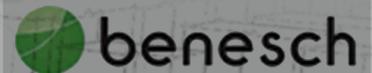


Architecture / Engineering Services  
Renovations at Bristol City Hall  
Schematic Design Narratives

June 17, 2021



## Renovations at Bristol City Hall

111 North Main Street,  
Bristol, CT

June 17, 2021

### ARCHITECTURAL PROJECT NARRATIVE

The over-arching intent of this project is the full renovation of the City Hall building. Originally constructed in 1963, the city hall structure has undergone several smaller renovations including ADA, finish, ceiling, lighting and other layout upgrades and improvements. The original structure was constructed of cast in place concrete, brick, and concrete masonry units, many of the improvements have included the addition of drywall partitions, and the addition of furred out gypsum board surfaces over existing. Other smaller improvements over the life of the building have been completed either by the city or through the commissioning of outside consultants and contractors.

The intent of the scope of this project is to fully renovate the existing 61,513 square foot building, the 573 square foot North Connector Bridge at the 3<sup>rd</sup> level, and the 1,709 Facilities Garage on site. The essential driver of need for this project is the necessary replacement of the nearly 60-year-old mechanical systems, as well the transformation of a fully accessible ADA compliant building. To help accomplish these goals, a new 7,158 entrance atrium addition is being added on the east side of the structure. The new addition will provide elevator access to each floor of the existing building from the main entry and plan for accessible parking spaces at the main entry. While the MEP, energy and ADA upgrades are necessary for the ongoing code compliance and normal functioning of this building, the opportunity to improve the façade on the east side (front) of the building is included in its scope. In an effort to connect the city scape of North Main, accessible parking, and a sloping grade with the new main entrance, new planters, ramping, pavers, and other site work have been added to the project's scope.

Currently, the project is planned as one phase with occupants intended to occupy swing space at both the former Webster Bank Building location, and the Bristol Courthouse. The potential for a third location to house records and other storage is being discussed as a potential.

The final project area including renovations and additions of the main structure is; 68,671 square feet. Swing space areas are additional to this total.

### DEMOLITION SCOPE

Prior to the demolition of any areas, the removal of hazardous materials is necessary.

Roof Level- Most of the existing mechanical penthouse and mechanical screen area will be removed. One end will remain and be enclosed to house mechanical systems. All roofing and copings will be removed to the existing concrete roof slab level

Exterior Walls- On the north, south and west sides of the building, the existing brick is planned to remain and be repaired and repointed in any areas necessary. The existing drive-up window structure on the west side of the building will also be removed. All window systems are to be removed with existing masonry opening prepared for replacement.

All limestone areas will remain, be power washed and repointed where necessary. The east elevation will have the entire façade of brick, its block backup and all associated glazing removed.

Interior - All interior partitions, ceilings, floor finishes and MEP systems will be removed. This is considered a “gut” of the interior with all materials and systems being removed to expose the interior concrete structural slabs and columns. The exterior walls will be demolished to expose the inside surface of the masonry back-up to the exterior brick. Much of the council chambers will remain intact with limited demolition of ceilings, 20% of the wall panels finishes and the seating being removed. Limited demolition will also take place in the stairwells, where only the drywall guardrails will be removed.

Facilities Garage and Connector- The roof, overhead doors, windows, pass doors and mechanical systems will be removed from the facilities garage and prepared for new. The existing connector to the courthouse parking garage will be reglazed and prepared to accept new lighting and finishes.

## **NEW CONSTRUCTION**

Interior of Existing City Hall- New furring is proposed at all existing columns, all exterior exposed concrete masonry unit back-up walls, and stairwell walls with metal studs and 5/8” drywall finish. All interior partitions are to be 3 5/8” metal studs at department suites and 6” metal studs at corridors walls with 5/8” drywall finish. Interior glazed partitions are planned to be demountable, glazed architectural walls such as Nxt Wall or Faulkbuilt.

The City Clerk’s Vault will be 8” cmu walls to achieve a 4 hour rating, a 4 hour vault door, and a pre action fire suppression system, constructed on the existing slab. Typical office space areas will be fit out with 2x2 suspended ceiling tile. Corridor ceilings will be a combination of 20% drywall soffits, 50% Armstrong Woodworks Linear Planks, and 30% 2x2 tile grid.

The Council Chamber walls will be removed and refinished with the removal of 20% of the wood paneling on the sides and west end of the room. Sound absorptive panel will be installed in those areas along with the new curving wall on the east end of the room. The ceiling will be a 20% Metal stud and gypsum board with lit ceiling coves and Armstrong Woodworks Linear plank suspended ceilings and Axiom trim surrounds.

