



Memorial Boulevard Cultural Center
Bristol, Connecticut

BUILDING PROGRAM DRAFT

December 1, 2017

Architecture
Quisenberry Arcari + Malik Architecture

Site
TODesign, LLC

Mechanical, Electrical and Plumbing Systems
CES, Inc.

Theater Planning
Nextstage Design

Acoustics and Audio/Visual Systems
Jaffe Holden

Food Service
Crabtree McGrath Associates

QuisenberryArcariMalik

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Introduction

The purpose of this building program is to provide an effective means of communication between the project Client and the design professionals, and to ultimately result to a facility that responds to the specific needs of the end users. This program summarizes the project thinking as it relates to:

- Objectives of the Cultural Center
- Organizational structure
- Site Program
- Mechanical, Electrical and Plumbing Program
- Theater Program
- Acoustical and Audiovisual Program
- Furniture, equipment and technology
- Space relationships

The Building Program was developed from several sources, including client interviews, programming meetings with the Memorial Boulevard Cultural Center Board, the Memorial Boulevard Cultural Center Building Committee, the City of Bristol Department of Public Works, and the citizens of Bristol who attended several public hearings on the project. Decisions were made by all the above stakeholders in a collaborative process.

Also included within this program document is an Existing Building Conditions Survey (Attachment F). It includes reports related to the existing conditions of the building and its mechanical, electrical, plumbing and fire protection systems. Excluded from the survey is any evaluation of existing hazardous materials that may be present.

Executive Summary

I. Project Summary

The Memorial Boulevard School is a handsome historic building constructed in 1921. It served as a school from the time of its construction until 2011 when the Board of Education decided to vacate the building and move to a new K-8 school. At that time the City of Bristol began to investigate opportunities for reuse of the building. Feasibility studies were completed in 2008 and 2015 which indicated that because of the excellent condition of the building, its prominent location at the end of Memorial Boulevard Park, and the existence of a 900-seat auditorium within the building, the best use would be a cultural center with a regional theater developed in the existing auditorium.

Smith Edwards McCoy Architects (now a part of QA+M Architecture) was engaged in December 2015 to begin work on the project, beginning with Programming phase and progressing through the Design Development phase. We worked with the Memorial Boulevard Cultural Commission (Marie O'Brien, chair) and the Memorial Boulevard Cultural Center Building Committee (MBCC, Frank Stawski, chair) to establish a project program and scope. Naturally, this being a cherished community building there was also extensive input from the community at large through a series of public hearings that were a component of the regularly scheduled MBCC meetings.

The following sections summarize our current understanding of the program for the Phase One project for the Memorial Boulevard Cultural Center.

II. Site

The site of the Memorial Boulevard School is to be developed to support the use of the building as a cultural center and theater. To that end, parking should be maximized. It is understood that the existing site itself cannot support the number of parking spaces required for the theater and for the balance of the building, but the City will work toward a parking solution that satisfies Planning and Zoning. The parking solution may include the reconfiguration of Willis Street to allow for additional parking.

Other required site features include a truck dock to allow an 18-wheel vehicle to make deliveries to the backstage area of the building, various walkways and ramps, retaining walls, site lighting, and the possibility of a terrace for outdoor dining and arts display. It is important that the site be designed to allow for school buses to enter the site to unload and pick up passengers.

The design of the parking lots will be completed by the City of Bristol Department of Public Works. All other site design will be performed by the QA+M design team.

III. Theater

The centerpiece of the cultural center will be the development of the school auditorium into a professional theater. Theater program requirements include:

- a. 750 seats with improved site lines and seating sizes
- b. Men's and Women's toilet rooms as required by Code or otherwise
- c. Patron amenities including food and beverage concessions (see Crabtree McGrath program draft)
- d. Ticket office, Manager's Office, General storage

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- e. Handicap accessibility to the theater and to the stage
- f. Upgraded theatrical rigging and lighting (see NextStage Design program draft)
- g. Upgraded acoustical components and audiovisual systems (see Jaffe Holden program draft)
- h. Conversion of one classroom into theatrical support areas including dressing rooms, costume storage, toilet and shower facilities
- i. Addition adjacent to stage to include green room and stage support spaces.
- j. Truck dock with lift at rear of new addition.
- k. Resolution of existing egress and related code issues

IV. Lobbies

- a. New handicap accessible entrance to theater portion of the building.
- b. New elevator(s) to provide access to 3 levels of the theater
- c. Refurbished existing lobbies and stairs

V. Other portions of the theater wing

- a. In the gymnasium, swimming pool and locker rooms below the gymnasium, the only work that is required is to install the elevator to connect the lower two levels of the building to the upper three levels.

VI. Balance of building

- a. First floor
 - 1. Provide handicap access from main door to first floor (this may be accomplished via an existing ramp at the rear of the building- to be determined)
 - 2. Upgrade two existing men's and women's toilet rooms for accessibility, finishes, etc....
 - 3. Upgrade existing elevator within existing masonry shaft (Modification from the State may be required if existing shaft cannot meet required ADA code dimensions)
 - 4. Upgrade existing finishes as required in corridors and stairs
 - 5. No work in classrooms other than as required to facilitate installation of Phase One MEP upgrades (see CES' schematic narrative)
- b. Basement, Second, Third floors
 - 1. No work other than as required to facilitate installation of Phase One MEP upgrades (see CES' schematic narrative)

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Overall Space Requirements

MEMORIAL BOULEVARD CULTURAL CENTER- SPACE NEEDS						
Function	Group	Room Name		Area (net)	Grp. Area	Comments
Lobby	First Floor	Main Lobby			2,560	
Lobby		Landing and Stair		555		
Lobby		Stair Lobby		360		
Lobby		Elevators (2)		155		
Lobby		Elevator Lobby		120		
Lobby		Main Lobby		705		
Lobby		Steps and Ramp		260		
Toilets		Women's Vestibule		115		
Toilets		Women's Room		290		
Admin		Cultural Center Administrative Offices			500	
Admin		Box Office		235		
Admin		Manager's Office		215		
Concessions		Concessions Area			630	
Concessions		Bar		230		
Concessions		Food Prep		320		
Concessions		Curatorial Closet		20		
Theater	Theater				3,555	
Theater		Seating Area		3095		322 Seats
Theater		North Stair Vestibule		195		
Theater		Light/Sound Lock		130		
Theater		Convenience Stair		135		
Stage Areas	Stage				3,165	
Stage Areas		Stage		1060		
Stage Areas		Backstage and Stairs		915		
Stage Areas		Wheelchair Lift		35		
Stage Areas		Costume Storage		65		
Stage Areas		Dressing Rooms (2)		235		
Stage Areas		Shower Room		50		
Stage Areas		Toilet Room		55		
Stage Areas		Storage		25		
Stage Areas		Green Room		640		
Stage Areas		Deck Lift		85		
Lobby	Second Floor	Lobby			3,075	
Lobby		Landing and Stair		375		
Lobby		Stair Lobby		400		
Lobby		Elevator Lobby		120		
Lobby		Elevators (2)		155		
Lobby		Lobby		750		
Lobby		Concessions (2)		210		
Lobby		Storage (2)		500		
Lobby		Light Locker (2)		160		
Toilets		Men's Vestibule		120		
Toilets		Men's Room		235		
Theater	Theater-2nd Floor				1,380	
Theater		Box and Cabaret Seating		1310		78 seats
Theater		Convenience Stair		70		
Stage Areas	Stage-2nd Floor				555	
Stage Areas		Catwalk		555		
Lobby	Third Floor	Lobby			1,145	
Lobby		Landing and Stair		200		
Lobby		Stair Lobby		345		
Lobby		Elevator Lobby		120		
Lobby		Elevators (2)		155		
Toilets		Women's Vestibule		120		
Toilets		Women's Room		205		
Toilets		Men's Room		135		
Admin	Admin Office				340	
Admin		Storage/Office		250		
Admin		Stage Manager Office		90		
Theater	Theater				2,090	
Theater		Stadium Seating Area		2090		353 seats (352 + 2HC)

Space Program Narrative

This section covers the general minimum requirements in a space such as layout, location and built-in items such as casework, millwork, plumbing, and FFE (furnishings fixtures and equipment). For descriptions of the Theater

I. LOBBIES, STAIRS AND ELEVATORS

First Floor Landing and Stair

General- The main entrance landing and stair are to be fully accessible to the handicapped. It should be welcoming, well-lit and easily identifiable from the parking lot and access sidewalks. Finishes and lighting should express the professional quality theater beyond while being durable and practical. Access to the adjacent elevator lobby should be clearly defined. The main stair should be elegant and approachable.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA

First Floor Stair Lobby

General- The stair lobby leading to the elevators should flow comfortably from the main entrance and have a consistent aesthetic.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Elevators (2)

General- The elevators should have a consistent aesthetic with the main lobby. They should be durable and allow for the transportation of passengers and freight.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA.

First Floor Elevator Lobby

General- The elevator lobby should be welcoming and elegant. The finishes should be attractive and durable. Access to the First Floor Main Lobby should be clearly indicated.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) – TBD.

First Floor Main Lobby

General- The main lobby should be welcoming and elegant and clearly express the professional quality of the theater beyond. The finishes should be attractive and durable. Access to the Box Office and Bar area should be clearly indicated.

Technology- as required by Code or by the Theater and Audio-Visual Programs.

Furniture, Fixtures and Equipment (FFE) – TBD.

First Floor Steps and Ramps

General- The steps and ramps from the main lobby to the theater should flow comfortably and lead patrons clearly to the main parterre cross-aisle. The finishes should be attractive and durable.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) – NA.

First Floor Women’s Vestibule and Toilet Room

General- These spaces should continue the feeling of the professional theater. Finishes should be elegant and durable. Ideally the number of toilet and lavatory fixtures should exceed the number required by the Code to increase patron convenience.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) – TBD.

Second Floor Landing and Stair

General- Finishes and lighting should express the professional quality theater beyond while being durable and practical. The main stair should be elegant and approachable.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Second Floor Stair Lobby

General- The stair lobby leading to the second floor lobby should be as visually open as possible from the stairs and have a consistent aesthetic.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Elevators (2)

General- The elevators should have a consistent aesthetic with the main lobby. They should be durable and allow for the transportation of passengers and freight.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA.

Second Floor Elevator Lobby

General- The elevator lobby should be welcoming and elegant. The finishes should be attractive and durable. Access to the Second Floor Lobby should be clearly indicated.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) – TBD.

Second Floor Lobby

General- The lobby should be welcoming and elegant and clearly express the professional quality of the theater beyond. The finishes should be attractive and durable. Access to the seating areas should be clearly indicated. There should be ample room for patrons to access the concessions areas during intermission.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) – TBD.

Second Floor Men's Vestibule and Toilet Room

General- These spaces should continue the feeling of the professional theater. Finishes should be elegant and durable. Ideally the number of toilet and lavatory fixtures should exceed the number required by the Code to increase patron convenience.

Technology- as required by Code.

FFE- NA

Third Floor Landing and Stair

General- Finishes and lighting should express the professional quality theater beyond while being durable and practical. The main stair should be elegant and approachable.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Third Floor Stair Lobby

General- The stair lobby leading to the second floor lobby should be as visually open as possible from the stairs and have a consistent aesthetic.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Elevators (2)

General- The elevators should have a consistent aesthetic with the main lobby. They should be durable and allow for the transportation of passengers and freight.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA.

Third Floor Elevator Lobby

General- The elevator lobby should be welcoming and elegant. The finishes should be attractive and durable. Access to the Second Floor Lobby should be clearly indicated.

Technology- TBD.

Furniture, Fixtures and Equipment (FFE) – TBD.

Third Floor Women’s Vestibule and Toilet Room

General- These spaces should continue the feeling of the professional theater. Finishes should be elegant and durable. Ideally the number of toilet and lavatory fixtures should exceed the number required by the Code to increase patron convenience.

Technology- as required by Code.

FFE- NA

Third Floor Men’s Toilet Room

General- This space should continue the feeling of the professional theater. Finishes should be elegant and durable. Ideally the number of toilet and lavatory fixtures should exceed the number required by the Code to increase patron convenience.

Technology- as required by Code.

FFE- NA

Lower Mezzanine Landing and Stair

General- Finishes and lighting should be durable and practical. The minimum amount of work required to repair disruption to existing finishes during the installation of the new elevators and to meet the egress requirements of the Code should be undertaken.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Lower Mezzanine Stair Lobby

General- Finishes and lighting should be durable and practical. The minimum amount of work required to repair disruption to existing finishes during the installation of the new elevators and to meet the egress requirements of the Code should be undertaken.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Elevators (2)

General- The elevators should have a consistent aesthetic with the main lobby. They should be durable and allow for the transportation of passengers and freight.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA.

Lower Mezzanine Elevator Lobby

General- Finishes and lighting should be durable and practical. The minimum amount of work required to repair disruption to existing finishes during the installation of the new elevators and to meet the egress requirements of the Code should be undertaken.

Technology- TBD.

Furniture, Fixtures and Equipment (FFE) – TBD.

Gym Level Landing and Stair

General- Finishes and lighting should be durable and practical. The minimum amount of work required to repair disruption to existing finishes during the installation of the new elevators and to meet the egress requirements of the Code should be undertaken.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Gym Level Stair Lobby

General- Finishes and lighting should be durable and practical. The minimum amount of work required to repair disruption to existing finishes during the installation of the new elevators and to meet the egress requirements of the Code should be undertaken.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Elevators (2)

General- The elevators should have a consistent aesthetic with the main lobby. They should be durable and allow for the transportation of passengers and freight.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA.

Gym Level Elevator Lobby

General- Finishes and lighting should be durable and practical. The minimum amount of work required to repair disruption to existing finishes during the installation of the new elevators and to meet the egress requirements of the Code should be undertaken.

Technology- TBD.

Furniture, Fixtures and Equipment (FFE) – TBD.

Gym Level Elevator Machine Room

General- The Elevator Machine Room is a mechanical space. It should be designed to meet the needs of the new elevators and meet all Code requirements.

Technology- as required by the elevator manufacturer or by Code.

FFE- NA

Gym Level Ramp

General- The ramp is intended to meet accessibility requirements on the Gym Level. It should be designed to meet the needs of the Code.

Technology- NA

FFE- NA

II. ADMINISTRATIVE OFFICES

Box Office

General- The Box Office should be easily accessed from the Main First Floor Lobby. The space should be welcoming and efficient. There should be 3-4 ticket windows, one of which should be accessible to the handicapped. The finishes should be attractive and durable.

Technology- As required to allow for telephone communications and online ticket sales.

FFE- 4 ticket window workstations with work surfaces and desk chair. Rear credenza with printers and storage for printed material. Balance TBD.

Manager's Office

General- Manager's Office should be adjacent to the Box Office and provide sufficient space for a small group meeting.

Technology- Provide telephone, power outlets and data drops as required.

FFE- (1) desk and chair (1) large work table, (8) chairs, (1) 4-drawer lateral files, (3) bookcases, other items TBD.

Second Floor Storage Rooms (2)

General- The two existing storage rooms on the second floor should be refurbished as required to best meet the needs of the theater and the adjacent concessions areas.

Technology- TBD

FFE- TBD

Third Floor Storage/Office

General- The space behind the elevators on the third floor should be developed as general storage or as an additional office as needed.

Technology- Provide telephone, power outlets and data drops as required.

FFE- TBD.

Stage Manager's Office

General- The former projection room above the third floor should be developed as the stage manager's office.

Technology- Provide telephone, power outlets and data drops as required. Refer to the Theater and Audio-Visual programs for a full description of technology required in this space.

FFE- TBD.

III. CONCESSIONS

First Floor Bar

General- Provide maximum bar countertop space to allow for convenient patron access during intermission. The bar should appear professional and elegant. Finishes should be attractive and durable. Refer to the Food Service portion of the program for a full description of the Bar.

Technology- as required for communications and for cash and credit card concessions sales.

FFE- TBD.

First Floor Food Preparation

General- The Food preparation space should be durable, well-lit and easily cleaned. Refer to the Food Service portion of the program for a full description of the Food Preparation area.

Technology- TBD.

FFE- TBD. Refer to the Food Service portion of the program for a full description of the Food Preparation area.

Second Floor Concessions Areas (2)

General- Provide maximum bar countertop space to allow for convenient patron access during intermission. The bar should appear professional and elegant. Finishes should be attractive and durable. Refer to the Food Service portion of the program for a full description of the Bar.

Technology- as required for communications and for cash and credit card concessions sales.

FFE- TBD.

IV. THEATER- 750 seats total

First Floor Seating Area

General- The first-floor seating area should be comfortable and elegant and express the professional-level quality of the theater. The aisles, orchestra and rear parterre aisle should be carpeted. The floor in the seating areas should be the existing concrete floor with a durable applied finish.

Technology- as required by Code for listening assistance and for safety.

FFE- 322 fixed theater seats of the most comfortable dimensions possible without sacrificing capacity. Space for code-required wheelchair seating must be provided. The seats should be durable and elegant. Refer to the Theater portion of the program for a full description of the proposed seating.

North Stair Vestibule

General- This existing space should have upgraded finishes, lighting, railings, etc. to flow comfortably from the newly designed theater.

Technology- TBD.

FFE- NA.

First Floor Light/Sound Lock

General- This new space should create an effective light and sound lock from the theater to the balance of the building. Finishes and lighting should be consistent with the theater seating area.

Technology- TBD.

FFE- NA.

First Floor Convenience Stair

General- This existing stair should have upgraded finishes, lighting, railings, etc. to flow comfortably from the newly designed theater to the box and cabaret seats above.

Technology- TBD.

FFE- NA.

Second Floor Light/Sound Locks (2)

General- These spaces should create an effective light and sound lock from the theater to the second floor lobby. Finishes and lighting should be consistent with the theater seating area.

Technology- TBD.

FFE- NA.

Second Floor Seating Area

General- The second-floor seating area should be comfortable and elegant and express the professional-level quality of the theater. The aisles and seating areas should be

carpeted. The floor in the box seating areas should be the existing concrete floor with a durable applied finish.

