

Architectural + Engineering Services
For
Theatre Renovation Options Memorial Boulevard School



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20 November 2008

Mayor Arthur J. Ward
Bristol City Hall
111 North Main Street
Bristol, CT 06010

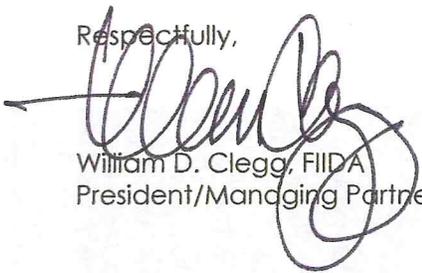
RE: Memorial Boulevard Theater Feasibility Study

Dear Mayor Ward,

Our team has thoroughly enjoyed the opportunity to study the Memorial Boulevard Theater. This building is a real gem. The unique and innovative 1921 design poses a tremendous venue for varied performing arts groups. The renovation and upgrades being concluded will serve the citizens of Bristol for decades that a facility that any artist would love to perform in.

Being a youngster who witnessed performances in this wonderful hall and being a small part of what may come has been a personal thrill. The Schoenhardt team stands ready to move this theater and your city to a great future of outstanding performances.

Respectfully,


William D. Clegg, FIDA
President/Managing Partner



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11/20/08 11:27



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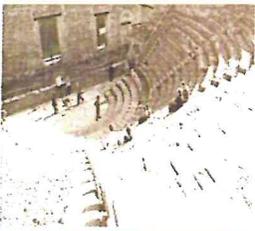
Project Overview

Memorial Boulevard School



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Project Overview

Memorial Boulevard School

Executive Summary

EXECUTIVE SUMMARY

Our team of Architects, Interior Designers, Engineers, Environmental Specialists, Theater Consultants and Cost estimators has considered the aspects of this upgrade and conversation in a very thorough and serious manner.

Exhaustive site investigations, detailed interviews with local arts groups, building users and city officials have offered a clear insight into the existing land tour and creative uses for this gem of a building. After meeting numerous times with the committee, the Schoenhardt team offers the following Feasibility report. We hope you find it informative and useful in planning the next steps in moving this project to a brilliant open performance in a newly renovated quality hall.



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Project Overview

Memorial Boulevard School

Project Goals

The City of Bristol, through the Memorial Boulevard Theater Committee, established the following planning goals as a part of seeking feasibility study renovation options and implementation recommendations to the theatre located within the Memorial Boulevard Middle School.

The building, originally constructed in 1922 as Bristol High School, has a theatre with existing seating accommodations of 921. The overall acoustics are not considered to be problematic; however the stage is undersized and its' infrastructure and technology is dated by at least thirty years. There are no staging areas or side access points for performers. The seating accommodations are aged and considered to be no longer repairable.

The property is owned and maintained by the Bristol Board of Education, situated at the western edge of Memorial Boulevard Park, which is owned and maintained by the Bristol Parks and Recreation Department. Parking is suitable for school operations; modifications may be required to accommodate the increased use of the of the theatre facility.

As a part of Bristol's continuing efforts to rejuvenate its downtown area, the Mayor has begun an initiative to make renovations to the theatre to enhance its long-term usefulness. Potential uses for the theatre include but are not limited to community performances; local arts organizations, professional performances, dance and music recitals, government meetings and corporate rentals.

The goals of the study are to investigate and consider the following design and facility upgrades as a part of the renovations:

1 – Stage and Auditorium Related Components

- Enlarge proscenium
- Resurface stage
- New sound, lighting, curtains, rigging
- New seating, flooring, visibility, site-lines, code

2– Public Areas

- New public lobby, overflow/circulation
- Code complying toilet facilities, entry, elevators

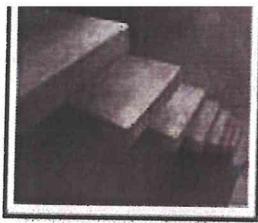
3– Stage and Performance Support

- Stage sets, loading area, back stage storage
- Rehearsal/classroom, staging area for performers

4– Building Systems

- Heating/air conditioning
- Fire and code related upgrades
- Sound & lighting control systems, video projection





Memorial Boulevard School

The following explains the strategy and process we utilized to help the City of Bristol through the feasibility study process for the Memorial Boulevard Middle School Theatre.

PROJECT INITIATION

Schoenhardt conducted meetings with the City of Bristol and others with knowledge of the middle school theater to review previously completed building studies and improvements, determine problem areas and to review expectations of the feasibility study analysis.

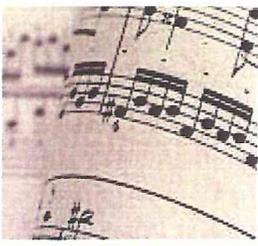
1 - Discovery: Gather Information / Stakeholder Interviews

- Review the building's historically significant features, and determine building chronology to determine changes over time.
- Review existing drawings, building reports.
- Meet with stakeholders to discuss any concerns regarding the preservation of the building. Develop a team approach and work to build consensus to address preservation.
- Review past and current theatre uses, establish priorities for the restoration and rehabilitation of specific architectural features.
- With city and stakeholders, develop list of potential new functions of the theatre beyond opportunities identified in the initial RFP.

2 - Site Analysis: Determine physical site conditions and restrictions for structure

- Review local regulatory requirements for site planning, conservation wetlands and other site restrictions.
- Review site conditions, i.e., contours, configuration, access points, that may impact development.
- Review, globally, potential use relationships that may impact site positioning of additions (if applicable), access, parking, etc.
- Review site utilities and capacities, outline potential infrastructure needs for renovations.
- Prepare and present report.





Memorial Boulevard School

3 - Building Analysis: Determine physical condition of structure

- Review current code conditions, i.e. Building, Life Safety, ADA, etc.
- Review structure -outline areas in need of repair or code correction.
- Review programmatic needs of the building.
- Develop corrective measures to be undertaken.
- Prepare and present report.

4 - Conceptual Design: Synthesize Information & Develop Design Scenarios

- Study and identify the best, most practical and efficient options for the building.
- Develop design sketches that depict the building renovations, modifications, and additions.
- Develop parking studies.
- Develop HVAC alternatives based on upgrading existing systems including proposed alternative replacement systems.
- Develop options for technology upgrades (e.g. sound, video, computer capabilities).
- Develop interior design concepts including finishes and lighting.
- Develop interior furniture, fixtures, and equipment (FF&E) needs.
- Develop current year statements of probable cost for renovations.
- Attend various meetings/ -present study findings as needed.

5 - Systems Analysis: Determine physical conditions of structural, mechanical, electrical, plumbing, life safety, lighting, audio/visual and acoustical components of the buildings

- Investigate environmental conditions of the building.
- Review existing building systems conditions and capacities.
- Develop diagnostics for renovations and/or additions for each building system.
- Prepare and present report.

6 - Cost Analysis: Provide global statement of probable costs and phasing

- Using experience, historical data and input from the construction field, develop preliminary estimate of probable construction costs for agreed upon scope.

7 - Report: Prepare and present final report





Memorial Boulevard School

IMPLEMENTATION – FUTURE PHASE

Schematic Design

- We will prepare schematic level drawings, specifications, and finish selections. We will examine zoning issues as required.
- We will develop access and egress plans, including loading access.
- We will address all programmatic building elements along with structural and MEP requirements, building code and ADA requirements, and preservation issues.
- We will address acoustical issues and all theatrical systems and equipment. We will develop a schematic statement of probable cost.
- Throughout Schematic Design, we anticipate working very closely with you and our consultant team with regular meetings and presentations.

Design Development

- We will thoroughly review the Schematic Design package and take it to the next level of detail with the refinement of building plans, elevations, details, and materials.
- We will begin to finalize design elements, materials, and finishes.
- We will develop more detailed specifications for building materials and equipment. We will revise the construction budget and provide value engineering as required.
- We will continue to meet regularly with you and the consultant team, providing 50% and 100% design development packages for review and approval.

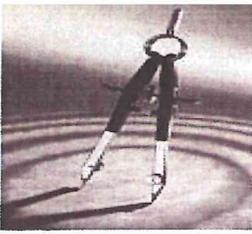
Contract Documents

- We will prepare complete construction plans, including, but not limited to, plan and profile views, cross sections, typical details and detailed statements of probable costs.
- We will prepare all construction documents, including, but not limited to, notices, special provisions, and detailed unit price bid proposals.
- We will submit construction documents at the 80% stage for review.
- We will provide finished drawings and specifications to the City for bidding by the Purchasing Agent. We have noted that the City has developed standard bid terms and conditions that may be used as a template for such work.

Bidding

- Our firm will be available for assistance in the bidding process. We will assist in the review and evaluation of bids received, including detailed analysis of the three lowest bids and recommendation for award of contract.





Memorial Boulevard School

Contract Administration

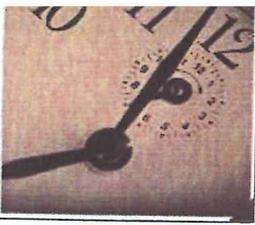
- Our firm's obligation during construction will involve plan and specification interpretation and clarification as necessary, attendance at job meetings, assistance in compliance throughout construction, assistance in the coordination of special inspections, review of materials testing, and approval of payment requisitions from contractor(s)
- We will process shop drawings and submittals, observe construction on-site regularly, attend progress meetings, and develop punch lists. We will monitor the building permit and certificate of occupancy processes. We will continue to meet with you regularly throughout the construction process.

KEY ISSUES

Schoenhardt has determined the following to be key issues to be addressed and resolved before the implementation of this project work:

- Since the Memorial Boulevard Middle School is a historical building, much thought and care will have to go into any options that are considered, particularly if an addition expected;
- Developing community support for chosen option(s);
- Working with theater management, developing a venue that will host events appealing to the community;
- Developing a cohesive funding package for submission to the State of Connecticut;
- Mechanical/code/structural upgrades will have to be handled in a way as to maintain the buildings historic integrity.





Project Overview

Memorial Boulevard School

Project Process

WORK PROGRAM/TIME SCHEDULE

	Mid June-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	
FEASIBILITY STUDY	Mid June to Nov 8																		
PRELIMINARY RECOMMENDATION						●													
RECOMMENDATIONS TO GOVERNING BOARDS						●													
CITY COUCL PRESENTATION							●												
SCHEMATIC DESIGN							2 Months												
DESIGN DEVELOPMENT									3 Months										
LAND-USE APPLICATION PREPARATION (if necessary)												1 Month							
LAND-USE APPROVALS (if necessary)													2 Months						
CONSTRUCTION DOCUMENTS													4 Months						
BID NEGOTIATION																			1 Month
CONSTRUCTION																			Construction Commencement
OCCUPANCY																			



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Project Context

Memorial Boulevard School

Community Uses

Our staff interviewed members of the theatre committee as well as community members to compile the following list of current known groups or performers that could benefit from a quality performing arts venue:

- The OM (Older Members) Show – now in it's 67th continuous year
- The Bristol Choral Show
- Local Theatre Arts Musicals
- The Nutmeg Symphony
- Bristol Wind & Brass
- The Reunion Jazz Band
- Major Bristol Dance Organizations – presently there are (5) groups within the city
- Baton Studios
- Visiting or Touring Groups:
 - The Dallas Brass
 - Military Bands
 - National & Regional Jazz Performers
 - Veterans Events
- Governmental and Business Groups seeking large meeting venues





Project Context

Memorial Boulevard School



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Project Context



Memorial Boulevard School

BD Downtown Revitalization

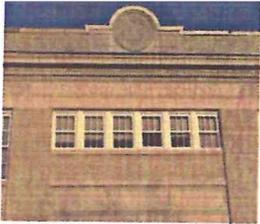
DOWNTOWN REVITALIZATION

Years of planning and leadership of both the city of Bristol and the State of Connecticut have brought the city to a bright future. Construction activity on the RT 72 extension to the downtown and quite close to the Memorial Boulevard Theater is progressing at a steady pace and will be completed near or prior to any planned renovations to the Theater. The significantly improved access to the theater will benefit ticket sales to many scheduled or planned performances.

The future of the old Bristol Center Mall site is currently in the planning stages; however suggested uses for the site and vision by Regional / National Developers will be encouraged by the plans to bring active Performing Arts to a location within a short walk from the planned development area. Synergistic uses of residential boutique retail, Bistro dining and entertainment venues will benefit from the strong local arts scene.



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Existing Conditions

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Existing Conditions

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Existing Facility Programming



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Existing Conditions

Memorial Boulevard School

Code/Life Safety Overview

BUILDING & LIFE SAFETY

Currently this building is a mixed use occupancy with separated educational, and assembly uses. The construction appears to be of type II-A (where building elements are of non-combustible materials and protected). The building is equipped with both a sprinkler and fire alarm system throughout. The means of egress stairs are of fire rated construction and provide egress directly to the outside. Although the interior and exterior egress doors meet the egress width requirement, the egress stair width at the South wing and main entry does not meet the current occupancy load. The number of exits, and their distribution is adequate. The building appears to meet the required area and height limitations. The number of required plumbing fixtures does not meet current codes and additional fixtures will be required for both the assembly and educational use. The building exterior walls insulating value is unknown. However all windows have been replaced with insulated glass windows. The new roof will be provided with insulation with an average value of R-30.

The proposed additions to the theatre and possible renovations to the gymnasium and pool areas in the north wing will require that the new construction and renovations be of type II-A construction, in order to stay within the area and height limitations. The proposed addition to the theatre entry lobby will provide ample circulation at the lobby area and increase the exit capacity. The new elevators will provide access to most public areas on all levels. Access to the stage and proposed green room will be provided by means of lifts. The existing restroom facilities on the second floor should be renovated to accommodate the occupancy load of the theatre balcony. New restroom facilities will need to be provided at the ground level lobby to accommodate the theatre occupancy load, additional restroom facility should be provided at the basement level in the current locker room areas, to accommodate the black box theatre occupancy load, or should the gym be reused.

The existing educational occupancy in the rest of the building could be continued as is until the new middle school is build. If the desire is to change the use of this portion of the building to business use, then the entire building will be required to meet current code standards. This will most likely include upgraded or new mechanical, plumbing and electrical systems.



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Existing Conditions

Memorial Boulevard School

Code/Life Safety Overview

ACCESSIBILITY

Accessibility is currently very limited to this building. Handicap parking is very limited and the accessible route from the parking to the accessible entry is not clearly marked. Handicap parking and handicap accessible drop off areas should be provided with stripes, sign and properly marked accessible route to the accessible entries. Curb ramps with tactile warning strips shall be provided at all accessible routes as required. Of the 5 major building entries, only one at the rear of the building has access to grade by means of a ramp. Current standards require that at least two entries including the main entry be accessible. All doors in accessible routes require proper hardware for handicap access. Maneuvering clearance is available from the public corridors to most classrooms, and the existing elevator provides access to all levels. However the elevator call buttons are key controlled and do not meet ADA standards. Neither the auditorium, the gymnasium nor the pool, has handicap access. The proposed additions and modifications to the north wing should incorporate handicap accessibility. The interior ramp at the ground level appears to exceed the maximum slope, and requires proper handrails. Public restrooms are not accessible except that boys and girls room in the South wing have ambulatory accessible compartments. All rest rooms require modification to provide full accessibility, or single use handicap toilets shall be provided at each level. It was noted that in many areas controls, including light switches are located high on the wall. All controls need to be located between 35" and 48" high from the floor.

HEALTH/ENVIRONMENT

A report prepared by RTK Environmental group has been included in this report and provides assessment of lead and asbestos presence in this building.



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Existing Conditions

Memorial Boulevard School

Site Zoning/Utilities Overview

ZONING/UTILITIES OVERVIEW

The Memorial Boulevard Theater is located at 70 Memorial Boulevard in Bristol, Connecticut. The property encompasses approximately 7.5 acres that is bordered by Memorial Boulevard to the north, Willis Street to the west, South Street to the south, and Mellen Street to the east. The proposed site improvements for the project involves the installation of new pavement, sidewalks, concrete curbing, precast masonry retaining walls, storm drainage, electrical service, fire, and domestic water services.

ZONING & PARKING

The project is located within a R-40 zone, which is a single-family residential zone. Since the building will be classified as a school a special permit and site plan approval will be required for this project.

The theater requires one parking stall per three seats for off-street parking. There are 900 seats proposed, therefore 300 parking stalls are required. The proposed layout provides 106 parking stalls within the project site. Willis Street isn't posted as a no parking street therefore both sides can accommodate approximately 34 on-street parking stalls. The required 160 stalls that remain and any additional parking needed may be accommodated by the surrounding businesses, since most theater events are scheduled during off business hours. This will involve agreements between the theater and those businesses.

New parking areas within the site will receive a new pavement section, which shall be 3-inches of bituminous concrete, 4-inches of processed aggregate base, and 8-inches of gravel sub-base. The parking areas will also receive concrete curbing and 4-inch white painted pavement markings.

New sidewalks within the project site will be a minimum of 5-feet wide and handicap accessible ramps will be added. The sidewalk section shall be 5-inches of concrete and 6-inches of processed stone base. All disturbed areas within the project limits will receive 4-inches of topsoil and turf establishment.

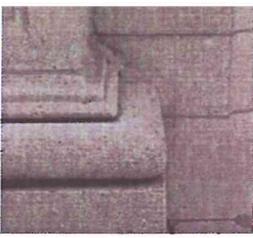
UTILITIES

The existing building is serviced by a 6" ductile pipe and 1 ¼" copper line, which are both tapped from an existing 8" water main on Willis Street. A new 4" ductile iron domestic and 8" ductile iron fire service will be provided, which shall include taps, valves, and apparatuses. The existing sanitary sewer, telecommunications, and power connections will be maintained. The existing on site storm drainage will be replaced with a new system that will be connected to the existing inlets within Willis Street. A subsurface detention system will be proposed to accommodate the increased peak flow. This new detention system will be three HDPE pipes with a 36-inch diameter and approximately 50-feet long. New water quality structures (i.e. Stormceptor) are proposed to remove silt, debris, and oil from the storm water before it enters the existing inlets.

The manhole and perforated pipe north of the building that is being impacted due to the new addition will be removed. Two new manholes and perforated pipes are proposed outside of the new building footprint and connected to the existing manhole, which is located to the northeast. These new manholes and pipes will be approximately 10 to 15 feet deep.

The proposed work qualifies for both a stormwater quantity and quality control credit under sustainable sites. The use of a quality structure and maximizing pervious cover shall achieve the two stormwater credits.





Existing Conditions

Memorial Boulevard School

Architecture and Interiors

The Boulevard theatre is part of the Memorial Boulevard School Complex. This building was erected in 1922 as the Bristol High School and consists of four stories plus a basement level. The use of the building consists of a primarily educational use with accessory assembly use at the north wing.

The gymnasium level or basement consists of a gymnasium, and pool areas with corresponding locker room areas, as well as a mechanical area.

The ground level consists of a balcony above and around the gym, with gymnasium and pool supporting spaces in the north wing, cafeteria and supporting spaces in the center portion, and industrial classrooms, kitchen and faculty lounge in the west wing.

The first floor consists of an auditorium with stage, and classrooms in the north wing, administrative offices, nurse, and special education in the central area, library and classrooms in the West wing.

The second floor consists of a balcony over the auditorium and classrooms in the north wing, classrooms in the central and west wing.

The third floor consists of the upper balcony and classrooms in the north wing, and classrooms in the central and west wing.

EXISTING CONDITION

On July 10, 2008 a field investigation was conducted to determine the general condition of the building and assess the feasibility of renovating the auditorium, gymnasium and pool areas for use as a theatre, with a black box theatre, and supporting spaces.

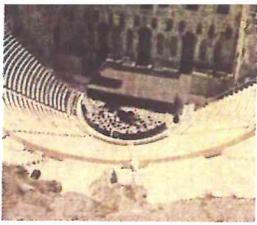
The building construction is in masonry exterior walls and interior bearing walls. The floor and roof construction is concrete deck. The building structure is protected with the exception of the steel roof trusses above the auditorium. A fire alarm and sprinkler systems were installed in 1993 throughout the building.

EXTERIOR WALLS

Exterior walls appear in good to fair condition. Ornamental stone is in need of caulking or re-pointing. Windows are newer and in good condition. Steel lintels above the windows show some rust. These should be cleaned and properly flashed to avoid further deterioration and rust build up. No major damage or deterioration is evident in the masonry veneer. Some minor damage is evident at the lower portion of the ornamental stone, and should be repaired. All exterior walls should be cleaned. All the exterior stair railing is in poor condition and should be restored or replaced. Exterior concrete stairs are in need of repair or replacement. All iron picket fence should be restored or replaced.



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Existing Conditions

Memorial Boulevard School

Architecture and Interiors

ROOF

The existing upper roofing is asphalt membrane with metal flashing of unknown age. Both the roof and flashing condition is poor and past its usable life expectancy. HVAC equipment is located above the auditorium area as well as on the west side. Operational roof vents are above the stage area. A number of air shafts terminate above the roof. Various curbs, conduits, antennae etc. are also located above the roof.

The existing lower roof is also asphalt membrane roofing with metal flashing. This roof immediately above the mechanical rooms in the basement level and contains a number of roof vents, and HVAC equipment. This roof is approximately two feet above grade and provides means of egress from the west side of the stage and auditorium. A fence and gate secures this area from grade level.

Construction documents for new asphalt membrane roofing at both the upper and lower roof and masonry parapet restoration have been prepared. Contract award and construction is to follow in the near future.

INTERIOR

The plenum space between the roof slab and the ceiling below is accessible. This space was originally utilized as a return air plenum by means of ceiling mounted vents. These were later abandoned and all air is now ducted. The space is generally dry. Some minor water damage is evident where roof leaks above the auditorium ceiling area. Sprinklers have been provided. Electrical panels for mechanical equipment are located at these levels. The steel roof truss structure above the auditorium is exposed to this space and appears to be in good condition.

In general interior finishes are in fair conditions. Original and subsequent finishes are of good materials and have endured the years well. However sign of wear and deterioration are evident.

The auditorium finishes consists of plaster ceiling and walls with wood and plaster trim. Water damage is evident at various locations both at the ceiling and walls. The floors consists of vinyl composition tiles and sheet over concrete slab. These appear to be the original finishes and show sign of wear and deterioration. At various locations the concrete slab is exposed. The seating appears to be in fair to poor condition.

The gymnasium ceiling is exposed to the structure above. At the gym level, the masonry walls are the original glazed brick finish, and the floor is a newer vinyl composite finish material. At the gym balcony level, the walls are plaster finish on masonry walls and the floor is vinyl composition tile. The pool area including the pool, pool deck, shower area, stairs and bleacher is the original ceramic tile and glazed brick finish. A newer suspended acoustical tile ceiling has been installed below the original ceiling.



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Existing Conditions

Memorial Boulevard School

Architecture and Interiors

Most toilet rooms appear to be the original ceramic tile finish. Although this has been well maintained, it shows signs of age and is past its life expectancy. Plumbing fixtures, accessories and toilet partitions have also been well maintained. These appear to have been replaced at various times in different locations. Handicap accessibility in these rooms does not meet current standards. Depending on the scope of work for this building all toilet rooms should be refinished, refurbished and made fully accessible.

Classrooms, administration and support areas are generally plaster finish walls, the ceiling varies from suspended acoustical ceiling tiles, to 12"x12" acoustical tiles adhered to the underside of the slab above, or plaster finish. The floor finish varies from vinyl composition floor tiles to the 9" x 9" asbestos composition tiles, linoleum sheet goods, or painted concrete. Wood trim is present in most rooms. Most interior doors and frames are also wood. In general the interior finishes are in fair condition but show signs of wear at various locations.



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Existing Conditions

Memorial Boulevard School

Historical Overview

HISTORICAL OVERVIEW

Bristol High School, now known as the Memorial Boulevard Middle School, was built in 1921 as a joint venture between the city and Alfred F. Rockwell, founder and president of New Departure Manufacturing Company. (New Departure manufactured products such as doorbells, bicycle brakes, ball bearings.) Memorial Boulevard was Rockwell's inspiration. He offered the city the land for the new school and funds for 50% of the new high school's cost; in return, the city would build Memorial Boulevard and pay for the half the school.

The school was designed by architect Wilson Potter and opened in September 1922. (Other buildings designed by Wilson include Broad Street School, Norwich (1897), and the United Bank Building New Milford (1904). For the Bristol High School Wilson worked in the Classical Revival style, appropriate to the scale, dignity, and monumentality of Memorial Boulevard.

Three stories high with a raised basement level, the building is H shaped, a layout that provides maximum natural light and ventilation to interior spaces. The façade is on the short side of the H facing Memorial Boulevard, a symmetrical, tripartite composition with projecting center section.

The exterior is faced with light colored brick to suggest the elegance of stone, with cast stone porticos and trim, and enlivened with rusticated masonry, monumental arched windows, and plaques engraved with study subjects such as Music, Art, Concert, Science, Business, History, and Language.

Much of the historic exterior building fabric remains intact, with the exception of the windows, which were recently replaced.

NATIONAL REGISTER STATUS & GRANT OPPORTUNITIES

At present the building is not listed on the National Register of Historic Places. According to Susan Chandler, Historical Architect at the Connecticut Commission on Culture and Tourism, it may be a good candidate for the state or National Register, and therefore would be eligible for grant opportunities.

MASONRY – EXISTING CONDITIONS

The building masonry appears to be basically sound. The brick and mortar are in good condition. Selected areas of the cast stone trim have suffered mortar loss and will require re-pointing.

The cast stone porticos on the north and east sides of the building, however, are significantly deteriorated. The portico roofs are in very poor condition and have allowed water infiltration that has damaged the cast stone. Since the porticos are significant design elements of the building, their preservation should become a priority.

We recommend that an architectural building materials conservation consultant review the condition of the exterior masonry and design the repairs of the cast stone porticos. We can recommend qualified conservation firms as needed.



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Facility Program

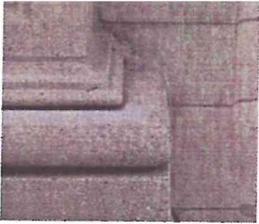
Memorial Boulevard School

Project Summary

The MBS Theatre will be a multi-purpose performance space accommodating programs that range from dance and theatrical productions, music recitals to public speaking and presentations. The facility design takes into consideration the need for a variety of community uses as well as a potential performance venue for Bristol's future K-8 music and theatre education programming needs. Additionally, the stage and Performance Support components of the design will allow the facility to be useful for workshops and classes in a variety of theatre and music performance related interests from courses in acting, comedy, improvisation, dance, as well as, stage and craft design, lighting and sound workshops to the greater Bristol community.



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Facility Program

Memorial Boulevard School



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Memorial Boulevard School

LOBBIES

The new entry vestibule and lobbies are essential in establishing a more open inviting space that draws the patron inside while providing ample overflow during performance breaks while also serving accessibility requirements.

LOBBY & VESITBULE

Quantity: 1

Proposed SF: see final program analysis (multiple levels)

Airlocks (2)

PROGRAM ACTIVITIES

Public Circulation

Special Events / Pre-Function

Critical Access – Concessions, Auditorium house,

Coat Check, Tickets, Toilets

FURNISHINGS

Benches, Planters, Poster Display, Tables and Chairs,

Acoustical Window Treatment

FIXED EQUIPMENT

Recessed Wall Display, Remote TV Monitors

FINISHEES

Stone, Tile, Carpet

TECHNOLOGY

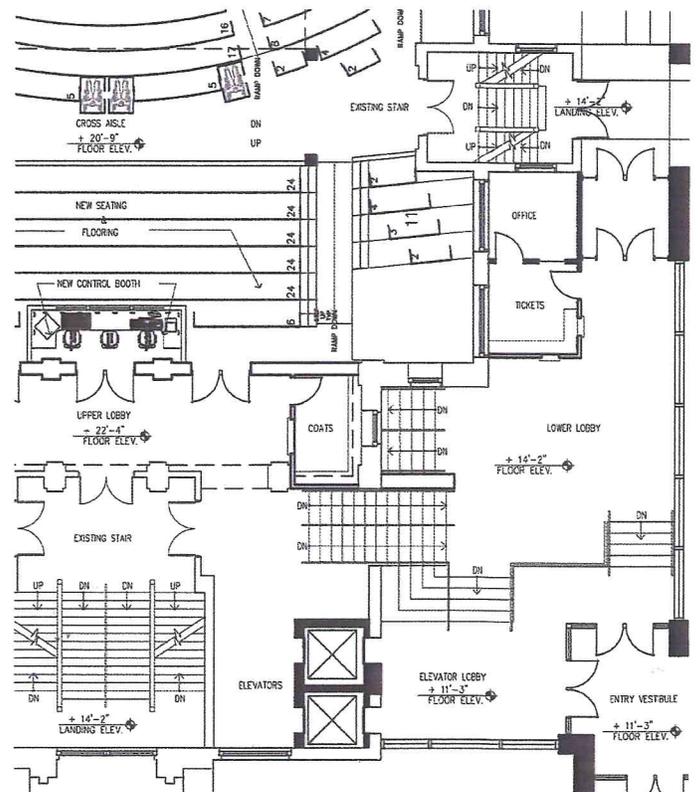
Intercom, Voice Video, Data, Security

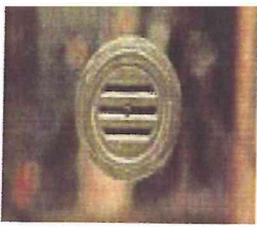
SPECIAL REQUIREMENTS

ADA Accessibility

Architectural Lighting / House Lighting

HVAC





Memorial Boulevard School

TICKETING/BOX OFFICE OPERATIONS

Ticketing and Box Office will serve minimal requirements for front house event management and ticket sales as well as serve as a secure location for staff items.