Interior of Addition – The interior construction of the addition will include a combination of exposed structural steel, and 5/8” drywall on metal studs. A horizontal wood plank finish will clad the elevator tower. The handrail and glass guard system shall be by C.R. Lawrence. 20% of the ceilings will be metal stud and gypsum board soffits and coves, with 60% Armstrong Woodworks Linear Planks, 20% will be 2x2 suspended Ceiling Grid.

Existing Stairwells- Existing concrete masonry units in the stairwells will remain. A new painted steel handrail and guard system and lighting will be installed.

New Roof All Areas-New, tapered polyisocyanurate (polyiso) rigid insulation board will be installed to meet a minimum of R-25 over both the existing concrete roof decks and the new metal deck at the addition. New TPO (Thermoplastic Polyolefin) membrane roofing, and aluminum perimeter copings will be typical to all roofs. New tapered insulation and roofing will slope to both existing drains, and new roof drains respectively, with a combination of overflow scuppers and overflow drains installed.

Exterior of Existing City Hall-In addition to power washing the existing limestone and brick and repointing on the North, South, and West Elevations, a new Kawneer curtain wall system will be installed in each of the existing masonry openings. The glazing system will allow for operable windows and will be installed at each opening with spandrel glass panels between windowsills at 30" above the finished floor, down to the ceiling height of the floor below.

Metal stud and drywall window pockets will conceal solar fabric roller shades by Mecho. The interior finished areas below the curtain wall sill in these areas will be framed in 3 5/8" metal studs and 5/8" gypsum board and capped with a solid surface sill at the interior.

On the east elevation, the areas to remain outside of the new addition, will be a new Kawneer 7 1/2" curtain wall system. Operable windows and spandrel panels will be installed similar to the other sides of the building.. An interior metal stud and gypsum wall will be installed with a solid surface cap similar to the installation on the opposite elevations. A preformed, composite metal panel, installed as part of the Kawneer curtain wall system will form a surround at the roof, sides and first floor elevation. Kawneer supplied solar shades, and mullion extensions will also be integral to the curtain wall system and select areas.

A small percentage of areas on the east elevation at the ground floor, currently exposed, will be below grade once the addition and its entrances are constructed. These areas will be infilled with reinforced, mortar filled- solid concrete masonry units, waterproofed, with drainage board, crushed stone backfill, and drainage piping to the storm system.

Exterior Addition- The exterior skin of the addition is planned to be 6" cold formed metal framing filled with R 21 batt insulation with 5/8" gypsum board at the interior and 5/8" exterior gypsum sheathing with spray air and moisture barrier. 2" of rigid insulation will be applied to the exterior of the metal stud wall, the masonry cavity will include full height mortar net and a 1" airspace. The exterior finish will be 4" face brick. With an overall R value of R 31, this wall system will be supported by a structural steel tube subframe. A combination of recessed bands of an alternating brick style will articulate the 4 story façade. Additionally, precast accents will be used in limited areas.

7 1/2" Kawneer Curtainwall glazing will be installed on the north and south elevations as well as outside the exposed structural stair. Centria metal clad canopies will be constructed over the north and south entrances.

Facilities Garage and Connector-The facilities garage will receive new mechanicals, roofing, windows, and overhead doors. Its existing skin will be repaired, repointed and power washed. The connector will receive new glazing in the existing aluminum window frame system.

## INTERIOR FINISHES

Existing City Hall-The general departmental office area walls will be 80% painted gypsum board with a select 20% of the wall areas receiving vinyl wall coverings. Other than the transparent walls Glazed Architectural Walls such as Nxt Wall or Faulkbuilt, all other doors and openings will be solid core wood with hollow metal frames. The flooring in the office and meeting room areas will be carpet tile. All meeting room walls will receive full height vinyl wallcovering with resilient material chair rail.

The corridor walls will be painted with 20% percent receiving 2 layers of drywall and reveal details such by Fry Reglet Architectural Metals at 12" o.c. vertically. Plastic laminate millwork with quartz counters will be installed in all departmental openings, within each department, and within conference and meeting rooms. Limited areas of millwork surrounds will be installed around openings to each department. Overhead rolling shutters will also be installed in these openings.

General floor finish for corridors will be porcelain tile (basis of design Daltile, Panoramic) 6mm thick product in 3 color curved pattern. Pattern and locations will be installed as indicated on the floor plan/ finish plans. Enclosed vestibules and exterior entrances will receive a metal grille with carpet insert walk off system.

The Council Chambers will have the remainder of its wood panels stained and refinished, new fixed seating, and a new wood and quartz counter surface Council Bench. The flooring will be carpet tile.

All bathrooms will receive porcelain tile floors and full height porcelain tile wainscot. Floor drains will be installed in each. Stainless steel restroom partition- stalls and a metal stud and gypsum board soffit cove at the 2x2 ceiling along the lavatories will be included. Bradley sink units with integral hand dryers and soap dispensers in solid surface material will be standard.