Technology- as required by Code for listening assistance and for safety.

FFE- 78 theater seats of a variety of types: loose seating and cabaret tables and chairs in the level areas, with the balance to be fixed and loose seating in the box seating areas. Space for code-required wheelchair seating must be provided. The seats should be durable and elegant. Refer to the Theater portion of the program for a full description of the proposed seating.

Second Floor Convenience Stair

General- This existing stair should have upgraded finishes, lighting, railings, etc. to flow comfortably from the newly designed theater below.

Technology- TBD.

FFE- NA.

Third Floor Stadium Seating Area

General- The third-floor seating area should be comfortable and elegant and express the professional-level quality of the theater. The aisles should be carpeted. The floor in the stadium seating areas should be the existing concrete floor with a durable applied finish.

Technology- as required by Code for listening assistance and for safety.

FFE- 354 fixed theater seats (including two accessible seating positions) of the most comfortable dimensions possible without sacrificing capacity. Space for code-required wheelchair seating must be provided. The seats should be durable and elegant. Refer to the Theater portion of the program for a full description of the proposed seating.

V. STAGE

Stage

General- The stage must provide a state-of-the-art performing space for a variety of performance types. Refer to the Theater portion of the program for a full description of the Stage area including rigging and lighting.

Technology- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology required in the Stage area.

FFE- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology FFE in the Stage area.

Backstage and Stairs

General- Refer to the Theater portion of the program for a full description of the Backstage area.

Technology- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology required in the Backstage area.

FFE- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology FFE in the Backstage area.

Wheelchair Lift

General- Provide an easily accessible wheelchair lift to allow for accessibility to the stage from the seating area. The Wheelchair Lift must be sensitively integrated into the architecture of the proscenium.

Technology- as required by Code.

FFE- NA.

Costume Storage

General- Refer to the Theater portion of the program for a full description of the Costume Storage area.

Technology- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology required in the Costume Storage area.

FFE- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology FFE in the Costume Storage area.

Dressing Rooms (2)

General- Provide a Men's Dressing Room and Women's Dressing Room. Rooms should include ample counterspace for theatrical makeup and at least two lavatories. Finishes should be durable. Lighting should be suitable for application of stage makeup.

Technology- as required by Code or by the Theater and Audio-Visual programs.

FFE- TBD

Shower Room

General- Provide a wheelchair accessible unisex shower room for performer use. Room should include one shower and one lavatory. Finishes should be durable.

Technology- as required by Code.

FFE- NA.

Toilet Room

General- Provide a wheelchair accessible unisex toilet room for performer use. Room should include one water closet and one lavatory. Finishes should be durable.

Technology- as required by Code.

FFE- NA.

Storage Room

General- Provide a general storage room. Finishes should be durable.

Technology- NA.

FFE- NA.

Green Room

General- Refer to the Theater portion of the program for a full description of the Green Room area.

Technology- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology required in the Green Room area.

FFE- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology FFE in the Green Room area.

Dock Lift

General- Provide a Dock Lift to allow sets and material to be unloaded from a truck to the Green Room area. Finishes should be durable.

Technology- as required.

FFE- NA.

Second Floor Catwalks and Stairs

General- Refer to the Theater portion of the program for a full description of the Backstage area.

Technology- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology required in the Backstage area.

FFE- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology FFE in the Backstage area.

Third Floor Control Booth

General- Refer to the Theater and AV portions of the program for a full description of the Control Booth area.

Technology- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology required in the Control Booth area.

FFE- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology FFE in the Control Booth area.

Third Floor Catwalks and Stairs

General- Refer to the Theater portion of the program for a full description of the Backstage area.

Technology- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology required in the Backstage area.

FFE- Refer to the Theater, Acoustics and Audio-Visual portions of the program for a full description of the technology FFE in the Backstage area.

VI. RENOVATED SPACES IN THE BALANCE OF THE BUILDING

Entrance Landing and Stair

General- The main entrance landing and stair are to be fully accessible to the handicapped. It should wherever possible maintain existing finishes and architectural details. Any new required finishes should be durable and practical.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA

Wheelchair Lift (1)

General- The elevators should have a consistent aesthetic with the existing architecture. They should be durable and allow for the transportation of a passenger from the first floor stair landing to the first floor.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA.

Landing Level Wheelchair Lift Vestibule

General- The wheelchair lift vestibule should have a consistent aesthetic with the existing architecture.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA.

First Floor Wheelchair Lift Vestibule

General- The upper wheelchair lift vestibule should have a consistent aesthetic with the existing architecture.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA.

First Floor North-South Corridor

General- The main north-south corridor should be repaired from any damage generated by the installation of new mechanical stubs and restored as much as possible to its original aesthetic.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

First Floor East-West Corridor

General- The main east-west corridor should be repaired from any damage generated by the installation of new mechanical stubs and restored as much as possible to its original aesthetic.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - TBD

Elevators (1)

General- The existing elevator cab should be replaced within the existing elevator shaft. It should have a consistent aesthetic with the existing architecture. A Code Modification may be required for this work if the existing shaft cannot contain a fully-accessible cab.

Technology- as required by Code.

Furniture, Fixtures and Equipment (FFE) - NA.

Women's Toilet Room

General- The existing Women's Toilet Room should be refurbished to allow for handicap accessibility. Wherever possible, existing historic finishes should be maintained.

Technology- as required by Code.

FFE- NA

Men's Toilet Room

General- The existing Men's Toilet Room should be refurbished to allow for handicap accessibility. Wherever possible, existing historic finishes should be maintained.

Technology- as required by Code.

FFE- NA



ATTACHMENT A

QuisenberryArcariMalik

195 Scott Swamp Road Farmington, CT 06032 + (860) 677-4594 + qamarch.com

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

For

Bristol Community Cultural Center
Bristol, CT

July 11, 2016

Revised: November 30, 2017



Prepared by:

Consulting Engineering Services, Inc.

811 Middle Street, Middletown, Connecticut, 06457

CES PN 2016036.00

OVERVIEW:

The following describes the proposed mechanical, electrical, plumbing and fire protection systems, which shall serve the proposed renovation of the auditorium (approx.. 17,870 square feet) and first floor area (approximately 9,690 square feet) of the existing Memorial Boulevard School which will be converted to the new Bristol Community Cultural Center, located in Bristol, Connecticut. Mechanical, Electrical, Plumbing, and Fire Protection systems shall be in accordance the current Building Code of the State of Connecticut.

DIVISION 21 - FIRE PROTECTION SPRINKLER SYSTEM

- Existing fire protection system shall be back fed from new fire protection service. Fire Protection system shall be in accordance to NFPA 13.
- A new 8" fire protection line will be routed to the building from water mains in utility designated location.
- Results from a recent flow test shall be provided by the water utility company. At this time, we are assuming that the available flow and pressure are adequate for the building without the assistance of a fire pump.
- A new 8" main fire protection water service with backflow preventer shall replace the existing within the main building's fire service room. New service shall backfeed the existing fire protection system.
- New piping shall be installed to serve new standpipes in stairwells and auditorium stage areas. Standpipes shall be Dry and extend to the roof level.
- New floor control valve assembly shall be provided to renovated first floor to properly zone the sprinkler system. Provide new piping and floor control valve assembly to each floor and cap for future connection to properly zone the sprinkler system.
- New sprinkler piping and sprinkler heads shall be installed in stairwell of renovated area.
- New sprinklers shall be concealed, fully recessed in finished areas with ceilings. Sidewall, exposed, extended coverage sprinklers shall be installed where appropriate. Quick response sprinkler heads shall be used in light hazard locations. Sprinklers, unless noted otherwise, shall have a 1/2" orifice and a 165°F temperature rating. Intermediate temperature classification sprinklers shall be installed within the mechanical room, skylights and other applicable areas.
- New piping for the sprinkler system shall be steel pipe, ASTM A 53; Schedule 40 seamless carbon steel. Schedule 10 pipe shall be allowed for pipe sizes larger than 2" diameter when roll grooved mechanical couplings are used. Sprinkler piping shall be installed above ceilings and concealed within chases where applicable. All dry system piping shall be galvanized steel.
- New fittings shall be grooved mechanical fittings: ANSI A21.10 ductile iron; ASTM A47 grade malleable iron. Couplings shall be ASTM A536 ductile iron or malleable iron

housing, EPDM gasket with nuts, bolts, locking pin, locking toggle or lugs to secure roll grooved pipe and fittings.

DIVISION 22 - PLUMBING SYSTEMS:

22 10 00 Plumbing and Piping Systems

- A new 4" domestic service, which will replace the existing service, shall originate from utility designated location and will enter the building tunnel in existing entrance location. A new service assembly shall replace the existing in the same location. The service assembly located within the water service room shall consist of shut-off valves and backflow preventers. Domestic cold water, domestic hot water, and domestic hot water recirculation piping shall be Type L copper conforming to ASTM B 88. Domestic water piping shall be insulated with rigid molded, noncombustible glass fiber insulation conforming to ASTM C335. Domestic water piping throughout the building shall be installed above ceilings and concealed within walls. Jacketing shall be provided on piping exposed in occupied areas (when exposed pipe is located below 10').
- A new natural gas service shall replace the existing. A new utility provided gas meter shall be installed with necessary accessories in the existing meter location with the new natural gas piping entering the building in the existing location. Natural gas piping shall serve new boiler and water heater with enough capacity to handle additional equipment in the future, approximately 8 MBtu total. Gas piping shall be ASTM A53 schedule 40 black steel.

22 11 00 Hot Water Systems

- The hot water distribution system shall include 110°F piping to serve the building. The water in the storage tank will be stored at 140°F. An automatic High/Low tempering valve, by Leonard or approved equal, will reduce to the water to 110°F for the building piping.
- New domestic water mains shall feed risers installed to serve renovated first floor space and auditorium, as well as future renovated areas. New cold water, hot water, and hot water return piping shall serve renovated first floor areas and auditorium from new riser. New cold water, hot water, and hot water return piping shall be provided at each floor level from new risers and capped for future connections.
- Hot water recirculation pumps shall be installed to maintain the appropriate temperatures in the domestic hot water distribution system. The pump shall be controlled by the building management system (BMS) to minimize energy consumption. Hot water recirculation piping shall be brought to all lavatory and sink locations.

22 00 00 Hot Water Plant

- Domestic hot water shall be generated by one (1) 130 gallon, gas fired water heater/storage tank, 399 MBH, PVI Conquest or approved equal, located in the mechanical room.

22 40 00 Plumbing Fixtures and Specialties

- New plumbing fixtures shall be provided for renovated areas. All plumbing fixtures required to be accessible shall be in accordance with the Americans with Disabilities Act (ADA), 504 and UFAS standards.
- Water closets and urinals shall be wall hung, vitreous china, low consumption (0.125 gallon per flush urinals and high efficiency 1.28 gallon per flush water closets), by American Standard or approved equal. Flush valves shall be battery operated, by Sloan or approved equal.
- Lavatories shall be wall hung, vitreous china, by American Standard or approved equal. Faucets shall be low consumption battery operated, by Symmons or approved equal.
- Wall hangers for water closets, urinals, and lavatories shall be heavy duty adjustable height type installed within chase spaces provided behind fixtures, by J.R. Smith or approved equal.
- Drinking fountains shall be stainless steel, wall recessed, two-tier, ADA style, vandal resistant manufactured by Elkay or approved equal.
- Mop basins shall be floor mounted, 24"x24", molded stone, with wall mounted faucet & trim, by Fiat or approved equal.
- Sinks shall be stainless steel, by Elkay or approved equal with gooseneck faucets, by Simmons or approved equal.
- Cast iron floor drains shall be installed at all gang toilet rooms. Heavy-duty cast iron floor drains & floor sinks shall be installed in the mechanical room. Floor drains shall be by J.R. Smith or approved equal. Trap primers shall be provided for floor drains.
- Emergency gas solenoid valves shall be provided in the kitchen.
- Hose bibbs shall be installed in all group toilet rooms, by Woodford or approved equal.

DIVISION 23 - MECHANICAL SYSTEMS

The mechanical systems are based on heating and cooling the building while meeting the objective for energy efficiency. Heating design shall be 70 degrees and cooling design shall be 75 degrees. All systems listed are designed to exceed ASHRAE 90.1-2007 and energy efficiency standards.

HVAC Controls

A Building Management System (BMS) shall be installed to control the mechanical and selected electrical systems. BMS shall be by Automated Logic, Alerton or Andover.

- The system shall include a personal computer with graphics based display, modem and capabilities for alarming off-site.

- The BMS shall provide temperature control for all HVAC systems and control select lighting in the new building.
- The system shall be programmed for occupied/unoccupied cycles for the air handling equipment, with an override feature for spaces that would be utilized after-hours.
- The system shall monitor occupancy sensing devices to control the amount of outside air being brought in to each classroom to assist in energy conservation.
- The BMS shall be accessible from any Web browser, with proper authorization.

Heating Plant

- The heating plant, for space heating in the auditorium and First Floor office areas will consist of (1) high efficiency natural gas fired boiler, Camus Dynaforce Series Model DRH-2000, 2,000,000 btuh input, 1,896,000 btuh output. The boiler will be mounted on a 4" thick reinforced concrete housekeeping pad. The existing steam boiler that serves the existing spaces not being renovated shall remain as is.
- The heating hot water pumping plant will consist of one pair of hot water heating pumps. Each of the pumps will be sized for 100% capacity, for complete redundancy. The pumping will be a variable primary arrangement for the boilers and will send water to the building for space heating systems and terminal heating units (baseboard fin tube, air handling units, dedicated outdoor air system units (DOAS), cabinet unit heaters, throughout the facility. The space heating hot water supply temperature will be reset inversely with outside air temperature, to minimize energy consumption. Heating hot water pumps shall be vertical inline type, 10 HP by Armstrong or approved. Pumps will be mounted on 4" thick concrete housekeeping pads in the boiler room. The pumps shall be installed with new air separators, expansion tanks, isolation valves, etc.
- The new hot water heating supply and return piping distribution system associated with the new gas fired hot water boiler shall be sized for future expansion of the system (6 million btuh). Hot water supply and return piping shall be routed from the boiler room up to the first floor and auditorium and will include capped branch take offs for future connection.

Cooling Plant

- The cooling system serving the auditorium shall be a packaged DX cooling, rooftop air handling unit (RTU) with a hot water heating coil, for space cooling and heating. The RTU shall consist of multiple compressors for staging with the first compressor being variable speed. The capacity of the RTU shall be approximately 80 tons. The new RTU shall be connected to the existing supply and return duct distribution system serving the auditorium. Some branch ductwork modifications may be required in the spaces adjacent to the auditorium. The RTU shall be Trane, Aaon or approved equal.
- The renovated areas on the first floor shall be served by a Variable Flow Refrigerant System (VRF) comprised of Heat Pump condensing units to be mounted on the roof and branch Selector boxes to be installed above the first floor ceiling sized for future connection to ceiling mounted fan coil units. (Fan coil units will not be included in this phase of the project). VRF system shall be Mitsubishi, LG, Daikin or approved equal.

Heating, Ventilating and Air Conditioning

Systems for Specific Areas

1. Renovated First Floor Areas
 - Renovated spaces on the first floor will all be served by a dedicated outdoor air system (DOAS). Preconditioned outside ventilation air will be distributed through ductwork risers, corridor branches office branches and classroom branches direct to each space. The 100% outdoor air energy recovery ventilators will provide the outside air through the ductwork system, only 100% outside air and 100% exhaust air will be ducted from the roof and basement via the corridors and shafts. The existing exhaust ductwork shall remain and be re-used for the exhaust air of the DOAS. The DOAS will be a packaged DX rooftop unit with multiple compressors for staging with the first compressor being variable speed. The DOAS will be located on the roof which will have a heating hot water coil, DX cooling coil with hot gas reheat for dehumidification, a supply fan, an exhaust fan and an energy recovery wheel.
2. Theater
 - The theater will be served by a new 7,000 CFM single zone variable air volume roof mounted air handler with integral heating hot water and chilled water coils. Air Handler shall be by Trane or approved equal. The unit will also incorporate demand control ventilation which will modulate the amount of outside air to the space based on occupancy and CO₂. The existing ductwork distribution in this area will be removed and new ductwork will be provide.
3. Tel/Data and security equipment rooms
 - Data closets will be served by ductless split units, by Mitsubishi or approved equal. Total units will be **(2) 1.5 ton units**. Unit consists of indoor wall mount air handler and roof mount condensing unit.
4. Corridors/Miscellaneous areas
 - All restrooms, mechanical/electrical rooms and storage areas shall be provided with exhaust systems
 - The stairwells, entrances and vestibules shall be served by hot water cabinet unit heaters with space temperature sensors and control valves. All storage areas, mechanical rooms and electrical rooms shall be provided with hot water unit heaters with space temperature sensors.
5. Notes:
 - All motors (fan and pump) 3 HP and larger shall be high efficiency and provided with VFD.

Code Compliance

- All systems will be designed to code compliance for percentage of outside (fresh) air and will exceed requirements stated in ASHRAE 90.1, 2007, International Mechanical Code, International Energy Code as well as ASHRAE 62.1.

Materials and Methods

1. Include the following basic materials and methods of construction:
 - Installation of P.E. sealed design documents shall not be considered complete until P.E. signed and sealed installation compliance letter has been issued.
 - All ductwork and accessories shall meet SMACNA standards. After installation of duct is complete third party shall clean all ductwork.
 - Provide all HVAC equipment with extra set of filters.
 - Seismic restraints shall be designed and installed as required per State of Connecticut Building Code and Fire Safety Code which requires the seal of a licensed professional engineer. Abovementioned professional engineer will be required to verify installation is correct and complete per seismic code. This includes piping, ductwork, equipment, and equipment bases.
 - Provide glass fiber insulation for all hydronic piping and ductwork. Insulation shall be installed to meet the Energy Code.
 - Provide fire stopping around mechanical penetrations in accordance with fire stopping requirements. System shall be capable of maintaining against flame and gases. System shall be UL listed and comply with ASTM E814.
 - Provide mechanical identification for mechanical systems. Identification shall comply with ANSI A13.1.
 - All pipe connections shall be installed to allow for freedom of movement of the piping during expansion and contraction without springing. Swing joints, expansion loops and expansion joints with proper anchors and guides shall be provided where shown.
 - Provide vibration isolation for hydronic piping, ductwork, and equipment.
 - Hydronic piping 2 1/2"φ and under shall be Type L copper. Piping 3" and over shall be ASTM A-53; Schedule 10 black steel pipe with welded, flanged or grooved joints.
 - All equipment served by hydronic piping shall have isolation valves on the supply and return lines. Isolation valves shall also be provided at branch take-offs.