BOX OFFICE

Quantity: 1

Proposed SF: 225

Ticket Sales Windows (2)

PROGRAM ACTIVITIES

Ticket Sales

Access to Lobby

Front Office

FURNISHINGS

Desk, Office Chair, File Cabinet

Stool Height Chairs (2)

Lockers (3)

FIXED EQUIPMENT

Safe, Ticket Counters and Drawers, Monitors

FINISHES

Carpet, Paint

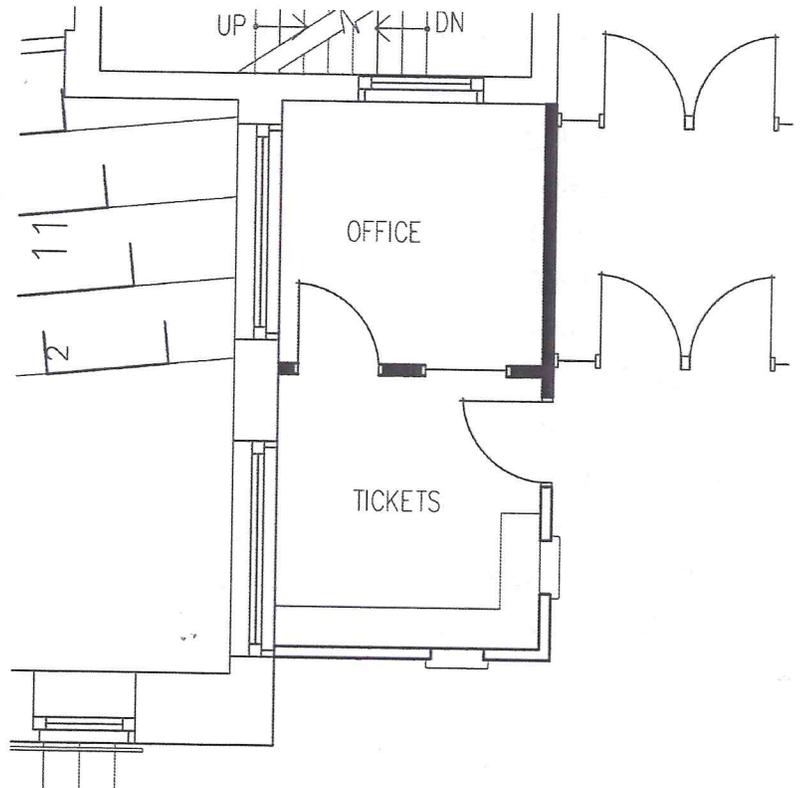
TECHNOLOGY

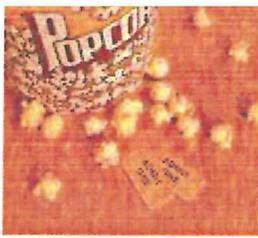
Remote TV Monitors, Intercom

Voice, Video, Data, Security

SPECIAL REQUIREMENTS

ADA Accessibility





Memorial Boulevard School

Public Areas

SERVICES

The coat Check and concessions share a counter area off the main upper lobby backed –up by a wet-room housed with a kitchenette and janitor closet.

COAT CHECK/CONCESSION/JANITOR CLOSET

Quantity: 1

Proposed SF: 275

Divided Counter, Mobile Coat Racks, Kitchenette,
Janitor Closet

PROGRAM ACTIVITIES

Coat Storage, Direct Access to Auditorium, Lobby
Service Bar / Concessions

General Storage

FURNISHINGS

Refrigerator, Microwave

FIXED EQUIPMENT

Kitchen Cabinet Millwork, Mop Sink

FINISHES

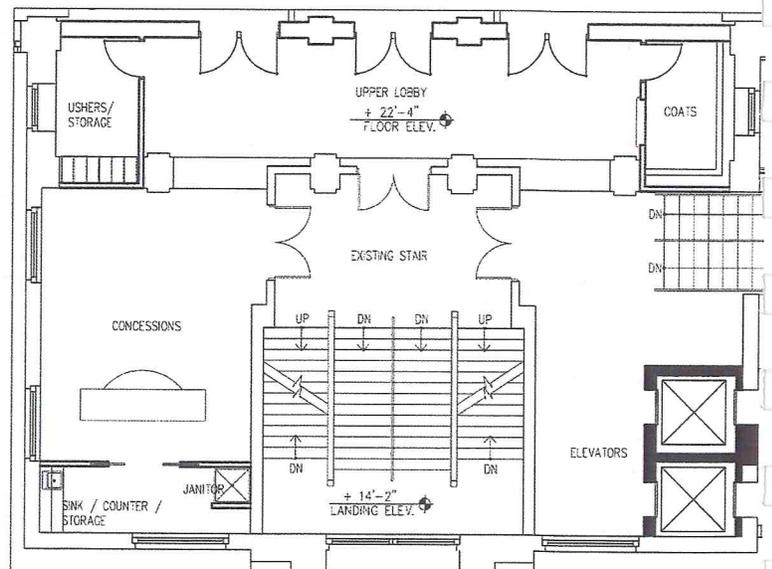
Tile, Carpet, FRP

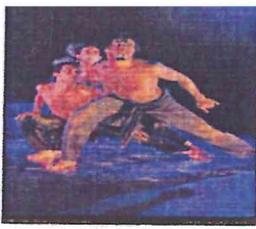
TECHNOLOGY

Power Outlets – Floor and Wall Locations, Security

SPECIAL REQUIREMENTS

Mobile Millwork for Event Flexibility





Memorial Boulevard School

RESTROOMS

Multiple toilet facilities are required to accommodate the variety of potential simultaneous assembly related events that may occur throughout the facility.

RESTROOMS

Quantity: Per Plans

Proposed SF: Per Plans

Provided on Multiple Levels – Men, Women, Unisex

PROGRAM ACTIVITIES

Toilets

Lounge Area

Family Facility – Baby Changing

FURNISHINGS

Soft Seating in Lounges – Family Facility

FIXED EQUIPMENT

Motion Sensitive Fixtures, Baby Changing Stations

FINISHES

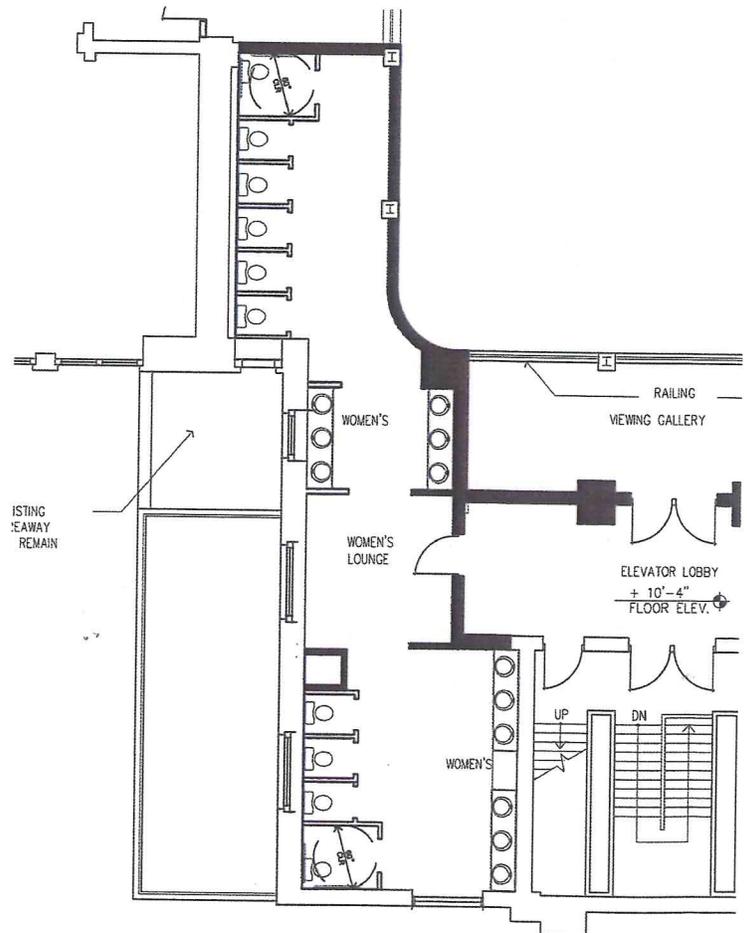
Tile, Solid Surfacing Paint

TECHNOLOGY

Intercom, Security, Audio

SPECIAL REQUIREMENTS

Handicap Accessibility Per Code





Memorial Boulevard School

AUDITORIUM – HOUSE

The MBS Theatre will be designed to accommodate up to 900 seats. The main and balcony levels will accommodate approximately 450 seats each, with accessible seating and code compliant exiting dispersed throughout. Sound and light isolation will be provided at all doors to public areas.

AUDITORIUM HOUSE AND BALCONY

Quantity: 1

Proposed SF: Existing / see program analysis

Seating Capacity: 900 Seats

Some Removable Seating for Stage Thrust

PROGRAM ACTIVITIES

Drama, Dance, Theatrical and Musical performances

Community Events

K-8 Performance Venue

FIXED EQUIPMENT

New Fixed Seating, Sound System, House Lighting,

Portable Control

FINISHES

Floor – Painted Concrete/Carpet, Paint, Acoustic Treatment

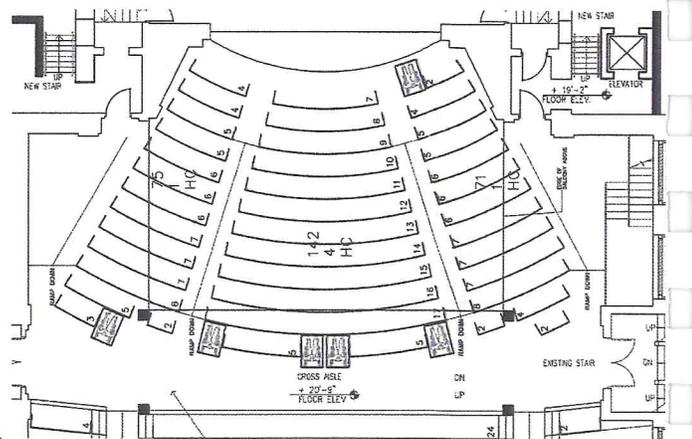
TECHNOLOGY

Intercom, Security, Voice, Video, Data, Projection System,

Theatrical Lighting

SPECIAL REQUIREMENTS

Sight Lines, Seat/Aisle Clearance, Light and Sound Isolation from Lobby, HVAC Acoustics





Memorial Boulevard School

STAGE

The current stage size and configuration is inadequate for today's theatrical requirements. The proposed plan calls to keep the existing stage while expanding its' depth to the extent of the existing exterior west wall of the back-of-house, while accommodating the new back-of-house in the proposed addition.

AUDITORIUM STAGE

Quantity: 1

Proposed SF: Existing / see program analysis

PROGRAM ACTIVITIES

Drama, Dance, Theatrical and Musical performances

Community Events

K-8 Performance Venue, Rehearsal Space

FURNISHINGS

House Curtain, Fire Curtain, Projection Screen

Cyclorama, Orchestra Shell, Storage

FIXED EQUIPMENT

Sound, Lighting, Stage Rigging

FINISHES

Black Paint, Equipment Finishes, Wood Floor – Existing

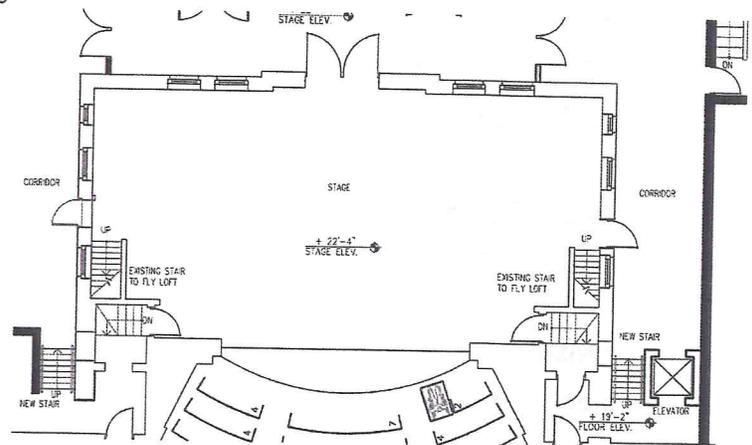
TECHNOLOGY

Power – Floor/Walls, Security, Voice, Video, Data, Projection System, Theatrical Lighting

Portable Control

SPECIAL REQUIREMENTS

Light and Sound Isolation, HVAC Acoustics, Portable Thrust Stage and Orchestra





Memorial Boulevard School

CONTROL/SUPPORT

The MBS Theatre will include a new lighting and sound control booth located at the back of the existing auditorium. The existing project booth in the upper balcony will be reconfigured to accommodate the new facility.

CONTROL AND PROJECT BOOTHS

Quantity: 1 each

Proposed SF: 635

PROGRAM ACTIVITIES

Lighting and Sound for Productions

Access to Lobby and Stairs

Access to House and Storage

FURNISHINGS

(2) Office chairs

FIXED EQUIPMENT

Sound and Light Boards, Monitors, Recording and Projection Equipment

FINISHES

Black Paint, Equipment Finishes,

Wood Floor - Existing

TECHNOLOGY

Power – Floor/Walls, Security, Voice, Video,

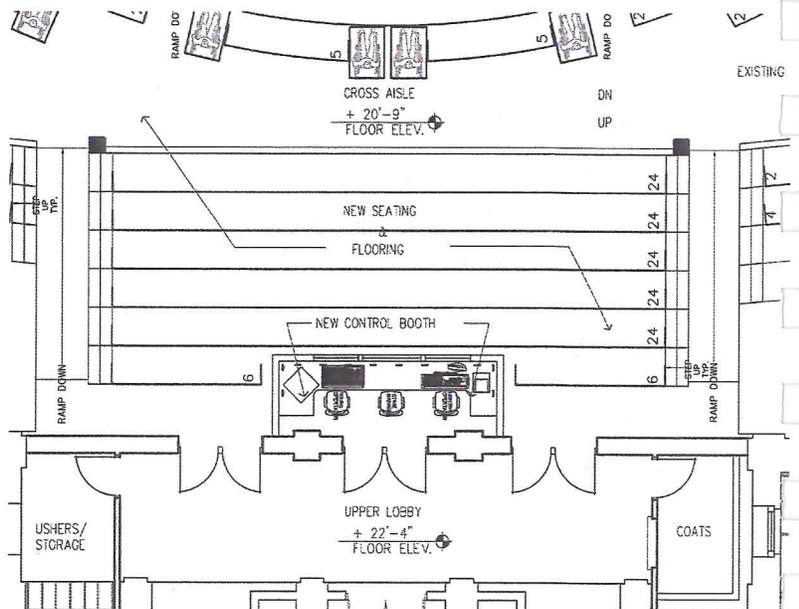
Data, Projection System, Theatrical Lighting

Portable Control

SPECIAL REQUIREMENTS

Light and Sound Isolation, HVAC Acoustics,

Fixed and Operable Glazed Openings





Memorial Boulevard School

SCENERY SHOP /STORAGE

MBS Theatre will include a Set Workshop with fabrication and storage areas as well as a receiving/loading area to accommodate delivery of large materials and equipment.

SCENERY AND STORAGE

Quantity: 1 each

Proposed SF: 1,00 SF

PROGRAM ACTIVITIES

Set Fabrication/Storage

Loading/Receiving

Access to Stage and Storage

FURNISHINGS

Tools, Equipment

FIXED EQUIPMENT

16'H Overhead Door, Tall Doors to Stage,

Storage Cabinets

Sink with Chemical Clean Trap

FINISHES

Concrete Floors, Masonry Walls, Skylights,

Exposed Structure, Utility Lights

TECHNOLOGY

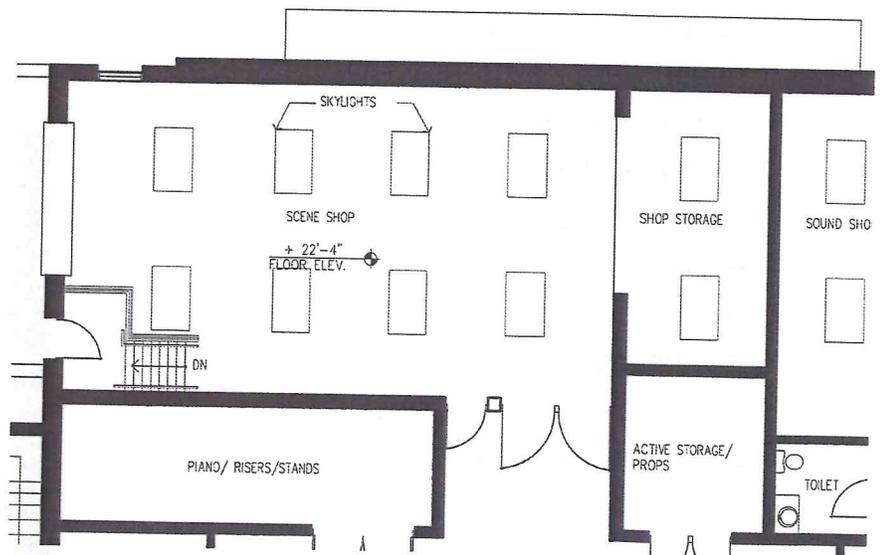
Automated Doors, Dust Collection,

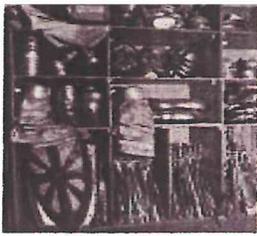
HVAC, Specialty Doors

Portable Control

SPECIAL REQUIREMENTS

Safety Clean, Flexible Workroom, Stage Level





Memorial Boulevard School

ACTIVE STORAGE/PROPS

MBS Theatre will include a storage room that accommodates completed Prop Storage as well as Active Storage for materials used for ongoing productions.

ACTIVE SOTRAGE PROPS

Quantity: 1 each

Proposed 50 SF

PROGRAM ACTIVITIES

Storage Room

Access to Set Workshop and Stage

Access to Stage and storage

FURNISHINGS

Program equipment

FIXED EQUIPMENT

Shelves, Tall Cabinets

FINISHES

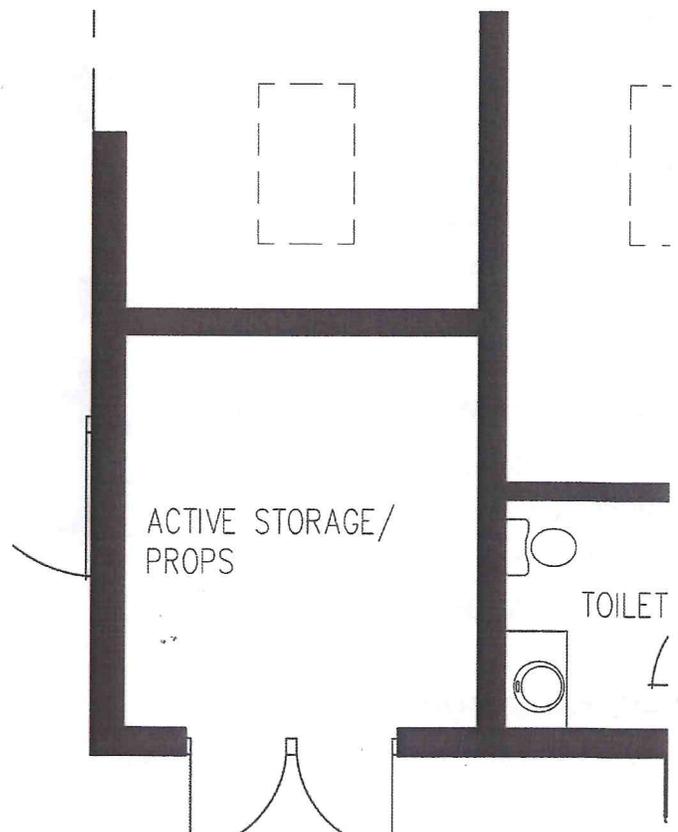
Painted Concrete, Exposed Structure

TECHNOLOGY

Power Outlets, Floor and Wall

SPECIAL REQUIREMENTS

HVAC, Stage Level





Memorial Boulevard School

PIANO STORAGE

MBS Theatre will include a piano storage room that accommodates the appropriate storage and care of a grand piano.

PIANO STORAGE

Quantity: 1 each

Proposed SF: 150

PROGRAM ACTIVITIES

Storage Room

Access to Stage and storage

FURNISHINGS

Program equipment

FIXED EQUIPMENT

Program Equipment

FINISHES

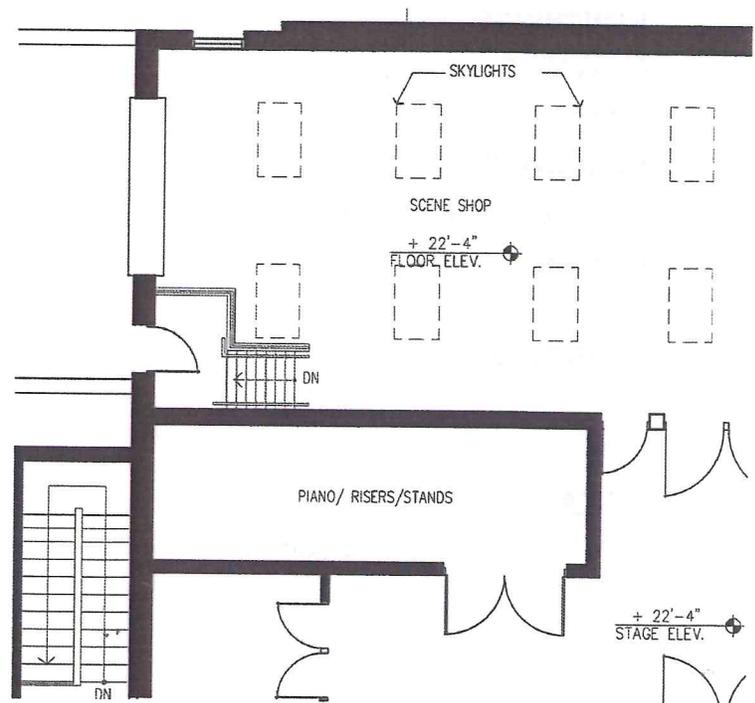
Painted Concrete, Vapor Proof Material

TECHNOLOGY

Power Outlets, Floor and Wall

SPECIAL REQUIREMENTS

HVAC, Separate Environment Control, Stage Level





Memorial Boulevard School

OFFICES

MBS Theatre will include a general office that serves as a touch-down location for a facility director manager and technical director.

FACILITY DIRECTOR/TECHNICAL DIRECTOR

Quantity: 1 Shared

Proposed SF: 350

PROGRAM ACTIVITIES

Tour / Production / Bookings

Technical Director / Props Master

FURNISHINGS

Desks (2), File Cabinets,

Office Chairs, Work Table

FIXED EQUIPMENT

Marker Board, Tack Board

FINISHES

Carpet, Paint, Acoustical Ceiling

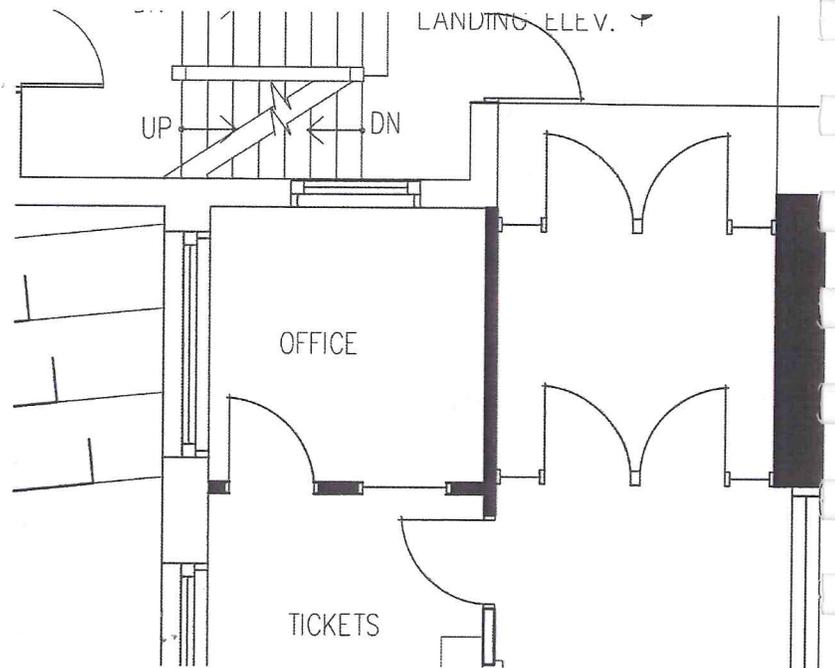
TECHNOLOGY

Power Outlets, Floor and Wall, Video,

Data, Security, Printer

SPECIAL REQUIREMENTS

HVAC, Performance Support Level





Memorial Boulevard School

MULTI-PURPOSE

MBS Theatre will include a multi-purpose room used for variety of events including, dance, choir and band rehearsal as well as a classroom / workshop space.

MULTI-PURPOSE

Quantity: 1

Proposed SF: 1,000

Sound Proof Setting

PROGRAM ACTIVITIES

Music, Dance and Choral Rehearsal

Community Theatre

Meeting / Workshop

Access to Green Room

FURNISHINGS

Upright Piano, Padded Folding Chairs

Mirrored Wall, Ballet Bar, Marker Board

FIXED EQUIPMENT

Counter, Sink, Kitchenette

Closet Shelves, Storage, sound Isolated Doors / Hardware

FINISHES

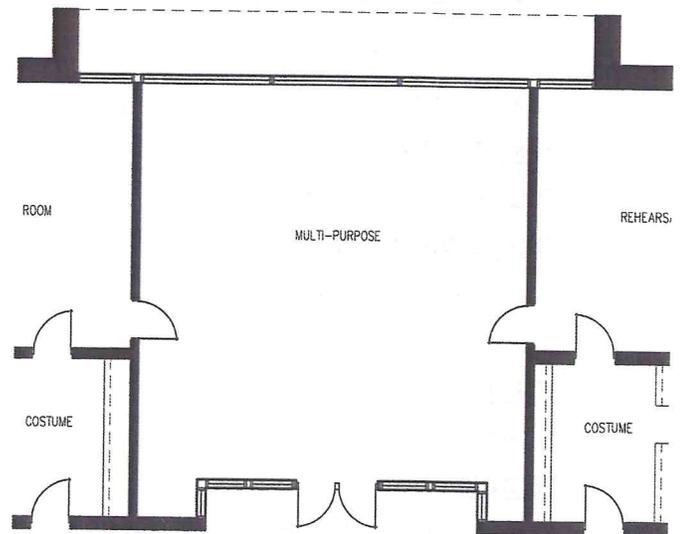
Carpet, Paint, Acoustical Ceiling

TECHNOLOGY

Power Outlets, Floor and Wall, Video, Data, Security, Microwave, Refrigerator

SPECIAL REQUIREMENTS

HVAC, Separate Environmental Controls, Performance Support Level



THE ATDC STUDDENT LEVEL





Memorial Boulevard School

GREEN ROOM/REHEARSAL

MBS Theatre will include a multi-purpose room used as a performer's green room for productions as well as a choir and instrument rehearsal room.

