
87	**Trade Cost Total**				**$25,398,171**
88					
89	**Mark-ups (on Direct Trade Costs Subtotal)**				
90	General Conditions and Requirements	9.00%	$25,398,171		$2,285,835
91	Insurance	1.40%	$27,684,006		$387,576
92	Bonds	1.00%	$28,071,582		$280,716
93	Permit		$28,352,298		NIC
94	Fee	3.00%	$28,352,298		$850,569
95					
96					
97	**Estimate Construction Cost Subtotal**				**$29,202,867**
98					
99	Escalation To The Midpoint of Construction	10.67%	$29,202,867		$3,115,946
100	**Assume Construction to Begin June 2025**				
101					
102	**ECC Total, including Escalation (Base)**				**$32,318,813**
103					
104					
105	***Option 1: Air Source Hydronic Heat Pump & Fan Cooil Unit Systems***				
106					
107	**02- 14 ARCHITECTURAL & STRUCTURAL**				
108					
109	02-14 Architectural & Structural				
110	Architectural & Structural				$13,069,226

Burlington Police Station

Burlington, MA

Alternates

11,130 GSF

	ELEMENT			TOTAL	Total/GSF
111					
112					
113	**21 & 22 FIRE PROTECTION & PLUMBING**				$901,638
114					
115	**23 00 00 H.V.A.C.**				
116					
117	Sheetmetal				
118	Galvanized Ductwork	**32,765**	LBS	$15.90	$520,970
119	Aluminum Ductwork	**360**	LBS	$18.90	$6,804
120	Black Iron Ductwork	**500**	LBS	$24.60	$12,300
121					
122	Sheetmetal Accessories				
123	Sheetmetal Accessories	**1**	LS	$208,388.00	$208,388
124					
125	Insulation				
126	2" Thk Fiberglass Duct Wrap	**20,163**	SF	$6.40	$129,045
127	Fire Proof Insulation	**200**	SF	$23.90	$4,780
128					
129	Heating Hot Water Piping				
130	Heating Hot Water Piping	**36,406**	SF	$9.80	$356,779
131					
132	Chilled Water Piping				
133	Chilled Water Piping	**36,406**	SF	$11.90	$433,231
134					
135	Air Conditioning Condensate Piping				
136	Air Conditioning Condensate Piping	**36,406**	SF	$2.80	$101,937
137					
138	Equipment				
139	Packaged Rooftop Heat Pump 12,000 CFM w/ Heat Recovery	**1**	EA	$178,450.00	$178,450
140	Packaged Rooftop Heat Pump 2,000 CFM w/ Heat Recovery	**1**	EA	$29,850.00	$29,850
141	Fan Coil Units	**36,406**	SF	$6.50	$236,639
142	Air Cooled Chiller/ Heat Pump 180 Ton	**1**	EA	$364,125.00	$364,125
143	Electric Boiler 300 KW	**1**	EA	$78,950.00	$78,950
144	End Suction Circulators	**6**	EA	$7,400.00	$44,400
145	Hydronic Specialties (Air Separator, Exp Tanks, Glycol Feed)	**1**	LS	$28,000.00	$28,000
146	Hydronic Supplemental Heating (Unit Heaters, Radiant	**36,406**	SF	$2.90	$105,577
147	Etc)				
148	Commercial Kitchen Hood w/ Fan	**1**	LS	$29,850.00	$29,850
149	Exhaust Fans	**36,406**	SF	$3.10	$112,859
150					
151	Automatic Temperature Controls				
152	DDC Temperature Controls	**36,406**	SF	$9.50	$345,857
153					
154	Miscellaneous				
155	Coordination Drawings, Submittals, As Builts, O&M's	**1**	LS	$48,750.00	$48,750
156	Rigging,Hoisting, and Scaffolding	**1**	LS	$47,125.00	$47,125
157	Valve Tags, Pipe Identification	**1**	LS	$16,750.00	$16,750
158	Seismic Restraint , Certification	**1**	LS	$11,960.00	$11,960
159	Testing and Balancing	**1**	LS	$15,000.00	$15,000
160					
161	**23 00 00 H.V.A.C. Total**				**$3,468,376**