DIVISION 26 - ELECTRICAL SYSTEMS

Main Service and Distribution

1. The building shall be provided with a 2000A, 480/277V, 3-phase, 4-wire, main electrical service with circuit breaker distribution and integral TVSS and ground fault. The main switchboard shall be located in a Main Electrical Room. Include the following;
 - Electrical service shall be provided underground from the Utility pad mount transformer in schedule 40 PVC conduit. When crossing roadways, sidewalks, etc, concrete encased conduit shall be provided.
 - All conductors shall be copper.
 - Run 1#4/0 copper in 1 ¼-inch conduit each from the main switch to the water main, gas main, and sprinkler main, building steel.
 - Run 1#4/0 copper from the main switch enclosure to (3) ¾"x10' ground rods driven at the exterior of the building and 1#4/0 copper from the main switch to the concrete footing rebar.
 - Provide (4) 4" C from the utility company point of connection to the equipment backboard for the Telephone, Cable Television services and Network interface cabling.
 - Shunt trip device for first responder (Fire Department) to disconnect building power.
2. The building shall be provided with 300Kw emergency / standby diesel generator, 60Hz, 1800RPM, 3phase 480Y/277Volt, with weatherproof sound attenuated enclosure and tank capable of providing 36 hours of run time. Provide two circuit breakers, one 100Amp 3pole for ATS #1- Life safety/ Emergency lighting requirements, one 400Amp 3pole for ATS #2 - standby load requirements.

Distribution

1. The building shall be provided with panelboards and feeders as follows:
 - Main Electrical Room shall contain:
 - 2000A, 480/277V main switchboard. Metering will be provided separately for lighting loads, receptacle loads, kitchen loads, and HVAC loads. Switchboard shall include TVSS device and ground fault.
 - One distribution panel (Lighting) shall be 480/277V, 3PH, 4W, 42-pole, 600amp main circuit breaker type.
 - One distribution panel (Mechanical Equipment) shall be 480/277V, 3PH, 4W, 42-pole, 1000amp main circuit breaker type.
 - One Life Safety distribution panel (Emergency Lighting) shall be 480/277V, 3PH, 4W, 42-pole, Bussman Quik-spec fusible type with 100Amp main switch.

- One distribution panel (Standby Load) shall be 480/277V, 3PH, 4W, 42-pole, 600amp main circuit breaker type.
- One Transformer shall be 75 KVA dry-type 480/277V to 208/120V, 3-phase, 4-wire step down transformer with harmonic filters (208v Standby Load). Provide a #6 ground from the transformer to the building steel as required by code.
- One general purpose panelboard (208/120v Standby Load) shall be 208/120V, 3PH, 4W 42-pole, 250 amp main circuit breaker type.
- ATS #1 100Amp, 480Y/277Volt, 3phase- Life Safety / Emergency Lighting distribution.
- ATS #2 600Amp, 480Y/277Volt, 3phase- Standby Power load distribution.
- One Transformer shall be 500KVA dry-type 480/277V to 208/120V, 3-phase, 4-wire step down transformer with harmonic filters (General Receptacle Load). Provide a #6 ground from the transformer to the building steel as required by code.
- 1600A, 208/120V, 3-phase, 4-wire distribution switchboard (General Receptacle Load).
- Main Boiler Room shall contain:
 - One general purpose panelboard (General Receptacle) shall be 208/120V, 3PH, 4W 30-pole, 100Amp main circuit breaker type.
 - One general purpose panelboard (Standby Equipment) shall be 208/120V, 3PH, 4W 30-pole, 100 amp main circuit breaker type.
 - One general purpose panelboard (Mechanical Equipment) shall be 480/277V, 3PH, 4W 42-pole, 400 amp main circuit breaker type.
 - One general purpose panelboard (Standby Equipment) shall be 480/277V, 3PH, 4W 42-pole, 100 amp main circuit breaker type.
- First Floor Kitchen / Cafe shall contain:
 - One general purpose panelboard (Kitchen Equipment/Receptacle) shall be 208/120V, 3PH, 4W 84-pole, 400amp main circuit breaker type.
 - One general purpose panelboard (Standby Equipment/Receptacle) shall be 208/120V, 3PH, 4W 30-pole, 100 amp main circuit breaker type.
- First Floor Remote Electrical Room – West (Auditorium)
 - One general purpose panelboard (Lighting) shall be 480/2770V, 3PH, 4W 42-pole, 100 amp main circuit breaker type.
 - One general purpose panelboard (Emergency Lighting) shall be 480/2770V, 3PH, 4W 42-pole, Fusible Branch with 50Amp main switch (Bussman Quik- spec) type.

- One general purpose panelboard (General Receptacle) shall be 208/120V, 3PH, 4W 84-pole, 250amp main circuit breaker type with integral transient voltage surge suppression.
 - One general purpose panelboard (Standby Equipment/Receptacle) shall be 208/120V, 3PH, 4W 30-pole, 100 amp main circuit breaker type.
 - One general purpose panelboard (Standby Equipment) shall be 480/277V, 3PH, 4W 42-pole, 100 amp main circuit breaker type.
 - One general purpose panelboard (Equipment) shall be 480/277V, 3PH, 4W 42-pole, 100 amp main circuit breaker type.
 - First Floor Remote Electrical Room - East
 - One general purpose panelboard (Lighting) shall be 480/2770V, 3PH, 4W 42-pole, 100 amp main circuit breaker type.
 - One general purpose panelboard (General Receptacle) shall be 208/120V, 3PH, 4W 84-pole, 250amp main circuit breaker type with integral transient voltage surge suppression.
 - One general purpose panelboard (Emergency Lighting) shall be 480/2770V, 3PH, 4W 42-pole, Fusible Branch with 50Amp main switch (Bussman Quik- spec) type.
 - Existing Basement, Main Floor, Second and Third Floors
 - Reefed all existing panelboards to remain from new 1600Amp distribution switchboard.
3. Branch circuits shall be installed in EMT conduit. Type MC cable shall be limited to concealed spaces above finished ceilings in classrooms or drywall type partitions after first device. EMT conduit shall be used to the first device in a branch circuit and shall be used in all masonry or CMU partitions.
- (3) Duplex receptacles and (1) quadruplex receptacle per office, (1) circuit per office.
 - (1) Duplex receptacle (GFCI type) mounted above sink in each toilet room.
 - (4) Duplex receptacles, (8) quadruplex receptacles, (6) L5-20R twist-lock receptacles per MDF room, (9) circuits per MDF.
 - (4) Duplex receptacles, (5) quadruplex receptacles, (4) L5-20R twist-lock receptacles per IDF rooms, (4) circuits per IDF rooms.
 - Circuits for all HVAC equipment as required including radon system components. 120V Wiring to control panels, control transformers, etc shall be provided by the electrician while low voltage control wire shall be included in division 23.
 - Circuits for all plumbing equipment.
 - Circuits for the Fire Alarm Equipment and Sound Equipment as required.

- Circuits for office equipment as required.
- Circuits for security system and devices as required.

Areas of Refuge

1. Master annunciator with two-way voice communication located in a constantly attended location, two-way voice communication station at each area of refuge location, and a dedicated outside telephone line to report to local emergency services.

Fire Alarm System

1. The building will be provided with an addressable fire alarm system in compliance with code requirements and ADA regulations. Voice evacuation shall be provided throughout the building. The system shall be provided with a fire alarm control panel with a Zetron panel to contact the local fire department. Manual pull stations with lexan pull station guards shall be installed in the egress paths at exterior doors and at entrances to stairwells. Audible and visual signaling devices shall be installed in classrooms, corridors, toilets, etc. Visual-only signaling devices shall be installed in all conference rooms, work rooms, etc. The system shall include the following equipment:
 - Remote annunciator mounted at main entry doors and secondary entry doors.
 - (1) Speaker/75 candela strobe in all offices.
 - (1) Speaker/75 candela strobe in all toilet rooms.
 - Speaker/75/15candela strobes within the corridors, 40-50feet on center.
 - Speaker/ 75 candela strobe units with voice evacuation equipment shall be provided in the Auditorium.
 - Monitoring modules for sprinkler tamper and flow switches.
 - Monitoring modules for fire extinguishing system for district computer data center.
 - (2) Duct smoke detectors for each air-handling unit, (1) in the supply, and (1) in the return duct. Test switches shall be located in accessible locations.
 - Signal to BMS system for fan shut-down, and damper actuation on alarm condition.
 - Magnetic door hold-open devices at all required corridor doors, connected to the FACP.
 - Smoke detector within five feet of both sides of the corridor doors with magnetic hold-opens, where required by building fire separation.
 - Monitor module for Food Service Hood fire extinguishing system (Ansul System).
 - All fire alarm system wiring shall be plenum rated fire alarm MC cable where concealed and EMT conduit with type THHN wire where exposed.
 - Smoke damper (smoke detector) connection to the fire alarm system where ductwork passes through smoke rated walls

- Carbon monoxide sensors will be provided in the Mechanical rooms where fossil fuel burning equipment is located.
- (1) Monitor module per existing Fire Alarm initiation circuit to remain.
- Refeed existing Fire alarm audio/visual to remain from new fire alarm control panel.

Lighting Systems

1. Exit signs will be self-contained, universal mounted, LED illuminated, low energy usage fixtures.
2. Typical illumination levels include:
 - a. 15fc - Corridors, toilet rooms, storage rooms, stairways, café area.
 - b. 35 - 45fc – Offices, Conference rooms and utility rooms.
 - c. 45 – 50fc – Food service.
 - d. 30fc – Auditorium.
3. The following fixtures will be provided:
 - 2' x 4' recessed high efficiency architectural LED fixtures in office/work areas, and other select locations (Refer to attached cut sheets).
 - 2' x 2' recessed high efficiency architectural LED in corridors, small offices. (Refer to attached cut sheets).
 - 1' x 4' surface / pendant mounted industrial LED fixtures with wire guards in utility spaces. (Refer to attached cut sheets).
 - 1' x 4' surface mounted wraparound LED fixtures in storage spaces. (Refer to attached cut sheets).
 - 2' x 2' recessed high efficiency architectural LED fixtures and 6" wide recessed LED perimeter light fixture at the mirror in toilet rooms.
 - 1' x 4' surface / pendant mounted industrial LED fixtures with wire guards in mechanical and electrical rooms. (Refer to attached cut sheets).
 - 1' x 4' surface mounted wraparound LED fixtures in MDF and IDF rooms. (Refer to attached cut sheets).
 - Accent and feature lighting shall be provided as selected by the Architect, in areas such as corridors, main lobby etc.
4. Occupancy sensors shall be provided in all areas except in utility rooms and other rooms exempted by code.
5. Occupancy sensor switches with wall override shall be provided in all small offices, single occupancy toilet rooms, storage rooms and janitors closets.

6. Corridor and stairwell lighting shall remain on during occupied hours, but will be controlled by occupancy sensors during unoccupied times. This will require communication with the building management system.
7. Illuminated low level exit signs and handicap accessible exit signs shall be provided where required by code.

Materials and Methods

1. Include the following basic materials and methods of construction:
 - Wiring shall be THHN/THWN copper, installed in EMT conduit for general circuits.
 - Type MC cable shall be used as prescribed in sections above.
 - Devices shall be specification grade, NEMA 5-20R etc.
 - Disconnect switches shall be fusible heavy-duty type. NEMA 1, 3R or 4X as required for locations installed.
 - Circuit breakers shall be fixed element, thermal magnetic type.
 - Panelboards shall have copper bussing, with hinged, lockable, door-in-door trim.
 - Branch circuit breakers shall be bolt-on type.
 - All conduits, circuits and devices shall be labeled.
 - Conduits below slabs shall be schedule 40 PVC, with rigid steel conduit sweeps.
 - Conduit and backboxes with pull wire for telecommunication cabling.
2. Include the following miscellaneous items:
 - In all single occupant toilet rooms: emergency call light/bell mounted above the doors and associated call switches shall be provided.

Energy Conservation

1. All new equipment specified, shall be designed per the 2009 International Energy Conservation Code.
2. Through the use of the building management system (BMS), occupied/unoccupied cycles shall be established to avoid unnecessary energy consumption.

Code Compliance

1. All electrical systems will be designed in accordance with the *State of Connecticut Building Code*, the *State of Connecticut Fire Safety Code*, *Americans with Disabilities Act* and the *National Electrical Code 2005 edition, 504 and UFAS*.

DIVISION 27-TELECOMMUNICATION SYSTEMS

Services

1. Three (4) 4" underground conduits shall be provided for telecommunication services. These conduits shall run from either a utility pole on the street, or the nearest campus utility distribution manhole to the building MDF. Exact routing of conduit shall be coordinated with, and dictated by the owner's IT representative. Conduits shall include the following:
 - a. (1) 4" conduit for telephone (copper pairs)
 - b. (1) 4" conduit for fiber
 - c. (1) 4" conduit for cable TV
 - d. (1) spare 4" conduit
2. Service cabling shall be provided by the appropriate utility company.



ATTACHMENT B

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**nextstage
design**

**Preliminary
Theater Planning
Narrative**

PROJECT

Bristol Memorial Boulevard Cultural Center

Bristol, CT

This report was prepared by Nextstage Design for QA+M Architects.

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THEATER PLANNING NARRATIVE

Performing arts buildings have unique and sometimes unusual requirements. This narrative seeks to define and describe these requirements. Its purpose is threefold:

- to serve as a record of discussions among the owner, users, and design team
- to inform the preparation of a cost estimate for the proposed building
- to guide further development of the proposed building

At this early stage of development, many design elements are not defined—nor should they be. This report is preliminary, and (almost all) its contents are subject to revision.

REPORT ORGANIZATION

This report is organized to enable everyone involved in the project to easily find the portions of greatest interest. The relevant criteria are outlined for:

- Population
- Use
- Design and planning
- Adjacent (associated) spaces
- Theater equipment
- Architectural and structural
- Mechanical
- Electrical
- Plumbing and fire protection

Program and design criteria

The first four sections under each program space (population, use, design and planning, and adjacent spaces) outline program and design criteria for the space.

Theater equipment

The next section describes the specialty equipment and seating that is typically designed and specified by the theater planner. This equipment is accounted for in the theater equipment budget provided in Table 1. The equipment is organized by CSI section number.

Other disciplines

The remaining sections provide design criteria for the architectural and engineering disciplines, in two categories:

Theater equipment accommodation

This category outlines the requirements that the theater equipment places on other systems and elements in the building. This work is not accounted for in the theater equipment budget, and its cost must be developed by the cost consultant.

Special building elements

This category includes building elements that are unique to performing arts buildings or that have unusual requirements when found in performing arts buildings. These elements will be designed and specified by the architect and engineers. This work is not accounted for in the theater equipment budget, and its cost must be developed by the cost consultant.

Building-wide systems

Discussion of building-wide systems appears after the major program spaces.

Theater equipment budget

The theater equipment budget is provided in Table 1.

Multi-purpose Theater

POPULATION

750 audience members and 1 - 75 performers

USE

The theater will be used for simple functions such as a single speaker at a lectern, up to and including a fully produced musical theater production. It is anticipated that groups from small and volunteer to larger with some technical expertise will use the space for productions.

Flexibility is desired to accommodate this range of users and keep the operating costs minimal.

DESIGN AND PLANNING

The renovation of the existing space will decrease the seating capacity, provide wheelchair access to all areas, and create a more intimate space that supports a wide variety of events from lectures and meetings, to fully produced music, drama, dance, and musical theater work.

The existing glazing is desired for daylighting and to provide views from the performance space to the exterior.

ADJACENT SPACES

Sound locks

Both the audience chamber and the stage require sound locks, which may also serve as light locks.

Piano storage

Storage for a grand piano at stage level may be required. Assume Steinway Model D or similar.

Performer prep and waiting

Currently there is no suitable space for performers of small or large ensembles to prepare for performances. Dressing rooms, wardrobe preparation areas, and a "green" room are not present. QA+M's schematic design does include an addition at stage level for these activities.

Loading dock and scene dock

The stage is above grade which makes loading equipment, scenery, costumes, and props very challenging. QA+M's schematic design includes a lift at the loading dock to bring items

from truck level to the stage. This area needs to be developed to ensure safety and proper sizing for the anticipated uses of the stage.

A scene dock will provide an area off stage to assemble scenery and props, and for storage of musical instrument cases and crates. This area may also provide storage area for an orchestra enclosure, discussed below.

THEATER EQUIPMENT

The theater specialty equipment will be designed to serve two purposes. First, a basic infrastructure of power and control signal cabling and positions for mounting lights, draperies, and portable audio/video equipment will be designed and provided. Secondly, a compliment of fixed and/or portable equipment will be provided as resources allow to enable basic events and productions to be supported. Once the programming of events is established, the operators of the venue will be able to rent or purchase additional quantities of equipment to support the events and productions typically encountered.

11 61 13 Orchestra Enclosures

If orchestral acoustic music is to be performed on the stage, the acoustician recommends a portable enclosure that will reflect the sound out of the stage into the audience chamber. These enclosures typically include ceiling reflectors and side and rear walls made up of rolling towers. The ceiling reflectors contain concert lighting fixtures and “tip and fly” above the stage for storage when not in use. (see rigging system below) The towers are tri-fold units on wheels with weighted bases that can nest together for storage. The towers are typically the height of the proscenium opening and require trained personnel to set up and strike each time the enclosure is used.