GREEN ROOM/REHEARSAL

Quantity: 2

Proposed SF: 500

Sound Proof Setting

PROGRAM ACTIVITIES

- Waiting and Director Instruction
- Rehearsal, Access to Kitchenette
- Access to Stage House
- Access to Dressing Room

FURNISHINGS

Tables and Chairs, Soft Seating

FIXED EQUIPMENT

- Tack Board, Marker Board
- Counter, Storage Cabinets

FINISHES

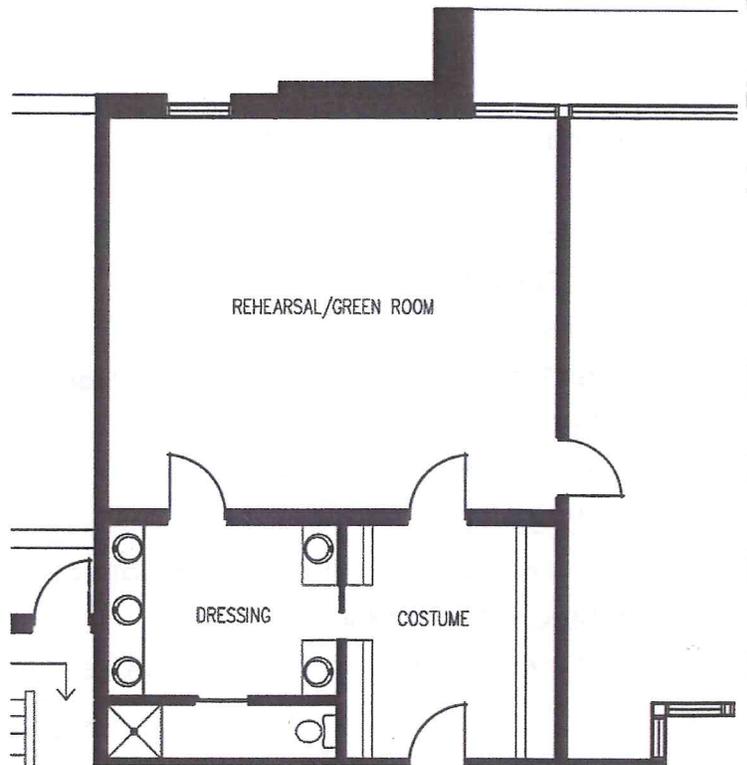
Carpet, Paint, Acoustical Ceiling

TECHNOLOGY

- Power Outlets, Floor and Wall, Video, Data, Security, Monitors to Stage

SPECIAL REQUIREMENTS

- HVAC, Separate Environmental Controls, Performance Support Level





Facility Program

Memorial Boulevard School

Square Footage Analysis

Square Footage Analysis

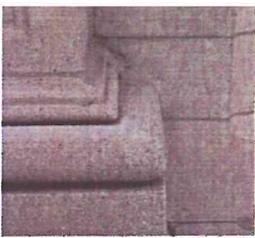
I. Facility Area Diagram: Net Area Devoted to Project by Floor

Facility Level	Program Areas						Total	Total Floor Net Area	Net Area Uncaptured
	Pool	Gymnasium	Locker Rooms	Academic	Auditorium				
Lower Gymnasium	556		2,878			3,434	9,900	6,466	
Upper Gymnasium		1,160		1,796		2,956	6,522	3,566	
Main Auditorium				1,800	7,600	9,400	9,490	80	
Lower Balcony				1,800	4,247	6,047	6,047		
Upper Balcony				1,800		1,800	2,540	740	
Total	556	1,160	2,878	7,196	11,847	23,637	34,489	10,852	
Total Existing Net Area Devoted to Project							23,637		
Total Net Area of Memorial Boulevard Theater Program							36,566		
Existing Facility Net Area Shortfall							12,929		12,929
									-10,852
									2,077

II. Net Area: Existing vs. Facility Program

Facility Level	Total	
Lower Gymnasium		
Upper Gymnasium	9,900	
Main Auditorium	6,522	
Lower Balcony	9,490	
Upper Balcony	6,047	
Total Existing Facility Net Area	34,489	
Total Net Area of Memorial Boulevard Theater Program	36,566	
Existing Building Square Footage Shortfall	2,077	





Memorial Boulevard School

Room #	Room Description	Area	Occup/unit	Unit SF	Remarks	Priority
PUBLIC AREAS						
Lobbies						1
100	Outer lobby vestibule	180	900	0.2		
101	Inner lobby	5,850	900	6.5		
102	Public circulation	4,500	900	5		
Sub-total Lobbies		10,530				
						1
Ticketing						
110	Box Office Windows	100	2	50	Combine spaces into a single 250-300 sf area w/2-5 occup.	
111	Box Office Operations	100	1	100		
Sub-total Ticketing		200				
Services						
140	Coat Check	85			SF could be part of Lobby Not near performers dressing rooms	
141	Ushers Changing/Lockers	85				
112	Supply Room/Support	50	1	100		
142	Janitors Closet	40	2	20		
Sub-total Services		260				
Restrooms						
150	Public Washrooms - male	315	9	35	H/C accessibility included	
151	Public Washrooms - female	850	17	50	H/C accessibility included	
Sub-total Restrooms		1,165				
TOTAL PUBLIC AREAS		13,780				





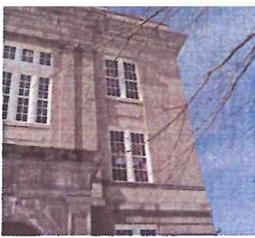
Facility Program

Memorial Boulevard School

Final Program Analysis

Room #	Room Description	Area	Occup/unit	Unit SF	Remarks	Priority
PERFORMANCE SPACES						
Auditorium						
200	Orchestra/Auditorium House	4,400			(900 Seat) Total Capacity	
201	Mezzanine	4,000				
Sub-total Auditorium		8,400				
Stage						
210	Mainstage	1,638			58'-6"W x26'D (exist. to ext.walls)	
211	Support stage	300				
Sub-total Stage		1,938				
Catwalks						
220	Loading gallery				Probably not a catwalk, but behind Min. of 2 at approx 30 and 45 deg.	
221	Fly floor					
222	Crossover					
223	Auditorium catwalks					
Sub-total Catwalks		0			counted in auditorium gross square footage	3
Overhead						
240	Grid				requirements, may need to be reinforced or replaced.	
Sub-total Overhead		0			counted in stage gross square footage	
Control/Support						
250	Control - light/stage manager	150	1	150	Needs to be outside booth or with window to monitor sound quality Prob. just a video projector in the booth or under the balcony. Must be on center line of thr. 70 rob. refurb. existing projection booth SF is counted as part of house, may be created by removing some seats.	
251	Control - sound	125	1	125		
252	Control - projection	0				
253	Follow spots	210	3			
254	Sound cockpit/control	150	1	150		
Sub-total Control/Support		635				
Services						
260	Dimmer room	150	1	150		
261	Sound rack room	100	1	100		
Sub-total Services		250				
TOTAL PERFORMANCE SPACES		18,046				





Memorial Boulevard School

Room #	Room Description	Area	Occup/unit	Unit SF	Remarks	Priority
STAGE SUPPORT						
<i>Storage</i>						
300	Rigging store	150	1	150	Some can be combined. adjacent to stage adjacent to prop shop adjacent to electrics shop adjacent to sound shop adjacent to orchestra pit adjacent to scene shop	
301	Props Store	50	1	50		
302	Lighting Store	150	1	150		
303	Sound Store	50	1	50		
304	Piano/Instrument Store	300	1	300		
305	Scenery Store	200	1	200		
Sub-total Storage		700				
<i>Workshops</i>						
310	Scenery Shop	1,000			Some can be combined. Located on same floor as stage.	
311	Active Storage/Props	50	1	50		
312	Electrics Shop	150	1	150		
313	Sound Shop	150	1	150		
Sub-total Workshops		1,350				
<i>Stage Offices</i>						
321	Shared Management Office	350	1		near stage, dock and dressing rooms	4
Sub-total Staff Rooms		350				
TOTAL STAGE SUPPORT		2,400				
Room #	Room Description	Area	Occup/unit	Unit SF	Remarks	Priority
PERFORMANCE SUPPORT						
<i>Dressing rooms</i>						
402	Women's ensemble dressing room	300	1		with WC and shower	
403					with WC and shower	
404	Men's ensemble dressing room	300	1			
405	Green Room/Rehearsal	500	2			
405	Multi-Purpose Room	1,000	1			
Sub-total Dressing Rooms		2,100				
TOTAL PERFORMERS SUPPORT		2,100				

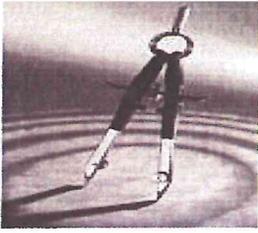




Memorial Boulevard School

Room #	Room Description	Area	Occup/unit	Unit SF	Remarks	Priority
SERVICES						
<i>Loading Dock</i>						
612	Loading Dock	0			located within Scene Shop	
615	Janitorial store	150	1	150		
616	Janitor closets	90	3	30	10'W x 15'D	
Sub-total Loading Dock		240				
TOTAL SERVICES		240				
SPACE DESCRIPTION TOTALS For Entire Program						
Space Description		Area				
PUBLIC AREAS		13,780				
PERFORMANCE SPACES		18,046				
STAGE SUPPORT		2,400				
PERFORMERS SUPPORT		2,100				
SERVICE		240				
Total Net Square Feet		36,566				





Planning Concepts

Memorial Boulevard School



Schoenhardt



Memorial Boulevard School

OBSERVATIONS OF THE EXISTING FACILITY

The theatre at the Memorial Boulevard Middle School is in dire need of renovation if it is to serve the community in the future. As it is today, the theatre is almost unusable as a performance venue. Every theatrical system is either absent or in need of replacement, the lobby and backstage spaces are inadequate, and the seating is in poor condition. In addition, the sightlines are not clear enough to meet the expectations of today's audiences. Specific deficiencies include:

The stage rigging is a "hemp" system that uses natural fiber ropes to support the overstage battens. The ropes run through pulleys to the stage right wing, where the weight on the battens is counterbalanced by sandbags. This method of stage rigging is at least two generations out of date. The skills required to operate and maintain this type of system are being lost, even by Broadway stagehands, because it simply is not used today. The age of the various components is unknown, but the age of the building and the age of the technology strongly argue for a complete replacement and updating of the stage rigging system.

The stage lighting system simply cannot today's production and lighting design requirements. As the cost of electronic dimmers and controllers has fallen and the cost of labor has risen over the decades, the art of stage lighting has evolved from using relatively few high capacity, manually operated dimmers to using many low capacity, electronically controlled dimmers. The larger quantity of dimmers gives today's designer increased command over every aspect of the lighting design. This development is equivalent to replacing a few very large paintbrushes with many smaller ones, allowing the artist more control, greater attention to detail, and increased subtlety.

In addition to a shortage of stage lighting circuits and dimmers, there is a shortage of stage lighting positions and equipment. A typical theatre today has at least two lighting positions in the ceiling, positions at the sides of the proscenium, a position on the face of the balcony and multiple positions over the stage and at the sides of the stage. Currently, the theatre has only one lighting position in front of the stage (on the face of the balcony) and a very limited number of positions over the stage. The shortage of dimmers and lighting positions, combined with the dearth of stage lighting fixtures precludes creating any but the most rudimentary lighting designs.

The stage drapery is in very poor condition. The age of the draperies suggests that if they were ever treated with a fire-retardant, it has certainly lost its effectiveness by now. All of the stage draperies, including the house curtain, should be replaced with inherently flame-resistant fabrics.

Everyone involved with this project agrees that the existing seats are due for replacement. An examination of a section of the theatre also reveals that the sightlines can be greatly improved. It appears that the slope of the orchestra floor and the tiers of the balcony are designed to provide a clear view of the face of a performer at the curtain line. This is inadequate for several reasons. First, a multi-purpose theatre is certain to present dance, which requires a clear view of the body, not just the face, of the dancer. Second, an audience for a classical music or jazz performance will not have a clear view of the musicians, who will be seated, not standing. Finally, today's audiences are simply accustomed to unobstructed views – of their televisions, of the movie screen at the cinema – and expect it when attending the theatre, as well.





Memorial Boulevard School

EQUIPPING THE THEATRE

There were three guides that we used to determine what equipment would be required in the theatre. First, provide for the basic functions of the theatre by addressing the deficiencies described above. Second, supplement the basic functions with equipment required for the specific types of performances that will be presented. Third, advice from the theatre committee on the requirements of the specific users, as well as anticipated budget limitations. After considering all three guides, our theatre equipment recommendations include the following.

The hemp rigging system will be replaced by an industry standard counterweight system that employs wire rope instead of natural fiber rope and steel weights stacked on a guided carriage instead of sandbags hanging over the wings. The new rigging system will also include a fire curtain on the stage side of the proscenium. The counterweight system will provide support for legs and borders, a cyclorama and scrim, acoustic shell ceiling panels (as described below), a movie screen, stage lighting fixtures, and production specific requirements such as scenery, chandeliers and/or additional backdrops.

A new centralized dimming system will replace the few existing dimmers. This system combines dimmers and relays controlling the stage lights, work lights over the stage, running lights used backstage during performances and the auditorium lights into one, efficient system. Stage lighting circuits and data will be provided in the stagehouse and at all lighting positions in and over the house. The new, computerized, control console will generally be located in the control booth at the rear of the auditorium, but can be plugged into any number of locations in the theatre. New stage lighting positions will be installed to bring the lighting system up to today's standards. New stage lighting fixtures and accessories will be specified according to the size of the stage and the anticipated productions.

New stage drapery will replace the existing drapery. The new drapery will include legs and borders, a cyclorama and a scrim, tabs, and a new house curtain. All of the fabrics will be treated for flame resistance or will be of inherently flame-resistant fabric.

An acoustical shell, also called an orchestra shell, will join the volume of the stagehouse to the volume of the auditorium for acoustic music performances, such as a classical or jazz concert. The shell is an acoustically reflective enclosure that allows musicians to hear each other and that reflects sound out of the stage and into the auditorium. The shell is made of adjustable ceiling panels that are suspended over the stage and wall towers that are rolled into place as needed.

A set of stage extension platforms will enlarge the stage by expanding it into the auditorium. These platforms will be used by musicians to get closer to the audience, or by theatrical productions to accommodate a large cast or a large set.

New theatre seats include both fixed seats in the orchestra and center balcony, and loose seats in the side balconies.

The users of the theatre will require additional, miscellaneous equipment. Stagehands painting scenery and focusing stage lights need ladders and an electric personnel lift. Hampers are needed to store stage drapery that is not being used by a given production. Musicians need chairs, music stands and music stand lights. A chorus needs choral risers. A dance company needs a portable dance floor. All of these have been included in the equipment lists and the budget.





Memorial Boulevard School

FUNCTION AND FLEXIBILITY

A multi-purpose theatre is expected to be all things to all users: a theatre for dance and drama; a concert hall for music; an auditorium for public events; a cinema for film; a lecture hall for corporate or community meetings. It is expected to be easy to operate for the novice, yet sophisticated enough not to limit the professional. It should be large, to accommodate popular events, yet intimate so that small events aren't lost inside. We have addressed the flexibility that is required and the multiple functions of the theatre in a number of ways.

Flexibility of a space requires the ability to change. Change requires the ability to move. Movement requires that, as much as possible, things are not fixed in place. In order for the space to function as a theatre, concert hall, auditorium, cinema and lecture hall we have built flexibility into almost every system.

The stage rigging will have battens that are dedicated to lighting, but will also have circuits that can be repositioned if the dedicated battens are inadequate. The theatre will have legs and borders, a cyclorama and a scrim, all of which can all be shifted from one batten to another, or removed completely, as required by a production. There will be battens with no pre-determined purpose so that scenery can be hung where required.

The stage lighting system will provide a multitude of circuits and lighting positions so that lighting fixtures can be hung wherever they are required. A semi-permanent lighting design may be installed, but there will be an adequate number of additional fixtures and accessories to accommodate all of the "extras" that a production may require.

The orchestra shell is completely portable and adjustable. We will provide a variety of layouts for the side towers and tilt angles for the ceiling panels, so that the needs of a full range of music groups, from a quartet to a full symphony, are addressed.





Memorial Boulevard School

TECHNOLOGY

There are four significant leaps in technology that are proposed for the theatre. The first two, the sound and video systems, are addressed elsewhere in this study. The third is the stage lighting control system. Inexpensive, miniaturized electronics have revolutionized many products and industries, including stage lighting. In the past few decades the definition of a well-equipped theatre has gone from one having dozens of dimmers and scores of lights to one having hundreds of dimmers and lights. Today's lighting designers and lighting design students no longer design groups of fixtures with a single purpose on a single dimmer. Now, the lighting designer wants almost every fixture to have its own dimmer so that the brightness, color and position of each light is exactly as required for each moment of the show. To keep up with the increasingly sophisticated designer, control consoles have also become more sophisticated, and are now able to address thousands of dimmers and moving lights with less effort than was required to control a few dozen dimmers in the 1950s or '60s.

Fortunately, the revolution in electronics has also given us simple user interfaces that require no technical knowledge whatsoever. This theatre will be equipped with a mid-range control console with most of the capabilities that might be required by a professional designer. It will also have a simple user interface, so that a semi-professional, student or novice can quickly and easily create and save unique stage pictures. . Training sessions for the users will be part of the system specification and will be provided by factory trained technicians. For users who are interested in only the most basic lighting, push-button stations will completely bypass the control console and execute predetermined stage looks as determined by our office, along with user input.

Finally, the new stage rigging system will be a leap forward in usability and safety. The hemp system of rigging dates back centuries to a time when injured or out of work seamen would bring their knowledge of rope and rigging backstage. The system of natural fiber ropes, wooden pulley blocks, sandbags and pin rails was difficult to use. Rope would change length as the humidity changed, for example, and required constant attention and care.

By the middle of the 20th century a different rigging system, the guided counterweight system, was the new standard. This is the system that will be installed. Instead of fiber rope, the battens are supported by wire cables, which are stronger and more durable. Instead of sandbags counterbalancing the batten weight, a carriage (called an arbor) rides on a guide-rail on one side of the stage. The arbor's travel has top and bottom stops, and its weight limit is determined by the height of the arbor to prevent overloading the system components. Steel plates of known weight (either 21 or 42 lbs. depending on thickness) are loaded onto the arbor, eliminating the guesswork associated with bags of sand. No rigging system should be operated by a novice, but the guided counterweight system is faster and easier to learn, and is safer and easier to maintain. As with the lighting system, training sessions for the users will be part of the specification and will be provided by experienced technicians.





Memorial Boulevard School

LEED / GREEN DESIGN OPPORTUNITIES

There are several measures that can be taken advantage of in order to attain LEED certification or basic green design principles.

SITE DESIGN

- Existing location is characteristically good given it is a non-wetland urban context and is connected to community services and transportation.
- Since the intent is to preserve the ball fields, it would be advantageous to maintain less parking, pavement and building footprint than the zoning code allows.
- If possible, shade the parking area or provide high reflectivity pavement materials.
- If possible install highly reflective roofing material.
- Ensure that exterior and interior lighting does not cross onto adjacent properties.
- Reduce and manage the quality of storm water on site (expensive).

WATER EFFICIENCY

- If possible, provide plantings that need little or no irrigation.
- Reduce building water usage by installing efficient fixtures and automatic controls.

MATERIALS & RESOURCES

- Maintain as much of the existing construction as possible, including floors, walls, ceilings, and structural elements.
- During construction, divert at least 50% of waster from disposal.
- Re-use on site materials if possible.
- Use materials with 10%, 20% or more recycled content like wallboard, concrete, plastics, metals, ceiling tiles, flooring, countertops, cabinetry, and wall tile.
- Use 10% or more materials from regional sources.
- Use rapidly renewable materials such as bamboo and cork.
- Use only certified wood products.





Memorial Boulevard School

INDOOR ENVIRONMENTAL QUALITY

- Monitor the outdoor air delivery.
- Provide increased ventilation above code requirements.
- During construction and prior to occupancy, manage the indoor air quality.
- Use only low-emitting materials in carpets, paints, adhesives, and wood products.
- If possible, install lighting and thermal comfort controls for the occupants.
- If possible, provide day lighting for over 75% of the occupied spaces.

ENERGY & ATMOSPHERE

- Must provide fundamental commissioning; if possible provide enhanced commissioning.
- Must provide minimum energy performance, if possible optimize the energy performance.
- Must provide fundamental refrigerant management; if possible provide enhanced refrigerant management.
- If possible, drill for geothermal heat sources and provide photovoltaic panels.
- Install measurement and verification devices for energy usage.
- When signing a contract for power, sign with a provider that buys green power.





LEED for New Construction v 2.2 Registered Project Checklist

Project Name: City of Bristol Memorial Boulevard Theater

Project Address: 7 Memorial Boulevard; Bristol, Connecticut

Yes	?	No					
30	17	12	Project Totals (Pre-Certification Estimates)				69 Points
CERTIFIED			Certified: 26-32 points	Silver: 33-38 points	Gold: 39-51 points	Platinum: 52-69 points	

Yes	?	No					
5	3	4	Sustainable Sites				14 Points

Yes	?	No				
1	0	0	Prereq 1	Construction Activity Pollution Prevention		Required
1	0	0	Credit 1	Site Selection		1
0	0	0	Credit 2	Development Density & Community Connectivity		1
1	0	0	Credit 3	Brownfield Redevelopment		1
0	0	0	Credit 4.1	Alternative Transportation , Public Transportation		1
0	0	0	Credit 4.2	Alternative Transportation , Bicycle Storage & Changing Rooms		1
0	0	1	Credit 4.3	Alternative Transportation , Low-Emitting & Fuel Efficient Vehicles		1
1	0	0	Credit 4.4	Alternative Transportation , Parking Capacity		1
0	0	1	Credit 5.1	Site Development , Protect or Restore Habitat		1
0	1	0	Credit 5.2	Site Development , Maximize Open Space		1
0	0	1	Credit 6.1	Stormwater Design , Quantity Control		1
0	0	1	Credit 6.2	Stormwater Design , Quality Control		1
0	1	0	Credit 7.1	Heat Island Effect , Non-Roof		1
0	1	0	Credit 7.2	Heat Island Effect , Roof		1
1	0	0	Credit 8	Light Pollution Reduction		1

Yes	?	No					
2	3	0	Water Efficiency				5 Points

0	1	0	Credit 1.1	Water Efficient Landscaping , Reduce by 50%		1
1	0	0	Credit 1.2	Water Efficient Landscaping , No Potable Use or No Irrigation		1
0	1	0	Credit 2	Innovative Wastewater Technologies		1
1	0	0	Credit 3.1	Water Use Reduction , 20% Reduction		1
0	1	0	Credit 3.2	Water Use Reduction , 30% Reduction		1



LEED for New Construction v 2.2 Registered Project Checklist

Yes	?	No		
5	4	7	Energy & Atmosphere	17 Points

Yes			Prereq 1	Fundamental Commissioning of the Building Energy Systems	Required
Yes			Prereq 1	Minimum Energy Performance	Required
Yes			Prereq 1	Fundamental Refrigerant Management	Required

***Note for EAc1:** All LEED for New Construction projects registered after June 26, 2007 are required to achieve at least two (2) points.

3	1	6	Credit 1	Optimize Energy Performance	1 to 10
			Credit 1.1	10.5% New Buildings / 3.5% Existing Building Renovations	1
			Credit 1.2	14% New Buildings / 7% Existing Building Renovations	2
			--> Credit 1.3	17.5% New Buildings / 10.5% Existing Building Renovations	3
			Credit 1.4	21% New Buildings / 14% Existing Building Renovations	4
			Credit 1.5	24.5% New Buildings / 17.5% Existing Building Renovations	5
			Credit 1.6	28% New Buildings / 21% Existing Building Renovations	6
			Credit 1.7	31.5% New Buildings / 24.5% Existing Building Renovations	7
			Credit 1.8	35% New Buildings / 28% Existing Building Renovations	8
			Credit 1.9	38.5% New Buildings / 31.5% Existing Building Renovations	9
			Credit 1.10	42% New Buildings / 35% Existing Building Renovations	10

0	2	1	Credit 2	On-Site Renewable Energy	1 to 3
			Credit 2.1	2.5% Renewable Energy	1
			Credit 2.2	7.5% Renewable Energy	2
			Credit 2.3	12.5% Renewable Energy	3

0	1	0	Credit 3	Enhanced Commissioning	1
1	0	0	Credit 4	Enhanced Refrigerant Management	1
1	0	0	Credit 5	Measurement & Verification	1
0	0	0	Credit 6	Green Power	1



LEED for New Construction v 2.2 Registered Project Checklist

Yes	?	No		
5	3	0	Materials & Resources	13 Points

Yes	?	No		
1	0	0	Prereq 1	Storage & Collection of Recyclables Required
0	0	0	Credit 1.1	Building Reuse , Maintain 75% of Existing Walls, Floors & Roof 1
0	0	0	Credit 1.2	Building Reuse , Maintain 95% of Existing Walls, Floors & Roof 1
1	0	0	Credit 1.3	Building Reuse , Maintain 50% of Interior Non-Structural Elements 1
1	0	0	Credit 2.1	Construction Waste Management , Divert 50% from Disposal 1
0	0	0	Credit 2.2	Construction Waste Management , Divert 75% from Disposal 1
0	0	0	Credit 3.1	Materials Reuse , 5% 1
0	0	0	Credit 3.2	Materials Reuse , 10% 1
1	0	0	Credit 4.1	Recycled Content , 10% (post-consumer + 1/2 pre-consumer) 1
0	1	0	Credit 4.2	Recycled Content , 20% (post-consumer + 1/2 pre-consumer) 1
1	0	0	Credit 5.1	Regional Materials , 10% Extracted, Processed & Manufactured 1
0	0	0	Credit 5.2	Regional Materials , 20% Extracted, Processed & Manufactured 1
0	1	0	Credit 6	Rapidly Renewable Materials 1
0	1	0	Credit 7	Certified Wood 1

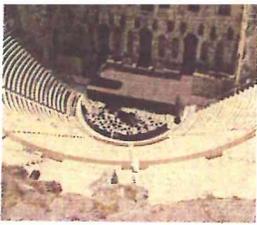
Yes	?	No		
12	1	1	Indoor Environmental Quality	15 Points

Yes	?	No		
Yes			Prereq 1	Minimum IAQ Performance Required
Yes			Prereq 2	Environmental Tobacco Smoke (ETS) Control Required
1	0	0	Credit 1	Outdoor Air Delivery Monitoring 1
1	0	0	Credit 2	Increased Ventilation 1
1	0	0	Credit 3.1	Construction IAQ Management Plan , During Construction 1
1	0	0	Credit 3.2	Construction IAQ Management Plan , Before Occupancy 1
1	0	0	Credit 4.1	Low-Emitting Materials , Adhesives & Sealants 1
1	0	0	Credit 4.2	Low-Emitting Materials , Paints & Coatings 1
1	0	0	Credit 4.3	Low-Emitting Materials , Carpet Systems 1
1	0	0	Credit 4.4	Low-Emitting Materials , Composite Wood & Agrifiber Products 1
1	0	0	Credit 5	Indoor Chemical & Pollutant Source Control 1
0	0	0	Credit 6.1	Controllability of Systems , Lighting 1
1	0	0	Credit 6.2	Controllability of Systems , Thermal Comfort 1
1	0	0	Credit 7.1	Thermal Comfort , Design 1
1	0	0	Credit 7.2	Thermal Comfort , Verification 1
0	1	1	Credit 8.1	Daylight & Views , Daylight 75% of Spaces 1
0	0	0	Credit 8.2	Daylight & Views , Views for 90% of Spaces 1



LEED for New Construction v 2.2 Registered Project Checklist

Yes	?	No		
1	3	0	Innovation & Design Process	5 Points
0	1	0	Credit 1.1 Innovation in Design: Provide Specific Title	1
0	1	0	Credit 1.2 Innovation in Design: Provide Specific Title	1
0	0	0	Credit 1.3 Innovation in Design: Provide Specific Title	1
0	1	0	Credit 1.4 Innovation in Design: Provide Specific Title	1
1	0	0	Credit 2 LEED® Accredited Professional	1



Planning Concepts

Memorial Boulevard School

Historic Preservation Design Approach

DESIGN & PRESERVATION APPROACH

THEATER

The theater design can be characterized as restrained classicism, with simplified but well proportioned classical details. The paneling, columns, and ceiling trim is simple and elegant.

DECORATIVE PAINT SCHEME

Research on the original appearance of the auditorium turned up no historic photographs or written descriptions. Anecdotally, a former teacher indicated that the auditorium was a golden yellow color.