Addition- The addition will primarily have 80% painted gypsum board with 20% wall covering. 25% of the gypsum walls will be 2 layers of drywall with reveal details at 12" o.c. such as Fry Reglet Architectural Metals. Horizontal wood planks over painted drywall and stainless-steel details will clad the elevator tower. The exposed structure will be painted. Main Stair floor finishes to be porcelain tile tread and riser. General floor finish porcelain tile (basis of design Daltile, Panoramic) 6mm product in 3 color curved pattern.

Existing Stairwells-The existing stairwells will receive new paint at all newly furred walls and existing walls. Stair tread and risers finish to be porcelain tile tread and riser. General floor finish porcelain tile (basis of design Daltile, Panoramic) 6mm product in 3 color curved pattern.

Facilities Garage and Connector- All existing surfaces at the interior of the Facilities Garage will receive new paint as well as the exposed structure. New VCT will be installed at any areas not requiring exposed concrete. New rubber flooring will be installed in the Connector.

## **SWING SPACE**

Other areas outside the improvements to City Hall, include both the temporary and permanent swing space improvements. While most departments will be moving for only the duration of construction, IT and the Emergency Management Departments will be permanently relocated. Finally, there is the potential for a third space, required for temporary storage.

Swing Space Improvements-The goal is to minimize construction cost at the swing space areas. Partial height temporary drywall and metal stud partitions will be constructed at the front of the former Webster bank space, with similarly constructed walls up to the existing ceilings to the rear. Much of the existing furniture will be reused with other necessary pieces being moved from the existing City Hall.

Much of the carpet will be reused to the rear of the Webster space with new carpet being installed to the front. New reception area will be carved out of the mezzanine space with a metal stud framed wall with hollow metal framed borrowed lights separating it from the areas below. All areas will receive new paint and an allowance at this phase should be held for existing lighting redistribution, power, data, and supply and return, rebalancing changes. Perimeter and center spaces at the offices at the courthouse will have temporary partitions constructed up to the ceiling. The IT and Emergency Management Departments will be constructed to remain permanently similar to the construction within the departments at the City Hall. Like the former Webster Bank space, an allowance at this phase should be held for existing lighting redistribution, power, data, and supply and return rebalancing changes

## Site Work

### Sidewalks

Concrete sidewalks are proposed to the west and south of the site. Sidewalk thickness will be 5" for pedestrian use. Sidewalks will have 12 inches of compacted rolled granular base material. Site stairs will be constructed with foundations below frost line.

Walkways constructed of concrete pavers are proposed to the north, east and south part of the site. Pavers to be Hanover Prest Brick Traditional Paver with a thickness of 2-3/8". Paver to have square edge. Pavers will be set on 6 inches of rolled granular base material, 5 inches of concrete, and set on a 3/4" bituminous setting bed. Three varying colors of this paver will be selected from standard and custom colors. Pavers located at accessible building entrances will be constructed with concrete pads and frost protected foundations.

### Vehicular Pavement

Existing vehicular pavement areas consisting of bituminous concrete will be milled and repaved with a new 2-inch top wearing course. Existing granite curbing is to be removed and reset after milling.

New vehicular parking and accent band proposed along North Main Street is to be constructed of 3" thick Hanover Prest Brick Traditional Pavers suitable for vehicular use. These pavers will be set on 12 inches of rolled granular base, 8 inches of concrete and 3/4 inch bituminous concrete setting bed. Two varying colors of this paver will be selected from standard and custom colors.

### Railings

Proposed railings at accessible ramps and stairs are to be galvanized steel and finished with a high-performance powder coat paint such as ColorGalv.

### Site Lighting

To include architectural grade LED light fixtures that are full cut-off. Ornamental fixtures are to be used throughout the site.

### Walls

Brick Walls will be constructed of a 12" cast-in-place concrete core with brick veneer on both sides and a precast concrete coping. Most walls will be 30" or 18", the wall adjacent to the ramp will be up to 6' tall. All footings will go to frost.

A 6' H x 1' W precast concrete lawn curb is also proposed around some plant beds. This lawn curb has a total height of 16 inches where 10 inches are buried below grade.

Any new walls required north of the building between the building and walk will be cast in place concrete with footings to frost depth.

### Planting

- Shade Trees shall be robust at 3- 3 1/2" caliber

- 10-12'H or 2-2 ½" caliber flowering trees
- 24-30" shrubs
- Planting beds to have planting soil to 18" depth
- Lawns shall be hydroseeded.

## **Site Work**

### Stormwater Management

The existing drainage system utilizes two legs of traditional catch basin inlets with reinforced concrete pipe, HDPE pipe & clay pipe (varying in size, 10" – 24") to collect and convey the stormwater to the 48" stormwater main in Laurel Street and ultimately discharge to the Pequabuck River Conduit located on the south side of North Main Street.