A storage area at stage level is required for the towers.

11 61 33 Theatrical Rigging

The existing stage house has outdated accommodations for modern stage rigging. A structural analysis will be done to determine the capacity of the structure and supplemental steel.

As the qualifications and number of technical staff will not be determined at the time of design, we recommend that a simple motorized rigging system be installed. A base system will be designed that includes the infrastructure for future expansion. The system will include both fixed speed hoists and variable speed hoists that lift and lower steel pipe battens above the stage to provide reasonable functionality of the stage. Fixed speed hoists will be used on electrics (lighting) battens and masking draperies. Variable speed hoists will be used on battens for moving elements can be mounted.

11 61 43 Theatrical Draperies

A base package of draperies will be designed including a main “house” curtain, black masking draperies, and a white cyc and black scrim to serve as a flexible back drop. All the draperies will be made with inherently flame-retardant fabrics.

11 61 91 Performance Lighting Instruments

Permanently mounted LED wash lighting fixtures will provide about 150 foot-candles of illumination on the stage for symphonic concerts of various sizes. An additional complement of LED wash fixtures and framing spotlights is provided for lighting “specials” for concerts and other events. A system of Cyc lights will also be provided for lighting backdrops or a white cyclorama drop. All fixture types provide both “tunable” white and colored light. Mounting hardware, cabling, and accessories will be provided.

12 61 13 Fixed Audience Seating

The fixed seating will be high-quality auditorium chairs with upholstered seats and backs, arm rests, and gravity-activated self-rising seat pans. The rear of the back and bottom of the seat pan will be wood veneer. Row letters, seat numbers, and aisle end standards with LED aisle lighting fixtures will be provided. All fabric and upholstery will meet relevant fire and building codes, and the acoustician’s requirements for acoustic performance. Designated aisle seats (transfer seats) will be provided as required. Widths of seats will vary from 20 to 23 inches to provide horizontal stagger. Some chairs may be demountable in pairs or singles to accommodate wheelchair seating locations.

12 62 29 Loose Audience Seating

High quality arm chairs may be provided at side loge or side balcony seating areas. If provided, these chairs will be upholstered wood frame chairs with finishes and fabrics matching the fixed chairs.

26 09 61 Theater Lighting Controls

A theater lighting system will control the intensity, color, and grouping of the lighting fixtures and architectural lighting fixtures within the stage and auditorium. The system provides integrated controls for

- house (audience area) lighting
- concert lighting
- performance (theatrical) lighting
- work lighting
- running light (low level lights backstage, often blue)

The lighting system consists of DMX-controlled relays, control electronics, distributed load receptacles, permanently-wired or portable cord-and-plug-connected LED lighting fixtures (specified under 11 61 91 Concert Lighting Instruments above) and a dedicated Ethernet system for control.

Theatrical LED fixtures are controlled via DMX/RDM protocol propagated over a lighting Ethernet. LED fixtures require no remote dimming racks, rather they need the line voltage power to be controlled by relays so they can be turned off when not in use.

A portable computerized theater lighting control console will send control signals to the lighting fixtures via the lighting Ethernet. In addition, master and local architectural control stations will be wired back to a central architectural lighting processor. Both systems allow individual, remote control of large numbers of fixtures. It will be possible to control all connected lighting either with the architectural controls or with the portable lighting control console.

ARCHITECTURAL AND STRUCTURAL

Theater equipment accommodation

The existing floor under the audience seating on the orchestra level has a constant slope, the balcony has stepped risers. Fixed chairs will be floor mounted with 2-inch deep anchors. The concrete will need to be evaluated to determine what fasteners can be used. Presumably, since there are chairs installed now, this is not anticipated to be a problem.

Stage floor

The existing stage floor is a wood strip floor covered with plywood. If dance is to be supported properly, the stage should be re-floored in a way that provides resiliency that to prevent injury to the dancers. For the loading of the floor we recommend a uniformly distributed live load of 150 PSF and a concentrated load of 500 pounds. An example of a concentrated load is a Steinway Model D grand piano.

Alternately, if the existing stage floor prevents installing a suitable floor for dance, a portable dance floor can be used when dance is performed.

Access platforms (catwalks)

Open work platforms may be required above the audience chamber to access house and concert lighting fixtures, and other building equipment. We recommend 40 PSF for floors and 30 PLF for lighting railings.

Lighting and rigging supports

We assume that some additional structural capacity will be required over the stage for the support of a rigging system. We recommend providing 25 PSF.

MECHANICAL

Heat gain

The impact of lighting has been reduced in recent years using lower wattage incandescent sources and the rapid adoption of LED sources. However, the HVAC design must still account for heat gain from spotlights and other equipment.

Stage ventilation

The stage has a floor area greater than 1,000 square feet, it must be provided with emergency ventilation (IBC 2015 410.3.7).

ELECTRICAL

Theater equipment accommodation

Provide electrical service, junction boxes, wireways, wiring, and final connections for chair mounted aisle lights.

The theater lighting controls will be shown on the electrical drawings and provided by the electrical contractor. Provide electrical services, load circuit wiring, standard gang back boxes, standard wireways, power and signal wiring, and final connections.

House lighting

Assuming that the architectural lighting within the auditorium and in adjoining vestibules will use LED sources, these fixtures must be specified with DMX drivers providing smooth dimming from full off to full on, and vice versa. These fixtures will receive a DMX control signal from the Theater Lighting Controls described above. The house lighting fixtures will be circuited to relay panels or house panelboards by the electrical engineer.

Work lighting

Work lighting is illumination intended primarily for use during non-performance periods. These fixtures do not need DMX drivers.

Running light

Running light refers to task lighting and floor lighting in backstage areas that allow personnel to work and move about safely during performance conditions. These fixtures do not need DMX drivers.

Convenience power

A higher density of convenience outlets is needed in the performance areas and support spaces than may be required by code or found in other occupancies. These areas will need 120-volt convenience outlets for specific functions—control devices, power tools, etc.

Temporary production power

An additional 200 amps of three-phase 120/208V with a double neutral is recommended for portable production equipment, touring or broadcast vans, and similar temporary uses. A company switch with cam-lok connectors is recommended to enable safe connection of portable equipment.

PLUMBING

Rain water drainage

Roof drains and leaders must be arranged to avoid conflict with the theater rigging. The acoustician may require that leaders be lagged and/or routed outside of the theater volume.

Utility sink

Provide a utility sink with settling tank (plaster trap) convenient to the theater.

Theater Equipment Budget

INCLUSIONS AND EXCLUSIONS

Budget numbers are provided only for the equipment and furnishings described as theater equipment above. The budget is organized by CSI division. The following inclusions and exclusion apply to the budget as noted:

Item	Division 11 Equipment	Division 12 Furnishings	Division 26 Electrical
Trade materials delivered to jobsite	Included	Included	Included
Labor and equipment for installation	Included	Included	Excluded
Trade contractor O&P	Included	Included	Excluded
Electrical services, raceways, Class I and Class II wiring	Excluded	Excluded	Excluded
General conditions, general contractor O&P, CM fees, taxes, permits, fees, bond premiums, escalation, and contingencies	Excluded	Excluded	Excluded

TABLE 1: THEATER EQUIPMENT BUDGET

	Meetings & Events Package	Modest Performances Package	Complete Performances Package	Subtotal by CSI Section	Subtotal by CSI Division
DIVISION 11					
11 61 13	Orchestra Enclosures		100,000		100,000
11 61 33	Theater Rigging	126,000	60,000	60,000	246,000
11 61 43	Theater Draperies	30,000	15,000	10,000	55,000
11 61 91	Lighting Instruments	150,000	50,000	60,000	260,000
	Subtotal, Division 11	386,000	225,000	130,000	661,000
DIVISION 12					
12 61 13	Fixed Audience Seating	318,750			318,750
12 62 29	Loose Audience Seating	12,000			12,000
	Subtotal, Division 12	330,750	-		330,750
DIVISION 26					
26 09 61	Theater Lighting Controls	120,000		25,000	145,000
	Subtotal, Division 26				145,000
	Total	\$ 836,750	\$ 225,000	\$ 155,000	\$ 1,136,750

Notes:

1. Costs are additive across the page; each package to the right builds on the package to its left
2. Costs are Rough Order of Magnitude and are not based on a design



ATTACHMENT C

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Acoustics and Audio/Video Systems Programming Narrative

**Bristol Cultural Center Auditorium
Bristol, Connecticut**

**Prepared for:
QA+M Architecture**

October 25, 2017

Introduction

This narrative overviews key architectural acoustic design issues in the areas of room acoustics, sound isolation, and mechanical systems noise and vibration control at the programming stage. Also included is an outline description and estimate of probable cost for audio/video systems, with possible upgrades.

The following is based on walk-throughs at the site, coordination with the design team, and two meetings with the Cultural Center Building Committee.

Architectural Acoustics

Room Acoustics

It is understood that the acoustics of the existing Memorial Boulevard School Auditorium are generally well regarded. Indeed, the hall's basic configuration is favorable to good acoustics. For example, given the total number of seats, the hall is neither exceedingly wide nor exceedingly deep, so none of the seats are too far from the stage, and the overall shaping of the walls and ceiling are conducive to properly reinforcing sound coming from the stage. On the other hand, a large number of seats on the orchestra level are deep under the balcony overhang and are thus separated from the main part of the auditorium, acoustically. Plans to expand lobby and support space by eliminating seating at the rear of the orchestra level will be beneficial.

It is intended that a wide range of programs will be presented in the renovated auditorium, from large meetings and presentations, theatrical performances and musicals, to band, chorus, and orchestra concerts. The various types of programs would ideally be supported by different acoustic conditions, with reverberation being the principle characteristic upon which the acoustics of the auditorium will be judged.

Reverberation is the lingering of sound in a space due to repeated reflection off the various boundary surfaces, and it is gauged objectively in terms of the amount of time, in seconds, that it takes a loud sound to become completely inaudible after it has stopped. A longer reverberation time serves to enhance the qualities of unamplified natural music (e.g. liveness, resonance, fullness). On the other hand, reverberation serves to garble and thus degrade the intelligibility of speech and the clarity of amplified music. Reverberation time in a given space is dependent on the overall geometric volume (size) of the space and the relative amounts of sound absorptive vs. sound reflective materials and finishes.

Unamplified natural music (e.g. choral and instrumental music) is traditionally best served by a mid-frequency reverberation time in the 1.8 to 2.0 second range (seating fully occupied). By contrast, programs involving speech (e.g. dramatic theater, meetings, and presentations) and amplified sound (e.g. amplified music and film) are best served by a mid-frequency reverberation time in the 1.0 second or lower range (fully occupied).

The reverberation time within the existing Memorial Boulevard School Auditorium is 1.7 seconds (unoccupied) and is estimated to be 1.3 seconds \pm when fully occupied. Thus the existing

reverberation time falls in between the extremes considered to be ideal for the range of programs to be presented. It is noted that the existing reverberation time is the maximum attainable in the space given the existing geometric volume and the all hard and sound reflective floor, walls, and ceiling. The only sound absorptive materials in the room are the (unavoidable) seats and occupants.

It is common practice in the design of new multi-purpose auditoriums to establish a geometric volume, relative to the number of sound absorptive occupants, which is large enough to develop reverberation in the higher 1.8 to 2.0 second range. Adjustable acoustic elements – typically in the form of retractable sound absorptive draperies or banners – are then introduced so that the reverberation time can be reduced to the 1.0 second or lower range for speech and amplified programming.

Because the geometric volume of the Memorial Boulevard School Auditorium is not large enough to generate reverberation in the higher 1.8 to 2.0 second range, provision of adjustable acoustic elements would be of limited benefit. Such elements are also costly, add to the complexity of the design and operation of the hall, and are visually impactful. For these reasons, adjustable acoustic elements are not recommended for the auditorium; rather, the reverberation time is recommended to be fixed.

Thus the design approach for fixed reverberation time will be to minimize the amount of sound absorptive materials in the auditorium other than the seats. The new rear wall will be studied to determine if sound absorption is needed to prevent echoes from returning to the stage, and provided only if needed. Also, means of blocking light transmitting through the exterior windows will be chosen to minimize absorption of sound.

(One possible approach to ideally serving the range of anticipated programs is to design physically for the low end of the reverberation time spectrum and then to allow the reverberation time to be increased electronically via an active acoustic system. However, such a system would likely cost in the range of \$300,000 to \$500,000 in this case, and is thus considered beyond the scope of this project).

One aspect of the auditorium's acoustics that presently does not work well is the projection of natural sound from the stage into the audience chamber, which is a common condition in proscenium theaters.

If a significant component of the auditorium's programming will include traditional choral and / or instrumental concerts – of a caliber such that performers will prefer or expect not to be amplified, and excellent natural acoustics are desired – then provision of a demountable concert enclosure (orchestra shell) is recommended. An orchestra shell consists of moveable sound reflective towers positioned around the sides and rear of the stage performance area, and overhead ceiling panels flown and stored via the stage rigging. An orchestra shell benefits the blending and projection of sound from the stage into the audience chamber, and additionally aids on-stage hearing, i.e. the ability for musicians to hear themselves and each other. For preliminary planning and cost estimating purposes, the orchestra shell should be based on the Wenger Forte model.

Given the size of the stage, the maximum number of performers that could be reasonably accommodated by an orchestra shell is 35-40 instrumental musicians, although the shell can be configured in different ways to accommodate smaller groups.

An orchestra shell is equipment that could be added to the facility at any time, although accommodations would need to be made for it in the initial renovation of the auditorium. A significant planning consideration is for storage of the side and rear wall towers - which would likely be on the order of 18-20 feet tall - off stage when they are not being used. Also, the shell ceiling panels would need to be accommodated in the design of the rigging system.

If, on the other hand, traditional choral and / or instrumental concerts are not expected to be a significant component of the auditorium's programming – and amplification of instruments and voices to aid projection of sound into the audience chamber is acceptable – then a more portable type of acoustic shell, such as Legacy type as manufactured by Wenger Corp., is recommended. The Legacy type of acoustic shell consists of rolling side and rear wall panels (with no suspended ceiling panels) that can be collapsed for storage and will fit through standard sized doors. The Legacy type acoustic shell is also equipment that can be provided at any time, and does not require any special technical provisions other than space for storage.

Sound Isolation

The auditorium interior is well protected from outside noise by the building envelope, except where there are exterior windows in the north wall; the windows are considerably weaker, acoustically, than the walls and roof. However, based on our observations at the site, noise intrusion through the windows is minimal. Emergency vehicles passing on Memorial Boulevard are audible, but most of the time outside noise is not apparent. We do not believe that the degree of exterior noise intrusion warrants replacing the windows with costly sound control units.

Where possible, sound and light locks (two sets of doors separated by a vestibule) should be incorporated into the entry points of the theater. Doors should be solid core wood or insulated metal, and should incorporate heavy duty adjustable gaskets on the head, jambs, and door bottom.

Mechanical Systems Noise and Vibration

Low background noise levels are a critical aspect of the acoustic environment in venues where unamplified programs will be presented. Accordingly, the recommended maximum background noise level for the stage and audience chamber, due to operation of the building heating, ventilating, and air conditioning systems, is NC (Noise Criterion) 20.

Achieving the relatively stringent background noise level will require careful consideration. The location of primary air handling equipment is an important factor, and locations on the roof directly above the auditorium should be avoided, if possible. Ductwork air velocities will need to be relatively low; the feasibility of re-using existing ductwork will be studied. Any new ductwork should be 1 in. internally acoustically lined. All reciprocating or rotating equipment will need to be vibration isolated from the building structure.

Audio/Video Systems

Audio System

The audio system fills multiple requirements – subtle voice lift for lectures and drama, moderately higher outputs for reinforced music, full-bandwidth audio for video and cinema playback, and audio to accompany computer program display. The audio system has controlled imaging and sound effects for musical theater and musical concerts and productions. System includes primary and auxiliary loudspeakers, surround sound, audio mixing console (medium format digital mixing console), digital signal processing, amplification, playback from CD as well as hard-disk based effects playback, patching, and recording capability. Audio system includes all cabling and terminations for audio and control required for proper audio system operation including, but not limited to, connections for microphones, a 4-channel wireless microphone system and other input devices. Front fills will be portable to accommodate downstage platform extensions preferably using a moveable pit rail for connectivity.

The system includes an assistive listening system to boost audio signals for the hard of hearing. The system transmits all amplified sound, as well as unamplified sound via a room microphone in the auditorium. The system can also be used for transmission of a second language or of audio descriptions for the sight impaired as the need arises.

Pricing is given for Option 1 which includes a sound system which will meet the requirements of touring artists, including line-array type loudspeakers and a comprehensive digital console package. Option 2 includes a more modest console system, a less robust loudspeaker package that would be sufficient for basic use, and no surround sound loudspeakers. With option 2, some rental equipment will be required to meet the needs of professional music and theater events.

Auditorium Audio System Option 1	\$500,000.
Auditorium Audio System Option 2	\$250,000.

Potential Upgrades to Basic Audio Systems

Following are possible upgrades to the basic audio systems described above, which would bring the facility a higher degree of capability to attract events that would require these systems. Costs would be additive to the above estimates.

Production Intercommunication System

This includes the capability and connectivity to communicate via a party line intercom between various connection points in the auditorium proper such as the house mix position, the recording camera plates, the backstage connection point, the auditorium control booth, the equipment rack room, and the various back of house spaces to be designated.

Production Intercom System	\$25,000.
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Program Relay System

The program relay system provides audio and video show relay to back of house designated locations such as dressing rooms, corridors and other support spaces. In addition, show relay can be sent to displays in the lobby for latecomer viewing. Lobby displays can also be used for digital signage.

Program Relay System\$25,000.