Where paint is peeling in the auditorium, we were able to determine portions of an earlier paint scheme. Samples on plaster walls appear to have been a medium gold color at one time. Samples on the trim appeared as a deeper gold tone. Where we examined decorative details on the proscenium, earlier color schemes appear more complex, with many more changes over time. It is possible that a highly decorative paint color palette is concealed beneath the layers of paint.

Determining original decorative paint schemes is best left to architectural conservators who are trained in sampling techniques and analysis. Conservators can also make "exposures" by removing layers of paint to expose decorative painting, stenciling, etc. We recommend that a professional paint analysis be undertaken before proceeding further with the auditorium interior design.

LAYLIGHT

The colored glass laylight was an important feature in the original auditorium design scheme. The colors of the glass appear to be in harmony with the warm golden tones we noted in the earlier paint colors. We recommend that an architectural conservator analyze the paint color of the laylight frame and review the overall condition of the laylight. We also recommend that the lighting behind the laylight be refurbished.

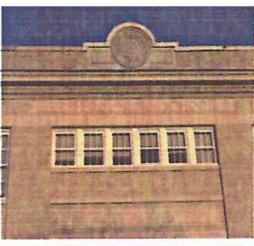
LIGHTING

We have no pictorial or physical evidence of the original lighting fixtures for the auditorium. Examination of the plaster wall surfaces did not reveal evidence of previous fixture locations, so we can surmise that the current sconces replaced earlier fixtures in the same locations.

The current fixtures are not in harmony with the architecture of the auditorium, and we recommend replacement with fixtures that are more sympathetic to the classical design scheme.



Schoenhardt



Planning Concepts

Memorial Boulevard School

Historic Preservation Design Approach

SEATING

The existing seating is not original, probably dating to the mid twentieth century. In all likelihood the original seats were wood. When replacement seating is specified, we recommend upholstered seating with wood backs.

FLOORING

The existing deep brown linoleum flooring appears to be original. Given the scope of work anticipated in the renovation project, it will not be possible to retain the flooring. Because it is not a significant decorative feature of the space, however, the integrity of the auditorium will not be compromised.

WINDOW TREATMENTS

There is no pictorial or physical evidence of early window treatments beyond some brackets for drapery rods. Window treatments will be needed for lighting control and acoustics when the theater is renovated. We recommend that design decisions for the window treatments be made after the paint analysis has been done, to ensure that the color and design of the new draperies are in keeping with the historic color scheme.

SCHOENHARDT'S APPROACH TO HISTORIC PRESERVATION

We are committed to preserving our architectural heritage. The variety of styles, materials, and details of older buildings adds a richness and texture to the built environment that could never be duplicated today. We believe that historic structures should be preserved so that others may appreciate them and learn from them.

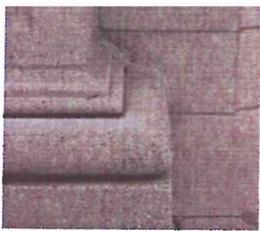
A historic preservation project begins with research. We determine whether the building is listed on local or state historic registers or the National Register of Historic Places. We learn as much as we can about the building's history and how it has changed over time. We determine which components have been repaired, altered, or replaced. We ascertain whether the structure is sound, the roof is watertight, and whether the building systems are safe and energy efficient. Our findings are documented in a report that clearly defines the physical condition of the building for our client.

Once the research is done and the condition of the building has been assessed, we work with our clients to define their needs. During the programming process we jointly establish the direction and scope of the project, the space requirements, and the overall vision for the building. We determine if the client's goal is a meticulous historic restoration, a respectful renovation, or an adaptive re-use with a new function. If more space is required, we explore options for additions that are sympathetic to the existing building in scale, in materials, and in details. We endeavor to make our work as true to the original design and construction as possible and to blend any alterations harmoniously with the surrounding buildings and landscape. Older buildings pose special challenges in terms of building codes, fire safety, and handicapped accessibility. We take great care to integrate building code upgrades without compromising the historic character of the structure.



Schoenhardt

Throughout the design process we work closely with historic and design review committees to develop a team approach and to ensure that their concerns are addressed. We have excellent relationships with many local design review committees as well as the Connecticut Commission on Culture and Tourism, the Connecticut State Historic Preservation Office, and the Rhode Island Preservation Commission. Historic structures can teach us about our past. Our goal in preservation is to save these treasures to enrich the lives of future generations.



Memorial Boulevard School

SCHOENHARDT'S APPROACH TO ADDITION DESIGN

Our approach to the design of additions to historic buildings follows the federal standards called the Secretary of the Interior's Guidelines for the Treatment of Historic Properties. These ten standards address alterations and additions to historic buildings, while preserving "features which convey its historical, cultural, or architectural values." Two of the standards address design of additions:

New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

THE MEMORIAL BOULEVARD SCHOOL THEATRE ADDITION

The Classical Revival school building is a formal, symmetrical building with an imposing presence. The heavy masonry walls exude more of a sense of solidity and permanence, and less of a feeling of the warmth and welcome appropriate to a performing arts venue.

In the design for the additions for the theater, we have selectively incorporated aspects of the original masonry design such as the water table, string course, and rusticated brickwork, as well as the cast stone and distinctly textured brick materials. For the entrance, we have expanded the proportion of glass for a more open, inviting space that draws patrons inside, particularly when brilliantly lit at night. The original masonry wall within the new lobby spaces remains intact and visible from the outside through the large expanses of glass, leaving the historic building fabric intact and incorporating it as a dramatic design element within the addition.

SOURCES

<http://www.alcpost2.org/blvd.html>





Memorial Boulevard School

Observations

The existing site poses many challenges and opportunities. The formal approach to the original building design is reflected in the site design as well. The building was originally sited on a balanced and formal plot bound by two boulevards on the north and south sides respectively. Wyllis Street did not exist in the buildings early days, being added during street alterations to the surrounding network, including realignment of South Street. This addition of Wyllis Street and alterations to South Street permanently limited the extent of potential building or site expansion on the on these respective sides of the building. The school was placed on an raised earth platform, putting it above the average site grade by around six feet or so. This design approach, not unlike similar structures of its' day, creates design challenges mostly in regard to building accessibility. The schools' playing fields on the east side of the site reinforce the formality and austerity of the original design and serve as beneficial and needed open space to the surrounding neighborhoods as well as maintaining the appropriate character and identity of Memorial Boulevard. It is our recommendation to preserve this aspect of the site context by avoiding any design solutions that propose parking in the playing field area. With two remote access curb cuts on Wyllis Street and Memorial Boulevard, the majority of the existing parking area and the existing theatre facility located there, the north side of the site presents more design opportunities than any other, though slightly limited to direct access from vehicles approaching the facility from Memorial Boulevard west bound direction.

Design Approach

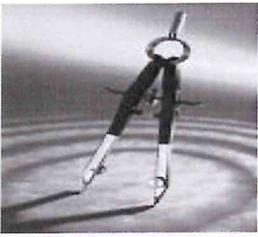
The following design considerations were established after considering the given limitations and site conditions:

- Anchor Parking and Access
- Address ADA Accessibility
- Maintain / Disperse Vehicle Circulation
- Separate Back-of-House Access

The limitations of the site prescribe a need and simultaneous opportunity for the main parking to be relocated on the north side, as the existing theatre faces this area while two existing access / entry points can be maintained from Wyllis Street and Memorial Boulevard. The contours and existing grades in this area serve the proposed design, requiring minimal cut and fill during excavation, contributing to achieving LEED sympathetic guidelines. ADA accessibility and vehicle circulation is resolved by creating a vehicle access lane ascending from the main north parking to the a new ADA accessible entry at the east end of the theatre . This access lane is uni-directional, forcing traffic to circulate in a clockwise direction around the building allowing access to Wyllis Street and ultimately back into the main north parking.

This design approach successfully separates ambulatory and non-ambulatory patrons by placing them at two different levels; an opportunity presented by the existing grade differences, while it also disperses traffic flow around the entire facility, alleviating congestion in the main lot. Handicap required spaces are located at the upper level along the new access lane. Additional non-handicap spaces are located along this access lane as well to help further disperse the required parking and distributing parking to all entry / exit points. A side street with limited vehicular traffic volume; Wyllis Street presents an excellent opportunity for truck access, while also significantly separating patron traffic from the loading dock.





Planning Concepts

Memorial Boulevard School

Preferred Architectural Scheme

See Appendix



Schoenhardt



Memorial Boulevard School

OVERVIEW

The purpose of this theatre equipment budget is two-fold:

- To annotate the attached spreadsheet with descriptions of the kind and quality of equipment being considered for inclusion in the base bid and deduct alternates for this project.
- To provide a checklist of infrastructure items that are needed to make the installation and operation of the theatre equipment possible. The infrastructure will be drawn and/or specified by other disciplines in coordination with requirements outlined in this and other documents produced by our office.

This document is organized by specification section numbers according to the CSI 2004 Masterformat. The costs given in the attached spreadsheet do not include contractor markups, taxes, infrastructure costs or general conditions costs. Infrastructure requirements, which need to be priced in addition to equipment costs, are described in the footnotes.

The equipment described as base bid provides the equivalent of a moderately equipped performing arts high school theatre. The base bid provides the community of Bristol with a fully functioning theatre with the inventory that a contemporary production requires. However, understanding that there are budget and other considerations, we have also included a series of deduct alternates. The deduct alternates limit the flexibility of the theatre or have a lower level of performance, but still provide a theatre equipped to meet the needs of most users.

The choices described herein are not final. They are based on our discussions with the building committee and our experience in the operations of theatres that present locally produced and touring productions. Additional study will be required during subsequent phases of the project.





Memorial Boulevard School

ACOUSTICAL SHELL

After consultation with the project's acoustician, we have determined that the base bid shell for the Bristol Memorial Theatre is a Wenger Diva system, or its equivalent. Our office will draw and specify the shell in coordination with the acoustician. The Diva shell consists of:

- Ceiling panels that will be supported by dedicated line-sets of the stage rigging system.[] The panels will store in a vertical position and will be tilted from vertical to horizontal for performances. The tilting mechanism will allow the users to control the degree of tilt, and to vary it from one type of musical performance to the next. Guidance on these adjustments will be by the acoustician. The panels will also have integrated lighting fixtures to provide light levels appropriate to reading sheet music (60-80 horizontal fc).
- Side and rear towers that will nest into one another for compact storage. The towers will have integral doors for musicians to enter the stage and at least one set of doors wide enough to accommodate a grand piano. Transportation carts will allow 2-3 stagehands to easily move the panels from storage to performance positions and back again.
- Panels are varied, based on 5', 10' or 20' radius, as determined by the acoustician, for optimized acoustical performance.
- Panels can be faced with almost any wood veneer or laminate, or with a paintable surface.
- Panels are a 5" thick composite of materials specifically engineered for their acoustic properties.

The deduct alternate, as determined by the acoustician, is a Wenger Forte system, or equivalent. The differences between the Diva system described above and the Forte system are:

- The panels are based only on a 10' radius.
- The panels are made of a 1" thick composite, rather than 5", and are therefore less responsive at lower frequencies.
- The surface is paintable. Veneers and laminates are not available.

PLATFORMS

The base bid includes a set of platforms to extend the apron of the stage in order to enlarge the stage for major productions. The platform system will be as follows:

- Platforms will have an extruded aluminum edge, a plywood deck and a textured laminate top to resist scratching.
- Legs will be supplied with screw leveling adjustable feet. Legs can be installed and removed without any special tools.
- Adjacent platforms will lock together with an integral locking device.
- Carts will be included to aid in transporting and storing the platform system.

The deduct alternate for stage extension platforms is simply to eliminate them from the project, and to do without or to build them in-house. There are no manufactured alternatives at a lower price.





Memorial Boulevard School

STAGE RIGGING

The base bid for the Bristol Memorial Theatre includes a fully equipped double-purchase stage rigging system that will be comprised of the following components:

- A fire curtain that overlaps the proscenium by 18" at each side and 24" at the top, unless otherwise required by code.[2] The fire curtain will be manually operated, or released in the event of a fire. It will also be connected to the rate-of-rise fire alarm system for automatic release.[3] The system will include a glass-fabric, code compliant drop on a counter-weighted rig with smoke pockets at the side, a smoke seal at the top, an auto-release mechanism, a governor to slow the rate of descent as the curtain reaches the stage floor, a lattice track arbor[4] and manual pull-ring stations at each side of the stage.
- A house curtain that is equipped for guillotine and travel operation. The curtain will be hung from a bi-parting, manually operated traveler track which in turn will be hung from a counter-weighted batten. Travel operations will be from the stage floor level. Guillotine operation will be from the fly floor.
- 42' wide, double-purchase counter-weighted battens on 8" centers for the full depth of the stage. Of 39 such battens installed, their usage will be as follows:
 - 4 battens permanently rigged for stage lighting
 - 3 battens for legs
 - 3 battens for borders
 - 3 battens for acoustic shell ceiling panels
 - 1 batten for a scrim
 - 1 batten for a cyclorama
 - 1 batten for a projection screen
 - 23 battens available for production use

The battens are used to hang stage masking panels, backdrops, scenery and stage lighting. Each line-set will be capable of supporting #1000 and will be operable from the fly floor. Each line-set will include a batten, lift lines, head and loft blocks, an arbor, stage weights, an operating line and compression locks for the operating line.





Memorial Boulevard School

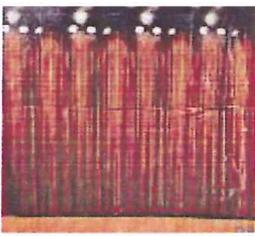
Additional equipment that is required and will be installed includes:

- A full stage depth J-bar guide wall to guide the counterweight arbors.
- Full stage depth lock rail at the fly floor, with one compression rope lock for each operating line.
- Full stage depth two-circuit index strip light hung above the lock rail on the fly floor. One circuit will have white lamps for working conditions and one circuit will have blue lamps for performance running light.
- 42' wide double-purchase counterweighted battens on which are hung the acoustic shell ceiling panels. Each line-set will be capable of supporting #1500 and will be operable from the fly floor. Three such line-sets will be required, as noted above.
- Full stage depth pin rails for tying off miscellaneous rigging. One will be installed on the onstage side of the fly floor and one on the electrics gallery on the opposite side of the stage. The pin rails are used to manage multi-cable spot lines and for rigging temporary battens that are either not parallel to the proscenium or are in the wings. The pin rails will be equipped with a set of synthetic rope, blocks, sandbags and clews.
- Upstage/downstage walk-along traveler tracks in the left and right wings to support tabs on both sides of the stage.

The deduct alternate for the stage rigging is based on the following changes.

- Battens will be spaced 12" on center, instead of 8". Of 26 such battens installed, their usage will be as follows:
 - 4 battens permanently rigged for stage lighting
 - 3 battens for legs
 - 3 battens for borders
 - 3 battens for acoustic shell ceiling panels
 - 1 batten for a scrim
 - 1 batten for a cyclorama
 - 1 batten for a projection screen
 - 10 battens available for production use
- Eliminate the pin rail and associated rope rigging hardware.





Memorial Boulevard School

STAGE DRAPERY

The Bristol Memorial Theatre will have a full set of stage drapery, including:

- A house curtain of inherently flame resistant velour, jacquard or other appropriate fabric, lined, with 75% fullness in deep knife pleats.
- Three sets of legs and borders to mask the full depth of the stage. The legs and borders will be made of 25 oz., inherently flame resistant, black velour with no fullness.
- Three tabs on each side of the stage. The tabs will be made of 25 oz., inherently flame resistant, black velour with no fullness.
- A full stage width canvas cyclorama that is typically lit with colored light and used as a backdrop.
- A full stage width, black, sharks-tooth scrim, which is hung downstage of the cyclorama to control bounce light and create additional depth for the cyclorama.

There is no reasonable deduct alternate for this modest set of stage drapery.

STAGE, HOUSE & WORK LIGHT DIMMING EQUIPMENT

The Bristol Memorial Theatre will have a complete dimming and control system for the stage, house, work and running light systems, and will include:

- A dimming system consisting of 2 ½ full sized, high density dimming racks. Each full rack contains 48 slots for dual dimmer or relay modules. Each dimmer module contains two 20A, SCR electronic dimmers with a 500ms rise time. Each relay module contains two 20A relays. We recommend using Electronics Theatre Controls (ETC) or Strand dimming and control on this project.
- A control system consisting of a computer controlled console, which will permit control of dimmers, moving lights and lighting accessories and the recording of cues in memory for recall during performances. Operator monitors, a remote designer's monitor, and a remote focus unit will complete the designer/operator end of the control system. The data processing end will be a standard 19" equipment rack housing the data processing, repeating and distribution equipment.
- Power will be distributed from the dimmer racks throughout the stage and auditorium.[5] Catwalks, box booms, balcony rails and other locations will be outfitted with plugging boxes containing one 20A stage pin receptacle per circuit. Above each connector, the circuit number will be engraved on a label that will be mechanically fastened to the faceplate to assure durability. Over the stage, a number of line-sets will be dedicated to stage lighting and will have raceways running above the batten. The raceways will be outfitted with one 20A stage pin receptacle per circuit. These circuits will also be numbered with engraved labels.
- Data will be sent from the control console to the lighting control equipment rack. From there DMX and Ethernet cables will distribute the data to every lighting position where there is power.[6] The house, work and running lighting systems will be controlled via low voltage push button preset and slider plates that will be located at control, stage management and appropriate entry points. Some of these plates will be locked out during performances to prevent their accidental use.



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- A company switch for touring production dimming, sound and scenery. We anticipate needing one switch @ 200A, 3-phase, 4-wire for touring dimmers & scenery.



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The deduct alternate for the stage dimming and control system is as follows:

- Install all of the stage lighting circuits and plugging boxes, but purchase only 75% of the dimmers. Initially, the dimmers can be shifted from one slot to another to provide power at the plugging locations required for each production. Over time the remaining dimmers can be purchased as needed or as money becomes available.
- Use 300ms rise time dimmers instead of 500ms. The difference is that the 500ms rise time dimmers produce less "hum" or "buzz" in the filament when lights are at a low level. This is considered to be especially important in symphonic music and in dance concerts because the house lights are often left at a low level to allow the audience to refer to their programs.
- Eliminate the company switch.

STAGE LIGHTING FIXTURES

The Bristol Memorial Theatre will have a full compliment of stage lighting equipment and accessories, including:

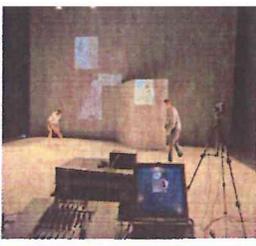
- Lekos and PARs in quantities required for a complete lighting design.
- 3-circuit striplights in lengths required to illuminate the full width of the cyclorama from the top or bottom.
- Two followspots.
- An inventory of accessories such as booms, top hats, barndoors and sidearms.
- An inventory of stage cable and data cable in various lengths.

The deduct alternate for stage lighting fixtures includes:

- Reduce by 1/3 the number of stage lighting fixtures, the quality of some fixtures, and the associated hardware and accessories.

An alternative deduct alternate is to purchase the entire inventory, but to accept used equipment, in some cases. This alternate is difficult to price in advance, as one can't predict what used equipment will be on the market. It also limits potential bidders to the largest rental houses (such as High Output in Boston, and PRG and 4 Wall in New Jersey).





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MISCELLANEOUS STAGE EQUIPMENT

The base bid equipment listed under this section is typically purchased directly by the theatre, and some of it may already be owned. Whether it is owned or not, it is generally required for the efficient operation of the theatre.

- An electric personnel lift capable of reaching 25', which is used to focus lights onstage and to adjust hanging scenery.
- A variety of stepladders, from 6' to 12', which will be used by painters, carpenters and electricians when loading in or out each production. This inventory should also include an A-frame ladder with an adjustable-height center reaching 18' to 20'.
- A portable dance floor and storage roll box. The portable dance floor (frequently referred to as "Marley") is a special purpose, multi-layered vinyl floor that is rolled out and taped down for dance performances.
- Hampers for the storage of unused stage drapery and backdrops.
- Orchestra chairs, music stands and music stand lights for a 12-piece pit orchestra.
- 3-step choral risers with side and back railings.
- The deduct alternate for miscellaneous equipment would defer the following equipment for purchase at a later date:
 - Electric personnel lift
 - Portable dance floor
 - Choral risers

FIXED THEATRE SEATING

The Bristol Memorial Theatre will have a fixed-seating capacity of approximately 900 seats.

- The self-rising seat will have an inner foam cushion and will be covered with wool plush or other medium priced fabric that exceeds a test of 50,000 double rubs. The upholstery fabric will be based on historic seating fabrics and will be coordinated with the historic end standards described below.
- The seat back will be of curved plywood covered with 1" of foam. It will be covered with the same fabric as the seat. Its back will be a stained veneer to match the armrests.
- The armrests will be of hard wood, securely fastened to the standards, stained and sealed.
- The standards will be cast steel. End standards will have a historic design. Several designs are available. The end standards will include an integral aisle light.
- Each row will be labeled at the end standards. Each seat will be labeled with the seat number.
 - Removable chairs for the orchestra pit and swing arm seats for ambulatory handicapped (per code) will also be included.





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The deduct alternate for seating is to select a lower priced chair. The differences would include:

- Using the manufacturer's standard fabric.
- Plastic seat pans instead of metal, and plastic seat backs instead of wood. Plastic colors would be selected from the manufacturer's standard color range.
- Plain end standards instead of historic end standards.

MOVABLE THEATRE SEATING

The Bristol Memorial Theatre will have movable or loose chairs in the boxes of the balcony. They will be wood or steel framed chairs, covered in the same fabric as the fixed seats.

[1] Acoustic shells are typically supplied by the stage rigging contractor. If this project is bid otherwise the CM or GC shall coordinate requirements between the stage rigging contractor and the acoustic shell contractor.

[2] Smoke pockets at the sides and the smoke seal at the top of the proscenium may require blocking for attachment.

[3] A 120v circuit and connection to the rate-of-rise fire alarm system will be required for the automatic release mechanism.

[4] Proscenium wall of masonry or blocking is required for attachment of the lattice track.

[5] The Electrical Engineer shall specify two conductors and ground for each circuit and conduit between wiring devices and dimmer racks. Long parallel runs with sound or data lines should be avoided. The Electrical Contractor shall set and install all wiring devices, conduit and wiring.

[6] The Stage Lighting System Integrator shall coordinate wire types and network configurations with the Electrical Contractor and required conduit with the Electrical Engineer.





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RIGGING SYSTEM DESIGN

This document outlines rigging static and live load parameters and is provided as a basis to develop the structural steel in the stagehouse of the Bristol Memorial Theatre. This document is preliminary, and changes to the rigging system, and therefore the structural steel that supports it, may be required as the project evolves.

COUNTERWEIGHT RIGGING SYSTEM

A manually operated counterweight rigging system is the primary method of suspending and moving stage scenery, drapery, masking and lighting. Each counterweight set (or lineset) includes: a pipe batten, wire rope, loft block, head block, arbor, hand line, locking rail and tension block. The pipe batten (typically 1½" Sched. 40) is horizontal and parallel to the proscenium wall. The batten is suspended over the stage by wire ropes which run vertically to the loft block, which turns it 90° (horizontal) toward the head block, which turns it 90° down to terminate at the top of the arbor. The loft blocks are typically attached to I-beams that run from the proscenium wall to the back wall of the stage. The loft block beams are typically spaced 8'-11' OC, and are arranged symmetrically around the center line of the proscenium opening. Loft block beams must be level and horizontal. The quantity and spacing of the counterweight sets varies from theatre to theatre. Typically, the rigging sets are spaced between 6" and 12" on center for the entire depth of the stage.

Rigging in the Bristol Memorial Theatre will be a double-purchase counterweight system. The double-purchase system allows us to place the operating floor of the rigging system (also known as the fly floor) approximately half-way up the stage left wall, leaving room below for a loading dock and personnel door. This is a one-to-one/two system where each pound of equipment hung from the batten is counterbalanced by a pound/two pounds of counterweight on the arbor. For each foot the batten travels, the arbor travels a foot/two feet. The battens and arbors produce roughly equal dynamic horizontal and vertical loads on the loft block beams and head block beams.

The proposed double-purchase counterweight rigging system in the Bristol Memorial Theatre will allow 40 linesets to be installed, spaced on 8" centers. Each of these linesets will have a lifting capacity of 1,000 lbs. It is possible that the budget will reduce the number of linesets initially installed, but the building must be designed to accept the weight of the complete rigging system.

The loads that will be supported by the roof structure are:

- 42' long battens hung over the stage and their associated loft blocks
- Arbors at the stage right rigging wall, their associated head blocks and the counterweight in use
- Loading Bridge (where weight is loaded and unloaded on the arbors), the Fly Floor (where the system is operated), which stacked vertically, and the counterweight that is in not in use
- Gridiron or Walking Grid, which is below the loft blocks and provides access over the entire stage for additional rigging and maintenance of the rigging system.





Planning Concepts

Memorial Boulevard School

Performance-Related Equipment

LAYOUT OF THE STAGE RIGGING SYSTEM

As currently planned, each 42' long batten will be supported by 5 lift lines on 10' centers, with the center lift line on the centerline of the proscenium. The system's loft blocks are designed to attach to beams running upstage/downstage. The structural engineer will advise us on whether the loft blocks are mounted to the roof steel or to the walking grid.

The arbor guides and arbors will be attached to the stage left wall and will project far enough to avoid interruption by any engaged columns or posts on that wall. Over the arbors, head blocks will be installed on I-beam(s). 15"-20" onstage from the arbors, the Loading Bridge and Fly Floor will be hung from the roof steel.

Finally, over the entire stage there will be a walking grid that allows inspection of the rigging system as well as spot rigging for scenery not parallel to the proscenium or for scenery flown into a storage position off-stage. The loft block may be mounted on this grid, as well.

All of the above will be detailed in our TR (Theatre Rigging) series of drawings. Based on our drawings and the loads given below, the structural engineer will size and specify the beams supporting the loft blocks, multi-sheave blocks, loading bridge/fly floor and head blocks, as well as the walking grid, fly floor and loading bridge.

ADDITIONAL REQUIREMENTS

GRIDIRON OR WALKING GRID

The walking grid extends over the entire stage and must support a live load of 50 lbs/square foot with a 1,000 lb concentration. See attached SK-6 for details.

ROPE LOCKS AND LOCKING RAIL

The vertical position of each batten is held in place by a rope lock mounted to the locking rail. Locking rails are located on the fly floor. The locking rail, which is welded to the offstage edge of the fly floor, must sustain an uplift load of 400 lbs/linear foot. The Rigging Contractor will provide and install the locking rail and rope locks on the fly floor, which is designed by the structural engineer.

PIN RAIL

A pin rail, which is welded to the onstage edge of the fly floor, must sustain an uplift load of 500 lbs/linear foot with a 1,000 lb concentration. The Rigging Contractor will provide and install the pin rail on the fly floor, which is designed by the structural engineer.



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Performance-Related Equipment

STAGE RIGGING LOADS

STATIC LOADS

The following calculations outline the static vertical loads that the blocks exert on the loft block and head block beams.

$$40 \text{ loft blocks} \times 20 \text{ lbs} = 800 \text{ lbs per loft block beam}$$

$$40 \text{ head blocks} \times 78 \text{ lbs} = 3,120 \text{ lbs on head block beam(s)}$$

In addition, while they are moving components of the stage rigging system, the self-weight of the battens is suspended from the loft block beams, and the self-weight of the arbor is suspended from the head block beam(s)

$$40 \text{ battens} \times 114 \text{ lbs} = 4,560 \text{ lbs across loft block beams}$$

$$40 \text{ arbors} \times 155 \text{ lbs} = 6,200 \text{ lbs on head block beam(s)}$$

LIVE LOADS

The following calculations outline the live loads on the loft and head blocks, and therefore on their respective beams. Note that these loads are concentrated at the head block beam but are spread over the loft block beams. The horizontal loads at each beam are roughly equal to the vertical loads.

LINESETS

$$*650 \text{ lbs / batten} \times 40 \text{ battens} = 26,000 \text{ lbs across loft block beams}$$

$$*1300 \text{ lbs / arbor} \times 40 \text{ arbors} = 52,000 \text{ lbs at head block beam(s)}$$

*assumes a 65% diversity factor

LOADING BRIDGE & FLY DOOR

When individual linesets are not fully loaded, the unused counterweight is stored on the loading bridge and fly floor. Counterweight is steel bricks in two sizes:

$$14" \times 6" \times 1" \text{ (21 lbs)}$$

$$14" \times 6" \times 2" \text{ (42 lbs)}$$

Counterweights are stacked up to 5 bricks high along the curbs of the loading bridge and fly floor. If all of the linesets were unloaded the counterweight would be distributed as follows:

$$\text{Loading Bridge stores 66\% of counterweight } (52,000 \text{ lbs} \times .66) = 34,320 \text{ lbs}$$

$$\text{Fly Floor stores 34\% of counterweight } (52,000 \text{ lbs} \times .34) = 17,680 \text{ lbs}$$





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WALKING GRID

Additional live load may be suspended from the walking grid for individual productions. Productions may require scenery or lighting to be suspended from battens that are not parallel to the proscenium, or individual scenic items (such as chandeliers) to be suspended. The walking grid should be designed to support 50 lbs of live load per square foot with a 1,000 lb concentration.