Burlington Police Station

Burlington, MA

Alternates

11,130 GSF

	ELEMENT				TOTAL	Total/GSF
162						
163						
164	**26 ELECTRICAL (BASE)**					$2,270,687
165						
166	*Additional Electric For This Option:*					
167	2" Emt, 4 3/0	**100**		LF	$69.27	$6,927
168	2 1/2" Emt, 4 250Mcm	**200**		LF	$86.35	$17,269
169	200 Amp Disconnect HR CH	**1**		EA	$2,988.70	$2,989
170	600/500 Amp Disconnect Elect Boiler	**1**		EA	$9,356.33	$9,356
171						
172	**32 - SITEWORK (BUILDING)**					$289,217
173						
174	**BUILDING SUBTOTAL**					**$20,035,686**
175						
176						
177	**31 SITEWORK**					
178						
179	Base					**$2,227,018**
180						
181	**31 SITEWORK Total**					**$2,227,018**
182						
183						
184	**SITEWORK SUBTOTAL**					**$2,227,018**
185						
186	Auxiliary Building					$990,000
187						
188	**BUILDING AND SITEWORK TOTAL (BASE)**					**$23,252,704**
189						
190	Design Contingency	15.00%	$23,252,704			$3,487,906
191						
192						
193	**Trade Cost Total**					**$26,740,610**
194						
195	**Mark-ups (on Direct Trade Costs Subtotal)**					
196	General Conditions and Requirements	9.00%	$26,740,610			$2,406,655
197	Insurance	1.40%	$29,147,264			$408,062
198	Bonds	1.00%	$29,555,326			$295,553
199	Permit		$29,850,879			NIC
200	Fee	3.00%	$29,850,879			$895,526
201						
202						
203	**Estimate Construction Cost Subtotal**					**$30,746,406**
204						
205	Escalation To The Midpoint of Construction	10.67%	$30,746,406			$3,280,642
206	**Assume Construction to Begin June 2025**					
207						
208	**ECC Total, including Escalation (Option 1)**					**$34,027,047**
209						
210						
211	***Option 2: Air Source VRF System***					
212						

Burlington Police Station

Burlington, MA

Alternates

11,130 GSF

	ELEMENT			TOTAL	Total/GSF
213	**02- 14 ARCHITECTURAL & STRUCTURAL**				
214					
215	02-14 Architectural & Structural				
216	Architectural & Structural				$13,069,226
217					
218					
219	**21 & 22 FIRE PROTECTION & PLUMBING**				$901,638
220					
221	**23 00 00 H.V.A.C.**				
222					
223	Sheetmetal				
224	Galvanized Ductwork	**31,053**	LBS	$15.90	$493,738
225	Aluminum Ductwork	**360**	LBS	$18.90	$6,804
226	Black Iron Ductwork	**500**	LBS	$24.60	$12,300
227					
228	Sheetmetal Accessories				
229	Sheetmetal Accessories	**1**	LS	$197,495.20	$197,495
230					
231	Insulation				
232	2" Thk Fiberglass Duct Wrap	**19,109**	SF	$6.40	$122,300
233	Fire Proof Insulation	**200**	SF	$23.90	$4,780
234					
235	Refrigerant Piping				
236	Refrigerant Piping	**34,503**	SF	$9.90	$341,580
237					
238	Air Conditioning Condensate Piping				
239	Air Conditioning Condensate Piping	**34,503**	SF	$2.80	$96,608
240					
241	Equipment				
242	Packaged Rooftop Heat Pump 12,000 CFM w/ Heat Recovery	**1**	EA	$178,450.00	$178,450
243	Packaged Rooftop Heat Pump 2,000 CFM w/ Heat Recovery	**1**	EA	$29,850.00	$29,850
244	VRF Outdoor Units 80 Ton	**1**	EA	$147,450.00	$147,450
245	Indoor Heat Pumps	**34,503**	EA	$9.80	$338,129
246	Electric Supplemental Heating (Unit Heaters, Radiant Panels,	**34,503**	SF	$1.80	$62,105
247	Sally Port VRF Heating	**1**	LS	$13,450.00	$13,450
248	Commercial Kitchen Hood w/ Fan	**1**	LS	$29,850.00	$29,850
249	Exhaust Fans	**34,503**	SF	$1.20	$41,404
250					
251	Automatic Temperature Controls				
252	DDC Temperature Controls	**34,503**	SF	$8.50	$293,276
253					
254	Miscellaneous				
255	Coordination Drawings, Submittals, As Builts, O&M's	**1**	LS	$41,250.00	$41,250
256	Rigging,Hoisting, and Scaffolding	**1**	LS	$39,450.00	$39,450
257	Valve Tags, Pipe Identification	**1**	LS	$11,230.00	$11,230
258	Seismic Restraint , Certification	**1**	LS	$8,500.00	$8,500
259	Testing and Balancing	**1**	LS	$12,000.00	$12,000
260					
261	**23 00 00 H.V.A.C. Total**				**$2,521,999**
262					
263					