Theatrical Wireless Microphone System

This provides 24 channel wireless microphone system for use in theatrical productions and consists of minimally visible wireless earset type omnidirectional microphone system with good rejection of feedback and unwanted sounds, that is lightweight and stable on the head. Once the microphone is shaped to fit the head, the tough springy boom keeps its shape when stored. Includes 24 such microphone earsets and beltpack transmitters; heavy-duty portable lockable system rack with storage drawers for the microphones and beltpacks; battery chargers; connectivity to the audio system; power splitters and power paddle antennae mounted to microphone stands for portability; 4 channel rack-mounted receivers, switches for Dante network connectivity to audio system, cabling, terminations, engineering, fabrication, and installation.

24 Channel Wireless Theatrical Microphone System\$70,000.

Video Projection System

The video projection system consists of a high brightness, 4k HD video projector and roll-down projection screen. Video system accommodates presentational video such as PowerPoint, movies, and image magnification. Video system includes playback, switching and control capabilities and laptop connection points located in the booth and stage area. In addition, all necessary cabling is included as well as all equipment required for a fully functioning system.

Video Projection System\$150,000.

Robotic Camera and Audio Recording System

Includes pan-tilt-zoom camera, mounting, cabling and controls for three robotic camera positions located within the auditorium. Connection points are provided in the auditorium at various locations for portable video (for temporary displays and camera locations.) This system includes audio/video switching and the ability to broadcast live streaming and/or live to disk. A monitor will mount at the house mix position, with built-in multi-viewer to allow all presets and camera positions to be displayed. All equipment, programming, cabling and installation are included.

Robotic Camera Recording and A/V Streaming System\$45,000.

Broadcast System Package

Includes several locations in the auditorium for portable broadcast cameras to be brought in and connected to the broadcast truck. An exterior rated broadcast truck termination panel will be provided to include terminations for connectivity to the audio and video feeds from the auditorium such as SMPTE hybrid fiber, XLR tie lines and HD-SDI lines. The various lines will be gathered at patch

panels to be patched to the exterior broadcast truck termination panel. Separate company switches will be provided for additional power for the broadcasters to use: one 60A company switch for AV technical power and a 100A company switch for dock power for truck A/C, etc. A system of oversized conduit and cable passes for connectivity to the exterior broadcast truck port should be included as part of the theatrical scope of work and is not included here.

Broadcast System Package..... \$50,000 to \$75,000.

Portable Equipment

Includes portable AV equipment relevant to the programming of the space. This can include: wired microphones, fold-back loudspeakers, direct boxes, cables, stands, etc.

Portable Equipment\$25,000.

Audio/Video Estimate of Probable Cost Summary

Auditorium Audio System Option 1..... \$500,000.

Auditorium Audio System Option 2..... \$250,000

Production Intercom System \$25,000.

Program Relay System \$25,000.

24 Channel Wireless Theatrical Microphone System \$70,000.

Video Projection System..... \$150,000.

Robotic Camera Monitoring System..... \$45,000.

Broadcast System Package\$50,000 to \$75,000.

Portable Equipment \$25,000.

Sub-Total—Estimate for Div 27 AV Contractor \$640,000 to \$915,000.^{1,2}

Technical Power & Conduit Infrastructure \$300,000.³

Total AV-Related Construction Costs..... \$940,000 to \$1,215,000.⁴

Note 1: The budget estimates included here are for fully integrated, installed, tested and commissioned systems provided by a professional AV integrator.

Note 2: The budget estimates are for normal work conditions for a renovation in the Bristol area and are subject to market conditions. They do not include winches, rigging, technical power and cable

raceways, taxes, bonding, markups, contingencies, inflation, or allowance for unusual contractual requirements included in the specification General Conditions.

Note 3: Electrical costs related to AV will be estimated by the electrical engineer. However, the specific information needed for the EE to budget this may not yet be available. Based on our experience with similar projects, we estimate that the related electrical scope (technical power and low voltage conduit) will be approximately \$300,000. This infrastructure is recommended regardless of the options selected so that they can be added at a later date if desired. This amount is included here for guidance only – it is not a direct part of the Division 27 cost of the AV Systems, and should be carried as part of the Division 26 estimate.

Note 4: The total on this line is the estimated total AV System construction budget impact, including costs under both Division 26 and Division 27.



ATTACHMENT D

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November 30, 2017

Kenton McCoy, Principal
QA+M Architecture
195 Scott Swamp Road
Farmington, CT 06032

Project: Bristol Memorial Boulevard Cultural Center
Proposed Foodservice Equipment Program

Dear Sir.

Attached is the proposed foodservice program that has been prepared with the assistance of the Building Committee, Architect, and the Foodservice Consultant.

Bar – First Floor

1. Full service liquor bar capable of serving mixed drinks.
 - a. Cocktail station (two stations for two bar tenders)
 - b. Work boards and Hand sinks
 - c. Glassware shall be disposable.
2. Beer will be available by way of bottles only.
 - a. Slide top bottle coolers
3. Other beverages including wine and soft drinks will be available
 - a. Back bar bottle cooler for red and white wines
 - b. Soda dispensing system with remote bag system
 - c. The carbonator will be located either at the bar or near the syrup rack depending on the selected soda vendor.

Concessions – First Floor

1. Concession retail space.
 - a. Serving counter capable of serving pre packaged snacks (as presently planned)
Hand sink, display refrigerator.
 - b. Soft drinks dispensed from a hand held soda-dispensing gun.
 - c. Drop-in ice well with built in cold plate.
2. A back of house space of approximately 800 square feet is needed. It can be remote from the bar and retail space. This area will be equipped with the following:
 - a. Hand sink, prep tables, prep tables with sinks, pot washing sink, storage shelving units, reach-in refrigerator, and a mop sink for cleaning up spills.
 - b. Mechanical ware washer
 - c. This area will also be used for staging for an outside caterer to use for special events. It is anticipated that the Caterer will utilize its own licensed facility to prepare the meals.

Bar – Second Floor

There will be a full service bar located at this level.

1. Full service liquor bar capable of serving mixed drinks.
 - a. Cocktail station (one station for one bar tender and space for table service pick up).
 - b. Work boards, Glass washer, Hand sinks
2. Beer will be available by way of bottles. Draft beer is not anticipated.
 - a. Slide top bottle coolers
3. Other beverages including wine and soft drinks will be available
 - a. Back bar bottle cooler for red and white wines
 - b. Soda dispensing system with remote bag system

Concessions – Second Floor

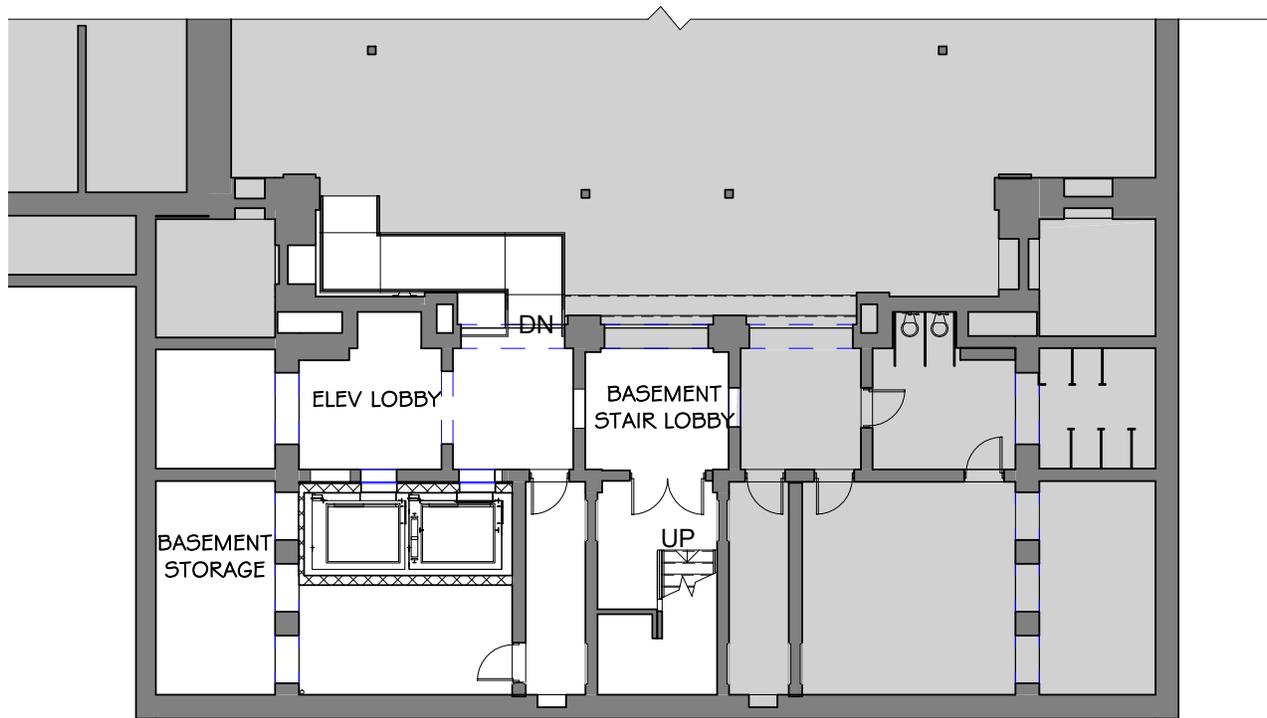
3. Concession retail space.
 - a. Serving counter capable of serving pre packaged snacks (as presently planned)
Hand sink, display refrigerator.
 - b. Soft drinks dispensed from a hand held soda-dispensing gun.
 - c. Drop-in ice well with built in cold plate.



ATTACHMENT E

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PROPOSED GYM FLOOR PLAN

1/16" = 1'-0"

1

PROPOSED ENTRANCE LANDING

Issue Date: 11/29/2017



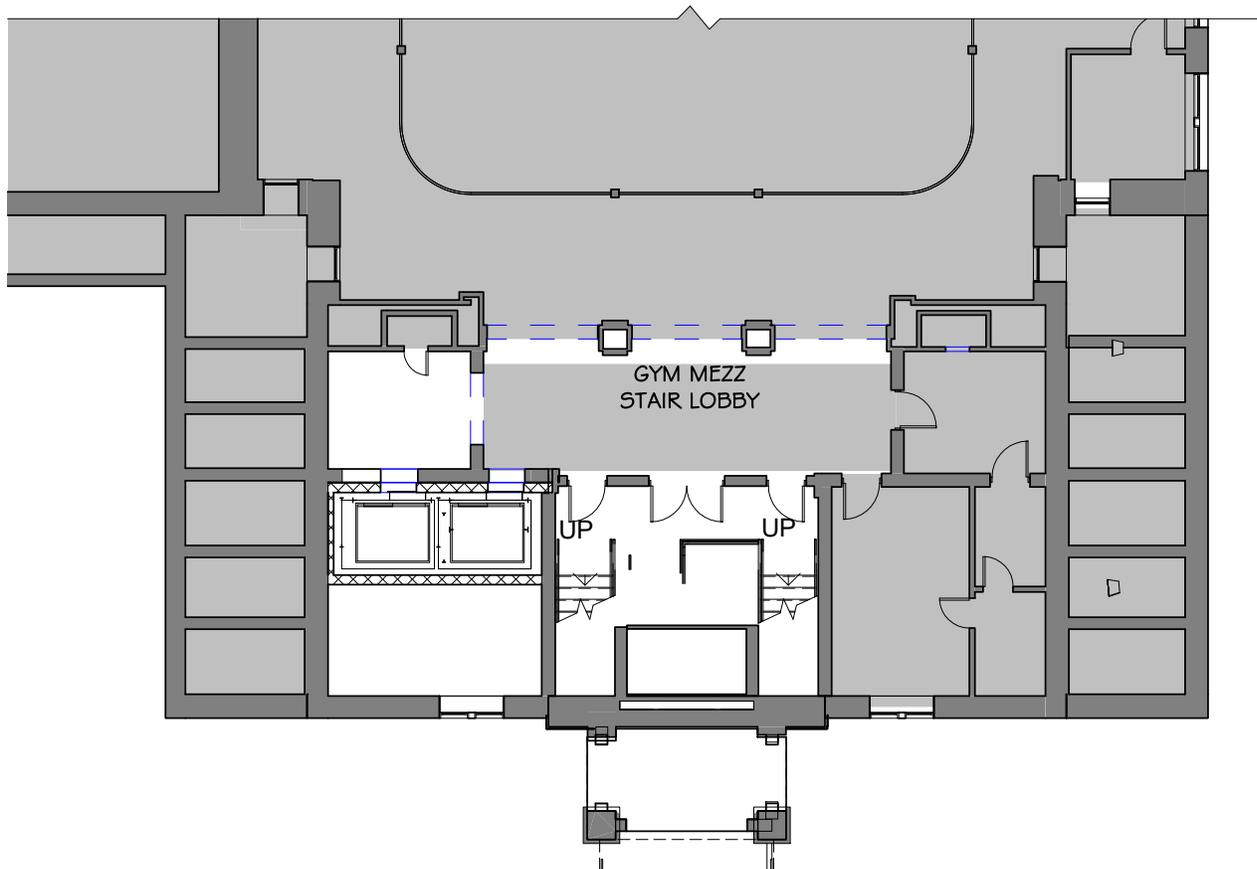
**MEMORIAL BOULEVARD
CULTURAL CENTER**

Sheet #:
PG - 001

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BRISTOL, CT

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PROPOSED GYM MEZZ. FLOOR PLAN

1/16" = 1'-0"

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PROPOSED GYM MEZZANINE

Issue Date: 11/29/2017



**MEMORIAL BOULEVARD
CULTURAL CENTER**

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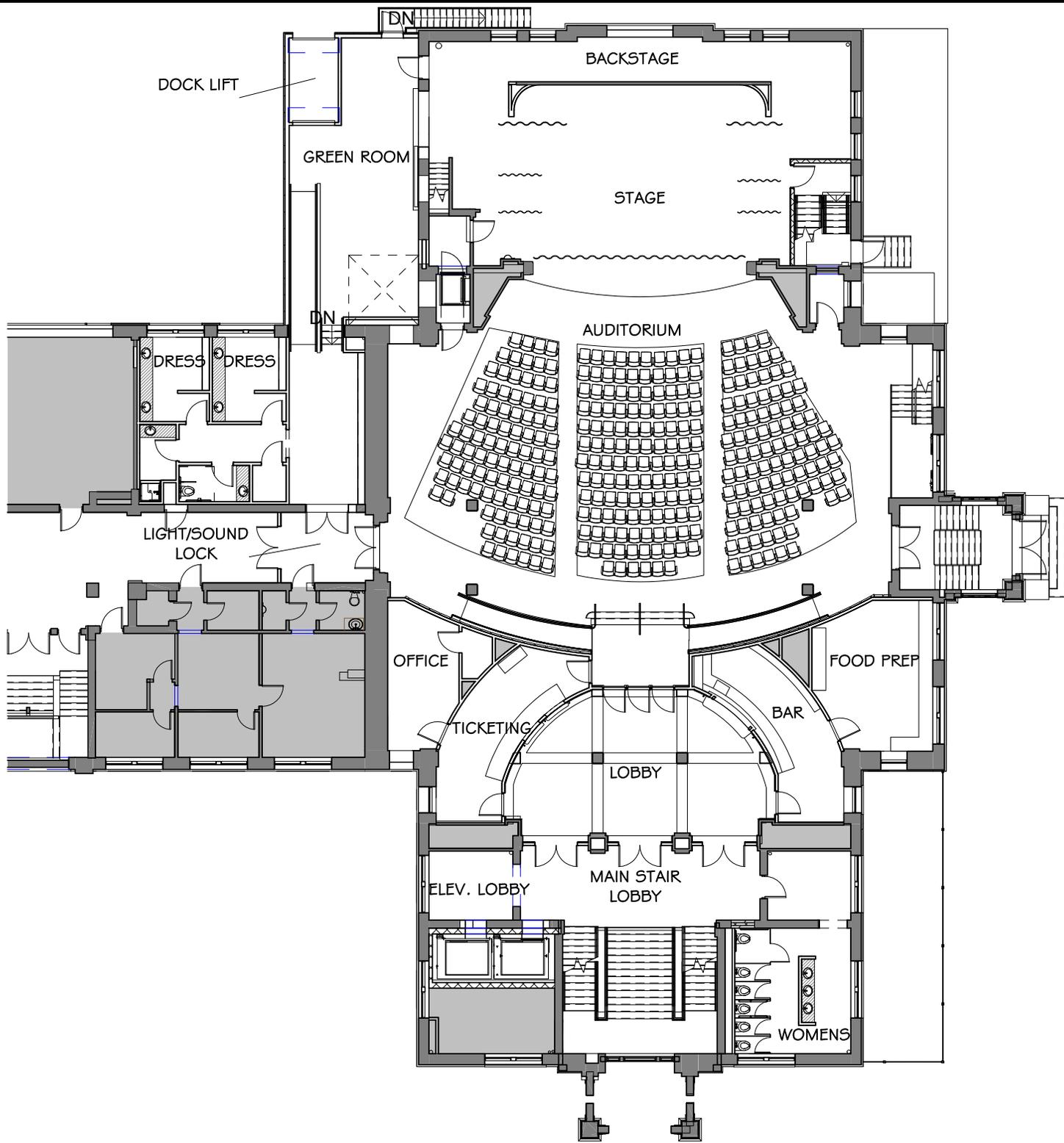
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PROPOSED FIRST FLOOR PLAN

1" = 20'-0"