DIVERSITY

The counterweight rigging system has a maximum possible load of 40,000 lbs. across the loft block beams and 80,000 at the head block beams. In typical practice, however, not every lineset will be used at maximum capacity for a given production. However, the rigging steel may see a concentration of three fully loaded sets over any 2'-0" of the span.

The maximum possible counterweight will not be purchased. Only 65% (52,000 lbs) of the maximum possible counterweight for the 40 typical linesets will be in use.

ALIGNMENT AND OBSTRUCTIONS

Lift lines for the battens run across the stage from the head blocks to the loft blocks and occur on regular spacing. In order to maintain this regular spacing it is crucial that Loading Bridge/Fly Floor Hangers, Head Block Spacers, Loft Block Cross Bracing, Walking Grid Hangers, Rigging Well Spacers and their connections are aligned so as to present the smallest possible cross-stage profile. The exact placement should be off-set from the linesets to eliminate any impact on batten spacing and placement.

Other possible rigging obstructions over the stage include sprinkler pipes and sprinkler heads, roof drain plumbing, HVAC ducts and smoke hatches. These should also be coordinated with the rigging to eliminate any possible interference.

Additional obstructions to the rigging system include access ladders and spiral staircases from the stage to the fly floor, from the fly floor to the loading bridge and from the loading bridge to the walking grid. Ladders, ladder cages, staircases and staircase bracing must all be coordinated so as to avoid obstructing the lock rail, the arbor side of the loading bridge and all rigging blocks and lift lines.





Memorial Boulevard School

ACOUSTICAL DESIGN APPROACH – THEATRE

ACOUSTICAL SHELL

An orchestra shell is desirable for use with unamplified musical events. An orchestra shell will enhance purely acoustical music by improving onstage hearing and projecting acoustical energy out of the stage area into the house volume. The shell will consist of movable side towers and flown overhead ceiling panels. Due to the size of the proscenium opening and the total area of the stage, the maximum number of performers that will be able to be reasonably accommodated with an orchestra shell will be approximately 35-40 musicians. A limited number of shell configurations will be required for groups of smaller sizes. The shell will need to be stored for amplified and non-musical performance. Refer to theater consultant's budget report for preliminary cost estimation. A series of sketches (SK-1, SK-2, and SK-3) is provided with this report that illustrates a conceptual shell layout and storage space requirements.

ROOM ACOUSTIC TREATMENTS

Acoustically absorptive finish treatments will be required to accommodate amplified programming. It is recommended that fixed absorptive treatment such as fabric wrapped acoustical panels or other absorptive acoustical treatment be added at the rear and side walls of the theater. For preliminary cost estimation purposes, treatment should be assumed to be 2" thick fabric wrapped panels covering 100% of the rear walls above a height 3'-4' a.f.f. and approximately 2000 sq.ft. of panels distributed on the side walls of the theater.

SOUND ISOLATION

In order to prevent unwanted noise from entering the theater during performance, adequate construction for sound isolation will be required. Where possible, sound and light locks should be incorporated into the entry points of the theater. Doors and door hardware will need to be selected for sound isolation. Typically, doors should be considered to be solid wood or hollow core metal doors with applied acoustical gasketing.

MECHANICAL SYSTEMS

Any new mechanical systems serving the theater will need to be designed to create low background noise levels. The background noise level design goal of the theater should be a maximum of Noise Criteria Level NC-30 to 35. For cost estimation purposes, it should be assumed that existing auditorium ductwork will be reused. New ductwork for the additional unit serving the stage should be considered to be fully internally lined, and sized for velocities less than 800FPM. Allowance should be made for four 7' long medium pressure drop sound attenuators, sized for 1000FPM face velocity, to be used at the auditorium and stage air handling units.

AUDIO & VISUAL SYSTEMS

See Appendix A





Memorial Boulevard School

ACOUSTICAL DESIGN APPROACH – PERFORMANCE SUPPORT SPACES (BACK OF HOUSE)

ROOM ACOUSTIC TREATMENTS

Certain spaces such as the Rehearsal/Multi-Purpose Rooms, Scene Shop, and Sound Shop, will require acoustical finish treatments. For cost estimation purposes, treatment should be assumed to be 2" thick fabric wrapped panels covering 25% of the wall areas and an ACT or similar acoustically absorptive ceiling system.

SOUND ISOLATION

Partition and floor/ceiling construction in back of house spaces will be selected to prevent sound transmission among these spaces and to the theater. These spaces may require multiple layer gypsum board or CMU wall construction. Doors and hardware will need to be selected for sound isolation. Typically, doors should be considered to be solid wood or hollow core metal doors with applied acoustical gasketing.

MECHANICAL SYSTEMS

Any new mechanical systems serving the back of house spaces will need to be designed to create low background noise levels. The background noise level design goal of the Rehearsal/Multi-Purpose Rooms should be a maximum of Noise Criteria Level NC-25. Other spaces should have a maximum Noise Criteria Level of NC-35. New ductwork for the additional unit serving the performance support spaces should be considered to be fully internally lined, and sized for velocities less than 1000FPM.





Memorial Boulevard School

AUDITORIUM

1 – PRIMARY SOUND REINFORCEMENT SYSTEMS

A number of loudspeaker arrays surrounding the stage area provide the majority of sound reinforcement for all seats.

A center loudspeaker array is suspended just above and downstage of the proscenium opening. An electric winch allows this array to be raised out of sight when not in use or lowered to the stage for service or removal.

Two side loudspeaker arrays, one grouping each at stage left and stage right, are suspended closer to stage level, just downstage of the proscenium opening. These arrays work in conjunction with the center array to provide stereo imaging and proper performer localization. Electric winches allow these arrays to be raised out of sight when not in use or lowered to the stage for service or removal.

Two sub woofer arrays, one grouping each at stage left and stage right, operate in conjunction with the other loudspeaker arrays to add warmth and power to the music program. These loudspeakers are incorporated into the side arrays or mounted under the stage.

2 – SUPPLEMENTAL SOUND REINFORCEMENT SYSTEMS

A number of low profile, supplemental reinforcement loudspeakers provide additional coverage and intelligibility to seats that are out of range of the primary loudspeaker arrays.

The first few rows of orchestra-level seating are supplemented by portable loudspeakers distributed along the stage edge or the orchestra pit rail.

Seats at the rear of the orchestra-level seating are supplemented by a ring of low profile loudspeakers suspended under the edge of the balcony rail.

Seats at the side and rear of the balcony-level seating are supplemented by loudspeakers mounted above the balcony.

3 – MIXING & PLAYBACK EQUIPMENT

A forty-eight input mixing console combines signals from live microphones, prerecorded material, and audio special effects. These signals can then be assigned through a matrix to any of the loudspeaker systems located throughout the theater.

An assortment of equipment is available for the processing of audio signals.

An assortment of equipment is available for the creation and/or playback of recorded material.





Planning Concepts

Memorial Boulevard School

Acoustical-Related Equipment

4 – EFFECTS/MONITOR SYSTEM

Spatial sound effects and other program requirements are accommodated by a group of loudspeakers, amplifiers, and a patching system.

Eight amplifier channels can be assigned to many different loudspeaker plug boxes on stage and throughout the theater.

Portable loudspeakers are provided for plug-in at the various locations as programming dictates.

Signals for this system are typically generated from the console at the house mixing position.

These loudspeakers and amplifiers can also function as a modest stage monitor system providing stage sound to live performers on stage or musicians in the orchestra pit.

5 – ADA-COMPLIANT AUDIO SYSTEM

This system transmits stage sound or other selected program material, by means of infrared carrier, to individual receivers provided for the hearing impaired.

The ADA system can also be used for transmission of narration and stage sound or other selected program material to individual receivers provided for the sight impaired.

6 – INTERCOM SYSTEM

The technical intercom system supplies four-channel communication among technical operating personnel through headsets with boom-mounted microphones. Stations are provided for all technical operating positions in the stage, house, control booths, and other key areas.

7 – LIVE ROOM MICROPHONE SYSTEM

A stereo microphone suspended in the audience chamber picks up signals from all performances, both amplified and unamplified. Signals from this microphone are distributed as needed to the ADA System, Intercom, Backstage, Lobby, and Control Booth. In addition, this audio source could be used to feed an archival recording system.

8 – BACKSTAGE PROGRAM AND PAGE

This system provides performance sound in dressing rooms and other key areas. When initiated, priority stage call announcements override performance sound. This system can be activated at several different locations to allow paging by the Stage Manager or their designee.

9 – LOBBY PROGRAM AND PAGE

This system provides performance sound in the lobby and other public areas. When initiated, public announcements or chime tones override the performance sound. This system can be activated at several different locations by the House Manager, Stage Manager, or their designee.



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Acoustical-Related Equipment

10 – MICROPHONES

A complement of wired microphones, wireless microphones, stands, cables, adapters, and accessories, appropriate to program needs, is provided.

11 – MAINTENANCE

An assortment of tools and test devices is provided for routine maintenance of the audio and video systems.

12 – SOUNDTRACK PLAYBACK SYSTEM

A plug box allows multi-channel soundtracks to be played back through the sound reinforcement system components.

13 – TECHNICAL VIDEO WIRING SYSTEM

A technical video wiring system provides access to locations in the control booth, the stage manager's console, the house manager's office, the orchestra pit, the catwalks, the balcony rail, the lobby, etc. Wiring from these locations is brought to a central location to facilitate interconnection.

A technical video distribution network allows cameras, monitors, displays, and recorders (all provided by others) to be routed to locations on the wiring system.

14 – VIDEO PROJECTION SYSTEM

A video projector is provided for showing video content on the projection screen.

A motorized roll-down projection screen is provided for use with the above-mentioned projector as well as other media.

Inputs are provided at various locations through the theater for plugging in video equipment such as laptops and other video sources (all provided by others).

15 – CONTROL SYSTEM

A microprocessor-based system stores system presets allowing for quick setup and restoration of often used processing configurations.

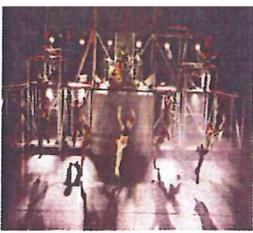
A wireless touchscreen remote control is provided for control during lecture-type events.

16 – POWER DISTRIBUTION SYSTEM

A sequencing panel board provides programmable, sequential start-up and shut-down of the audio and video systems.

A portable power distribution panel provides multiple outlets for use with portable audio and video equipment.





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17 – AUDIO & VIDEO EQUIPMENT HUBS

Additional audio and video equipment, required to interface all of the above systems, is located in the Control Booth and the Rack Room.

The equipment installed in these locations includes: signal processing, amplifiers, plug boxes, cable assemblies, racks, power sequencing, computers, and other infrastructure.

Cost estimates included here are for the audio and video equipment located in these spaces, not the architectural spaces themselves.

ESTIMATED COST OF THE INSTALLED AUDIO & VIDEO EQUIPMENT LISTED: \$650,000 *

** This estimate does not include: winches, rigging, technical power, cable raceways, taxes, bonding, mark-ups, contingencies, inflation, or allowance for unusual contractual requirements included in the specification General Conditions.*

ADDITIONAL INFORMATION FOR PURPOSES OF COST ESTIMATION

The following information describes additional cost items associated with the installation of the audio and video systems. These items are designed and/or specified by other members of the design team.

1 – ARCHITECTURAL SPACES FOR AUDIO & VIDEO EQUIPMENT

The Audio & Video Control Booth is a highly specialized room, acoustically treated and isolated. It houses both fixed and portable audio and video equipment used for show operations, sound mixing, and recording. An operable window opens directly into the audience chamber. It is typically located at the rear of the audience seating area on the orchestra level. This room is approximately 200 square feet.

AUDIO & VIDEO RACK ROOM

This room contains all of the large, power consuming, heat producing audio and video components. It is typically located in the stage house area or adjacent to the Audio & Video Control Booth. This room is approximately 100 square feet.

AUDIO & VIDEO STORAGE ROOM

This room is located with easy access to the stage area. Portable loudspeakers, microphones, stands, cables, and accessories are stored here when not in use. This room is approximately 100 square feet.

HOUSE MIXING POSITION

Audio and video operations area in the audience chamber. Portable sound mixing consoles, processing gear, and operators will be located in this area when programming dictates. This space requires a flat floor surface approximately 12 feet wide by 8 feet deep, which is typically accommodated by temporary removal of a group of seats.





Memorial Boulevard School

2 – HVAC SYSTEMS FOR AUDIO & VIDEO EQUIPMENT

The Mechanical Engineer will design and specify HVAC systems for rooms containing audio and video equipment. These rooms ideally should be maintained at an ambient temperature between 50 and 80 degrees Fahrenheit, and at a relative humidity between 35% and 50%. These environmental requirements are in effect 24 hours a day and usually necessitate a separate air handling system for each room containing audio and video equipment.

The estimated total heat loads generated by audio and video equipment are as follows:

- Audio and video equipment in the Control Booth will not exceed 2 kW.
- Audio and video equipment in the Rack Room will not exceed 12 kW.

These heat loads are for equipment only and do not include normal requirements for lighting or personnel.

3 – RIGGING SYSTEMS FOR AUDIO & VIDEO EQUIPMENT

The Theater Consultant will specify the following items for use with the audio and video equipment:

- Motorized winch for hanging loudspeaker cluster at Left Proscenium position. This loudspeaker cluster will require 2 lift lines with a total suspended weight not to exceed 1000 pounds.
- Motorized winch for hanging loudspeaker cluster at Right Proscenium position. This loudspeaker cluster will require 2 lift lines with a total suspended weight not to exceed 1000 pounds.
- Motorized winch for hanging loudspeaker cluster at Center Proscenium position. This loudspeaker cluster will require 2 lift lines with a total suspended weight not to exceed 750 pounds.
- Independent control system for each winch featuring five programmable preset stop positions for the clusters, as follows: one all the way up, one all the way down, and three intermediate.





Memorial Boulevard School

4 – ELECTRICAL SYSTEMS FOR AUDIO & VIDEO EQUIPMENT

The Electrical Engineer will specify the following items for exclusive use by the audio and video equipment (design criteria will be supplied by the audio and video designer):

- Audio and video technical power system fed from K-13 rated isolation transformer with copper windings, electrostatic shield, and double size neutral terminal. The estimated total load of all equipment connected to this device will be 60 kVA.
- Audio and video technical power isolated grounding system.
- Audio and video technical power company switch rated at 200 Amps, 3 phase.
- Audio and video technical power company switch rated at 60 Amps, 3 phase.
- Empty conduit and raceway systems connecting all audio and video equipment terminations. (Note that the wire and wire-pull labor for low voltage audio and video cables are included in the installed audio and video systems cost estimate.)

Cost estimates for these electrical systems should be provided by the Electrical Engineer. However, the specific electrical system requirements for audio and video systems cannot be fully valued until coordinated design documents are issued.

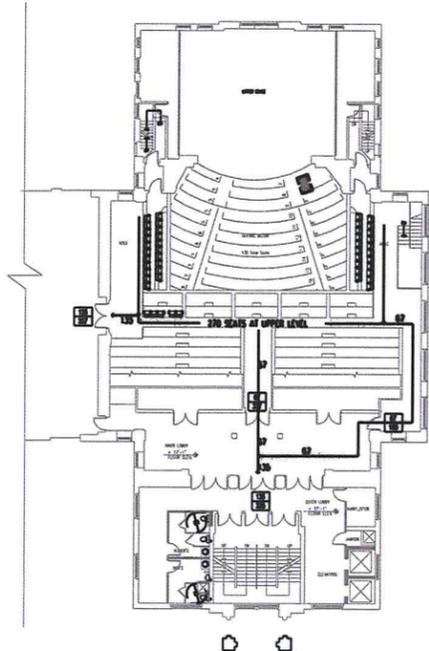
To aid in preliminary cost estimation, JHA offers experience with recent projects of this scope which suggests that the costs associated with providing and installing the audio and video technical power system and the empty conduit/raceway system will be approximately \$220,000.

This estimate may fluctuate depending upon current market conditions.

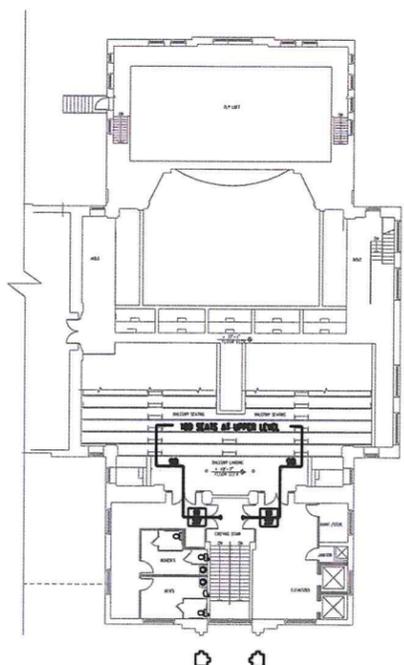
UTILITY SYSTEMS

Utility systems, such as: telephone, data transmission, fire and emergency, computer control, security, cable television, etc. are not covered in the above estimates. The design and specification of these systems are by others.

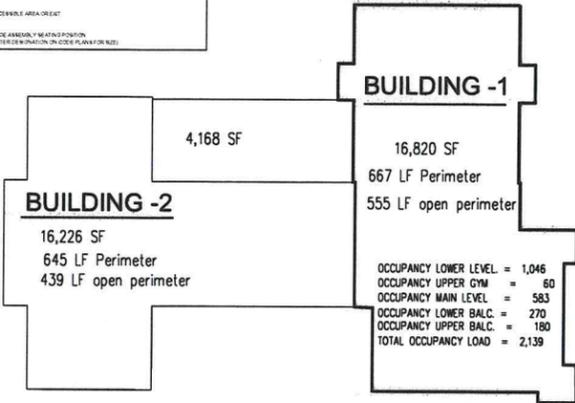




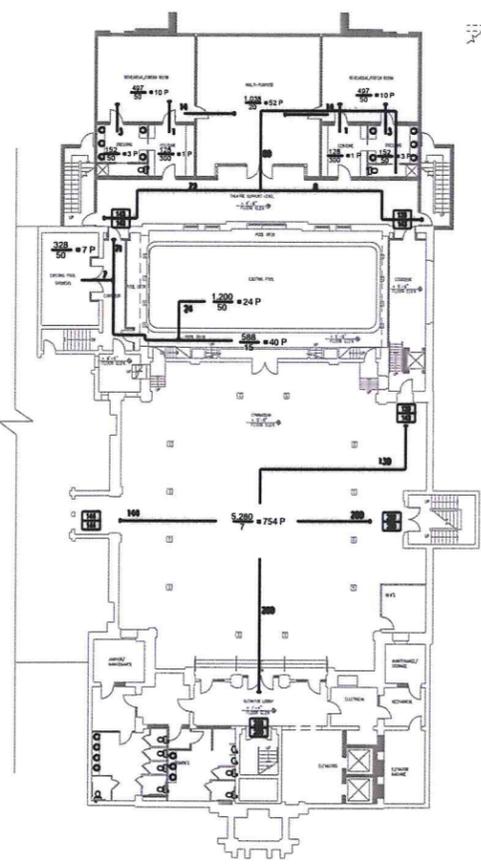
4 LOWER BALCONY LEVEL AUDITORIUM
NOT TO SCALE



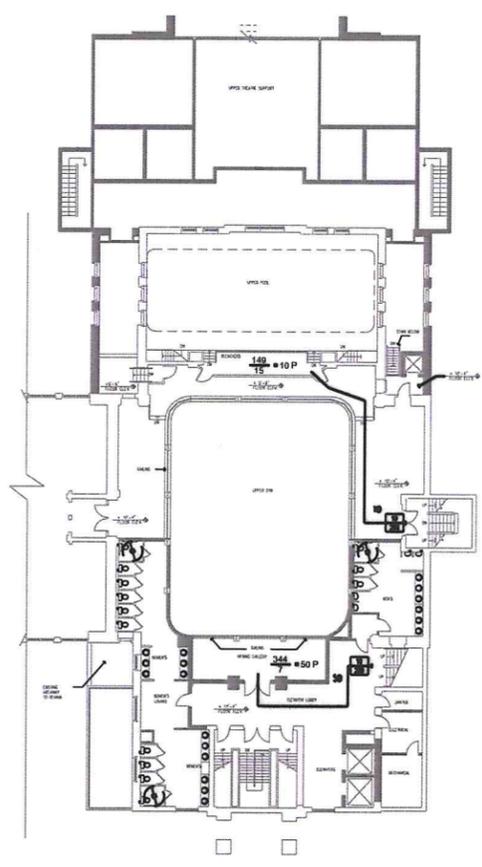
4 UPPER BALCONY LEVEL AUDITORIUM
NOT TO SCALE



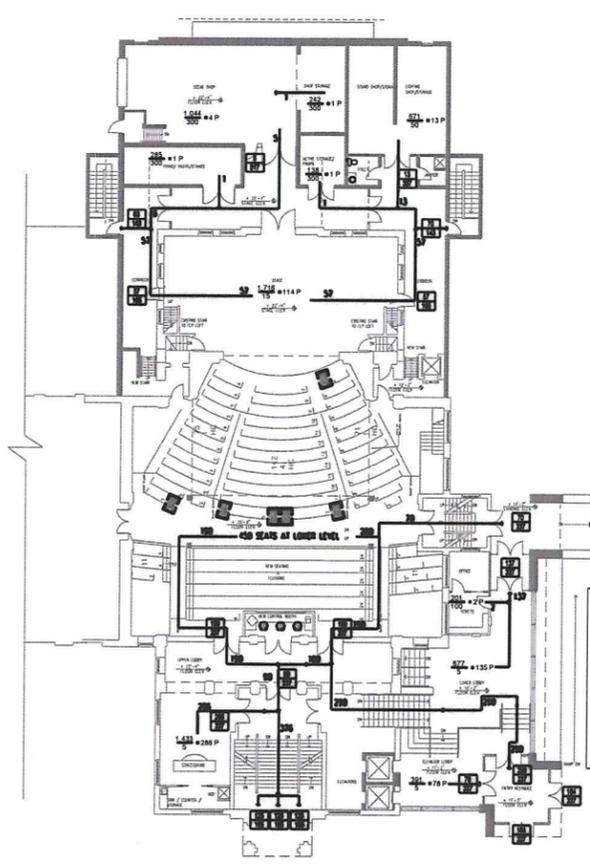
4 KEY PLAN
NOT TO SCALE



4 LOWER LEVEL GYM
NOT TO SCALE



4 UPPER GYM LEVEL
NOT TO SCALE



4 MAIN LEVEL AUDITORIUM
NOT TO SCALE

CODE INFORMATION BUILDING - 1				
REVIEW BASED UPON: IBC-2003, with CT Supplement, IPC-2003, NEC 70-2005, IECC-2003, CT FBC-2005, ICC ANS I A117.1-2003				
ITEM	REFERENCE	PERMITTED/REQ'D	PROVIDED	COMMENTS/CALCULATIONS
1. OCCUPANCY	CHAPTER 3	A-1	A-1	
2. CONSTRUCTION	CHAPTER 6	2A	2A	
3. SPRINKLERS	SECTION 903	YES/NO	YES	
PORTABLE FIRE EXTINGUISHERS	SECTION 906	YES/NO	YES	
FIRE ALARM AND DETECTION SYSTEM	SECTION 907	YES/NO	YES	
4. HEIGHT & AREA:	TABLE 503			
HEIGHT IN FEET		65	53	
STORES		3	4	
SQUARE FEET		15,500	16,820	
HEIGHT MOD. SPRINKLR AREA MODIFICATION	SEC. 504.506	4	4	
	SEC. 504.506	55,490	16,820	SEE ALLOWABLE AREA CALCULATIONS THIS SHEET
5. FIRE RESISTANCE RATING FOR CONSTRUCTION TYPE:	TABLE 601			SEE EGRESS PLAN FOR LOCATION OF UL DESIGNATION OF RATED ASSEMBLY
STRUCTURE		1	1	
BEARING WALLS		1	1	
EXTERIOR		1	1	
INTERIOR		1	1	
NON BEARING		0	0	
EXTERIOR		1	1	
INTERIOR		1	1	
FLOOR		1	1	
ROOF		2	2	
FIRE SEPARATION DISTANCES	TABLE 602			
6. OCCUPANCY LOAD	TABLE 1004.1.2		2,139	SEE EGRESS PLAN
7. NUMBER OF EXITS	SECTION 1010	4	7	SEE EGRESS PLAN
BUILDINGS WITH 1 EXIT	TABLE 1010.1	N/A	N/A	
SPACES WITH 1 EXIT	TABLE 1014.1	N/A	N/A	
8. COMMON PATH	PARA. 1013.3	75 FT	80 FT	SEE EGRESS PLAN
9. EXIT ACCESS TRAVEL	TABLE 1015.1	250 FT	156 FT	SEE EGRESS PLAN
10. TOTAL TRAVEL		N/A	N/A	SEE EGRESS PLAN
11. EXIT CAPACITY:		Allowable egress capacity	Actual egress load	SEE EGRESS PLAN
LOWER LEVEL	TABLE 1005.1	1,055	1,046	
UPPER GYM	TABLE 1005.1	490	60	
MAIN LEVEL	TABLE 1005.1	1,860	1,098	
LOWER BALCONY	TABLE 1005.1	717	270	
UPPER BALCONY	TABLE 1005.1	300	180	
COMPONENTS				
STAIRS			3 OCCUPANT	
DOORS			2 OCCUPANT	
12. ELEMENT RATING:	CHAPTER 10	2	2	SEE EGRESS PLAN
EXITS				
EXIT ACCESS CORRIDORS	TABLE 1016.1	0	0	
REMOVEDNESS	TABLE 1014.2.1	31 LF Min.	45 LF Provided	
13. INTERIOR FINISHES:	TABLE 903.5			
VERT. EXITS & PASSAGES		B	B	
EXIT ACCESS CORRIDORS & OTHER EXIT WAYS		B	B	
ROOMS & ENCLOSED SPACES		C	C	
14. PLUMBING FIXTURE	TABLE 2002.1			
BASED ON TOTAL OCCUPANCY OF 2,174				
MALE		9	11	
FEMALE		17	19	
UNISEX		1	1	
LAVATORIES		11	39	
15. AREA OF REFUGE	PARA. 1007.6	N/A	N/A	SEE EGRESS PLAN
16. ACCESSIBILITY	CHAPTER 11			
HP PARKING SPACES	SECTION 1106	YES/NO	YES/NO	
VAN		X	X	
CAR		X	X	
PASSENGER LOADING ZONE	PARA 1108.7	YES/NO	YES/NO	
ACCESSIBLE MEANS OF EGRESS	SECTION 1007			
OTHER FEATURES	SECTION 1109			
TOILET & BATHING FACILITIES	PARA 1109.2	YES/NO	YES/NO	
UNISEX TOILET	PARA 1109.2.1	YES/NO	YES/NO	
SIGNAGE	SECTION 1110	YES	YES	
17. INTERIOR ENVIRONMENT	CHAPTER 12			
INTERIOR SPACE DIMENSIONS	SECTION 1208			
ACCESS TO UNOCCUPIED SPACES	SECTION 1209			
18. ENERGY	IECC	CONDITION	VALUE	
(COMMERCIAL)				
DRY BULB	WINTER	X		
WET BULB	SUMMER	X		
DEGREE DAYS	HEATING	X		
	COOLING	X		
FIGURE 902.1(7)	CLIMATE ZONE	X		
				OBTAIN FROM HVAC DESIGNER
19. BUILDING ENVELOPE	REFERENCE	REQ'D	PROVIDED	COMMENTS
(COMMERCIAL)	IECC 1025.5 (802.2)(X)	U FACTOR R VALUE	U FACTOR R VALUE	SELECT TABLE MATCHING CLIMATE ZONE
SLAB OR BELOW GRADE		X	X	
WINDOWS/ GLASS DOORS		X	X	SELECT PF
ROOF ASSEMBLY		X	X	SELECT ASSEMBLY FROM LIST
FLOORS OVER OUTDOOR OR UNCONDITIONED SPACE		X	X	SELECT ASSEMBLY FROM LIST
ABOVE GRADE WALLS		X	X	SELECT ASSEMBLY FROM LIST
20. MODIFICATIONS	DATE:	DISCUSSION:		
PLUMBING FIXTURES CALCULATIONS REQUIRED.				AREA MODIFICATION
ASSEMBLY OCCUPANCY = 2,139 PERSONS.				Street frontage increase.
2,139 PERSONS = 1,070 MALE AND 1,070 FEMALES.				$A_s = 100 \left[\frac{1,070}{1,000} \right] \left[\frac{1,070}{1,000} \right]$
WATER CLOSETS REQUIREMENTS				$A_s = 100 \left[\frac{1,070}{1,000} \right] \left[\frac{1,070}{1,000} \right]$
FEMALES = $1 / 65 = 1,070 / 65 = 17$.				$A_s = 100 (1.05 - .20)$
MALES = $1 / 125 = 1,070 / 125 = 8$.				Allowable Floor Area.
LAVATORIES = $1 / 200 = 1,070 / 200 = 11$.				$A_s = A_c - \left[\frac{A_c}{100} \right] \left[\frac{A_c}{100} \right]$
				$A_s = 16,820 - \left[\frac{16,820}{100} \right] \left[\frac{16,820}{100} \right]$
				$A_s = 16,500 - \left[\frac{16,500}{100} \right] \left[\frac{16,500}{100} \right]$
				$A_s = 16,490$ sf