Burlington Police Station

Burlington, MA

Alternates

11,130 GSF

	ELEMENT				TOTAL	Total/GSF
264	**26 ELECTRICAL (BASE)**					$2,270,687
265						
266	*Additional Electric For This Option:*					
267	3/4" Emt, 4#10	**500**	LF		$20.78	$10,390
268	1 1/4" Emt, 4#2	**400**	LF		$42.88	$17,153
269	2 1/2" Emt, 4 250Mcm	**100**	LF		$86.35	$8,635
270					$0.00	$0
271	30 Amp Disconnect DCU	**5**	EA		$1,258.40	$6,292
272	100 Amp Disconnect HRHP	**4**	EA		$2,159.85	$8,639
273	200 Amp Disconnect RTU	**1**	EA		$2,988.70	$2,989
274						
275	**32 - SITEWORK (BUILDING)**					$289,217
276						
277	**BUILDING SUBTOTAL**					**$19,106,865**
278						
279						
280	**31 SITEWORK**					
281						
282	Base					**$2,227,018**
283						
284	**31 SITEWORK Total**					**$2,227,018**
285						
286						
287	**SITEWORK SUBTOTAL**					**$2,227,018**
288						
289	Auxiliary Building					$990,000
290						
291	**BUILDING AND SITEWORK TOTAL (BASE)**					**$22,323,883**
292						
293	Design Contingency	15.00%	$22,323,883			$3,348,582
294						
295						
296	**Trade Cost Total**					**$25,672,465**
297						
298	**Mark-ups (on Direct Trade Costs Subtotal)**					
299	General Conditions and Requirements	9.00%	$25,672,465			$2,310,522
300	Insurance	1.40%	$27,982,987			$391,762
301	Bonds	1.00%	$28,374,749			$283,747
302	Permit		$28,658,497			NIC
303	Fee	3.00%	$28,658,497			$859,755
304						
305						
306	**Estimate Construction Cost Subtotal**					**$29,518,252**
307						
308	Escalation To The Midpoint of Construction	10.67%	$29,518,252			$3,149,597
309	**Assume Construction to Begin June 2025**					
310						
311	**ECC Total, including Escalation (Option 2)**					**$32,667,849**
312						
313						
314	***Option 3: Ground Source VRF System***					

Burlington Police Station

Burlington, MA

Alternates

11,130 GSF

	ELEMENT			TOTAL	Total/GSF
315					
316	**02- 14 ARCHITECTURAL & STRUCTURAL**				
317					
318	02-14 Architectural & Structural				
319	Architectural & Structural				$13,069,226
320					
321					
322	**21 & 22 FIRE PROTECTION & PLUMBING**				$901,638
323					
324	**23 00 00 H.V.A.C.**				
325					
326	Sheetmetal				
327	Galvanized Ductwork	**31,053**	LBS	$15.90	$493,738
328	Aluminum Ductwork	**360**	LBS	$18.90	$6,804
329	Black Iron Ductwork	**500**	LBS	$24.60	$12,300
330					
331	Sheetmetal Accessories				
332	Sheetmetal Accessories	**1**	LS	$197,495.20	$197,495
333					
334	Insulation				
335	2" Thk Fiberglass Duct Wrap	**19,109**	SF	$6.40	$122,300
336	Fire Proof Insulation	**200**	SF	$23.90	$4,780
337					
338	Heating Hot Water Piping				
339	Heating Hot Water Piping	**34,503**	SF	$9.80	$338,129
340	Radiant Floor Heat	**34,503**	SF	$4.60	$158,714
341					
342	Chilled Water Piping				
343	Chilled Water Piping	**34,503**	SF	$11.90	$410,586
344					
345	Geothermal Field/ Piping				
346	Geothermal Field/ Piping	**25**	WELLS	$25,000.00	$625,000
347					
348	Air Conditioning Condensate Piping				
349	Air Conditioning Condensate Piping	**34,503**	SF	$2.80	$96,608
350					
351	Equipment				
352	Dedicated Outdoor Unit 12,000 CFM w/ Heat Recovery	**1**	EA	$178,450.00	$178,450
353	Dedicated Outdoor Unit 2,000 CFM w/ Heat Recovery	**1**	EA	$29,850.00	$29,850
354	Indoor Heat Pumps	**34,503**	EA	$9.80	$338,129
355	Water Cooled Chiller/ Heat Pump 180 Ton	**1**	EA	$364,125.00	$364,125
356	End Suction Circulators	**8**	EA	$7,400.00	$59,200
357	Hydronic Specialties (Air Separator, Exp Tanks, Glycol Feed)	**1**	LS	$38,000.00	$38,000
358	Hydronic Supplemental Heating (Unit Heaters, Radiant	**34,503**	SF	$2.90	$100,059
359	Etc)				
360	Exhaust Fans	**34,503**	SF	$3.10	$106,959
361					
362	Automatic Temperature Controls				
363	DDC Temperature Controls	**34,503**	SF	$9.50	$327,779
364					
365	Miscellaneous				