The density of redevelopment lends itself to traditional catch basin inlets with hoods for stormwater collection. Stormwater pipe will be reinforced concrete pipe 12" to 24" in diameter and HDPE pipe 8" – 24" in diameter. Treatment units will be added to both the north and south legs, where appropriately, in order to provide improvements to TSS removal for the site.

Peak flow will be controlled by an underground detention system located under the proposed south parking lot. This system will be constructed of HDPE pipe. Given the high impervious cover of the existing site, the size of this system is expected to be relatively small.

The roof runoff will be collected via scuppers and routed to two new outfall pipes (one to the north and another to the south) and tied directly into the stormwater system.

It is anticipated this parcel will be below the threshold of disturbance and not require a CT DEEP General Permit for Stormwater and Dewatering Wastewaters from Construction Activities.

### Sanitary Sewer

An existing sanitary trunk sewer main is located in the north parking lot. The existing sewer lateral (location to be verified) will be inspected and evaluated as to whether or not it still has the capacity and structural integrity to continue to be re-used. In the event that the lateral is no longer a viable option then a new sanitary sewer lateral will be installed and will be connected to the main in the north parking lot via a 6" SDR-35 PVC pipe per the City of Bristol DPW specifications and requirements.

### Potable Water

The current building does not have a sprinkler system and is only serviced via a 4" D.I. domestic water service located on the south side of the building. The proposed renovations will include sprinklering the building and a new 6" D.I. combined fire and domestic service that will then be split once inside the building per City of Bristol Water Department Regulations.

### Natural Gas

The existing building is not being serviced by a natural gas service. The proposed renovations will include installation of a new gas service from Laurel Street per Eversource's Standards and Regulations.

### Electric / Communications

The current building is be serviced by an existing pad mounted transformer located by the southeast corner of the building. The proposed renovations include the installation of a new pad mounted transformer in the same location as the existing transformer. A 150 kw diesel generator will be installed in the vicinity of the existing drive through. Services will be upgraded accordingly to accommodate the new equipment.

### Underground Storage Tanks

There are currently 2 underground storage tanks located within the scope of work, just east of the northeast corner of the building. Both are an 8,000 gallon fuel oil UST that have been pumped out except for approximately 145-200 gallons of sludge in each. They currently have 10 years remaining on their 30 year lifespan. These are slated to be removed, per DEEP guidelines, during the site demolition and site preparation.

**STRUCTURAL DESIGN NARRATIVE**

Bristol City Hall Renovation  
Bristol, Connecticut

**I. GENERAL DESIGN CRITERIA**

- A. Description: Renovation to an existing 4-story, concrete-framed, 60,000 sq. ft. government operations building. Structural design services include modifications and/or reinforcement to the existing concrete structure as required for interior improvement and the design of an approximately 10,000 sq. ft. steel-framed addition.
1. Risk Category: II
- B. Applicable Codes:
1. 2015 International Building Code with 2018 Connecticut State Building Code Amendments
  2. ASCE 7-10
  3. *Additional design, material, testing, and inspection standards shall be as referenced in the Model Code governing the project or as otherwise required by the Authority Having Jurisdiction.*
- C. Flood Load Criteria
1. FEMA designated zone: X
  2. Base Flood Elevation: N/A
  3. Design Flood Elevation: N/A
- D. Snow Load Criteria
1. Ground Snow Load: 35 psf
  2. Minimum Flat Roof Snow Load: 30 psf
  3. Importance Factor: 1.00
- E. Seismic Load Criteria
1. Mapped Acceleration Parameters:
    - a)  $S_s$ : 0.185
    - b)  $S_1$ : 0.064
  2. Site Class: D (Assumed)
  3. Importance Factor: 1.00
  4. Seismic Design Category: B
  5. *Values noted here shall be verified or updated by a qualified geotechnical engineer following geotechnical exploration and investigation*
- F. Wind Load Criteria
1. Basic Wind Speed: 120 mph (Ultimate)
  2. Exposure Category: C

**II. LOADING CRITERIA**

- A. All loading shown here is in addition to the self-weight of structure including decking or slabs.
- B. Slab-on-Ground:
1. Live Load: 100 psf
- C. Elevated Floors:
1. Superimposed Dead Load: 5 psf
  2. Partition Load: 20 psf

- 3. MEP Misc. Superimposed Load: 5 psf
- 4. Office: 50 psf
- 5. Assembly (fixed seats) 60 psf
- 6. Corridors above first floor 80 psf
- 7. Lobbies and first floor corridors 100 psf
- 8. Storage (light): 50 psf\*
- 9. Storage (high density) 150 psf\*
- 10. Egress: 100 psf

\*Storage loads to be coordinated with client requirements.