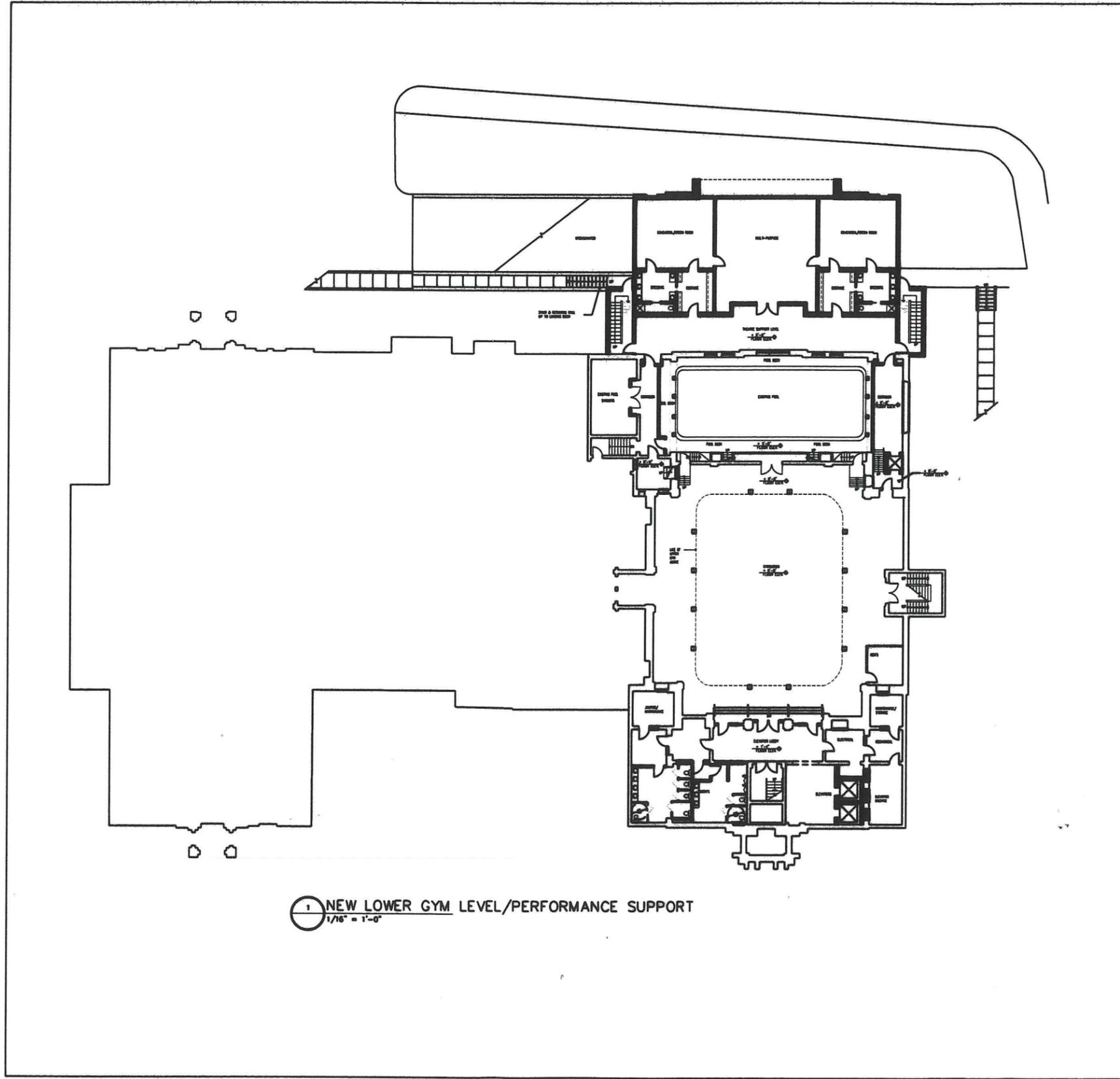
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F 718 768 2170

Memorial Boulevard Theatre
70 Memorial Boulevard
Bristol, Connecticut

Project: 07148.00
Initials: MPS
Date: 11-20-2008
Revisions:

SCALE: NTS
A-1



1 NEW LOWER GYM LEVEL/PERFORMANCE SUPPORT
 1/16" = 1'-0"



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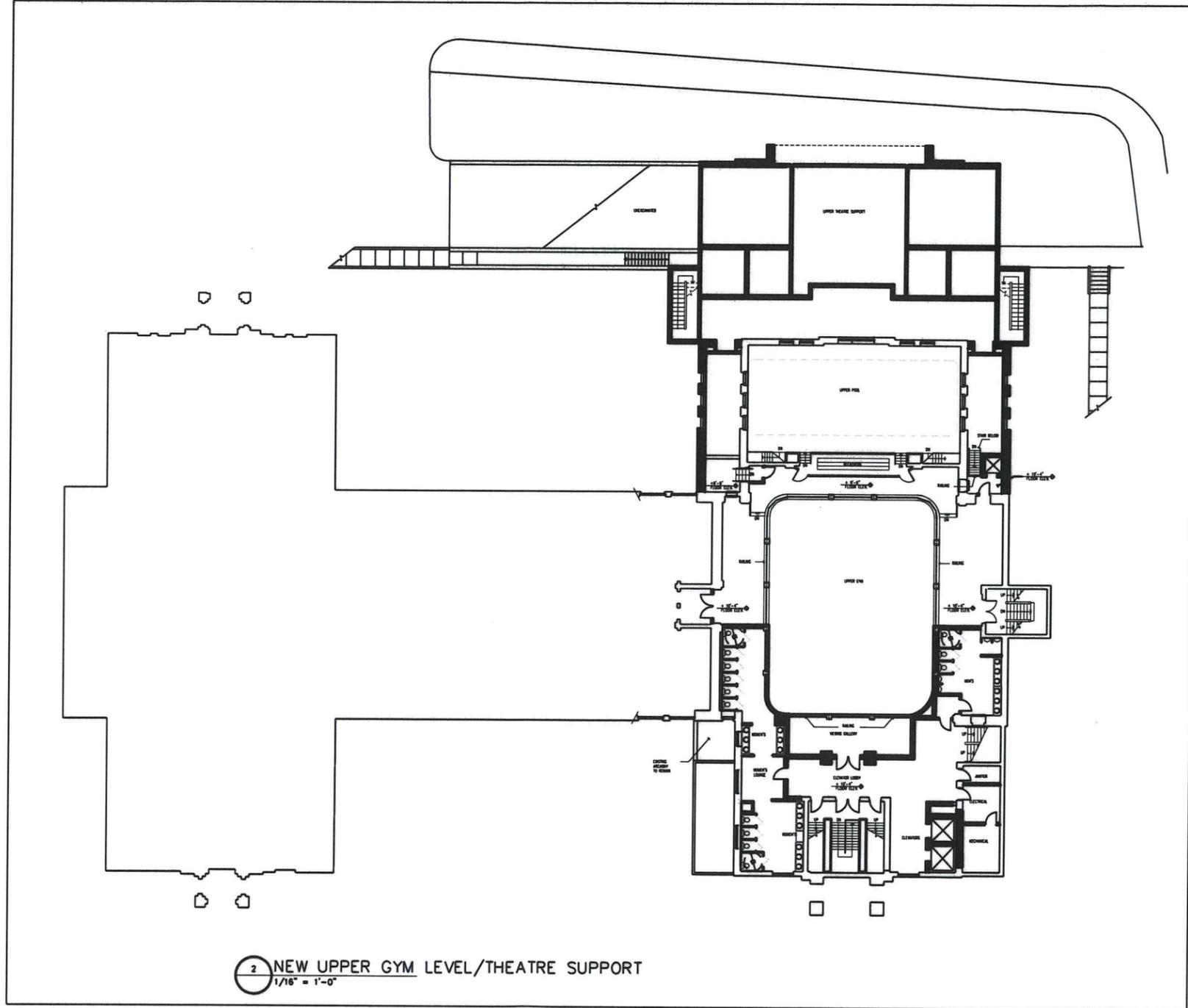
Additions and Renovations:
Memorial Boulevard Theatre

70 Memorial Boulevard
 Bristol, Connecticut

Project:	07148.00
Client:	NY
Date:	11-20-2008
Scale:	
Author:	
Checker:	
Printer:	

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

A-2



2 NEW UPPER GYM LEVEL/THEATRE SUPPORT
1/16" = 1'-0"

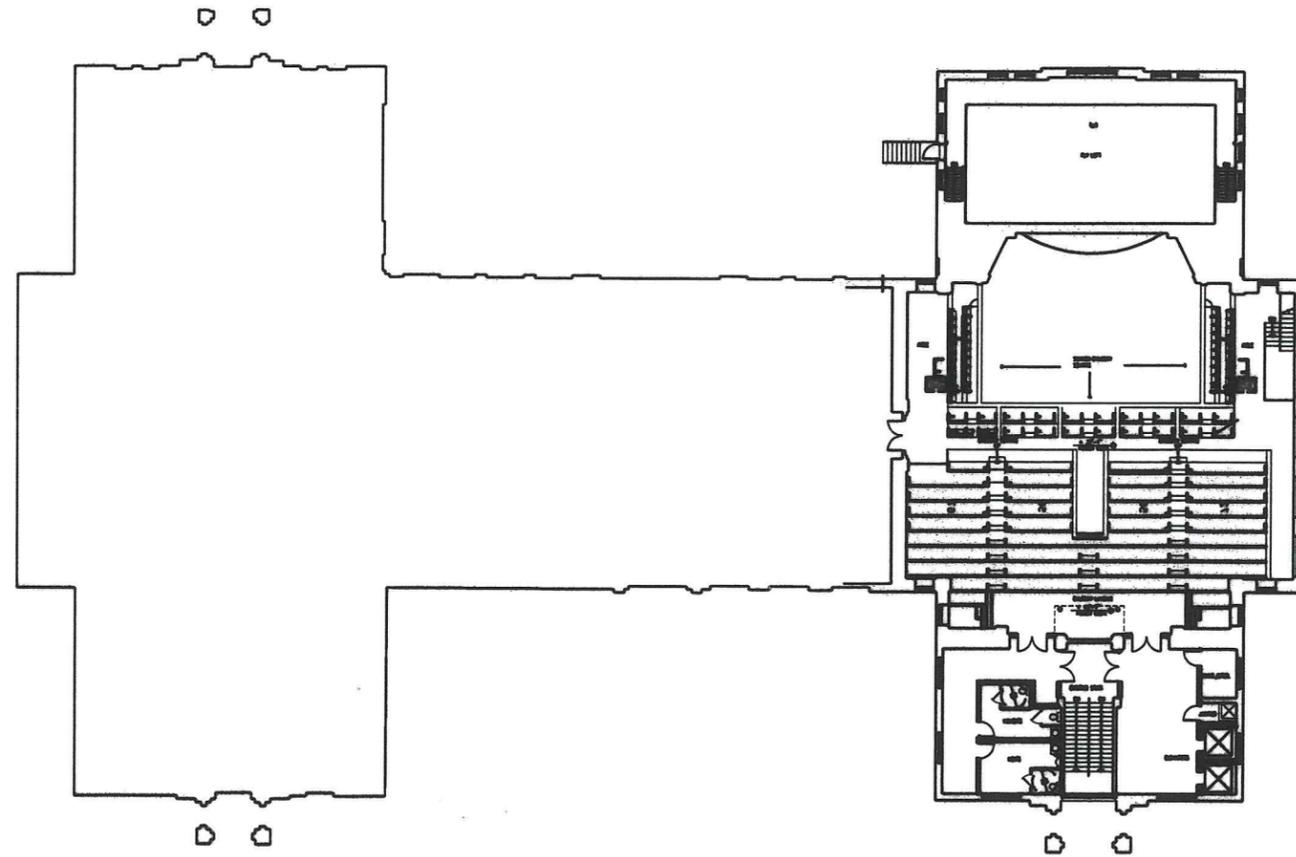
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Additions and Renovations:
Memorial Boulevard Theatre
 70 Memorial Boulevard
 Bristol, Connecticut

Project: 07148.00
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SCALE: 1/16" = 1'-0"
A-3



5 UPPER BALCONY LEVEL AUDITORIUM
1/16" = 1'-0"

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Additions and Renovations:
Memorial Boulevard Theatre
70 Memorial Boulevard
Bristol, Connecticut

Project:	07148.00
Architect:	MPS
Date:	11-20-2008
Scale:	
Sheet:	
Revised:	
By:	
Check:	
Appr:	

SCALE: 1/16" = 1'0"
A-6



3 NORTH ELEVATION
3/32" = 1'-0"

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Memorial Boulevard Theatre

70 Memorial Boulevard
 Bristol, Connecticut

Project: 07148.00
 Scale: 1/32" = 1'-0"
 Date: 11-20-2008

Scale: 3/32" = 1'-0"
A-7



1 EAST ELEVATION
3/32" = 1'-0"



2 WEST ELEVATION
3/32" = 1'-0"

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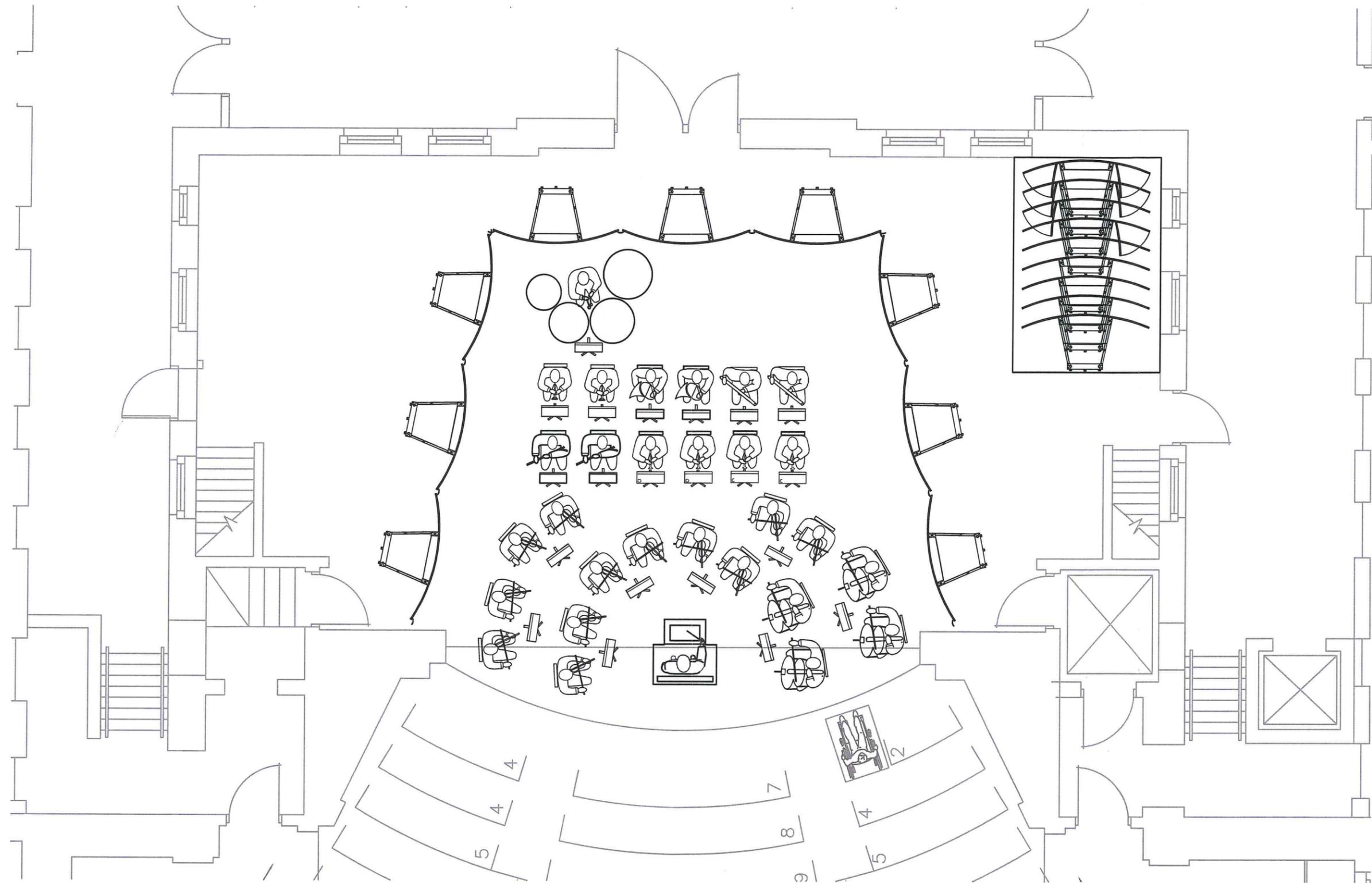


Additions and Renovations:
Memorial Boulevard Theatre
70 Memorial Boulevard
Bristol, Connecticut

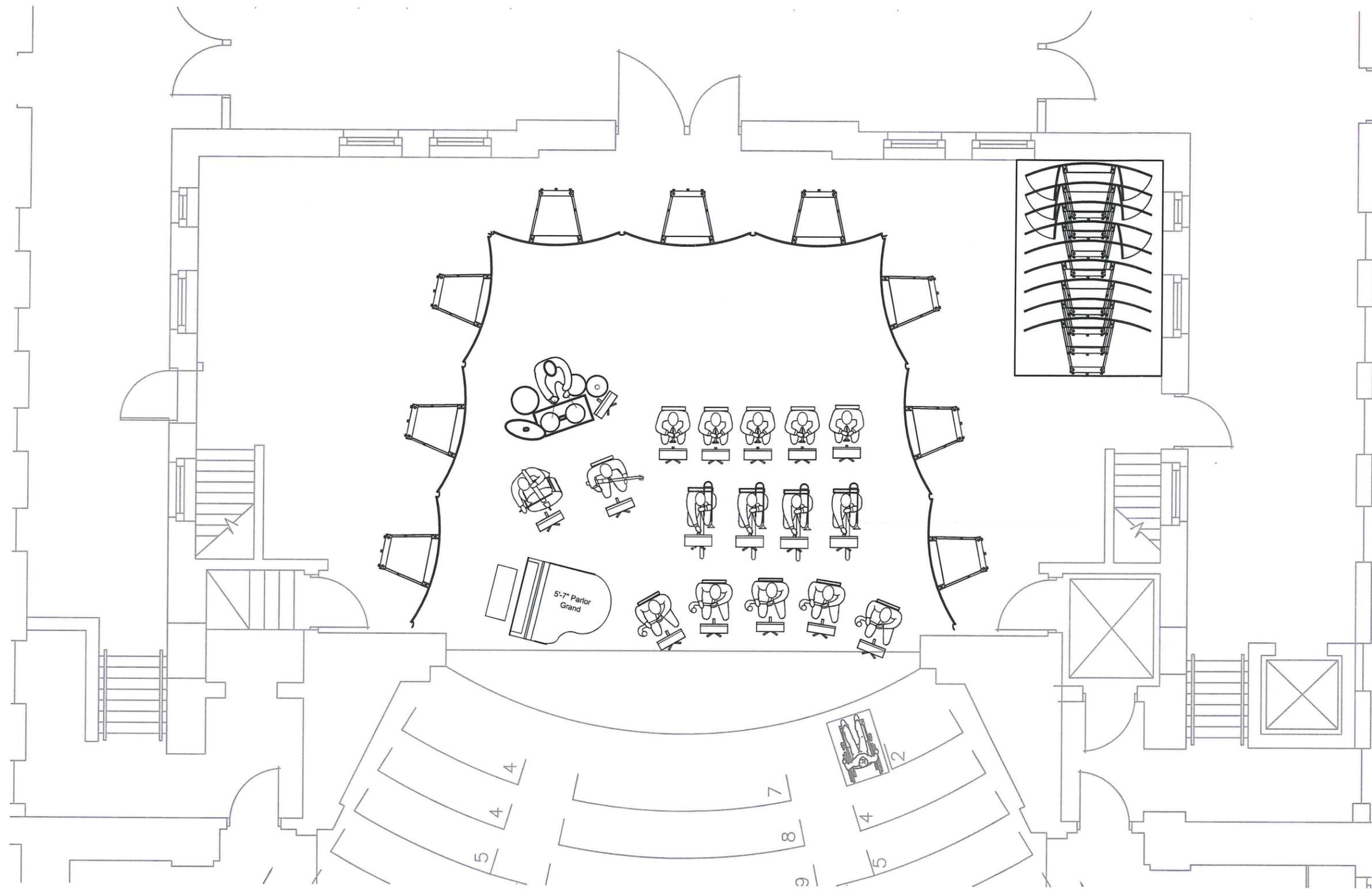
Project: 07148.00
Initials: MFS
Date: 11-20-2008
Revisions:

SACLE: 3/32" = 1'-0"

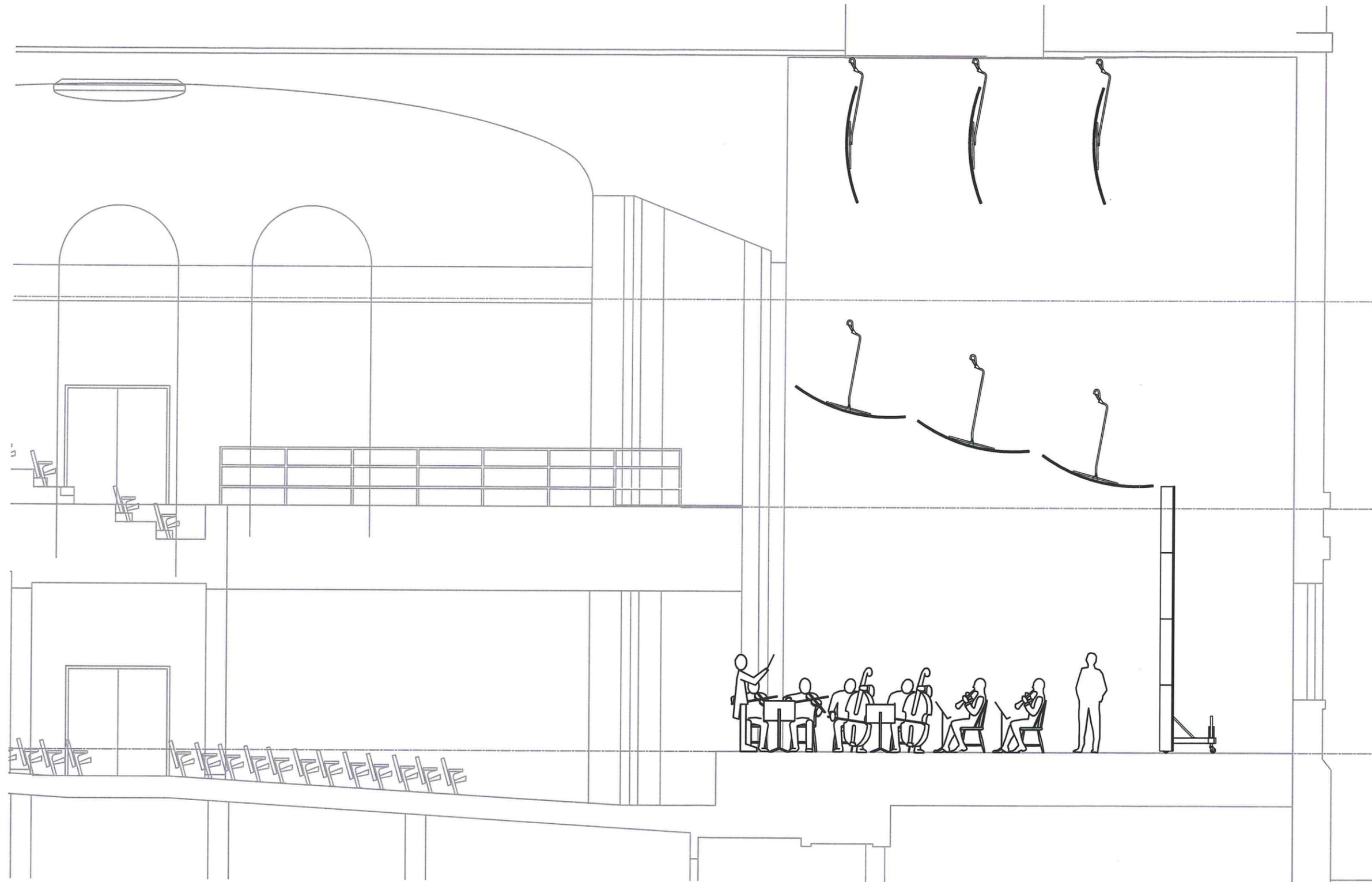
A-8



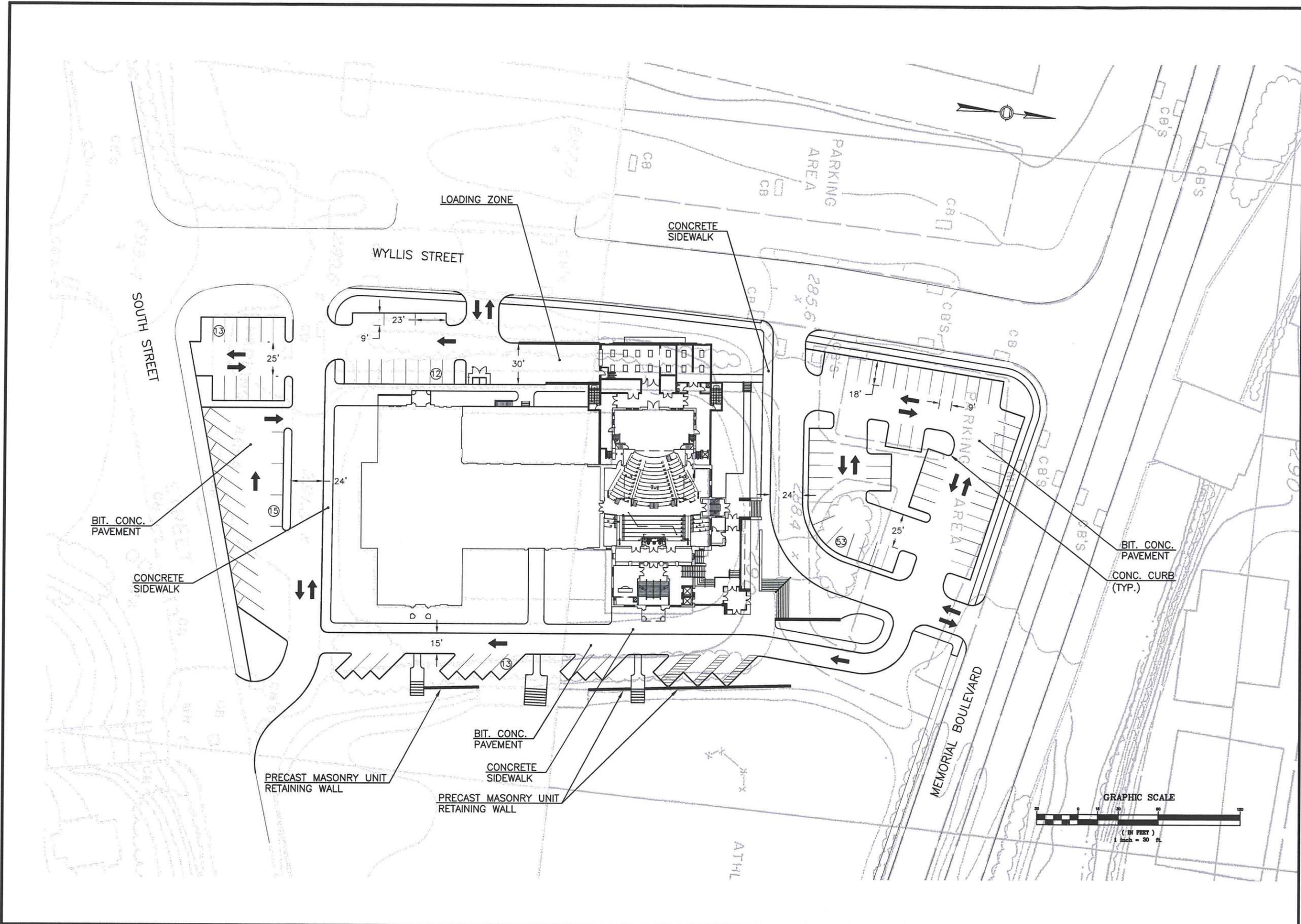
SK-01	DRAWING	SCALE 1/8"=1'	DATE 10OCT08	PROJECT Memorial Boulevard Theater
	PROJ# 08-0039	BY MAW	TITLE Conceptual Orchestra Shell Layout - Plan Chamber Orchestra	JaffeHolden 114-A Washington St., Norwalk, CT 06854 T: (203) 838.4167 / F: (203) 838.4168 1453 3rd St. Prom., Santa Monica, CA 90401 T: (310) 319.1333 / F: (310) 319.1344 JaffeHolden.com