Burlington Police Station

Burlington, MA

Alternates

11,130 GSF

	ELEMENT				TOTAL	Total/GSF
366	Coordination Drawings, Submittals, As Builts, O&M's		**1**	LS	$48,750.00	$48,750
367	Rigging,Hoisting, and Scaffolding		**1**	LS	$47,125.00	$47,125
368	Valve Tags, Pipe Identification		**1**	LS	$16,750.00	$16,750
369	Seismic Restraint , Certification		**1**	LS	$11,960.00	$11,960
370	Testing and Balancing		**1**	LS	$15,000.00	$15,000
371						
372	**23 00 00 H.V.A.C. Total**					**$4,148,590**
373						
374						
375	**26 ELECTRICAL (BASE)**					$2,270,687
376						
377	*Additional Electric For This Option:*					
378	3/4" Emt, 4#10		**2,500**	LF	$20.78	$51,951
379						
380	30/2 Amp Disconnect pumps		**25**	EA	$755.04	$18,876
381						
382	**32 - SITEWORK (BUILDING)**					$289,217
383						
384	**BUILDING SUBTOTAL**					**$20,750,186**
385						
386						
387	**31 SITEWORK**					
388						
389	Base					**$2,227,018**
390						
391	**31 SITEWORK Total**					**$2,227,018**
392						
393						
394	**SITEWORK SUBTOTAL**					**$2,227,018**
395						
396	Auxiliary Building					$990,000
397						
398	**BUILDING AND SITEWORK TOTAL (BASE)**					**$23,967,204**
399						
400	Design Contingency	15.00%	$23,967,204			$3,595,081
401						
402						
403	**Trade Cost Total**					**$27,562,285**
404						
405	**Mark-ups (on Direct Trade Costs Subtotal)**					
406	General Conditions and Requirements	9.00%	$27,562,285			$2,480,606
407	Insurance	1.40%	$30,042,890			$420,600
408	Bonds	1.00%	$30,463,491			$304,635
409	Permit		$30,768,126			NIC
410	Fee	3.00%	$30,768,126			$923,044
411						
412						
413	**Estimate Construction Cost Subtotal**					**$31,691,169**
414						
415	Escalation To The Midpoint of Construction	10.67%	$31,691,169			$3,381,448
416	**Assume Construction to Begin June 2025**					

Burlington Police Station

Burlington, MA

Alternates

11,130 GSF

ELEMENT	TOTAL	Total/GSF
ECC Total, including Escalation (Option 3)		**$35,072,617**

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- APPENDIX -

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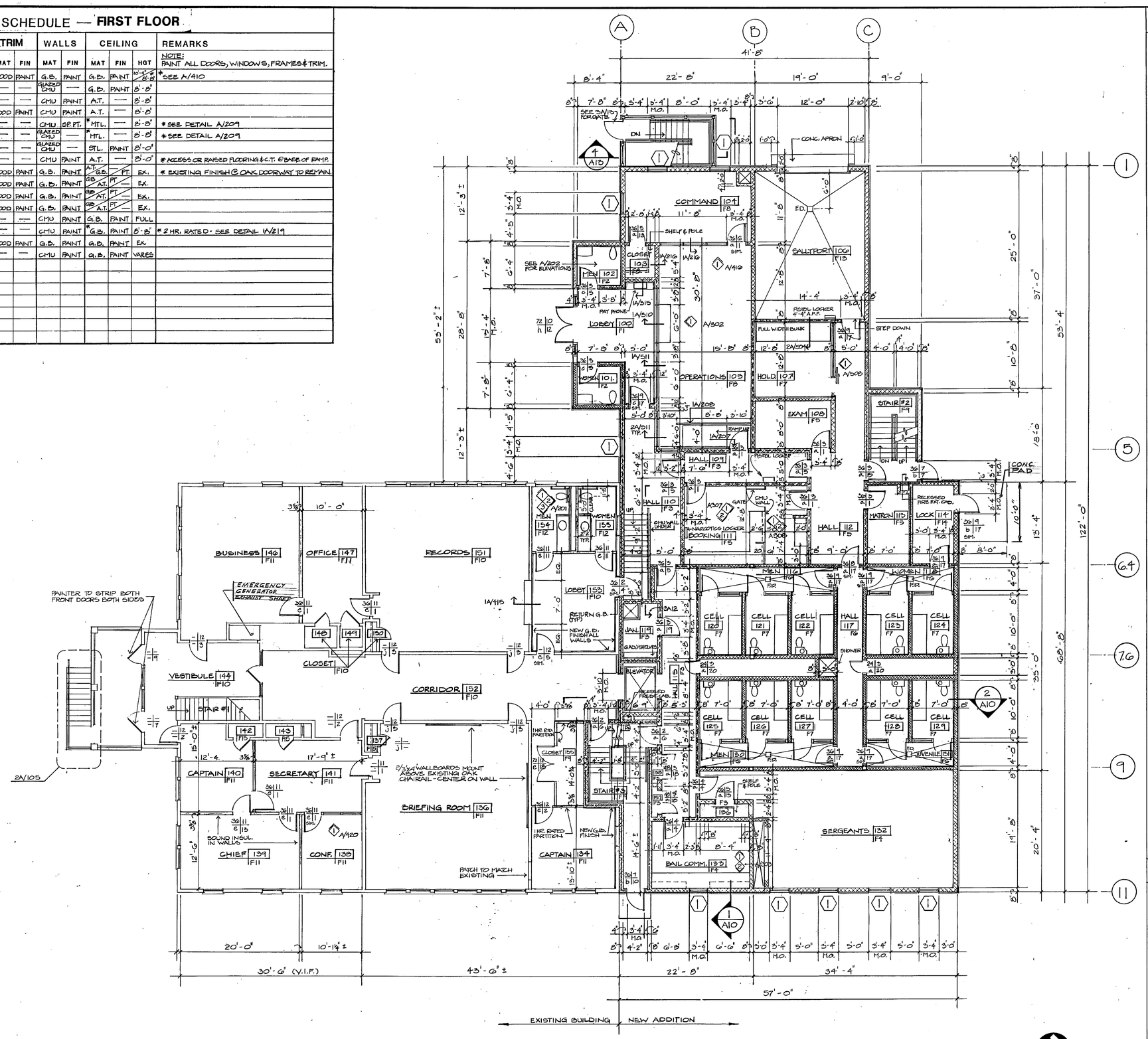
ROOM FINISH SCHEDULE — FIRST FLOOR