D. Roof:

- 1. Superimposed Dead Load: 10 psf
- 2. Live Load: 20 psf
- 3. MEP Misc. Superimposed Load: 5 psf
- 4. Mechanical Penthouse Superimposed Load: 50 psf
- 5. Rain Load:
  - a) Design Rainfall (100-year, 1-hour): 2.77 in
  - b) Maximum allowable depth as lowest point: 6 in

**III. MATERIAL DEFINITIONS**

- 1. Concrete:
- 2. Foundations: 3,500 psi
- 3. Foundation and Retaining Walls: 3,500 psi
- 4. Slab-on-Ground: 3,000 psi
- 5. Slab-on-Metal Deck 4,000 psi

B. Reinforcing:

- 1. Rebar: 60,000 psi

C. Masonry:

- 1. CMU F'm: 1,500 psi
- 2. Grout: 2,000 psi

D. Steel:

- 1. Wide Flange: 50ksi
- 2. Tube Shapes:
  - a) HSS Rectangular: 50ksi
  - b) HSS Round 42ksi
  - c) Pipe 36ksi
- 3. Other (unless noted Otherwise): 36ksi

**IV. DESCRIPTION**

A. Existing Building (Description of existing building structure provided for reference. All existing information referenced from original structural drawings set sheets F1-F8 prepared by Lyons and Mather, dated 6-30-62)

- 1. Shallow Foundations:
  - a) Spread and continuous footings with an assumed bearing pressure of 6000 psf (to be confirmed by a geotechnical investigation and report)
- 2. Slab-on-Ground:
  - a) 6 in thick concrete slab
- 3. Retaining/Basement Walls:
  - a) 12 in thick reinforced concrete

4. Columns:
    - a) 14 in x 14 in (varies 12 in to 16 in) spaced in an approximate 16 ft by 12 ft grid
  5. Floor Framing:
    - a) 6 in thick one-way reinforced concrete slab supported on 20 to 24 in deep reinforced concrete beams spaced at 12 ft on center.
  6. Roof Framing:
    - a) 4 to 6 in thick one-way reinforced concrete slab supported on 20 in deep reinforced concrete beams spaced at 12 ft on center.
  7. Lateral Load Resisting System:
    - a) Concrete moment frames
  8. Miscellaneous Elements:
    - a) Existing non-load bearing interior masonry walls to be removed. Select walls to be removed as directed by the architect. Removal will not have an impact on the structural system.
    - b) New curtainwall and cold-formed steel wall partition framing to be provided per architectural drawings. New curtainwall and cold-formed steel framing to be designed by others.
    - c) New exterior canopies and sunshades attached to existing structure to be coordinated with architect.
    - d) New occupiable roof deck over existing structure to be coordinated with architect.
    - e) Possible reinforcement required at existing concrete floor framing for high density file storage.
    - f) Modifications to existing concrete floor framing to infill existing floor openings or provide new mechanical openings. Steel reinforcing may be required at new floor openings.
  9. Façade:
    - a) Existing brick veneer to remain. Sections of existing brick veneer to be removed and replaced with new glazing per architectural drawings.
    - b) Possible reinforcement required at perimeter concrete beams and/or columns or additional steel framing for new curtainwall support at existing structure.
- B. New Addition**
1. Shallow Foundations:
    - a) Spread and continuous footings with an assumed bearing pressure of 3000 psf (to be confirmed by a geotechnical investigation and report)
    - b) Minimum bearing depth shall be 42 in below grade.
  2. Slab-on-Ground:
    - a) 4 in thick concrete slab reinforced with 6x6-W2.1xW2.1 welded wire reinforcing over a 10 mil (minimum) vapor retarder. Sub-grade (including aggregate where required) prepared according to the recommendations of a qualified geotechnical engineer. Control joints cut in at approximately 12'-0" on center with box outs at all columns and pre-molded joint filler between slab and structure where noted.
  3. Retaining/Basement Walls:
    - a) 12in thick reinforced concrete.
  4. Columns:
    - a) HSS6x6x3/8 steel columns spaced at approximately 12ft along new storefront and existing building.
  5. Floor Framing:
    - a) 3½" normal weight concrete on 2" 20-gauge composite metal deck (5½" total thickness) reinforced with 6x6-W2.1xW2.1 welded wire reinforcing. Composite wide flange steel beams spaced at approximately 8 ft on center. Composite wide flange steel girders and perimeter beams

6. Roof Framing:
  - a) 1½" 22-gauge type B steel roof deck on wide flange steel beams spaced at 6 ft on center. Wide flange steel roof girders and perimeter beams.
7. Lateral Load Resisting System:
  - a) Steel Systems Not Specifically Detailed for System Resistance (Moment frames)
8. Miscellaneous Elements:
  - a) Architectural exposed structural steel (AESS) to be coordinated with architect at curtainwalls.
    1. Exterior canopies and sunshades to be coordinated with architect.
9. Façade:
  - a) Exterior will be curtainwall and brick which will bear on grade to an approximate height of 47 ft and will require additional support from the elevated structural framing. Cladding will be backed by sheathing and non-load bearing cold formed steel studs to be designed and detailed by a specialty engineer.