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PROPOSED FIRST FLOOR PLAN

Issue Date: 11/29/2017



MEMORIAL BOULEVARD CULTURAL CENTER

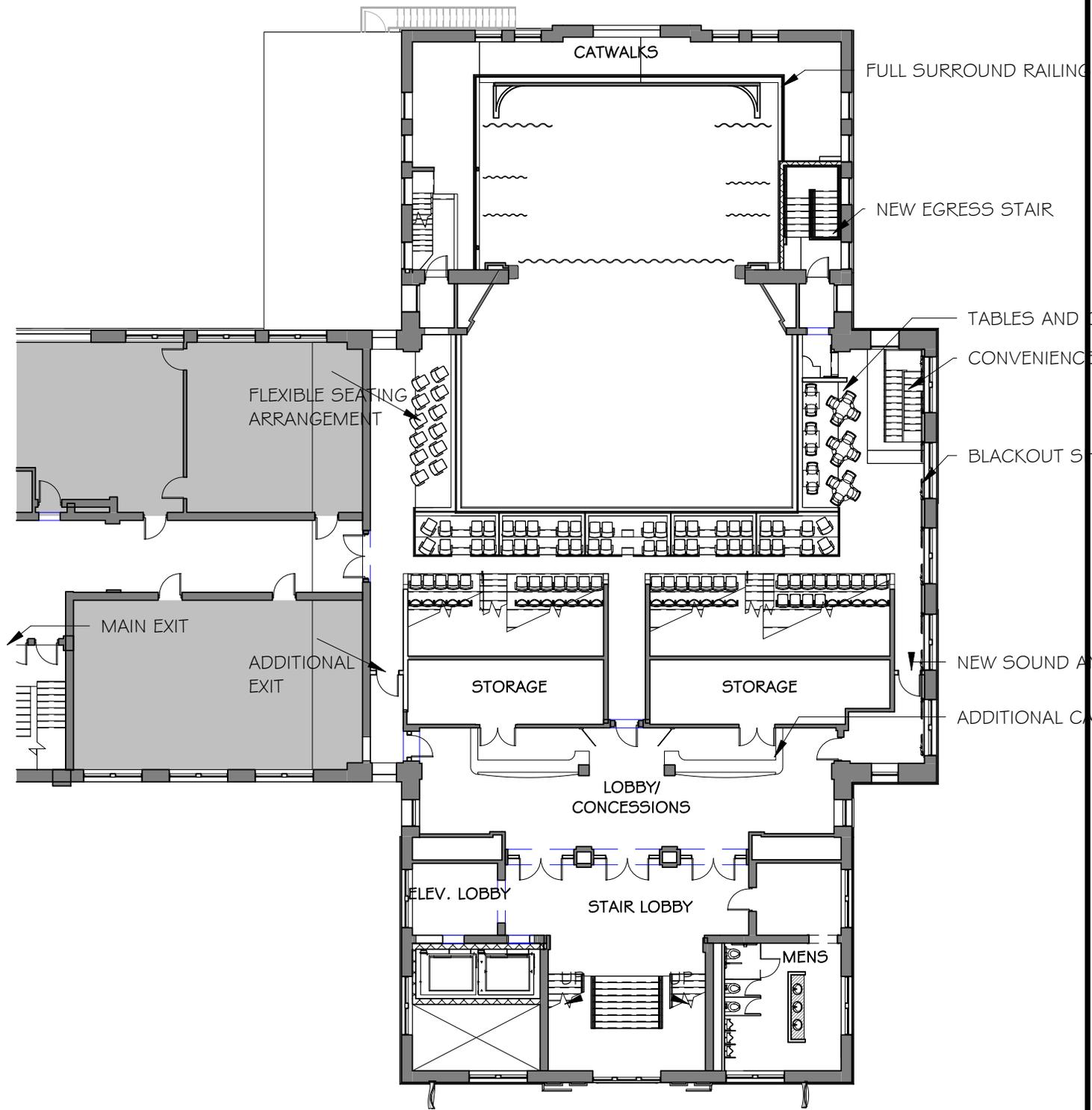
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PROPOSED SECOND FLOOR PLAN

1" = 20'-0"

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PROPOSED SECOND FLOOR PLAN

Issue Date: 11/29/2017



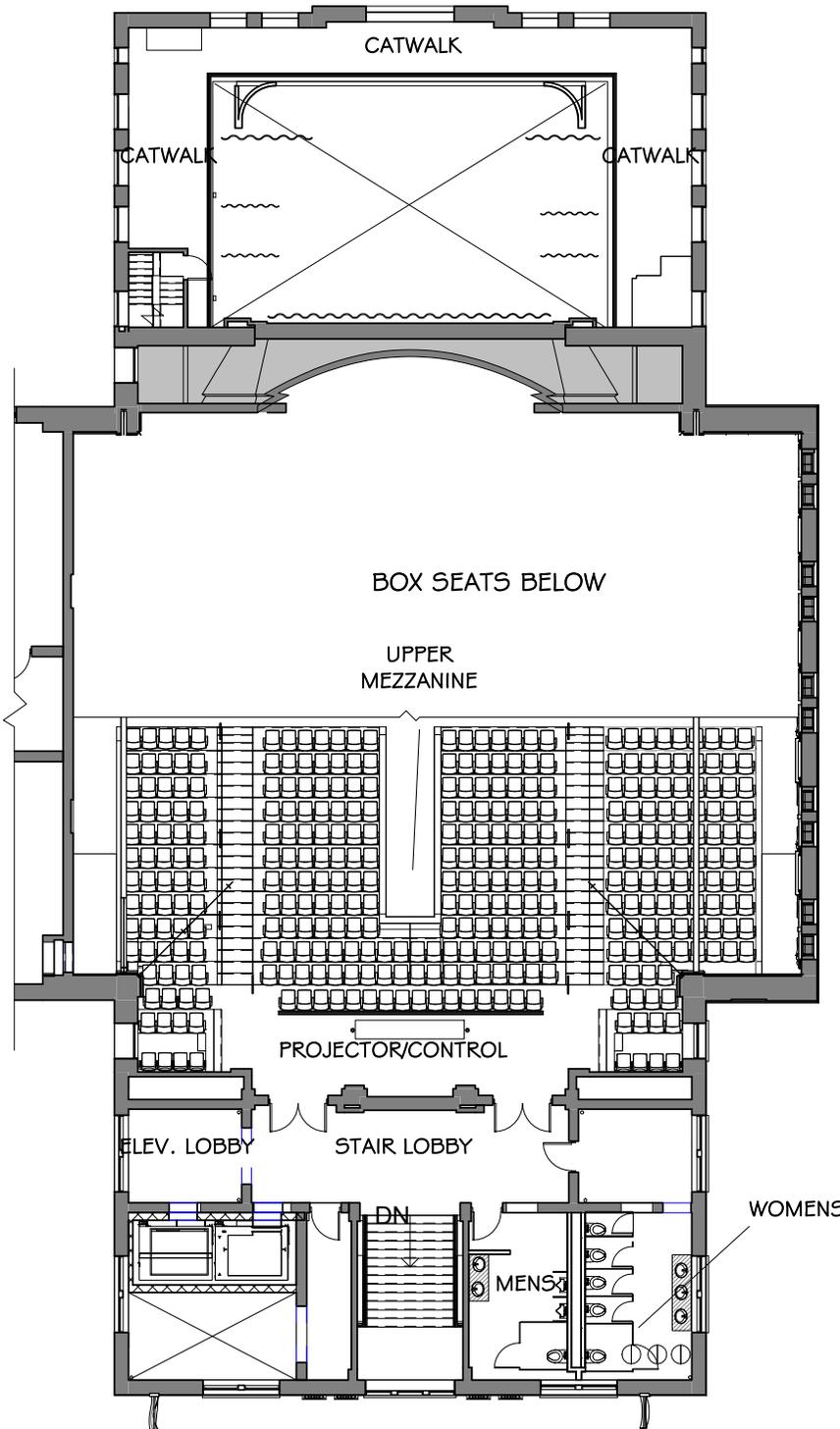
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BRISTOL, CT

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PROPOSED THIRD FLOOR PLAN

1" = 20'-0"

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PROPOSED THIRD FLOOR PLAN

Issue Date: 11/29/2017



MEMORIAL BOULEVARD CULTURAL CENTER

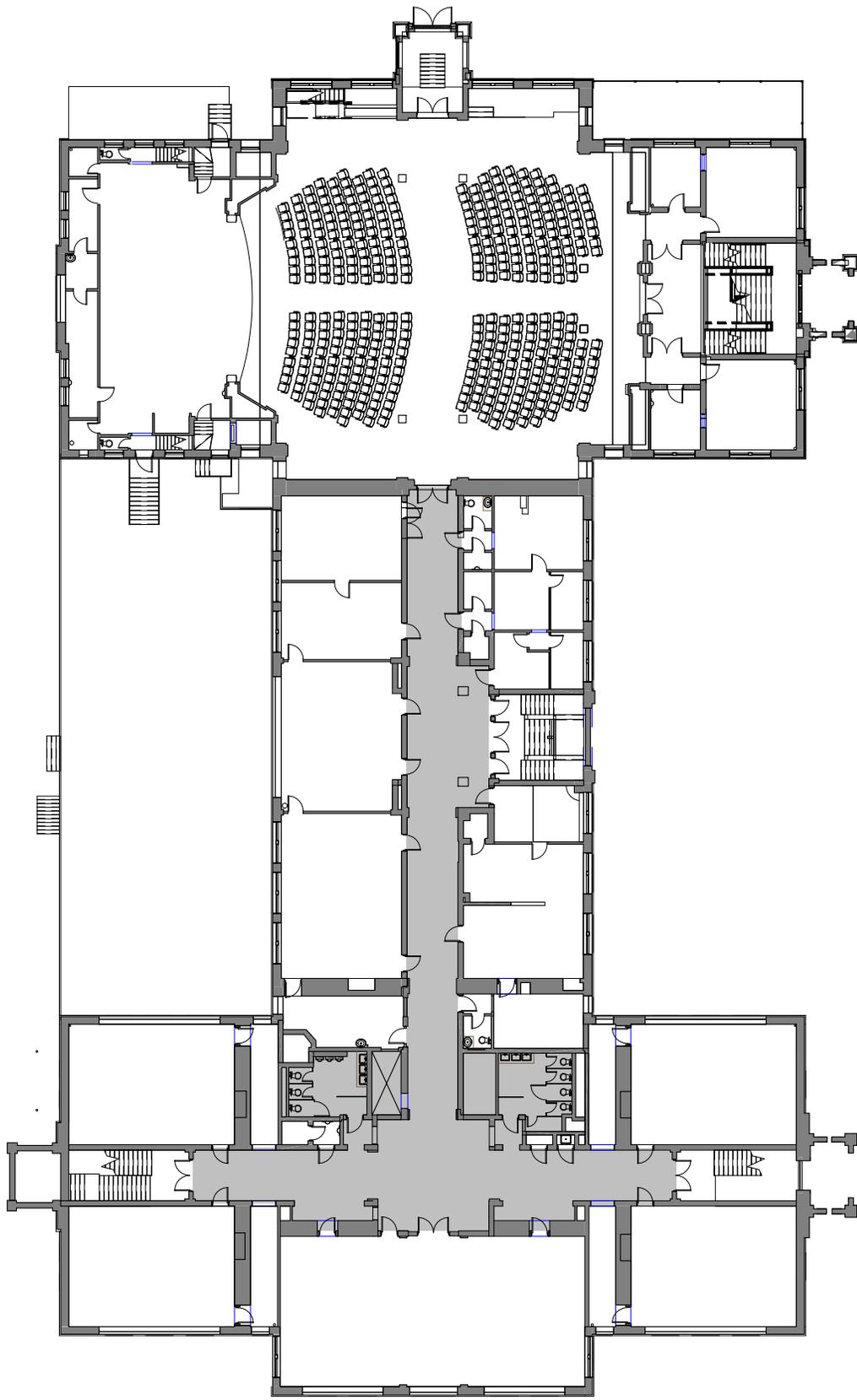
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BRISTOL, CT

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FIRST FLOOR EXISTING PLAN

1/32" = 1'-0"

1

OVERALL EXISTING FIRST FLOOR PLAN

Issue Date: 11/29/2017



**MEMORIAL BOULEVARD
CULTURAL CENTER**

Sheet #: **PG - 006**

120 MEMORIAL BOULEVARD
BRISTOL, CT

1763

KJW



ATTACHMENT F

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Bristol Memorial Boulevard Cultural Center

Bristol, Connecticut

Building Assessment Report

December 6, 2017





BUILDING ASSESSMENT REPORT

QA+M architecture performed a facility assessment for the Memorial Boulevard Middle School located in Bristol, Connecticut at the request of the City of Bristol and the Memorial Boulevard Theatre Committee (Owner). The QA+M team includes CES Engineers (MEP), Macchi Engineers (Structural), TO Design (Site), Nextstage Design (Theatre Design), JaffeHolden (AV & Acoustics).

Resources available from the Owner included a feasibility study performed by Schoenhardt (2008), feasibility study performed by DRA (2015), and a City of Bristol Fire Marshall Memorandum, August 4, 2015. Limited drawings were provided for review and relevant information compiled from previous reports has been incorporated into this review. Visual observations were utilized for this review. No destructive exploratory demolition was performed to determine hidden conditions or determination of any HAZMAT construction.

The school was designed by architect Wilson Potter in the Classical Revival Style and partially funded by Alfred F. Rockwell, president and founder of New Departure Manufacturing Company. The school was constructed in 1921 as the Bristol High School and later utilized as a Middle School until its closing in 2011. The building layout is a 4-story, H-shaped floor plan, with a basement level in the north wing. The ground floor sits on a raised site, approximately six feet above the surrounding grade.

- **Basement:** The basement consists of a gymnasium, pool, locker rooms, utility and mechanical spaces located in the north wing. The remaining areas consists of tunnels, unexcavated space, and the boiler room in the center section.
- **Ground Floor:** The ground level consists of an upper balcony around the perimeter of the gymnasium along with support spaces. The remaining areas consists of cafeteria in the center section with industrial arts, kitchen and support spaces in the south wing.
- **First Floor:** The first floor consists of the stage, 900-seat auditorium, support spaces, and classrooms in the north wing. The remaining spaces consists of offices and classrooms in the center section and library and classroom spaces in the south wing.
- **Second Floor:** The second floor consists of the upper auditorium seating and classroom space in the north wing. The remaining spaces consists of classroom space and support space in the center section and south wing.
- **Third Floor:** The third floor consists of the balcony level of the auditorium, support space, and classroom space in the north wing. The remaining spaces consists of classroom space and support space in the center section and south wing.

The main entrances are located on the east side through the north, center, and south sections. There are secondary entrances located on the north side of the auditorium/gymnasium and the west side of the south wing. There are auxiliary areaway entrances/exits along the south side of the building and out of the stage area onto the low roof on the west side. The egress stairs are located at each of the entrances/exits. The elevator in the south wing provides access from the ground level up to the third floor. Access to the roof is from a winding stair located in the south wing.



North Elevation



East Plaza at Main Entrance

USE AND SITE

The current building code Use Group is Educational with accessory uses for Assembly and Business, Assembly A-1, Construction Type II-A. The property is zoned R-40 with a building footprint of 33,532 square feet (approx. 105,000 total G.S.F. w/ approx. 70,000 NSF), on a 7.5-acre site located at 120 Memorial Boulevard. The building is a designated State Historic Property.



Site Plan

Access to the property is via two curb cuts along Wyllis Street, on the west side of the property and a curb cut off South Street. The front entrance to the building is along the east side facing the play fields, Mellen Street, and Memorial Park beyond. There are two parking lots, one on the north side and one on the south side with limited service parking along the west side of the building providing 106 parking spots. The site is landscaped along the east and west sides with trees, shrubs, and a combination of concrete

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sidewalks, asphalt paving, and concrete stairs with steel handrails. There are raised areaways which have been covered over the roofing systems to support mechanical equipment. The areas are enclosed with ornamental picket fencing set into pitch pockets.

There are two partially underground structures along the east side. One building is storage for playfield equipment. The other building houses pumps for the school underground drainage system. There is an underground drainage system below the school structure and tied into two 300 GPM pumps located in the partially underground field house. A Site Plan, dated 1958, shows the layout of the underground drainage system, consisting of 4-inch drain tile pitching to the south and exiting to a manhole at the southwest corner of the building. The pumps are reportedly in working order and maintained by the City of Bristol Facilities Department. The site drainage is typically sheet flow to curb mounted catch basins. Roof drains are tied to internal rain leaders and presumably tied into the underground storm drainage systems.

- *The trees are mature and in good condition. The shrubs are overgrown and too close to the building and should be pruned to allow adequate ventilation.*
- *The paving and hardscape surfaces are worn and in need of replacement. Alligatoring and cracking of the asphalt was observed, and full depth replacement is required in these areas. Restriping and designation of ADA compliant parking should be provided.*
- *Site stairs are worn and in need of repair and replacement. Several precast stair treads are worn and severely deteriorated requiring full replacement.*
- *The site handrails are worn and rusting at the bases set into the concrete.*
- *Raised areaway fencing is rusted with peeling paint requiring cleaning, prep, and repainting. The pitch pockets need to be cleaned up and refilled.*
- *There was no evidence of ponding water or heavy erosion on the site.*



East Elevation



Overgrown Shrubs on East Side



Wyllis Street Looking South



Typical Pavement Alligatoring



Deteriorated Concrete Pavement

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Deteriorated Concrete Steps



Deteriorated Concrete Site Stairs

STRUCTURE

The buildings are likely founded on reinforced concrete foundation walls and footings supporting perimeter load-bearing masonry walls, cast-in-place concrete floors, and a combination of exposed steel columns and steel columns encased in concrete. The floors are typically concrete slabs on grade at the basement level with a series of underground tunnels and unexcavated areas for the remaining foundations to the south. The exterior walls consist of a finished brick face with masonry backup walls and precast belt courses, heads, sills and panel decorative elements. The interior walls are typically brick with a plaster on metal lath finish, extending to the bottom of the floor structure above.

There are two ornate cast stone porticos at the east entrances on the north and south wings. The porticos have plaster ceilings, flat roofs with a torch down roofing membrane system, metal coping and an exposed scupper/conductor head/rain leader, presumably tied into the underground storm water system. The façade consists of precast columns, capitals, entablature, arches, keystones, etc. The brick façade has precast horizontal bands, precast lintels and sills with some decorative precast elements between the floors, select sections are engraved with dates, the school name and departments such as, Music, Art, Science, History, etc. There is an ornate cornice belt just below the roof parapet. The cornice belt has a metal coping on the horizontal surface with a vertical leg reglet into the masonry wall just below an existing precast band. The top of parapet wall is covered with metal coping.