TYPE	FLOOR		BASE		TRIM		WALLS		CEILING			REMARKS
	MAT	FIN	MAT	FIN	MAT	FIN	MAT	FIN	MAT	FIN	HGT	NOTE: PAINT ALL DOORS, WINDOWS, FRAMES & TRIM.
F1	C.T.	—	*WOOD	PAINT	WOOD	PAINT	G.B.	PAINT	G.B.	PAINT	10'-4" / *8'-8"	*SEE A/410
F2	C.T.	—	GLAZED CMU	—	—	—	GLAZED CMU	—	G.B.	PAINT	8'-8"	
F3	C.T.	—	GLAZED CMU	—	—	—	CMU	PAINT	A.T.	—	8'-8"	
F4	C.T.	—	GLAZED CMU	—	WOOD	PAINT	CMU	PAINT	A.T.	—	8'-8"	
F5	C.T.	—	GLAZED CMU	—	—	—	CMU	SP. PT.	*MTL.	—	8'-8"	* SEE DETAIL A/209
F6	C.T.	—	GLAZED CMU	—	—	—	GLAZED CMU	—	*MTL.	—	8'-8"	* SEE DETAIL A/209
F7	C.T.	—	GLAZED CMU	—	—	—	GLAZED CMU	—	STL.	PAINT	8'-0"	
F8	*V.T.	—	RES.	—	—	—	CMU	PAINT	A.T.	—	8'-0"	* ACCESS OR RAISED FLOORING & C.T. @ BASE OF RAMP.
F9	CARPET / RUB.	—	WOOD	PAINT	WOOD	PAINT	G.B.	PAINT	A.T. / G.B.	— / PT.	EX.	* EXISTING FINISH @ OAK DOORWAY TO REMAIN.
F10	LIN.	—	WOOD	PAINT	WOOD	PAINT	G.B.	PAINT	GB / A.T.	PT / —	EX.	
F11	CARPET	—	WOOD	PAINT	WOOD	PAINT	G.B.	PAINT	GB / A.T.	PT / —	EX.	
F12	C.T.	—	C.T.	—	WOOD	PAINT	G.B.	PAINT	GB / A.T.	PT / —	EX.	
F13	CONC.	HARDNER SEALER	—	—	—	—	CMU	PAINT	G.B.	PAINT	FULL	
F14	C.T.	—	GLAZED CMU	—	—	—	CMU	PAINT	*G.B.	PAINT	8'-8"	* 2 HR. RATED - SEE DETAIL 1A/219
F15	CARPET	—	RES.	—	WOOD	PAINT	G.B.	PAINT	G.B.	PAINT	EX.	
F16	RUBBER	—	RES.	—	—	—	CMU	PAINT	G.B.	PAINT	VARIES	



NOTES

1. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD.
2. SEE LINTEL SCHEDULE S-1 FOR SIZE OF LINTELS FOR ALL MASONRY OPENINGS.
3. SEE DETAIL A/501 FOR TYPICAL CELL FLOOR PLAN.
4. INSTALL NEW PLYWOOD UNDERLAYMENT @ ROOMS 153, 134, 135 AND PORTION OF ROOM 152 AS REQUIRED.
5. PROVIDE NEW MORTAR BOARD @ ROOMS 154 & 155.

LEGEND

▨	CMU w/ CLAPBOARD EXTERIOR WALLS
▨	DOUBLE GLAZED CMU
▨	SINGLE GLAZED CMU
▨	CMU
▨	SINGLE GLAZED CMU w/ CLAPBOARD
▭	3⅝ METAL STUD w/ ⅝" GYP. BD. BOTH SIDES
▭	EXISTING WALL
▨	1 HOUR FIRE RATING
▨	2 HOUR FIRE RATING