SK-02	DRAWING	SCALE 1/8" = 1'	DATE 10OCT08	PROJECT Memorial Boulevard Theater
	PROJ# 08-0039	BY MAW	TITLE Conceptual Orchestra Shell Layout - Plan Big Band	JaffeHolden 114-A Washington St., Norwalk, CT 06854 T: (203) 838.4167 / F: (203) 838.4168 1453 3rd St. Prom., Santa Monica, CA 90401 T: (310) 319.1333 / F: (310) 319.1344 JaffeHolden.com



SK-03	DRAWING	SCALE 1/8"=1'	DATE 10OCT08	PROJECT Memorial Boulevard Theater
	PROJ# 08-0039	BY MAW	TITLE Conceptual Orchestra Shell Layout - Section Chamber Orchestra	JaffeHolden 114-A Washington St., Norwalk, CT 06854 T: (203) 838.4167 / F: (203) 838.4168 1453 3rd St. Prom., Santa Monica, CA 90401 T: (310) 319.1333 / F: (310) 319.1344 JaffeHolden.com



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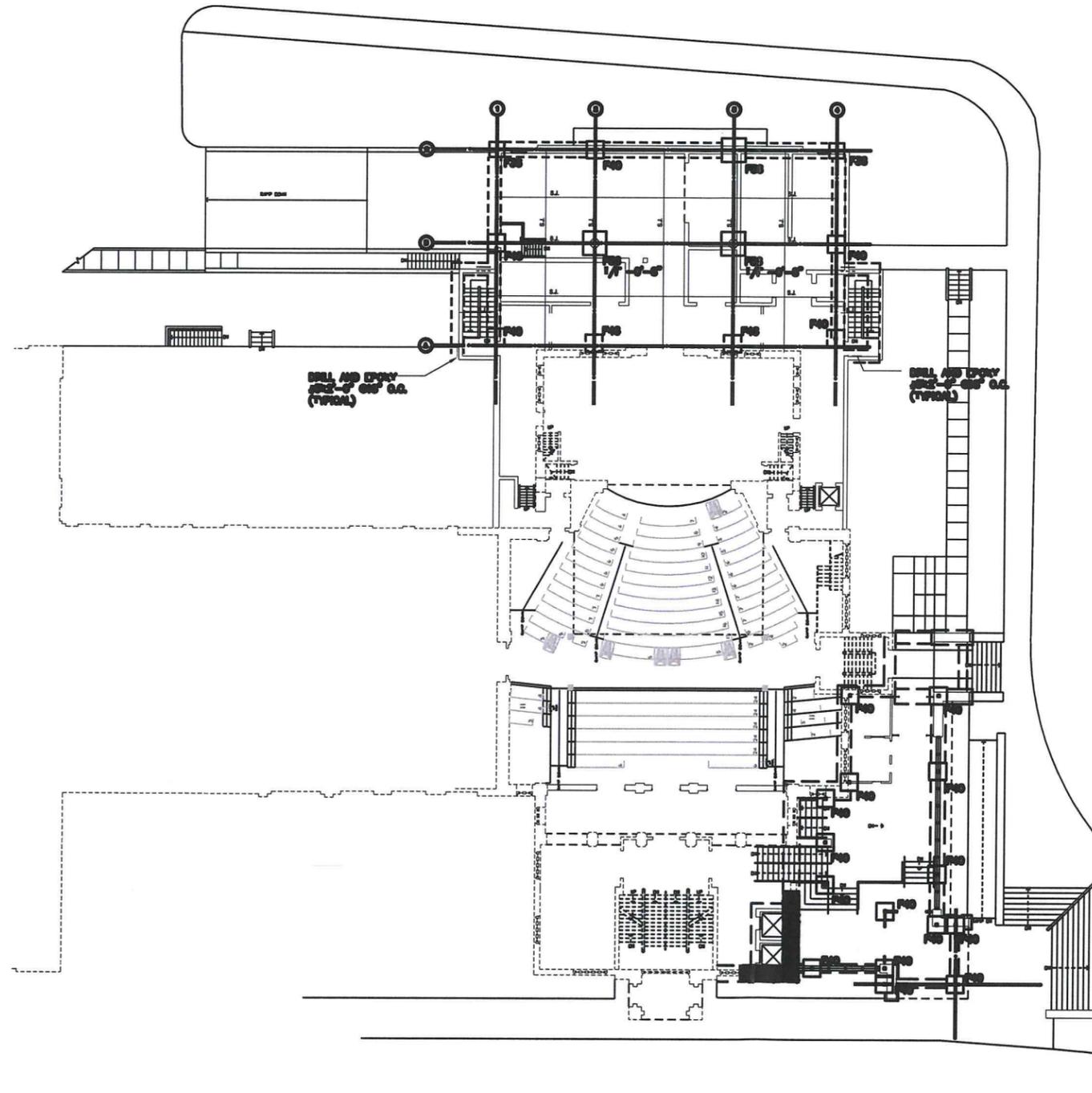
PURCELL
 ASSOCIATES
 CONSULTING ENGINEERS
 90 National Drive • Greenwich, Connecticut 06033
 (603) 633-8341

Memorial Boulevard Theatre
 Additions and Renovations:
 70 Memorial Boulevard
 Bristol, Connecticut

Project: 07148.00
 Initials: PAR
 Date: 10-30-08
 Revisions:

LAYOUT PLAN

C-1.0



Footings Schedule (2 Tons/SF)

TYPE	FOOTING SIZE		BOTTOM REINFORCEMENT (2' CLR FROM BOTTOM)
	LENGTH x WIDTH	DEPTH	
F30	3'-0" x 3'-0"	1'-0"	(4)-#4 Each way
F30	3'-0" x 3'-0"	1'-0"	(4)-#4 Each way
F40	4'-0" x 4'-0"	1'-0"	(5)-#5 Each way
F40	4'-0" x 4'-0"	1'-0"	(5)-#5 Each way
F50	5'-0" x 5'-0"	1'-0"	(7)-#5 Each way
F50	5'-0" x 5'-0"	1'-0"	(7)-#5 Each way

LOWER LEVEL and FOUNDATION PLAN

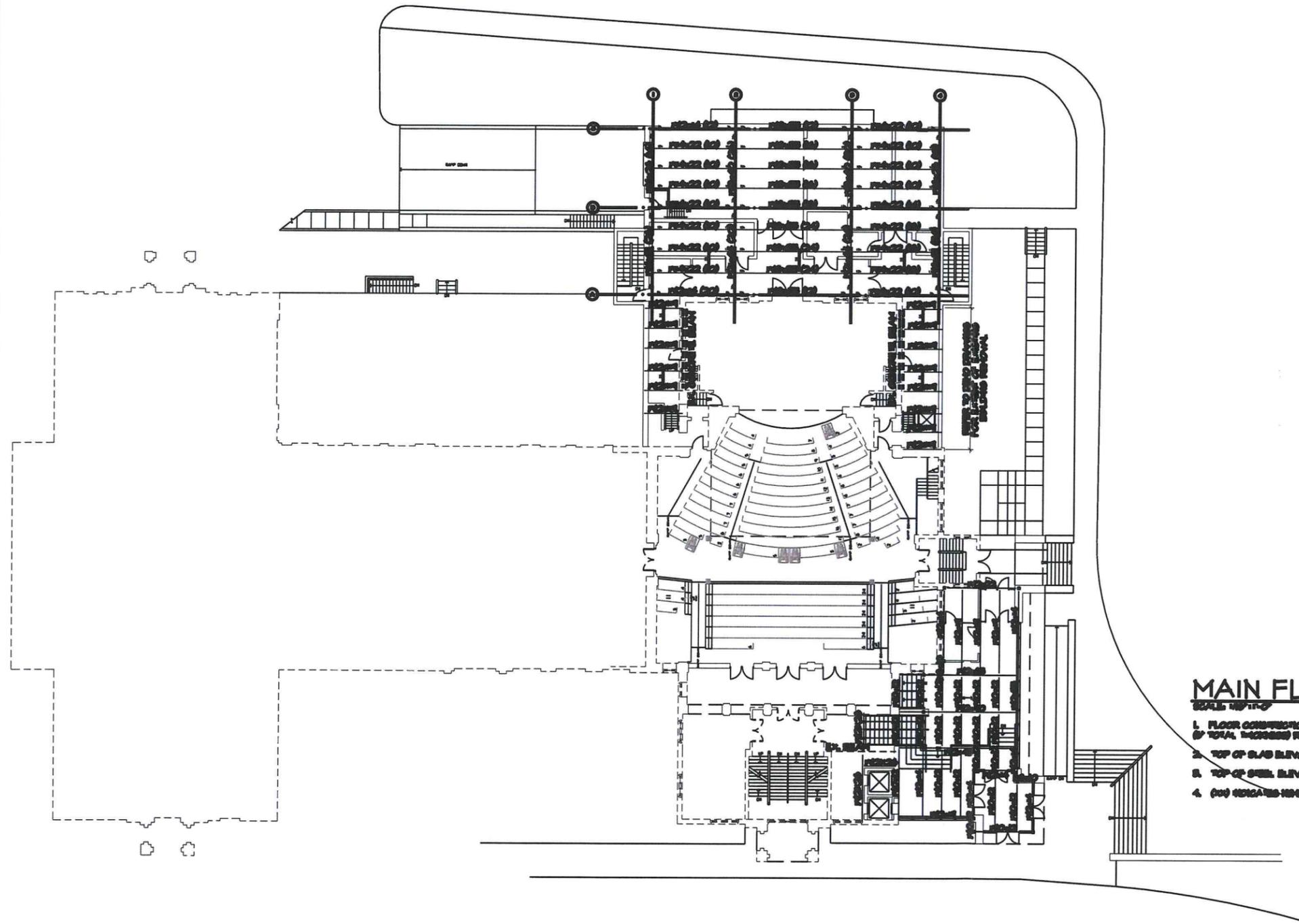
- SCALE 1/8"=1'-0"
1. TOP OF CONCRETE SLAB ELEVATION= 0'-0" UNLESS OTHERWISE NOTED
 2. FLOOR CONSTRUCTION OF CONCRETE SLAB NEXT, 5"= 5/8" REINFORC. BARS, (D-WIRES) OVER A ONE A 10 MIL. VAPOR BARRIER OVER A MINIMUM OF 12" LAYER OF COMPACTED 3/4" STONE.
 3. "S.A." INDICATES SHEET CONTROL JOINT, REFER TO TYPICAL DETAILS.
 4. "T.O.F." INDICATES TOP OF FOOTING ELEVATION FROM ELEVATION 0'-0".
 5. "S.L." INDICATES FINISHED SLAB BELOW MASONRY, REFER TO TYPICAL DETAILS.
 6. COORDINATE ALL SLAB ON GRADE EXPANSIONS WITH ARCH. DRAWINGS.
 7. COORDINATE ALL PLUMBING SCHEDULES AND LOCATIONS WITH PLUMBING & SPEC DRAWINGS.

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 Torrville, CT 06081
 860.658.4496

Memorial Boulevard Theatre
 Additions and Renovations:
 70 Memorial Boulevard
 Bristol, Connecticut

Project: 07148.00
 Initials: _____
 Date: _____
 Revisions:



MAIN FLOOR FRAMING PLAN

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

1. FLOOR CONSTRUCTION: 3" THICK NORMAL WEIGHT CONCRETE ON 1" THICK LOK GALV. CORRUGATED FLOOR DECK (3" TOTAL THICKNESS) REINFORCED WITH 6#-PLATE REBAR FIBER FABRIC (2-#4'S)
2. TOP OF SLAB ELEVATION (+0'-0")
3. TOP OF STEEL ELEVATION (+0') FROM TOP OF SLAB
4. (20) INDICATES NUMBER OF SHEAR STUDS WELDED TO THE TOP FLANGE OF STEEL BEAMS.

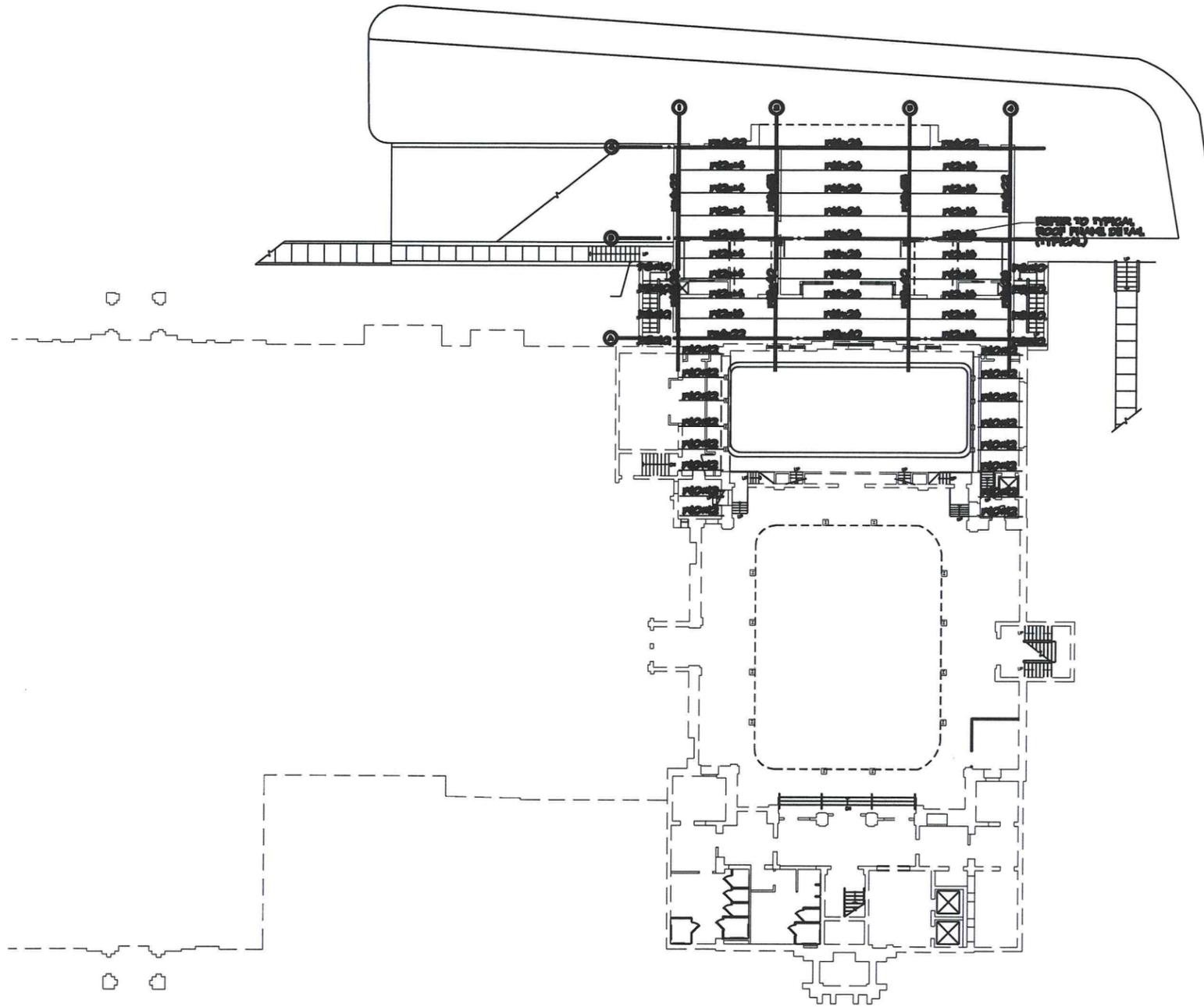
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Project: 07148.00
 Initials:
 Date:
 Revisions:

70 Memorial Boulevard
 Bristol, Connecticut



ROOF FRAMING PLAN

- 1. FINISH ROOF ELEVATION GIVEN ON PLAN IS TO THE SURFACE OF ROOF DECK. ELEVATION (60'-10") IS FROM FIRST FLOOR FINISH.
- 2. ROOF CONSTRUCTION: 1 1/2" MIN. 20 GA. GALV METAL ROOF DECK REFER TO SPECIFICATION FOR FINISH REQUIREMENTS.

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 860.582.1111

Additions and Renovations:
Memorial Boulevard Theatre
 70 Memorial Boulevard
 Bristol, Connecticut

Project: 07148.00
 Initials:
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Spec Section	Description	Area (sf)	34,726	
8	DOORS & WINDOWS			477,001
08110	Steel Doors and Frames		62,192	
08211	Flush Wood Doors		0	
08305	Access Doors		1,000	
08310	Overhead Doors		8,094	
08410	Aluminum Entrances & Storefront		296,151	
08710	Finish Hardware		85,313	
08800	Glazing		24,249	
9	FINISHES			940,335
09255	Gypsum Board & Plaster Assemblies		397,862	
09310	Ceramic Tile		121,530	
09511	Acoustical Panel Ceilings		43,693	
09661	Resilient Tile Flooring, Wall Base & Accessories		56,415	
09680	Carpeting		75,283	
09800	Acoustical Treatments		82,067	
09900	Painting		163,483	
10	SPECIALTIES			167,963
10100	Visual Display Boards		4,851	
10155	Toilet Compartments		41,608	
10200	Louvers and Vents		8,998	
10425	Signs		48,458	
10505	Metal Lockers		15,011	
10522	Fire Extinguishers, Cabinets & Accessories		8,067	
10800	Toilet Accessories		40,970	
11	EQUIPMENT			1,147,847
11060	Theatre and Stage Equipment		642,103	
11132	Audio Visual Systems & Equipment		500,000	
11452	Residential Appliances		5,744	
12	FURNISHINGS			293,506
12484	Floor Mats & Frames		17,667	
12491	Horizontal Louver Blinds		27,799	
12660	Fixed Audience Seating		248,040	
14	CONVEYANCE DEVICES			340,849
14200	Hydraulic Elevator		340,849	
15	MECHANICAL			2,130,000
15300	Fire Protection		275,000	
15400	Plumbing		500,000	
15500	HVAC		1,240,000	
15952	Building Management Controls System		115,000	
16	ELECTRICAL			1,270,000
16000	Electrical		1,270,000	
Sub-Total			10,968,526	1.30
6.25%	General Conditions		685,533	
0.18%	Building Permit-State Only		14,857	
0.80%	General Liability Insurance		93,351	
0.50%	Phasing & Temporary Conditions		58,270	
8.50%	Contingency-Design & Estimating		979,636	
5.00%	Escalation to Bid Day March 1, 2010		800,388	
1.00%	Construction Manager's Bond		136,006	
3.50%	Construction Manager's Fee		480,780	
0.30%	PreConstruction		42,653	
TOTAL			14,260,000	

Spec Section	Description	Area (sf)	34,726
2	SITE CONSTRUCTION		1,421,270
	Site Work General Conditions	128,250	
02070	Off-Site Utilities	0	
02080	Hazardous Materials Abatement	180,000	
02090	Selective Building Demolition	109,572	
02121	Erosion & Sedimentation Controls	29,915	
02140	Dewatering	15,000	
02225	Excavation & Backfill	148,899	
02300	Earthwork	107,904	
	Site Utilities-Electrical	93,446	
02700	Storm Drainage	142,898	
	Water Piping	44,416	
02730	Sanitary Sewer Piping	42,215	
	Propane Gas Service	0	
02741	Bituminous Concrete Pavement	139,846	
02751	Concrete Pavement & Curbs	101,623	
02772	Bituminous & Pre Cast Concrete Curb	66,355	
02870	Site Improvements	1,786	
02910	Topsoil	in Below	
02920	Lawns	28,353	
02930	Plantings	40,791	
3	CONCRETE		589,823
03301	Foundations	431,562	
03302	Slab-on-Grade	85,512	
03303	Slab-on-Metal Deck	72,749	
4	MASONRY		1,046,311
04210	Unit Masonry Assemblies	703,989	
04400	Architectural PreCast Concrete	192,322	
04510	Building Envelope Restoration-allowance	150,000	
5	METALS		625,213
05120	Structural Steel	307,783	
05310	Composite Form Deck	68,727	
05320	Metal Roof Decking	11,144	
05500	Metal Fabrications	75,145	
05510	Metal Stairs	145,992	
05810	Expansion Joint Cover Assemblies	16,421	
6	WOOD AND PLASTICS		205,916
06105	Miscellaneous Carpentry	27,162	
06206	Architectural Trades	78,331	
06402	Interior Architectural Woodwork	100,424	
7	THERMAL AND MOISTURE PROTECTION		312,492
07111	Composite Sheet Waterproofing	39,798	
07240	Aluminum Composite Panel	15,064	
07531	Membrane Roofing	138,303	
07720	Roof Accessories	29,675	
07810	Spray-On Fireproofing	34,532	
07841	Through-Penetration Firestop Systems	12,480	
07842	Fire Resistive Joint System	23,920	
07901	Joint Sealants	18,720	

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Unit Measure	Extension 31,200
02000 Site Work General Conditions						
	allow	\$19,000.00	/allo	1	allo	19,000
	Site SubContractor OH & P	\$950,000.00	\$\$	11.50%	%	109,250
	Site Work General Conditions					128,250
02010 Off Site Utilities						
	Existing	\$0.00	/allo	1	allo	0
	Off Site Utilities					0
02121 Erosion and Sedimentation Control						
	Anti-tracting Pads incl fabric	\$22.00	/ton	120	ton	2,640
	Stone Check Dam	\$35.00	/ton	42	ton	1,462
	Silt Fence	\$3.00	/lf	2,000	lf	6,000
	Hay Bayles at CB/MH/YD	\$55.00	/each	128	each	7,040
	Construction Fence and gates at North Site Only	\$9.85	/lf	980	lf	9,653
	Maintenance	\$52.00	/hr	60	hr	3,120
	Erosion and Sedimentation Control					29,915
02140 Dewatering						
		\$15,000.00	/allo	1	allo	15,000
	Dewatering					15,000
02300 Earthwork						
Slab Prep						
	15 Mil Vapor Barrier below Slab on Grade	\$1.25	/sqft	0	sqft	in Bldg
	Gravel Base for Slab-on-grade	\$22.12	/cuyd	0	cuyd	in Bldg
Excavation/Fill						
	Foundation Excavation	\$12.10	/cuyd	0	cuyd	in Bldg
	Foundation Backfill	\$14.63	/cuyd	0	cuyd	in Bldg
	Off-site Structural Fill	\$14.29	/cuyd	0	cuyd	in Bldg
	Interior MEP Excavation & Backfill in Clean Zone	\$28.00	/cuyd	0	cuyd	in Bldg
	Disposal of Spoil	\$8.00	/cuyd	0	cuyd	in Bldg
	Site Work					
	Tree Clearing-light to medium	\$15,000.00	/ac	0	ac	6,750
	Strip Existing Topsoil	\$5.32	/cuyd	186	cuyd	990
	On-Sites Cuts & Fills	\$7.95	/cuyd	922	cuyd	7,330
	-Premium Rock Excavation-Mass	\$7.00	/cuyd	0	cuyd	0
	-excavate & crush	\$9.00	/cuyd	0	cuyd	0
	-backfill from stockpile	\$8.00	/cuyd	0	cuyd	0
	-Trench	\$62.00	/cuyd	0	cuyd	0
	-excavate & crush	\$10.75	/cuyd	0	cuyd	0
	-backfill from stockpile	\$9.00	/cuyd	0	cuyd	0
	Disposal of Excess	\$4.75	/cuyd	1,108	cuyd	5,263
###	Rough Grading	\$3.45	/sy	9,110	sy	31,430
	Site Demolition					
	Removal of Existing-Bituminous Paving	\$5.84	/sy	4,655	sy	27,185
	-Concrete Paving	\$2.46	/sf	6,100	sf	15,006
	-Concrete Curbing	\$3.90	/lf	1,654	lf	6,451
	-Utilities	\$7,500.00	/allow	1	ls	7,500
	Earthwork					107,904
02550 Site Utilities-Electrical						
	Site Power					
	Connection to HV at Existing CL&P Manhole	\$3,000.00	/ea	1	ea	3,000
	Primary Raceway-conductors by Building	\$24.00	/lf	136	lf	3,264
	Transformer Pad & Manhole	\$4,565.00	/ea	1	ea	in Bldg
	Primary Switch	\$0.00	/ea	1	ea	CL&P
	Pad Mounted Transformer	\$0.00	/ea	1	ea	CL&P
	Secondary Raceways incl 2 spare (6)	\$24.00	/lf	360	lf	in Bldg
	Conductors 500 MCM (4)	\$78.00	/lf	320	lf	in Bldg
	Concrete Encasement for Ductbank	\$169.00	/cy	22	cy	3,677
	Excavation in situ	\$12.18	/cy	50	cy	614