Metal Cover at Cornice Belt and Roof Coping



Stains at Cornice Belt



North Wing Portico on East Side



Detail at North Wing Portico

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Base at North Portico, East Side



Typical Brick and Precast Band

- *There was no evidence observed of settlement or water migrating through the slab or foundation walls.*
- *The building was found to be structurally sound with no major settlement or structural distress observed.*
- *The brick joints are generally in good condition.*
- *There are select areas on the brick façade and select precast panels, lintels, and sills that require repointing.*
- *The metal coping at the cornice belt appears to be in good condition with no open joints or failed sealant observed.*
- *Water migration was observed at the underside of the top belt course cornice. This may indicate some open head joints and sealant joint in the existing precast band above the metal cornice coping or other brick joint failures. The head joints should be re-pointed, and the horizontal sealant joint replaced.*
- *The entire façade should be cleaned with special attention to the underside of the cornice belt.*
- *Entrance portico's; the structures need to be cleaned and all organic material removed prior to any repair work. Previous patching has failed and requires removal and replacement with new composite patching mortars and finishes. Select decorative elements require recasting of new pieces. Spalled and large cracks in finishes requires removal of any loose material down to sound substrate prior to repairs. Minor crazing should be sealed with a clear breathable sealer to avoid further water penetration.*

ROOFING

The roofing was replaced in 2008 with a torched-down granular surfaced modified asphalt system over concrete roof decks. The roof membrane continues up the parapet walls and over the top of painted metal coping. Reportedly there is a 20-year warranty in effect. The roof structure above the Auditorium consists of curved steel trusses radiating from the center of the Auditorium ceiling supporting ribbed steel formed pans and cast-in-place concrete. The roofs over the classrooms and corridors have the similar ribbed steel formed pans with cast-in-place concrete, approximately 24-inches on center. The main roof

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deck above is an undulating form with roof drains at the low points. There is a rooftop mechanical unit on the roof over the Auditorium, a smoke hatch over the Auditorium stage area, various rooftop fan units, vent piping, and roof drains. All penetrations appear to be properly flashed with no observed failures. There is a brick faced chimney, elevator penthouse, abandoned and capped penetrations, fans, vents, and rooftop mechanical equipment at the south side of roof. All penetrations appear to be flashed properly. The metal stairs to the elevator penthouse and the door/frame are rusted and require restoration. There is a mechanical areaway on the low roof located at the northeast corner. Access is from the basement level below or by portable ladder from above. There are steel stairs from the low roof up to various floor levels in the main building. There is a steel picket fence along the west edge of the low roof. There are several roof fans, abandoned and capped penetrations, vents, and drains. There is an exposed steel duct attached to the façade at the southeast corner, extending up and over the parapet.

- *The roofs are generally in good condition and no reported leaks or recent signs of water intrusion.*
- *The main roof drains appear to be operating as designed with no ponding observed.*
- *There was water intrusion observed directly below the rooftop mechanical unit above the Auditorium. The west end of the mechanical unit is missing the top section of hood, allowing wind driven rain into the unit. The City of Bristol was notified to address the penetration leak. The ceiling of the Auditorium has evidence of water intrusion from previous water leaks that have reportedly been repaired with the new roofing in 2008.*
- *All the steel stairs and railings at the low roof level are rusted and require extensive preparation and repainting.*
- *The lower roof on the north side has several areas of ponding, especially the south side. The drains are clogged with debris and require routine maintenance. Prolonged water ponding could possibly void the roof warranty and cause early deterioration of the roof membrane.*
- *The low roof areaway is covered with debris and organic material. The condition of the membrane is not known; however, replacement should be anticipated.*
- *The exposed ductwork and anchors are rusted requiring repair, prep, and painting.*



Classroom Wing Roof Looking North



South Wing

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Damaged Rooftop Unit at Auditorium



Low Roof at West Side Looking North



Kitchen Exhaust Duct West Side



Ponding at Clogged Drain on Low Roof West Side

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INTERIORS

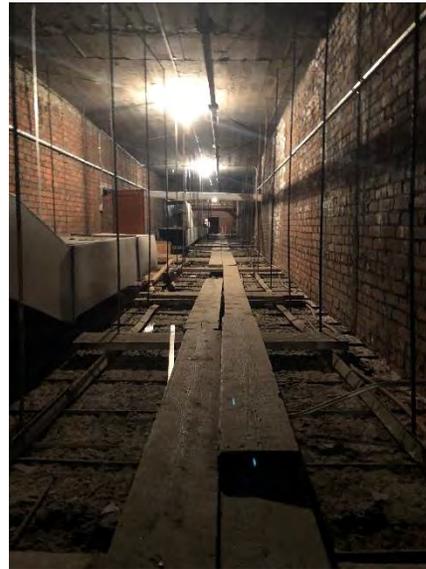
The elevated floors consist of cast-in-place concrete supporting classroom, toilets, stairs, and educational support spaces. The interior walls are typically masonry construction, extending to the bottom of the structure above. The interior finishes consist of plaster finish on the masonry walls, plaster ceilings on suspended metal lath, sheet and tile flooring, wood doors and frames, wood casework and cabinets, typical for the period of construction. The ground floor level floor finish was replaced with sheet linoleum in 1992. The remaining floors above have the original 9"x9" asbestos composition tiles. The toilet rooms typically have glazed ceramic tile with original fixtures and steel toilet partitions. The door hardware is knob style latching locksets and panic bars. Various hold-open devices were added at later dates. The pool, locker rooms, utility spaces, and gymnasium floor are located at the basement. There is a balcony around the perimeter of the upper level of the gymnasium. The locker rooms at the basement level have 1-inch thick marble partitions and original fixtures from the time of construction. There is one elevator providing access to all three floors of the classroom wing.

The Auditorium has a sloped elliptical ceiling consisting of suspended plaster on metal lath and steel channels, tied to the bottom chord of the exposed steel trusses and supported by steel rods attached to the deck above. Access above ceiling is via wood planks laid across the suspended plaster ceiling system in the corridors and classrooms. The plenum space above the Auditorium ceiling is congested with the diagonal truss configuration, light fixtures, return air ducts, and suspension support rods. There are no catwalks within this space.

- *Door hardware does not comply with current ADA Guidelines and should be replaced.*
- *All the finishes are worn and in need of replacement or extensive restoration.*
- *The Auditorium plaster ceiling needs restoration/repairs to previous water damage.*



Center Point of Trusses above Auditorium



Suspended Plaster Ceiling above Corridor

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Auditorium Ceiling

WINDOWS

The windows and exterior doors/frames were replaced in 1994 with a combination of Kawneer full lite medium stile aluminum/glass doors and fixed sash and double-hung aluminum, insulated glass units. The window configurations consist of single, double, triple units and large monumental arched topped units. The first-floor windows have exposed steel lintels, upper floors have precast sills and heads. The window treatments are a combination of Venetian blinds and roll-up shades. Several windows have no treatments.

- *The interior finishes are generally in fair to good condition. The future tenant fit out scope of work will determine the level of restoration/replacement required.*
- *The windows are in good condition with minor gasket and sealant repairs required.*
- *The steel lintels are rusted and need to be cleaning, prep, and repainting.*
- *All window treatments should be replaced.*



Typical Window Configurations



Detail at Typical Window with Rusted Steel Lintels

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Door and Transom



Detail at Door and Transom

PLUMBING/MECHANICAL/ELECTRICAL

Accurate and confirmed utility information regarding service locations from the street could not be verified. The building is provided with domestic water service, fire protection water service, gas service, and sanitary service discharge. A detailed survey evaluating the existing plumbing, mechanical, electrical, and fire protection system was performed by CES in 2015. The extracted report contains information still relevant and is attached for reference to this report.

Note; the existing systems are currently operating and providing heat and ventilation, lighting, life safety, and a full sprinkler system throughout the facility. All the systems have exceeded their useful life and require replacement to comply with new building codes and ADA accessibility guidelines for any proposed new uses. CES prepared an updated report, dated July 11, 2016 for Smith Edwards McCoy Architects with recommendations of new systems that will serve the proposed renovation of the 900 seat Auditorium and select areas for a new Bristol Community Cultural Center. The report is attached to this report for reference.

Plumbing Systems

Domestic water service is provided by City of Bristol Water Department, reportedly by a 6-inch ductile pipe and 1-1/4-inch copper line off an 8-inch water main in Wyllis Street. A separate 4-inch fire protection water service enters the building adjacent to the gas service. Gas service is provided by Yankee Gas Services Company providing service to the kitchen appliances and emergency generator. There is an indoor gas meter located in the basement. Exposed sanitary service piping is primarily cast iron and drains to the city sanitary system located in the street.

Water closets are a mix of floor mounted and wall mounted vitreous china with flush valves (non-water conserving) primarily from the time of construction. Urinals are wall mounted vitreous china with flush valves (non-water conserving) primarily from the time of construction. Lavatories are wall hung vitreous china with separate twist style faucets primarily from the time of construction. Drinking fountains are primarily wall mounted stainless steel. Electrical receptacles serving the units are GFCI protected. Sinks

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throughout the school and in classrooms are typically stainless steel, sizes vary, with lever type faucets. There are select specialty fiberglass pedestal sinks in Art Rooms and Industrial Arts classroom spaces. There are emergency eye wash units provided in the specialty classroom spaces. Custodian spaces have a combination of floor mounted fiberglass mop sinks and deep basin cast iron sinks.

A Burnham Model FD2LLVOT low pressure hot water boiler with a Beckett CF Burner provides hot water to a 1000-gallon water storage tank. There is one classroom supplied with an electrical instantaneous water heater.

The original grease trap for the kitchen has been abandoned in place and a new local "Big Dipper" grease trap installed in the kitchen space.

There is a reportedly operating central vacuum system for the school; however due to leaks in the piping, the system is not operating as designed.

Fire Protection Systems

The 4-inch fire protection service feeds the standpipes and hose cabinets located on the stage area of the Auditorium. The sprinkler system was extended throughout the school in 1993, except for the Pool Area. The original hose cabinets located throughout the school have been abandoned and the valves removed. The service includes a shut-off valve and Watts Model 909 reduced pressure backflow preventer and (2) antifreeze systems. The Stage area has a Bilco, Model D-SH, fusible-link fire vent system.

- *The Fire Alarm is an EST system reportedly in operating condition with no reported issues.*
- *A new sprinkler system was installed in 1993. The system is operating as designed with no reported issues.*

Mechanical Systems

The heating system consists of two 1974 HB Smith, M450L, #2 Heating oil, cast iron boilers with Carlin oil burners, rated for 4,177 MBH of steam. Steam is supplied throughout the building serving heating, ventilation units, and perimeter radiators and unit heaters. The steam piping consists of insulated cast iron supply and condensate return piping. There is an underground 10,000-gallon fuel storage tank with a fuel oil fill alarm serving the boilers via two pumps located in the boiler room. The tank is located on the north side of the property parking lot. The heating plant includes a vacuum condensate receiver and boiler feed system, approximately 12 years old. A separate cast iron boiler, Burnham Model FD12LLVOT; 439 MBH, provided heating for the pool.

The building is served by several heating and ventilation units, supplying air throughout the building. There are (3) "Seasons 4" air handling units for heat only; reportedly only one is currently operational. There is a "Herman Nelson Audi-Vent" unit serving the Gymnasium. There is a non-operational 12-year-old "Aaon" air handling unit. The Auditorium is served by a gas fired heating and DX cooling packaged rooftop unit providing 20,000 CFM; 50 tons of cooling capacity. Distribution to the Auditorium is via ductwork located with the truss space above the ceiling. There is return air plenum space, from the time of original construction, between the concrete roof deck and the 3RD floor suspended plaster ceiling

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system and above the Auditorium ceiling. Both areas are accessible via wood planks on top of the ceiling suspension systems. The air handling unit that serves the Administration is located above the ceiling with a remote condensing unit. The Media Center has an undersized "Herman Nelson" fan coil/unit ventilator for heating and cooling. There are roof mounted exhaust fans, sizes vary, serving general areas, classrooms, corridors, and gymnasium. Additional exhaust fans installed in window transoms have been added over the years to supplement ventilation. The kitchen has a dedicated exterior exposed exhaust duct from the kitchen cooking equipment up over the roof parapet.

The temperature control system is a pneumatic system with two air compressors, air dryer, with local controls mounted to individual radiators and unit heaters.

- *The Auditorium ductwork is reportedly in good condition.*
- *Generally, all components have exceeded their useful life and require replacement.*

Electrical Systems

The existing 32-year old electrical service to the building is a 1600-amp main disconnect switch, 208Y/120 volt, 3-Phase, 4-Wire service. The electrical distribution is primarily through 32-year+ old panelboards with some select new panelboards installed in conjunction with new work performed. Emergency lighting is a combination of select light fixtures wired to the emergency circuits and battery wall pack units. Exit signage consist of hard-wired fluorescent exit signs with battery backup. A 45kW, Onan, natural gas emergency generator provides emergency power for boiler equipment only.

The lighting throughout the building consists primarily of a combination of T-12 and T-8 surface mounted acrylic lens linear fluorescent fixtures and pendant mounted, linear, louver fluorescent fixtures.

Fire Alarm Systems

The Fire Alarm system is manufactured by EST and includes manual pull stations, horn strobes, ceiling mounted smoke detectors and a graphic annunciator panel located in the vestibule. Emergency lighting is provided by a combination of dual-head self-contained battery pack units and ceiling mounted 9"x9" self-contained fixtures. The security system is limited to a control panel, a door entry intercom and camera, door contacts, and motion detectors in the corridors. The Public-Address system is a Bogen Model Multicom 2000 with head in equipment located at the Main Office and ceiling mounted speakers in the rooms. The central clock system is manufactured by Simplex and includes a control panel and wall mounted clocks throughout the school.

Communication services for the Town of Bristol are reportedly provided by AT&T Connecticut, Fiber Technologies Networks LLC, and Level 3 Communications. Cable TV provider is Comcast of Connecticut Inc.

BUILDING CODE

The building is not currently open for public use. The existing building code Use Group is Educational with accessory uses for Assembly and Business. The current accepted construction classification is Type II-A, Non-Combustible, satisfying height and area requirements. The stairs appear to be adequate for the

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intended occupant load of the school wings of the building. The egress in the Auditorium is not fully compliant with select stairs that do not provide adequate egress width.

The elevated site platform for the building does not provide accessible access in compliance with current ADA requirements. There is one ramped entrance at the southwest corner of the building providing accessible access to the Ground Level, otherwise the accessible path of travel from the parking lots to entrances and through the building to all floor levels are not in compliance with ADA requirements. The elevator does not comply with current ADA clearance requirements. The elevator interior cab does not provide adequate clearance for an emergency gurney. The call buttons are key controlled and do not comply with current ADA requirements. The current toilet room clearances are not ADA compliant. The building may have complied with historic building codes at the time of permitting, however; any change in use of the building will require the entire facility be brought into full compliance with all current applicable codes and authorities having jurisdiction.

The exterior wall construction is not known and may not comply with new energy codes requirements for R-value. Maintaining interior historic materials and finishes and maintaining exterior façade materials do not always allow new insulation systems to achieve code required R-values. This issue is often a complicated resolution between the Historic Commission reviews and the building department, requiring detailed energy modeling and oversized mechanical units to compensate for energy code compliance.

AUDITORIUM/THEATRE COMPONENTS

The theatre components, seating, curtains, lighting, rigging, AV systems are outdated and have exceeded their useful life requiring replacement. The stage rigging system is the original hemp and pulley system, now outdated and unsafe. The smoke curtain is outdated. The stage curtains and legs, borders, and rear travelers are in poor condition and most likely have lost their fire-retardant effectiveness.

- *All the theatre components have exceeded their useful life and are outdated for today's productions requirements and technology requirements.*
- *Seating and improved sight lines are required accommodate expectations of today's audiences.*
- *Backstage access to equipment, storage, gallery and rigging is required.*
- *All lighting systems are outdated with inadequate circuits and controls.*
- *The stage curtains and legs, borders, and rear travelers are in poor condition and most likely have lost their fire-retardant effectiveness. All curtains, tracks, hardware, etc. should be replaced with new.*
- *Backstage spaces are inadequate or non-existent and should be added for today's performance needs.*
- *New technology and controls are non-existent and should be added for today's performance needs.*

POOL

The pool was covered in 2008 with 5/8-inch plywood supported by metal deck and light gage structural steel joist framing.

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- *The associated pool equipment, systems, drains do not operate as designed. Reportedly the pool would require extensive repairs to drains, pumps, equipment, code updates, and finishes to recommission.*

HAZARDOUS MATERIALS ASSESMENT

A hazardous materials assessment report was prepared for this facility by RTK Environmental Group. The HAZMAT assessment should be updated, and extent of all potential hazardous materials identified for proper removal and disposal.

END

Attachments:

- CES Mechanical, Electrical, Plumbing and Fire Protection Systems Existing Conditions and Recommended Systems Report prepared by CES Consulting Engineers, January 29, 2015 (Extracted from the DRA Feasibility Study Memorial Boulevard School, Bristol, CT, March 15, 2015).
- 1958 Site Plan.
- Lyons-Mather-Lechner, 1976 Floor Plans, A1-A14, M1-M5, E1-E6.
- Girard and Company, S31 Cross Section and Details (Pool Infill), October 22, 2008.
- CES Mechanical, Electrical, Plumbing and Fire Protection Systems Schematic Design Narrative, November 30, 2017 (Prepared for SmithEwardsMcCoy Architects).

PLUMBING NARRATIVE

PLUMBING UTILITIES – EXISTING SYSTEMS

1. Domestic Water:

- a. Existing Domestic Water Service: The existing domestic water service location and equipment could not be determined during the site walk-thru.

2. Natural Gas:

- a. Existing Natural Gas Service: The existing natural gas service enters the building in the tunnels below the school adjacent to the fire protection water service. There is an indoor meter assembly with shut-off valves. This natural gas service feeds the kitchen appliances and the emergency generator.