**V. ADDITIONAL CRITERIA**

- A. Deflection Criteria
  1. Elevated floor and roof framing vertical deflection
    - a) Live load: L/360
    - b) Total load: L/240
  2. Exterior cold formed steel studs horizontal deflection
    - a) Brick/stone veneer: L/600
    - b) Simulated stone walls or stucco finish: L/360
    - c) EIFS, ACM, or other flexible finishes: L/240

**VI. ITEMS NOT IN SCOPE**

- A. Targeted ground penetrating radar (GPR) scanning of the existing concrete structure may be required at locations where new structural framing attaches to the existing concrete structure. GPR scanning is recommended where the existing structural drawings do not provide sufficient detail to locate and avoid damaging existing rebar at new anchorage locations.

# MECHANICAL SCHEMATIC DESIGN REPORT

FOR

## **BRISTOL CITY HALL**

111 NORTH MAIN ST.  
BRISTOL, CT



Date: 06/14/21

## BRISTOL CITY HALL

### Mechanical, Electrical, Plumbing, and Fire Protection Schematic Design Narrative

June 14, 2021

Long Consulting Project No. 21011

#### GENERAL

The work described herein is a narrative of the schematic design of the Mechanical, Electrical, Plumbing, and Fire Protection systems for the Bristol City Hall located at 111 North Main Street, Bristol, CT.

#### HVAC

##### Demolition

The building is currently provided with heating and cooling from a two-pipe induction system consisting of multiple central station air handling units, two steam boilers, an electric scroll chiller, and a cross-flow cooling tower. All existing equipment, ductwork, registers and grills, and piping will be demolished and replaced with a new system.

##### **Demolished Equipment**

Cooling tower – (1) BAC model 15201  
Rooftop Units – (2) Serving council chambers  
Water cooled Chiller - Trane  
Central Station Air Handling Units – (4) mechanical Penthouse  
Low Pressure Steam Boiler – (2) Columbia Model MPH-60  
End Suction Pumps – five (5) Ground Floor mechanical room  
Steam to hot water heat exchanger  
Perimeter Induction Units

##### Construction

Complete new mechanical systems are to be provided for the entire building, including both the renovated portions of the building and new additions. The new systems will be designed in accordance with the requirements of the following codes and standards:

- 2015 International Mechanical Code (IMC)
- 2015 International Energy Conservation Code (IECC)
- 2018 Connecticut State Building Code (CSBC)
- Other State and Local Codes

#### Design Conditions, Heating/Cooling Load Calculations

##### Outdoor Design Conditions:

Cooling design conditions – 91°F Dry bulb  
74°F Wet bulb

Heating design conditions – 3°F Dry bulb

##### Indoor Design Conditions:

Cooling design conditions – 72°F Dry bulb  
50% Relative Humidity

Heating design conditions – 72°F Dry bulb

The building will be provided with heating, cooling, and ventilation from five new packaged rooftop units that each have a nominal cooling capacity of 20 tons. The units will contain DX-refrigerant cooling coils, natural gas furnaces, and supply fans that are controlled by variable frequency drives. The packaged rooftop units will be mounted on vibration isolation curbs. A 48x24 supply and return duct mains will be routed vertically from the roof to each floor through a duct shaft. Supply air will be distributed to each floor from an overhead duct distribution system. Return air will be drawn from each floor from a above ceiling return plenum. A combined fire/smoke damper will be provided at each duct connection to the supply and return duct risers. A Price model RM rectangular duct silencer will be provided at each duct connection to the supply and return duct riser. Temperature control will be provided to each space by 116 series variable air volume terminal units with hot water heating coils.

A new heating hot water loop will be installed to serve all new hot water heating coils located in variable air volume terminal units. Three new natural gas fired condensing boilers will be installed in the rooftop mechanical penthouse. The boilers will be Lochinvar model FBN0751 units. Two new 5 HP inline pumps located in the mechanical penthouse will circulate hot water through the building. Each boiler will be provided with a ½ HP inline boiler feed pump.

Heating hot water will be circulated to VAV terminal units from 4 hot water supply and return risers. A shut off valve will be installed at each riser, at each supply/return floor main connection, and at each VAV terminal unit.

The city council chamber will be provided with heating, cooling, and ventilation from two new packaged rooftop units that each have a nominal cooling capacity of 5 tons. The units will contain DX-refrigerant cooling coils, natural gas fired furnaces, and supply fans that are controlled by variable frequency drives. Supply air will be distributed to each floor from an overhead duct distribution system. Return air will be drawn from each floor from a above ceiling return plenum. A Price model RM rectangular duct silencer will be provided at each supply and return duct main.