RECORD DRAWING
DATE 9-15-92

THE PRESERVATION PARTNERSHIP
345 UNION STREET, NEW BEDFORD, MA 02740
TEL 617-996-3383

DATE: 25 FEBRUARY 1991
SCALE: 1/8" = 1'-0"
DRAWN BY: KML
CHECKED BY: DD

BURLINGTON POLICE STATION

FIRST FLOOR PLAN

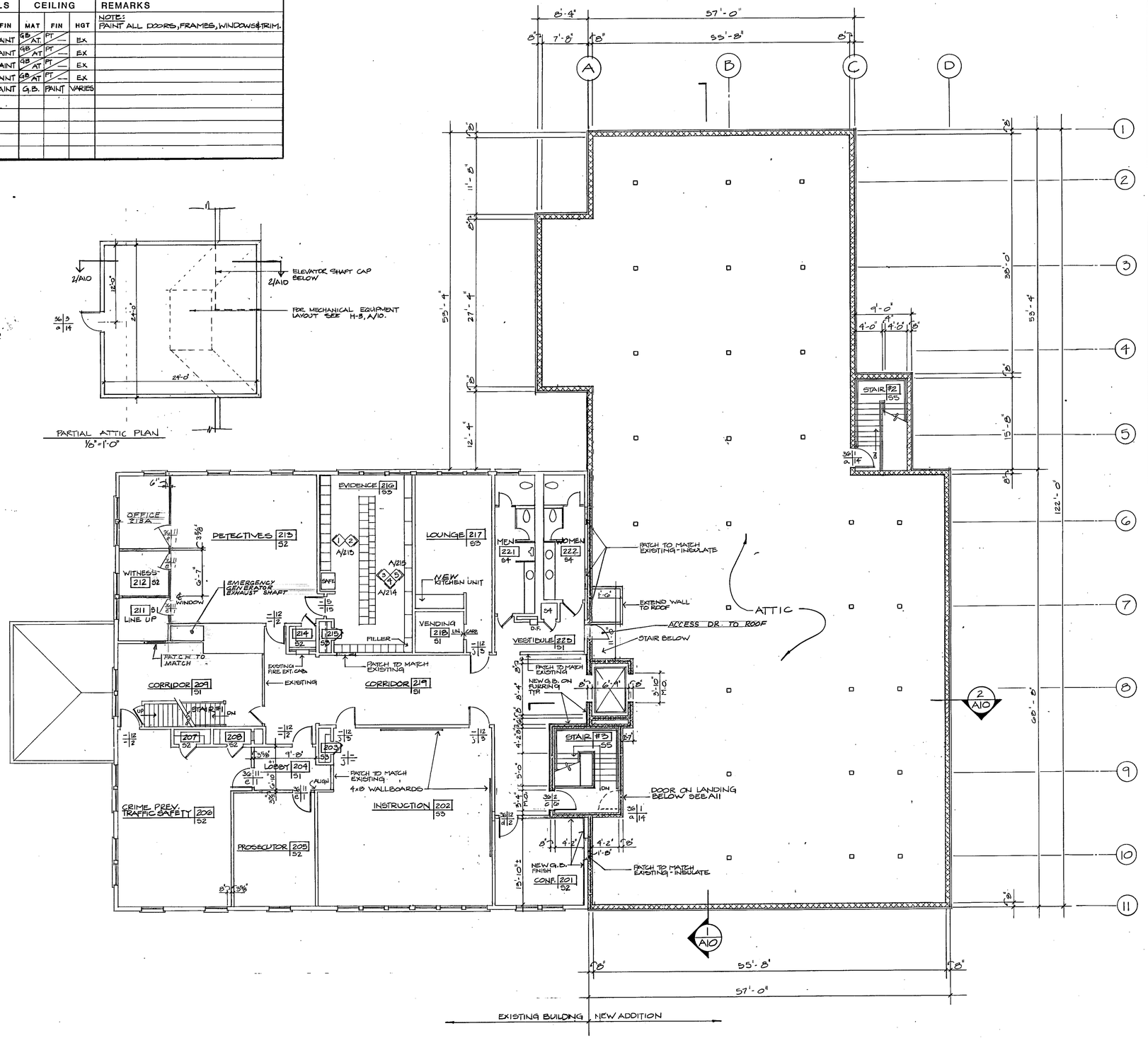
A2

ROOM FINISH SCHEDULE — SECOND FLOOR

TYPE	FLOOR		BASE		TRIM		WALLS		CEILING			REMARKS
	MAT	FIN	MAT	FIN	MAT	FIN	MAT	FIN	MAT	FIN	HGT	NOTE: PAINT ALL DOORS, FRAMES, WINDOWS & TRIM.
51	LIN.	—	WOOD	PAINT	WOOD	PAINT	G.B.	PAINT	GB/AT	PT/—	EX.	
52	CARPET	—	WOOD	PAINT	WOOD	PAINT	G.B.	PAINT	GB/AT	PT/—	EX.	
53	LIN.	—	WOOD	PAINT	WOOD	PAINT	G.B.	PAINT	GB/AT	PT/—	EX.	
54	EX.	—	EX.	—	WOOD	PAINT	G.B.	PAINT	GB/AT	PT/—	EX.	
55	RUB.	—	RES.	—	—	—	CMU	PAINT	G.B.	PAINT	VARIES	

NOTES

1. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD.
2. PROVIDE NEW UNDERLAYMENT & ROOM 201 AND PORTION OF CORRIDOR 219 AS REQUIRED.