3. Sanitary:

- a. Existing Sanitary Service: The sanitary sewer system provides sanitary waste drainage for plumbing fixtures located throughout the building. The piping material above grade is primarily cast iron. The plumbing fixtures drain to buried sanitary waste piping to the buildings exterior and to the municipal sewer system.



4. Storm:

- a. The storm piping is roof drains, secondary roof drains, and downspouts that drain to an underground piping system and drains to a storm water pump station located in an adjacent building at the playfields. Storm water is then pumped to the municipal storm water system. The piping is in fair condition. The storm water pumps and equipment is in poor condition.



- b. Problems with the storm drainage system were reported in the areas of the light wells. There are storm drains in each light well. In the recent storms, storm water has come up thru these storm drains flooding these light wells causing water to enter the building. Maintenance staff has added sump pumps to help pump out the water at these locations.



PLUMBING FIXTURES AND SPECIALTIES

1. Existing plumbing fixtures are as follows:

- Water closets are wall and floor mounted vitreous china with flush valves. Most of the fixtures are original to the facility in fair condition. The fixtures are non-water conserving type and non-ADA compliant.



- Urinals are wall hung, vitreous china, with flush valves. The fixtures are original to the facility in fair condition. The original fixtures are non-water conserving type and non-ADA compliant.



- Lavatories are wall hung vitreous china with two twist or metered style faucets. The fixtures are mainly original to the facility in fair condition. The fixtures are non-water conserving type and the faucets and drains are non-ADA compliant.



- Drinking fountains are wall mounted stainless steel units in fair condition. One of the single units may be ADA compliant with respect to controls however there are other units that do not have ADA compliant controls. In addition, the receptacles serving these drinking fountains are not GFCI protected.



- Stainless steel sinks with two lever type faucets are present in various areas of the facility. These sinks are non-ADA compliant and in fair condition.



- Classroom sinks consist of pedestal mounted fiberglass units with two-lever faucets. These sinks are in good condition but are not ADA compliant. In the Tech Lab, there is also a wash fountain that is in fair condition.



- Janitor sinks are a combination of wall mounted cast iron units with two lever faucets or floor mounted fiberglass units with two lever faucets. Some of these sinks have vacuum breakers. The cast iron sinks are original to the building and in poor condition.



- There are existing showers located in the locker rooms. There is also a single shower in the Custodian Area. This equipment is original to the facility, in poor condition, and non-ADA compliant.



- There is a central vacuum system at the school. This system is operational, however due to leaks in the system the system does not perform as it should. This system is original to the building and in poor condition.



- The Kitchen has a local grease interceptor manufactured by Big Dipper. This equipment is in good condition. There is an original grease trap that once served a dishwashing area that has been abandoned.



- There are emergency eyewash and shower unit located in the lower level that was used when the pool was operational. This unit is in good condition.



- There are emergency eyewash units located at some sinks in the classroom areas. These units drain directly into the adjacent sinks. These units are in good condition.



DOMESTIC HOT WATER SYSTEMS

1. The existing domestic hot water system includes a Burnham Model FD2LLVOT low pressure hot water boiler with a Beckett CF800 Burner. This boiler provides water to a 1000 gallon domestic water storage tank. The boiler, burner, and storage tank are in good condition. The recirculation pump at the storage tank is in poor condition.



**Memorial School
Bristol, CT**

**Mechanical, Electrical, Plumbing and Fire
Protection Existing Conditions and Recommended Systems Report**

CES PN – 2014391.00

January 29, 2015

2. At (1) sink in one of the classrooms there is an instantaneous electrical water heater installed to serve that particular sink. This water heater is in good condition.



RECOMMENDED PLUMBING SYSTEMS

1. Install new domestic cold water, hot water and hot water recirculating piping throughout the building to serve all new plumbing fixtures. All hot water and hot water recirculating piping shall be insulated to comply with the International Energy Conservation Code.
2. Replace existing oil fired domestic water heater with new high efficiency condensing type gas fired domestic hot water heaters to provide hot water for all new plumbing fixtures. The hot water distribution system shall be 110°F water to serve the building plumbing fixtures and 140°F water to serve the kitchen. The water in the storage tanks will be stored at 140°F. An automatic High/Low tempering valve, by Leonard or approved equal, will reduce the water temperature to 110°F for the building piping. Hot water recirculation pumps shall be installed to maintain the appropriate temperatures in the domestic hot water distribution system. The pump shall be controlled by the building management system (BMS) to minimize energy consumption. Hot water recirculation piping shall be brought to all lavatory, sink and shower locations.
3. Install a new system of sanitary, waste, and vent piping for all new plumbing fixtures. Kitchen plumbing fixtures which could discharge any fats, oil or grease into the building drainage system shall be piped separately to a grease trap/interceptor in compliance with Connecticut DEP requirements.
4. All plumbing fixtures shall be replaced. All plumbing fixtures required to be accessible shall be in accordance with the Americans with Disabilities Act (ADA), 504 and UFAS standards.
 - a. Water closets and urinals shall be wall hung, vitreous china, low consumption (0.125 gallon per flush urinals and high efficiency 1.28 gallon per flush water closets), by American Standard or approved equal. Flush valves shall be battery operated, by Sloan or approved equal.
 - b. Lavatories shall be countertop type, vitreous china, by American Standard or approved equal. Faucets shall be low consumption battery operated, by Symmons or approved equal.
 - c. Wall hangers for water closets, urinals, and lavatories shall be heavy duty adjustable height type installed within chase spaces provided behind fixtures, by J.R. Smith or approved equal.
 - d. Drinking fountains shall be stainless steel, two-tier, ADA style, vandal resistant manufactured by Elkay or approved equal.
 - e. Mop basins shall be floor mounted, 24"x24", molded stone, with wall mounted faucet & trim, by Fiat or approved equal.

- f. Cast iron floor drains shall be installed at all gang toilet rooms. Heavy-duty cast iron floor drains shall be installed in all mechanical rooms. Floor drains shall be by J.R. Smith or approved equal. Trap primers shall be provided for floor drains.
 - g. Hose bibs shall be installed in all group toilet rooms, by Woodford or approved equal.
 - h. Wall Hydrants shall be installed on exterior walls every 100 feet. Wall hydrants shall be non-freeze type by Woodford or approved equal.
5. Replace existing gas meter with a new gas meter and pressure regulator sized to provide the new total connected load and pressure requirements for the building equipment. New piping within the building will be installed to supply gas to the new hot water heating boilers, new domestic water heaters, kitchen make-up air unit and kitchen cooking equipment.

FIRE PROTECTION NARRATIVE

FIRE PROTECTION SERVICE

1. The building is served by a 4" fire protection service fed from a fire main in Summit Street. The original fire protection service only fed the stage area of the Auditorium. The fire service was upgraded to include sprinklers throughout most of the building with the exception of the renovated pool area. Sprinklers were not provided throughout the pool area when it was renovated. The fire service includes a shut-off valve and Watts Model 909 reduced pressure backflow preventer. This fire service equipment has been recently installed; the sprinkler piping and sprinkler heads are an older installation, more than 30 years old.



- The fire protection system includes (2) antifreeze systems where antifreeze is added to the sprinkler piping to avoid freezing of the piping. This equipment is in good condition.



- There are hose cabinets and standpipes located on the stage. This equipment is in good condition.



- There are original hose cabinets located within the building that have been abandoned. It appears that these hose cabinets have been disconnected as there is no valve in the cabinets.



RECOMMENDED FIRE PROTECTION SYSTEMS

1. Replace existing 4" fire protection water service with new 8" fire protection water service from main in street to building sprinkler room. New service shall supply both the new wet pipe sprinkler system and new manual-wet fire standpipe system.
2. Provide new manual-wet fire standpipe system in accordance with NFPA 14 "Installation of Standpipes and Hose Systems" in all exit stairways. Standpipe system shall be a Class I system with 2½" hose connections located on the intermediate landing between floor levels in every required exit stairway.
3. Provide modifications to the existing fire protection system, in accordance to NFPA 13, "Installation of Sprinkler Systems" and NFPA 14, "Installation of Standpipes and Hose Systems" and the City of Bristol standards for complete coverage throughout all areas of the building.
4. Alarm valves and flow switches shall be installed to properly zone the sprinkler system. All fire protection alarms shall be connected to the building fire alarm system.
5. Sprinklers shall be concealed pendants in finished areas with ceilings. Sidewall, upright, and extended coverage sprinklers shall be installed where appropriate. Sprinklers with protective baskets shall be installed where subject to physical damage. Quick response sprinkler heads shall be used in light hazard locations. Sprinklers, unless noted otherwise, shall have a ½" orifice and a 165°F temperature rating. Intermediate temperature classification sprinklers shall be installed within mechanical rooms, kitchen and other applicable areas.
6. Piping for the sprinkler system shall be steel pipe, ASTM A 53, Schedule 40 seamless carbon steel. Schedule 10 pipe shall be allowed for pipe sizes larger than 2" diameter when roll grooved mechanical couplings are used. Sprinkler piping shall be installed above ceilings and concealed within chases where applicable.
7. Fittings shall be grooved mechanical fittings: ANSI A21.10 ductile iron; ASTM A47 grade malleable iron. Couplings shall be ASTM A 536 ductile iron or malleable iron housing, EPDM gasket with nuts, bolts, locking pin, locking toggle or lugs to secure roll grooved pipe and fittings.
8. Kitchen exhaust hoods and ductwork shall be protected by a wet chemical type fire suppression system and shall be connected to the building fire alarm system.

MECHANICAL SYSTEMS:

EXISTING SYSTEMS

1. The existing building is heated by (2) HB Smith Mills 450 21-section cast iron steam boilers with Carlin oil burners. The boilers and burners were installed in 1974 and are in poor condition. The boilers are showing signs of leaks at the individual sections. The boilers serve steam pipe distribution throughout the building.



2. The heating plant also includes a vacuum condensate receiver and boiler feed system. The vacuum condensate system is less than ten years old and in good condition. The boiler feed system is also in good condition.



3. There is a buried 10,000 gallon fuel oil tank located on the north side of the building. There is a duplex fuel oil pump set located in the boiler room that pumps fuel oil from the tank to the boilers. There is also a fuel oil fill alarm system. All of this equipment is in fair to good condition.



4. The present heating system also includes cabinet unit heaters, ceiling mounted unit heaters, cast iron radiators and baseboard radiation. Most of the heating units within the stairwells have been disconnected. Most of this equipment is original to the building and is in fair to very poor condition.



5. There are a number of air handling units that serve various areas of the building. There are (3) Seasons 4 air handling units for heat only. Only (1) of these units is operational. There is a Herman Nelson Audi-Vent unit that serves the Gymnasium. This unit is in poor condition. There is an Aeon air handling unit that is approximately (10) years old that is not operational. The unit that serves the Auditorium is approximately (20) years old and is used for cooling only. The air handling unit that serves the Administration area is located above the ceiling in the area with a remote condensing unit. The remote condensing unit is over (20) years old and in poor condition.



6. The Media Center has a Herman Nelson fan coil/unit ventilator for heating and cooling. The cooling capacity of this piece of equipment is undersized for the amount of space to be cooled, especially with the addition of computers within the media center. This equipment is in fair condition.

- There are various exhaust fans throughout the building that serve general areas such as corridors and the gymnasium which includes roof mounted exhaust fans, ductwork, grilles and controls. The ventilation systems do not meet current codes for ventilation rates based on the age of the facility. The exhaust fans range from fair to good condition.



- A number of exhaust fans have been added to various rooms to help with ventilation. A number of louvers have been damaged and others covered over. This equipment is in poor condition.



9. The Tech-Ed area has air filtration systems, wall mounted to process the air within the space. This area should have a dedicated exhaust and make-up air system to remove any air with odors, etc.



10. The Kitchen includes an exhaust fan that serves the hood over the cooking equipment. The ductwork from the hood runs exposed in the Kitchen out to a roof mounted exhaust fan. The ductwork then extends up the side of the building to a discharge on the roof. The exhaust fan and ductwork serving this hood does not comply with current NFPA 96 requirements for a grease-laden exhaust system.



11. The steam piping consists of iron supply and condensate return piping. Some of this piping is missing insulation or the insulation has failed and replaced.



- The existing temperature control system is a pneumatic system consisting of two air compressors, air dryer, and local controls mounted at the individual radiators, cabinet unit heaters, etc. and additional sensors throughout the building. The pneumatic equipment is in fair condition.



RECOMMENDED MECHANICAL SYSTEMS

- Replace existing oil fired boilers with high efficiency gas fired condensing boilers. The heating plant will consist of two 2,000 output MBh boilers sized at 65% each of the total load to allow for some redundancy.
- The hot water heating plant will consist of two variable frequency driven hot water pumps. Each pump will be sized for 100% capacity (approximately 250 gpm), for complete redundancy. The pumping will be a variable primary flow arrangement for the boilers to send water to the building for space heating systems and terminal heating units (baseboard fin tube radiation, cabinet unit heaters, unit heaters etc.). The system will include 30% glycol for freeze protection. The space heating hot water temperature will be reset inversely with outside air to minimize energy consumption.
- The HVAC system will consist of a Variable Refrigerant Flow (VRF) system. The system will include a VFD driven 100% Outside Air Central station air-handling units (DOA) with DX cooling and hot water coil. The unit will provide Outdoor air to VRF terminal units. Approximately 1cfm/sqft will be supplied and slightly less exhausted to maintain positive pressure in the occupied offices/spaces. The DOA will provide approximately 75 Tons of cooling.
- The building should be provided with approximately 225 Tons of multiple air cooled roof mounted VRF heat pump condensing units. The indoor and outdoor units will be connected via refrigerant piping.
- The individual offices will all be served by ducted concealed variable refrigerant flow (VRF) air handlers which will reside above the ceiling. The VRF air handlers will be heating and cooling units capable of heat recovery. VRF air handlers shall be fed by branch selector boxes, each box shall serve multiple air handlers and be fed from one of the rooftop heat pump units.
- The gymnasium shall be provided with a 12,000 cfm single zone variable air volume air handling unit with a hot water coil and remote rooftop DX condensing unit for cooling. The unit will also incorporate demand control ventilation which will modulate the amount of outside air to the space based on occupancy and CO₂. The unit will need to be provided with outdoor air and a relief air via louvers at the perimeter of the building. The gym will be provided with ceiling mounted anti-stratification fans.
- The existing air handling unit serving the Auditorium will be replaced by a 35-Ton rooftop air handling unit. The existing ductwork distribution will be re-used. The unit will also incorporate demand control ventilation which will modulate the amount of outside air to the space based on occupancy and CO₂. The unit will also be supplied with an energy recovery wheel.

8. A kitchen exhaust fan and welded carbon steel ductwork shall be provided to accommodate the new café. A gas fired make up air unit shall be provided.
9. Data closets will be served by ductless split units. Unit consists of indoor wall mount air handler and roof mount condensing unit.
10. All Toilet Rooms will be provided with exhaust via the dedicated outside air handling units connected to vertical ductwork.
11. A Building Management System (BMS) shall be installed to control the mechanical and selected electrical systems.
 - The system shall include a personal computer with graphics based display, color printer, modem and capabilities for alarming off-site.
 - The BMS shall provide temperature control for all HVAC systems and control select lighting in the building.
 - The system shall be programmed for occupied/unoccupied cycles for the dedicated outdoor air handling equipment, with an override feature for spaces that would be utilized after-hours.
 - The BMS shall be accessible from any Web browser, with proper authorization.

ELECTRICAL NARRATIVE

EXISTING SYSTEMS

1. The building is served by a single electrical service rated 1600 amperes, 208Y/120volts, 3-phase, 4-wire. This service equipment consists of a 1600 amp main disconnect switch, distribution section and metering per utility company requirements. The service equipment is approximately 30 years old and in fair condition.



2. There is a 45kW natural gas fired emergency generator located off the boiler room. This equipment is manufactured by Onan. This generator serves the boiler room equipment only. This equipment is in poor condition.



3. There are a number of electrical panels located throughout the facility. These panelboards range from equipment that was installed original to the building and others that that have been installed to accommodate the addition of computers throughout the school. The condition of these panelboards range from poor to very good.



- 4. The lighting throughout the facility consists primarily of surface mounted acrylic lensed troffer style linear fluorescent fixtures or pendant mounted louvered linear fluorescent fixtures. Some areas such as storage rooms, mechanical rooms have industrial fluorescent fixtures. Most of the lighting has been upgraded to T8 technology, however, there are other fixtures using older T12 technology or incandescent lamps. Some of the fixtures have been damaged and are missing lenses. The lighting ranges from good to poor condition.



- The fire alarm system is manufactured by EST. The system includes manual pull stations, horn strobes, and ceiling mounted smoke detectors, and graphic annunciator. Some of the horn/strobe units are non-ADA compliant. This system is in fair condition. Additional audio visual devices as well as replacing the non-ADA compliant devices should be added to the building. The existing system is on record as having numerous maintenance issues.



6. The emergency lighting is provided by two-head self-contained emergency fixtures with batteries or a surface mounted 9"x9" self-contained emergency fixture. This system is operational however the equipment is in poor condition. Additional lighting fixtures are required to meet current requirements for emergency lighting.



7. The exit signs consist of fluorescent exit signs with batteries. This equipment is in good condition. Additional exit signs are required to meet current requirements for exit signs.



8. The facility does have a limited security system consisting of a control panel, limited cameras, door contacts, motion detectors, and a door entry intercom with camera. This system is in fair condition. Additional devices may be considered for enhanced security.



9. The existing PA system consists of wall or ceiling mounted speakers. It is manufactured by Bogen, Model Multicom 2000. The head end equipment is located in the main office. This head end equipment is in very good condition. Some of the speakers show signs of damage and should be replaced.



10. A central clock system manufactured by Simplex, including a control panel and wall mounted clocks is existing at the building. It appears that this system is operational and in fair condition. Some areas have had individual battery operated clocks added.