The City Clerk Vault will be provided with heating, cooling, temperature control, and humidity control from a single floor mounted dedicated HVAC unit. The unit will be a Liebert PDX023 unit with DX-refrigerant cooling coil, electric heating coil, humidifier and a supply fan. Supply air will be distributed from an overhead duct distribution system

Supplemental heating will be provided to building entrances from wall mounted hot water cabinet unit heaters. The unit heaters will be Modine CW004 units.

The atrium will be provided with a smoke control system. A 5 HP utility set exhaust fan will be mounted on the roof of the atrium. A 5 HP supply fan will be mounted on the roof of the atrium. The supply and exhaust fan will be controlled by the smoke control panel.

Control of the new HVAC system will be provided by the existing Snyder Building Automation Control system. All new components will be provided to integrate new HVAC equipment into the building control system.

### **New Equipment**

Packaged rooftop units –	(5) Trane Model YHD240
	(2) Trane Model YHD060
RTU Curbs	(7) Isolation curbs
Boilers	(3) Lockinvar Crest Model FBN0751
Boiler Feed Pump	(3) 1/2 HP inline pumps
HW Loop Pumps	(2) 5 HP inline pumps
VAV Terminal Units	(116) Price SDV with 2 row hot water heating coil
Duct Silencers	(32) Price Model RM
Fire/Smoke Dampers	(30) Greenheck SMD 201

City Clerk Vault                   (1) Liebert Model PDX023  
Unit Heaters                       (4) Modine CW004

## **ELECTRICAL**

### **General**

Complete new electrical systems are to be provided for the entire building, including both the renovated portions of the building and new additions. Complete new fire alarm systems are to be provided for the entire building, including both the renovated portions of the building and new additions. The new systems will be designed in accordance with the requirements of the following codes and standards:

- 2017 NFPA 70 - National Electric Code (NEC)
- 2015 International Energy Conservation Code (IECC)
- 2018 Connecticut State Building Code (CSBC)
- 2013 NFPA 72 – National Fire Alarm and Signaling Code
- Other State and Local Codes

### **Proposed Electrical System**

The building will be provided with a new 1600-amp, 480 volt, 3-phase electrical service that will originate from a utility transformer located on the site. The electrical service will enter the building at the main electrical room on the ground level and provide power to a new 1600-amp, 480 volt, 3-phase main service switch and main distribution panel.

The main distribution panel will provide power to 400-amp, 480 volt, 3-phase electrical panels located in electrical closets on each floor of the building. The 400-amp, 480-volt panel on the ground floor will be located in the main electrical room. The main distribution panel will also provide power to the new roof top units located on the roof of the building.

The 400-amp, 480-volt panels on each floor will provide power to the lighting on each floor. Each electrical closet on each floor will also have two 75 KVA transformers that will feed two 2-section 200-amp, 208 volt, 3-phase electrical panels. The transformers will be fed from the 400-amp, 480-volt panels. The 200-amp, 208 volt, 3-phase panels will provide power to the branch circuiting on each floor.

A new 150 kW, 480-volt, diesel fired, emergency generator in a weatherproof sound attenuated enclosure (Generac SD150) will be installed on the site to

provide emergency power to the building's life safety loads. The generator will provide power to a new 200-amp, 480 volt, 3-phase emergency panel through a 200 amp, 480-volt, 4-pole automatic transfer switch (ATS). The emergency panel and the ATS shall be located in an emergency electrical room on the ground floor separate from the main electrical room. The emergency electrical room will also house a 30 KVA transformer and a 100-amp, 208 volt, 3-phase panel for the 120/208-volt emergency loads. The emergency panels will provide power to the emergency lighting in the building, exit signs, fire alarm system, and the smoke control system in the atrium. The generator will be located on a concrete pad on the site. A 3" PVC shall be installed from the pad to the emergency electrical room to route feeders from the generator to the ATS. Two 1" PVC shall be routed out to the pad to run control wiring and all 120-volt circuits required for the generator operation.

The building will be provided with a new central fire alarm system with an addressable fire alarm control panel located in the main electrical room. The fire alarm control panel will monitor the buildings fire protection system through connections to all fire protection water flow and tamper switches. Fire alarm pull stations will be installed at building exits and at the exits to each floor. Fire alarm notification devices will be located throughout the building. Smoke detectors tied into the elevator recall system will be located in the elevator lobbies on each floor.

## **PLUMBING**

A complete new plumbing system is to be provided for the entire building, including both the renovated portions of the building and new additions. The new systems will be designed in accordance with the requirements of the following codes and standards:

- 2015 International Plumbing Code (IPC)
- 2015 International Energy Conservation Code (IECC)
- 2018 Connecticut State Building Code (CSBC)
- Other State and Local Codes

The existing 3" diameter domestic water service will be demolished and capped at the exterior wall. The existing Bradford White model D75T123N natural gas fired water heater will be demolished and all associated supply and recirculation piping.