LEGEND

- CMU
- CMU W/ CLAPBOARD
- 3⅝" METAL STUD W/ ⅝" GYP. BD. BOTH SIDES
- EXISTING WALL
- 2 HOUR FIRE RATED WALL

REDRAWING
DATE 9-15-92

THE PRESERVATION PARTNERSHIP
345 UNION STREET, NEW BEDFORD, MA 02740
TEL 617-996-3383

DATE: 25 FEBRUARY 1991
SCALE: 1/8" = 1'-0"
DRAWN BY: KML
CHECKED BY: DD

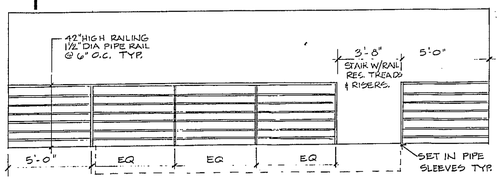
BURLINGTON POLICE STATION

SECOND FLOOR PLAN

A3

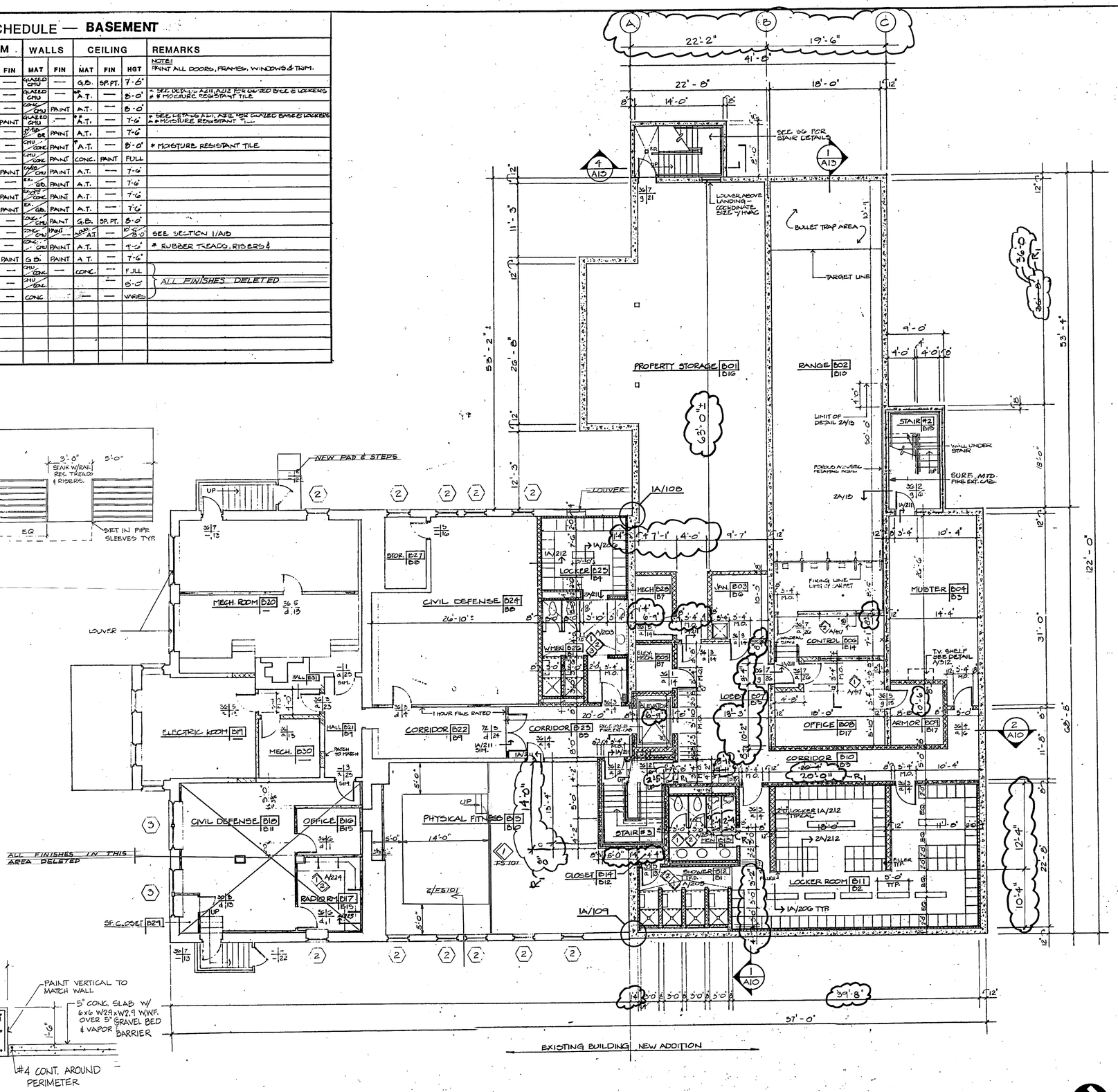
ROOM FINISH SCHEDULE — BASEMENT

TYPE	FLOOR		BASE		TRIM		WALLS		CEILING			REMARKS
	MAT	FIN	MAT	FIN	MAT	FIN	MAT	FIN	MAT	FIN	HGT	NOTE: PAINT ALL DOORS, FRAMES, WINDOWS & TRIM.
B1	C.T.	—	GLAZED CMU	—	—	—	GLAZED CMU	—	G.B.	SP. PT.	7'-6"	
B2	C.T.	—	GLAZED CMU	—	—	—	GLAZED CMU	—	WR A.T.	—	8'-0"	* SEE DETAILS A211, A212 FOR CURVED BASE & LOCKERS & * MOISTURE RESISTANT TILE
B3	C.T.	—	C.T.	—	—	—	CONC. CMU	PAINT	A.T.	—	8'-0"	
B4	C.T.	—	GLAZED CMU &	—	WOOD	PAINT	GLAZED CMU	—	** A.T.	—	7'-6"	* SEE DETAILS A211, A212 FOR CURVED BASE & LOCKERS & * MOISTURE RESISTANT TILE
B5	C.T.	—	C.T.	—	—	—	GYP. BD. / CMU	PAINT	A.T.	—	7'-6"	
B6	C.T.	—	C.T.	—	—	—	CMU / CONC.	PAINT	* A.T.	—	8'-0"	* MOISTURE RESISTANT TILE
B7	CONC.	HDR & SLR.	—	—	—	—	CMU / CONC.	PAINT	CONC.	PAINT	FULL	
B8	LIN.	—	RES.	—	WOOD	PAINT	GYP. BD. / CMU	PAINT	A.T.	—	7'-6"	
B9	LIN.	—	RES.	—	—	—	EX. GYP. BD.	PAINT	A.T.	—	7'-6"	
B10	A.F.	—	RES.	—	WOOD	PAINT	EXIST. / CONC.	PAINT	A.T.	—	7'-6"	
B11	CARPET	—	RES.	—	WOOD	PAINT	EX. / GYP. BD.	PAINT	A.T.	—	7'-6"	
B12	C.T.	—	—	—	—	—	CONC. / CMU	PAINT	G.B.	SP. PT.	8'-0"	