A new 2" diameter water service will be provided to the building. The new domestic water service will be equipped with a new Watts model 009M2-QT reduced pressure zone backflow prevention device. The water service will also

be equipped with a Watts model LF223 high-capacity water pressure reducing valve located on the water service.

A new 2" diameter domestic water riser will be routed in the mechanical riser within the common area bathrooms located on each floor. Plumbing fixtures located in the common area bathrooms and the staff lounges located on each will be provided with domestic hot water from a tank type electric water heater. A 1" diameter hot water supply and a ¾" hot water recirculation line will be routed to the plumbing fixtures on each floor. An AO Smith model ENT-30 tank type water heater with a 30-gallon storage capacity and a 4500-Watt heating element will be located in storage room on the second floor. A Taco model 006 BC4 will circulate domestic hot water to the fixtures. Each bathroom will be provided with a floor drain located in the center of the floor. The traps for all floor drain traps will be protected by a Zurn Z1072 trap seal primer.

Plumbing fixtures located on the ground floor and first floor will be provided with hot water from a tank type electric water heater. An AO Smith ENT-40 water heater with a 40-gallon storage capacity with a 4500-Watt heating element will be located in a storage room adjacent to the Ground floor Nursing room. A Taco model 006 BC4 will circulate domestic hot water to the fixtures.

Plumbing fixtures located on the third-floor mayor's office will be provided with hot water from a tank type electric water heater. A EEMAX model EMT2.5 mini tank type water heater will be located below the sink in the mayor's kitchenette.

### **New Equipment**

Watts 009M2-QT RPZ – 2" diameter service  
Watts model LF223 high-capacity water pressure reducing valve

Floor Drain – located in each bathroom.  
Zurn Z1072 trap seal primer – on each floor drain.

#### Water Heaters

AO Smith - ENT-30 water heater – 2<sup>nd</sup> floor Storage.  
AO Smith - ENT-40 water heater – Ground Floor Storage.  
EEMAX – EMT2.5 – below sink in Mayor's Kitchenette.  
HWH Recirc pumps – Two Taco model 006 BC4 pumps.

**Piping Materials**

Domestic water piping – Copper  
Sanitary waste and vent – Cast Iron  
Storm drain piping – Cast Iron

**Plumbing Fixtures**

Water Closets – Twenty-Two  
Fixture – American Standard 3461.001 ;  
Flushometer – American Standard 6047.161.002

Urinal – Three  
Fixture – American Standard 6550.001  
Flushometer – American Standard 6063.051.002

Lavatory – Seventeen  
Fixture – Toto LT909  
Valve – Toto TL960DDLQ

Sink – Four  
Fixture – Elkay ECTSR15159BG  
Valve – Elkay LKGT1042

Shower – Two  
Fixture – Toto TS626D2  
Valve – Toto TS300A55

**FIRE PROTECTION**

The building is not currently protected with an automatic wet sprinkler system. Due to the renovation of the building, the building will be required to be provided with an automatic wet sprinkler system and a Type I manual standpipe.

- NFPA 13 – Standard for the Installation of Sprinkler Systems
- NFPA 14 – Standard for the Installation of Standpipe and Hose Systems

A new 6" fire protection water service will enter the building at the ground level. A new Watts model 709DCDA double check detector assembly will be installed on the new 6" fire protection service. A 4" diameter standpipe will be routed from the ground floor the roof in one of the stairwells. A 4" diameter combined fire sprinkler and standpipe riser will be routed in the second stairwell. The

sprinklers located on each floor are supplied from the combined fire sprinkler and standpipe riser with a shutoff valve with a tamper switch, a flow switch, and a drain valve. Wet sprinkler piping will be schedule 40 black steel. A schematic sprinkler layout has been provided with the narrative for pricing.

## Design Criteria

### Hydrant Flow Data

Date:	5/24/2021
Static Pressure:	104 PSI
Residual Pressure:	55 PSI
Residual Flow:	4010 GPM

### Light Hazard Occupancy

Areas Of Applications:	1500 Sq Ft
Maximum Coverage Per Sprinkler:	225 Sq Ft
Design Density:	0.10 GPM Per Sq Ft
Spacing Between Sprinklers:	15'-0" Maximum
Distance Between Sprinklers & Walls:	1/2 Of Allowable Distance Between Sprinklers

### Ordinary Hazard (Group 1) Occupancy

Areas Of Applications:	1500 Sq Ft
Maximum Coverage Per Sprinkler:	130 Sq Ft
Design Density:	0.15 GPM Per Sq Ft
Spacing Between Sprinklers:	15'-0" Maximum
Distance Between Sprinklers & Walls:	1/2 Of Allowable Distance Between Sprinklers