B13	CONC. / CARP.	HDR & SLR.	RES.	—	—	—	CONC. / CMU	PAINT	GYP. BD. A.T.	—	10'-0" / 8'-0"	SEE SECTION 1/A13
B14	CARPET	—	RES.	—	—	—	CONC. / CMU	PAINT	A.T.	—	9'-0"	* RUBBER TREADS, RISERS &
B15	CARPET	—	RES.	—	WOOD	PAINT	GYP. BD.	PAINT	A.T.	—	7'-6"	
B16	CONC.	—	—	—	—	—	CMU / CONC.	—	CONC.	—	FULL	ALL FINISHES DELETED
B17	[illegible]	—	[illegible]	—	—	—	CMU / CONC.			—	8'-0"	
B18	[illegible]	—	[illegible]	—	—	—	CONC.		—	—	VARIES	



1 ELEVATION
1/4"=1'-0"

2 SECTION
1/2"=1'-0"



NOTES

1. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS.
2. PROVIDE NEW CONCRETE SLAB AT ROOMS B16, B17, B18, B23, B25, B26, STAIR #3 AND PORTION OF B13 & B24 AS REQ'D.
3. PITCH FLOORS TO FLOOR DRAINS (TYP.).
4. PROVIDE VENT OPENING AND PIPING OPENINGS AS REQUIRED BETWEEN THE ELEVATOR AND THE MACHINE ROOM. A/119
5. CMU BEHIND LOCKERS & ROOMS B25 & B11 SHALL BE UNGLAZED. CMU ABOVE AND @ ENDS SHALL BE GLAZED.

NOTES:
1. INT. JOINTS OF STONE FDN WATERPROOFED WITH THOROSEAL
2. EXT. OF EXISTING FDN. W.P. W/ THOROSEAL

LEGEND

- CMU
- DOUBLE GLAZED CMU
- SINGLE GLAZED CMU
- CONCRETE
- EXISTING WALL
- 1 HOUR FIRE RATING
- 3⅝" METAL STUD @ 16" O.C. GYP. BD. EA. SIDE
- 2 HOUR FIRE RATING
- BRICK TO MATCH EXISTING

RECORD DRAWING
DATE 9-15-92

R1 - AUG 29, 1991
JULY 25, 1991

THE PRESERVATION PARTNERSHIP
345 UNION STREET, NEW BEDFORD, MA 02740
TEL 617-996-3383

DATE: 30 PRELIMINARY 1991
SCALE: 1/8"=1'-0"
DRAWN BY: KML
CHECKED BY: DD

BURLINGTON POLICE STATION

BASEMENT PLAN
DIMENSION CLARIFICATION

A1

FS-101

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