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Unit Measure	Extention
	Premium for Rock Excavation-Trench	\$62.00	/cy	0	cy	0
	-excavate & crush	\$10.75	/cuyd	0	cuyd	0
	-backfill from borrow	\$29.00	/cuyd	29	cuyd	831
	Disposal for Off-Site	\$6.50	/cy	50	cy	328
	Site Lighting					
	Conduit for Power	\$11.22	/lf	1,324	lf	14,855
	Excavation in situ	\$12.18	/cy	212	cy	2,580
	Premium for Rock Excavation-Trench	\$62.00	/cy	0	cy	0
	-excavate & crush	\$10.75	/cuyd	0	cuyd	0
	-backfill from borrow	\$24.00	/cuyd	207	cuyd	4,964
	Disposal for Off-Site	\$6.50	/cy	212	cy	1,377
	Site Lighting Fixtures-relocate Existing	\$1,560.00	/ea	0	ea	0
	-new 25' standards-single	\$2,115.00	/ea	6	ea	12,690
	-double	\$2,745.00	/ea	2	ea	5,490
	-new 15' standards-single	\$1,672.00	/ea	8	ea	13,376
	-bollard	\$496.00	/ea	8	ea	3,968
	Concrete Bases-small	\$269.00	/ea	8	ea	2,152
	-large	\$845.00	/ea	24	ea	20,280
	Site Telecommunications					
	Conduit-PVC-4" dia Sch 80	\$16.00	/lf	0	lf	Existing
	-Steel Coated PVC-4" dia	\$24.00	/lf	0	lf	0
	Excavation in situ	\$12.18	/cy	0	cy	0
	Premium for Rock Excavation-Trench	\$30.00	/cy	0	cy	0
	-excavate & crush	\$10.75	/cuyd	0	cuyd	0
	-backfill from stockpile	\$19.00	/cuyd	0	cuyd	0
	Disposal	\$6.50	/cy	0	cy	0
	Handhole	\$1,121.00	/ea	0	ea	0
	Site Utilities-Electrical					93,446
02700 Storm Drainage Piping						
	8" CPP	\$13.00	/lnft	180	lnft	2,340
	12" CPP/RCP	\$16.12	/lnft	120	lnft	1,934
	15" CPP	\$18.23	/lnft	200	lnft	3,646
	18" CPP	\$21.68	/lnft	90	lnft	1,951
	24" CPP	\$26.70	/lnft	0	lnft	0
	connect to exist	\$1,082.46	/ea	4	ea	4,330
	MH-4'0" dia-Casting,Transition & Connection	\$1,678.00	/ea	1	ea	1,678
	-Per Vertical Foot of Depth	\$132.00	/vlnft	12	vlnft	1,584
	CB-Casting, Connection & Sump	\$1,345.00	/ea	8	ea	10,760
	-Per Vertical Foot of Depth less 2'0 sump	\$126.00	/vlnft	40	vlnft	5,040
	YD-Casting & Connection	\$829.00	/ea	4	ea	3,316
	-Per Vertical Foot of Depth	\$62.00	/vlnft	12	vlnft	744
	Underdrainage-Drainage Structures-10' each	\$29.00	/lnft	0	lnft	in Building
	-Roof Runoff	\$29.00	/lnft	0	lnft	in Building
	End Sections-15"	\$290.00	/ea	0	ea	0
	-Stone (in-situ)	\$12.70	/ton	0	ton	0
	-Erosion Control-permanent	\$7.90	/sy	0	sy	0
	Excavation in situ	\$12.18	/cy	666	cy	8,112
	Premium for Rock Excavation-Trench	\$30.00	/cy	0	cy	0
	-excavate & crush	\$10.75	/cuyd	0	cuyd	0
	-backfill from borrow	\$24.00	/cuyd	539	cuyd	12,947
	Disposal	\$6.50	/cy	666	cy	4,329
	Traffic Control	\$348.00	/da	0	da	0
	Pavement-Temporary Patch only	\$32.00	/sy	0	sy	0
	Insulation at Other Utility Crossings	\$2.75	/sf	68	sf	187
	Allow for Storm Water Detention-Underground	\$65,000.00	/ls	1	lsum	65,000
	Allow to repair/Extend Existing Cut-Off Drain (1940?)	\$15,000.00	/ls	1	lsum	15,000
	Storm Drainage Piping					142,898
02720 Water & Fire Piping						
	8" Water-Incoming Service	\$48.00	/lf	110	lf	5,280
	8" fittings allow	\$361.99	/each	4	each	1,448
	6" Water	\$43.20	/lf	0	lf	0
	6" fittings allow	\$264.47	/each	0	each	0
	4" Water	\$38.88	/lf	110	lf	4,277

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Unit Measure	Extention
						31,200
	4" fittings allow	\$191.00	\$\$	4	\$\$	764
	3" Water	\$34.99	/lf	0	lf	0
	3 fittings allow	\$145.00	\$\$	0	\$\$	0
	8" Taping Fee	\$5,500.00	/ea	1	ea	5,500
	6" Taping Fee	\$4,150.00	/ea	0	ea	0
	4" Taping Fee	\$3,693.50	/ea	1	ea	3,694
	8" divison valves	\$1,355.00	/ea	1	ea	1,355
	6" divison valves	\$1,200.00	/ea	0	ea	0
	4" divison valves	\$1,068.00	/ea	1	ea	1,068
	1" copper to Irrigation & exterior drinking fountains	\$22.34	/lnft	0	lnft	0
	Hydrant	\$2,624.92	/ea	1	ea	2,625
	Excavation in situ	\$12.18	/cy	308	cy	3,751
	Premium for Rock Excavation-Trench	\$30.00	/cy	0	cy	0
	-excavate & crush	\$10.75	/cuyd	0	cuyd	0
	-backfill from borrow	\$24.00	/cuyd	296	cuyd	7,104
	Disposal	\$6.50	/cy	308	cy	2,002
	Test & Flush	\$1,200.00	/lsum	1	lsum	1,200
	Traffic Control	\$348.00	/da	2	da	696
	Pavement-Temporary Patch only	\$32.00	/sy	35	sy	1,120
	Trust Blocks	\$211.00	/ea	12	ea	2,532
	Water & Fire Piping					44,416
02730 Sanitary Sewer						
	Connect To Exist Manhole	\$776.00	/ea	1	ea	776
	-rebuild existing invert	\$941.00	/ea	1	ea	941
	Connect To Building Cast Iron at 5'0"	\$387.00	/ea	2	ea	774
	8" SDR 35	\$18.50	/lnft	335	lnft	6,198
	6" SDR 35	\$23.15	/lnft	86	lnft	1,991
	8" fittings	\$102.95	/ea	4	ea	412
	6" fittings	\$91.09	/ea	2	ea	182
	MH-4'0" dia-Casting, Transition & Connection	\$1,666.00	/ea	2	ea	3,332
	-Per Vertical Foot of Depth	\$132.00	/vlnft	16	vlnft	2,112
	Test	\$2,500.00	/lsum	1	lsum	2,500
	Excavation in situ	\$12.18	/cy	562	cy	6,842
	Premium for Rock Excavation-Trench	\$30.00	/cy	0	cy	0
	-excavate & crush	\$10.75	/cuyd	0	cuyd	0
	-backfill from borrow	\$24.00	/cuyd	521	cuyd	12,504
	Disposal for Off-Site	\$6.50	/cy	562	cy	3,651
	Traffic Control	\$348.00	/da	0	da	0
	Pavement-Temporary Patch only	\$32.00	/sy	0	sy	0
	Sanitary Sewer					42,215
02790 Natural Gas Service						
	Existing Service to be partially relocated	\$0.00	/ea	0	ea	0
	Pad	\$1,600.00	/ea	0	ea	0
	Enclosure	\$1,750.00	/ea	0	ea	0
	PVC Coated Steel Pipe-4" dia-welded	\$61.00	/lf	0	lf	0
	Excavation in situ	\$12.18	/cy	0	cy	0
	Premium for Rock Excavation-Trench	\$30.00	/cy	0	cy	0
	-excavate & crush	\$10.75	/cuyd	0	cuyd	0
	-backfill from stockpile	\$19.00	/cuyd	0	cuyd	0
	Disposal	\$6.50	/cy	0	cy	0
	Natural Gas Service					0
02741 Bituminous Concrete Pavement						
	### Fine Grading	\$1.35	/sy	5,490	sy	7,412
	Bituminous Asphalt Concrete Paving-finish 1 1/2"	\$72.00	/ton	474	ton	34,095
	-base 1 1/2"	\$70.00	/ton	474	ton	33,148
	Process Stone Base 6"	\$12.87	/ton	1,576	ton	20,287
	Gravel Base-12"	\$14.76	/cy	2,075	cuyd	30,632
	Filter Paper	\$1.12	/sy	6,314	sy	7,072
	Bituminous Patch	\$32.00	/sy	225	sy	7,200
	Bituminous Concrete Pavement					139,846

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Unit Measure	Extention 31,200
02751 Concrete Pavement & Curbs						
	Concrete Pavement 5" thickness	\$7.00	/sqft	12,890	sqft	90,230
	Process Stone Base 6"	\$14.16	/ton	393	ton	5,557
	Gravel Base-6"	\$16.24	/cy	271	cuyd	4,395
	Premium Cost of Integral Curb	\$18.35	/lnft	0	lnft	0
	Premium Cost of ADA Ramps	\$2.12	/sqft	680	sqft	1,442
	Concrete Pavement & Curbs					101,623
02772/3 Curbing						
	Bituminous Curbing	\$5.15	/lnft	0	lnft	0
	Concrete Curb-straight	\$21.25	/lnft	2,438	lnft	51,808
	-curved	\$29.75	/lnft	489	lnft	14,548
	-raised at planters	\$41.65	/lnft	0	lnft	0
	Curbing					66,355
02870 Site Improvements						
	Line Painting-parking-standard stall	\$9.90	/each	20	each	198
	-ADA stall	\$42.00	/each	4	each	168
	-Bus stall	\$42.00	/each	0	each	0
	-Fire Lane Designation	\$450.00	/each	1	each	450
	-centerline/curb	\$1.85	/lnft	0	lnft	0
	-stop signs	\$125.00	/each	0	each	0
	-turning arrows etc.	\$125.00	/each	0	each	0
	-cross wlk identification	\$320.00	/each	2	each	640
	Traffic Control-signage	\$55.00	/each	6	each	330
	Utility Enclosure Fencing-8"0 high	\$18.95	/lnft	0	lnft	0
	-Gates-Pair 5'0	\$980.00	/leaf	0	leaf	0
	-Single-4'0	\$710.00	/leaf	0	leaf	0
	Wooden Guardrails	\$38.00	/lnft	0	lnft	0
	Site Improvements					1,786
02920 Lawns						
	Fine Grade & Seed	\$0.32	/sqft	28,785	sqft	9,211
	Topsoil	\$26.35	/cuyd	576	cuyd	15,170
	Maintenance	\$46.00	/hr	86	hr	3,972
	Lawns					28,353
02930 Planting						
	Allow					
	Large Shad Trees	\$550.00	/each	14	each	7,700
	Small Flowering Tree	\$476.00	/each	12	each	5,712
	Shurbs	\$89.00	/each	64	each	5,696
	Evergreen Screening Shrubs-4'	\$98.71	/each	12	each	1,185
	-6'-8'	\$312.00	/each	9	each	2,808
	Processed Planting Mix	\$27.70	/cuyd	133	cuyd	3,677
	Mulch	\$27.70	/cuyd	111	cuyd	3,075
	Tree Grates	\$1,091.35	/each	4	each	4,365
	Tree Guards	\$608.35	/each	4	each	2,433
	Maintenance	\$46.00	/hr	90	hr	4,140
	Planting					40,791

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Area (nsf) Unit Measure	34,726 Extention
02080 Hazardous Materials Abatement						
	Lead Paint Abatement					
	Stairs-Newel Post	\$9.13	/sqft	324	sqft	2,959
	-Stringers	\$10.19	/sqft	756	sqft	7,705
	-Risers	\$9.28	/sqft	741	sqft	6,874
	-Railings & Guardrails	\$4.15	/sqft	2,808	sqft	11,652
	Structural Steel-non-structural	\$11.44	/sqft	0	sqft	encased
	-structural-connections-1 sf areas	\$11.44	/sqft	200	sqft	2,288
	Radiators	\$0.00	/sqft	0	sqft	disposal
15%	Hollow Metal Work-Doors to remain	\$253.34	/each	32	each	8,227
24%	-Frames to remain	\$192.40	/each	32	each	6,248
	Plaster-walls	\$4.27	/sqft	7,800	sqft	33,340
	-ceilings	\$6.26	/sqft	9,320	sqft	58,351
	Window Casing-Wood	\$9.36	/sqft	1,050	sqft	9,828
	Disposal-drum	\$1,001.62	/each	32	each	32,528
	Hazardous Materials Abatement					180,000
02090 Selective Building Demolition						
	Remove Slab on Grade	\$5.04	/sqft	960	sqft	4,842
	Remove Foundation Walls-selective	\$41.60	/sqft	278	sqft	11,565
	Remove Masonry Walls-total	\$4.15	/sqft	1,124	sqft	4,664
	-partial	\$6.35	/sqft	435	sqft	2,764
	Remove Doors Frames & Hardware	\$101.82	/leaf	18	leaf	1,833
	Remove Exterior Windows & Glazing	\$0.00	/sqft	0	sqft	in Div 8
	Remove Ceilings	\$1.02	/sqft	1,190	sqft	1,213
	Remove Flooring	\$1.35	/sqft	6,500	sqft	8,788
	Progressive Cleaning	\$51.74	/hr	1,038	hr	53,706
	-Dumpspters	\$621.92	/each	32	each	20,197
	Selective Building Demolition					109,572
02225 Excavation & Backfill						
	Fine Grade	\$0.16	/sqft	6,363	sqft	993
	Vapor Barrier below Slab on Grade	\$1.16	/sqft	6,681	sqft	7,782
	Sub-Base 8" 3/4 stone	\$21.96	/ton	247	tons	5,431
	Base 4" 3/8 stone	\$25.92	/ton	122	tons	3,157
	Excavation & Backfill-Building					
	Foundation Excavation	\$10.52	/cuyd	2,802	cuyd	29,495
	Foundation Backfill-borrow	\$29.12	/cuyd	2,180	cuyd	63,472
	Rock Excavation-Premium-Mass	\$15.60	/cuyd	0	cuyd	0
	-excavate & crush	\$9.36	/cuyd	0	/cuyd	0
	-backfill from stockpile	\$8.32	/cuyd	0	/cuyd	0
	-Trench	\$43.68	/cuyd	0	cuyd	0
	-excavate & crush	\$11.18	/cuyd	0	cuyd	0
	-backfill from stockpile	\$9.36	/cuyd	0	cuyd	0
	Footing Preparation					
	Geotect Paper	\$0.70	/sqft	0	sqft	0
	Stone Base	\$26.11	/ton	0	tons	0
	Concrete Mud Slab	\$4.28	/sqft	0	sqft	0
	Foundation Drainage	\$22.46	/lf	544	lf	12,220
	Interior MEP Excavation & Backfill	\$57.20	/cuyd	80	cuyd	6,864
	Disposal of Spoil	\$6.76	/cuyd	2,882	cuyd	19,485
	Excavation & Backfill					148,899
Foundations						
85	Wall Footings-frost	\$426.40	/cuyd	45	cuyd	19,137
125	-retaining wall	\$411.84	/cuyd	70	cuyd	28,726
140	Spread Footings	\$414.96	/cuyd	93	cuyd	38,541
120	Foundation Walls-frost	\$438.88	/cuyd	91	cuyd	39,947
200	-retaining wall	\$505.44	/cuyd	167	cuyd	84,611
240	Piers	\$531.44	/cuyd	0	cuyd	0
275	Pilasters	\$542.88	/cuyd	4	cuyd	2,172
	Underpinning	\$1,037.92	/cuyd	18	cuyd	18,683
80	Elevator Pit-Mat	\$427.44	/cuyd	12	cuyd	5,006
98	-Walls	\$483.60	/cuyd	15	cuyd	7,312
	Reinforcing Steel	\$1,978.08	/tons	37	tons	73,543
	2" EPS Insulation @ Slabs & Foundations, 4'-0"	\$2.20	/sqft	4,556	sqft	10,045
Site Retaining Walls						
	UniBlock Masonry Walls					

Spec				Area (nsf)	34,726	
Section	Description	Unit	Unit	Quantity	Unit	
		Cost	Measure		Extension	
				Measure		
	Stone Footing	\$26.11	/ton	66	tons	1,727
	Geotect Paper	\$0.70	/sqft	941	sqft	655
	Walls	\$2.20	/sqft	855	sqft	1,885
	Underdrains to daylight	\$22.46	/lf	240	lf	5,391
	Retaining Walls					
125	Footings-retaining wall	\$411.84	/cuyd	48	cuyd	19,768
200	Walls-retaining wall	\$505.44	/cuyd	60	cuyd	30,326
	Reinforcing Steel	\$1,978.08	/tons	10	tons	20,532
	Underdrains to daylight	\$22.46	/lf	240	lf	5,391
	Site Stairs-Slab-On-Grade	\$61.36	/lf	296	lf	18,163
	Foundations			623	\$ 692.98	431,562
	Slab on Grade					
	Fine Grade-touchup only	\$0.11	/sqft	6,363	sqft	728
	Place Concrete-5"SOG	\$40.56	/cy	112	cy	4,542
	Normal Weight Concrete FOB-4,000 psi	\$96.26	/cy	112	cy	10,780
	Hard Trowelled Finish-5"SOG	\$1.06	/sqft	6,363	sqft	6,750
	Concrete Equipment-Pump	\$1,300.00	/day	0	day	0
	Concrete Reinforcement-rebar	\$1,996.80	/ton	3	ton	5,990
	-WWM-6 x 6 10/10	\$0.43	/sqft	6,936	sqft	2,957
	Column Diamonds-full	\$106.08	/each	2	each	212
	-partial	\$82.16	/each	18	each	1,479
	Control Joints-saw cut 1/4 depth	\$2.07	/lf	1,400	lf	2,897
	Concrete Trench Patches	\$12.53	/sqft	960	sqft	12,031
	Concrete Stairs on Grade	\$43.68	/lf	115	lf	5,023
	Orchester Renovations			0.50	4,704	sf
	Floor Preparation-Shot Blast	\$0.67	/sqft	4,704	sqft	3,131
	Form Risers	\$12.70	/lf	48	lf	610
	Place Concrete	\$44.34	/cy	94	cy	4,171
	Light Weight Concrete FOB-4,000 psi	\$96.26	/cy	94	cy	9,056
	Finish Concrete	\$1.92	/sf	4,704	sf	9,050
	Concrete Equipment-Pump	\$1,341.60	/day	2	day	2,683
	Concrete Reinforcement-rebar	\$2,392.00	/ton	0	ton	598
	-WWM-6 x 6 10/10	\$0.43	/sqft	5,127	sqft	2,186
	Curing	\$0.14	/sqft	4,704	sqft	636
	Bulkheads	\$17.63	/lf	0	lf	0
	Orchester Renovations			6.83	/sf	32,122
	Slab on Grade			7.73	/sf	85,512
	Slab on Metal Deck					
	Deck Preparation-cleaning only	\$0.09	/sqft	14,856	sqft	1,391
	Place Concrete-3 1/2" over 1 1/2" flute	\$24.96	/cy	208	cy	5,191
	Normal Weight Concrete FOB-4,000 psi	\$114.14	/cy	208	cy	23,739
	Hard Trowelled Finish-floors	\$1.97	/sqft	9,584	sqft	18,838
	Float Finish-roof	\$0.71	/sqft	5,272	sqft	3,728
	Concrete Equipment-Pump	\$1,341.60	/day	2	day	2,683
	Concrete Reinforcement-rebar	\$2,032.16	/ton	6	ton	12,831
	-WWM-6 x 6 10/10	\$0.43	/sqft	16,193	sqft	6,905
	Curing	\$0.14	/sqft	14,856	sqft	2,009
	Bulkheads & Riser Forms	\$17.63	/lf	0	lf	0
	Expansion Joint Preparation	\$18.62	/lf	64	lf	1,191
	Concrete Fill @ Pan Stairs	\$390.00	/cuyd	6	cuyd	2,151
	Locker Bases	\$10.17	/sf	60	sf	610
	Housekeeping Pads	\$10.26	/sf	280	sf	2,874
	Upper Balcony Renovations					
06150	Cold Rolled Framing			1,946	sf	
	6' 16 ga - metal studs-reinforced partitions	\$3.94	/lf	1,248	lf	4,919
	-bearing partitions	\$4.28	/lf	504	lf	2,160
	- track	\$3.24	/lf	3,504	lf	11,370
	- diagonal bracing	\$3.56	/lf	0	lf	0
	Sheet Rock in Wall Furring	\$0.00	/sqft	0	sqft	0
	Epoxy Anchors to Existing Concrete & Masonry	\$16.04	/each	876	ea	14,048
	Metal Deck on Landings	\$2.58	/sqft	2,282	sqft	5,884
	-edge screed	\$3.56	/lf	780	lf	2,774
	Pre-Cast Concrete Plank Risers-2" nominal	\$12.44	/sqft	1,170	sf	14,553
	Place Concrete-3 1/2" thick	\$64.62	/cy	25	cy	1,592
	LW Concrete FOB-4,000 psi	\$116.48	/cy	26	cy	2,987
	Concrete Pump	\$1,341.60	/day	1	day	805
	Finish Concrete	\$3.24	/sqft	2,282	sqft	7,403

Spec Section	Description	Unit	Unit Measure	Quantity	Area (nsf)	34,726	Extention
	Reinforcing	\$2,392.00	/ton	1			3,002
	-WWM-6 x 6 10/10	\$0.50	/sqft	2,510			1,253
	Upper Balcony Renovations			37.38	/sf		72,749
	Slab on Metal Deck			9.74	/sf		156,891
04200	Masonry Units						
	Face Brick - (allow \$600/M)	\$25.89	/sqft	9,293	sqft		240,555
	- premium for textured	\$2.55	/sqft	4,428	sqft		11,283
3	CMU-standard-lightly reinforced	\$14.66	/sqft	1,400	sqft		20,530
	-8" Back-Up Block incl grout & rebar	\$19.71	/sqft	2,962	sqft		58,375
	-12" Back-Up Block incl grout & rebar	\$27.99	/sqft	5,956	sqft		166,687
	Waterproof Membrane over CMU Backup	\$2.89	/sqft	10,318	sqft		29,831
	2" Polyisocyanurate Insulation @ Masonry Walls	\$3.07	/sqft	10,318	sqft		31,656
	Flexible Flashing - @ Masonry	\$9.47	/sf	639	sf		6,054
	Exterior Scaffolding	\$3.01	/sqft	12,175	sqft		36,594
	Interior Partitions						
	12" Partitions-2 hr	\$17.91	/sqft	1,848	sqft		33,095
	-0 hr	\$16.90	/sqft	1,826	sqft		30,859
	8" Interior Partitions-2 hr	\$19.71	/sqft	0	sqft		0
	-1 hr	\$15.03	/sqft	0	sqft		0
	-0 hr	\$14.66	/sqft	0	sqft		0
	6" Interior Partitions-0 hr	\$12.69	/sqft	660	sqft		8,374
	4" Chase Partitions	\$11.77	/sqft	60	sqft		706
	-column covers 2, 3 or 4 sided	\$16.64	/sqft	360	sqft		5,990
	Partition Infills-all types	\$21.17	/sqft	290	sqft		6,141
	Interior Scaffolding	\$2.44	/sf	7,062	sf		17,259
	Masonry Units						703,989
04400	Architectural PreCast Concrete						
	3" thick panels nominal 1'4 high x 3'4 running bond to match existing	\$29.12	/sqft	2,321	sqft		67,588
	Premium for Sloped Coping	\$29.12	/lf	379	lf		11,036
	Erection over CMU waterproofing & insulation in Div 4	\$16.62	/sqft	2,321	sqft		38,572
	Jointing-motar	\$5.67	/lf	1,103	lf		6,253
	Embedded Shaped PCC in Masonry-Coping-1'4 wide	\$33.28	/lf	374	lf		12,447
	-2'0	\$40.30	/lf	135	lf		5,441
	-Cantilevered OG	\$45.66	/lf	340	lf		15,523
	-Band	\$39.00	/lf	308	lf		12,012
	-Window Sills	\$22.57	/lf	164	lf		3,701
	Erection over CMU waterproofing & insulation in Div 4	\$14.95	/lf	1,321	lf		19,749
	Architectural PreCast Concrete						192,322
05120	Structural Steel						
11	Roof Framing-Standard			14			
	WF Sections	\$3,373.76	/tons	4	tons		13,495
	Tubular Steel-columns	\$3,686.80	/tons	3	tons		9,217
	Open Web Joist	\$3,106.48	/tons	6	tons		18,639
	Angles & Clip Angles	\$3,697.05	/tons	1	tons		3,697
12	Roof Framing-High & Conventional			0			
	WF Sections	\$3,432.43	/tons	0	tons		0
	Tubular Steel	\$3,576.53	/tons	0	tons		0
	Open Web Joist	\$3,197.58	/tons	0	tons		0
	Angles & Clip Angles	\$3,761.53	/tons	0	tons		0
12	Floor Framing			67			
	WF Sections	\$3,316.86	/tons	65	tons		215,596
	Tubular Steel	\$3,440.79	/tons	0	tons		0
	Open Web Joist	\$3,106.48	/tons	0	tons		0
	Angles & Clip Angles	\$3,619.69	/tons	2	tons		7,239
14	Floor Framing-Balconies			0			
	WF Sections	\$4,133.26	/tons	0	tons		0
	Tubular Steel	\$4,272.79	/tons	0	tons		0
	Open Web Joist	\$4,561.74	/tons	0	tons		0
	Angles & Clip Angles	\$3,881.77	/tons	0	tons		0
	Bracing	\$4,680.00	/tons	3	tons		14,040
	Moment Connections	\$497.12	/each	0	each		0
	Framing for RTU's	\$4,276.48	/tons	4	tons		17,747
	Base & Cap Plates	\$3,928.08	/tons	0	tons		0
	Leveling Plates	\$3,417.43	/tons	0	tons		0
	Anchor Bolts	\$81.12	/each	100	each		8,112
	Structural Steel			88	tons	3,511	307,783

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Area (nsf) Unit Measure	34,726 Extension
05310 Composite Floor Deck						
	LOK Floor 1 1/2", 20 ga. Composite Floor Deck	\$3.23	/sqft	14,856	sqft	48,050
	Floor Closure Screed-18 ga	\$7.26	/lf	1,154	lf	8,377
	Miscellaneous decking angles at columns & drains	\$3,697.05	/tons	0	tons	924
	Repairs to Existing Decking-allow	\$8.32	/sqft	350	sqft	2,912
	Shear Studs	\$5.18	/each	1,634	each	8,464
	Composite Floor Deck			4.63	/sqft	68,727
05320 Metal Roof Decking						
	Galvanized, 1 1/2", 20 ga. Roof Deck	\$2.86	/sqft	2,400	sqft	6,864
	Pre-Painted & Galvanized, 3", 20 ga. Acoustical Roof Deck	\$7.71	/sqft	0	sqft	0
	Repairs to Existing Decking	\$8.32	/sqft	0	sqft	in above
	Miscellaneous decking angles at columns & drains	\$3,078.40	/tons	1	tons	3,694
	Sump Pans for Roof Drains	\$117.26	/each	5	each	586
	Metal Roof Decking			4.64	/sqft	11,144
05500 Metal Fabrications						
	Loose Lintels-galv.	\$16.60	/lnft	245	lnft	4,067
	Hung Framing-galvanized	\$56.16	/lnft	160	lnft	8,986
	-attached "T" galvanized	\$27.04	/lnft	160	lnft	4,326
	Roof Ladders-up to ten (10) feet	\$1,742.00	/each	0	each	0
	-up to fifteen (15) feet	\$1,971.84	/each	0	each	0
	Ships Ladder to Roof-up to fifteen (15)	\$3,686.80	/each	1	each	3,687
	New Catwalks over the Orchestra in the trusses	\$270.40	/lnft	200	lnft	54,080
	Metal Fabrications					75,145
05510 Metal Stairs & Railings						
	Scissor Stairs					
19	Steel Stairs per riser	\$391.04	/riser	114	riser	44,579
	Landings	\$22.88	/sf	196	sf	4,484
	Guardrails & Hand Rails	\$71.48	/lf	102	lf	7,291
	Wall Railings	\$43.68	/lf	233	lf	10,177
	Center Railings	\$53.04	/lf	32	lf	1,697
	Main Stair-Existing-allow for retro-fit railings by riser	\$198.64	/riser	145	riser	28,803
	Main Exit Stair-Existing-allow for retro-fit railings-by riser	\$165.98	/riser	120	riser	19,918
	Exterior Railings	\$0.00				
	Guardrails & Hand Rails	\$89.35	/lf	302	lf	26,983
	Wall Railings	\$54.60	/lf	28	lf	1,529
	Center Railings	\$66.30	/lf	8	lf	530
	Metal Stairs & Railings					145,992
05810 Expansion Joint Cover Assemblies						
	Floor	\$37.44	/lnft	64	lnft	2,396
	Walls	\$47.84	/lnft	92	lnft	4,401
	Ceilings	\$30.16	/lnft	178	lnft	5,368
	Installation	\$63.70	/hr	67	hr	4,255
	Expansion Joint Cover Assemblies					16,421
06100 Rough Carpentry						
	Interior Blocking	\$3.94	/bf	800	bf	3,153
	Sheathing @ Backing	\$3.24	/sf	0	sf	0
	Window Head & Sill Blocking	\$3.56	/bf	1,200	bf	4,268
	Roof Blocking	\$3.56	/bf	5,550	bf	19,740
	Rough Carpentry					27,162
06200 Architectural Trades						
	Installation-HM & Wood Doors incl Finish Hardware	\$61.15	/hr	576	hr	35,224
	Installation-HM Vision Panels	\$61.15	/hr	25	hr	1,508
	Installation-AV Hardware Bracket	\$61.15	/hr	4	hr	245
	Installation-Miscellaneous Items	\$61.15	/hr	24	hr	1,468
	Safety-labor	\$61.15	/hr	300	hr	18,346
	-material	\$6,760.00	/ls	1	ls	7,500
	General Conditions, Overhead & Profit	\$0.22	/\$\$	64,290	\$\$	14,041
	Architectural Trades					78,331
06400 Architectural Woodwork						
	Performance Center					

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Area (nsf) Unit Measure	34,726 Extension
	Wall Paneling	\$24.96	/sf	960	sf	23,962
	-wood partion caps	\$32.47	/lnft	226	lnft	7,338
	Installation	22.00%	/\$\$	31,300	\$\$	6,886
	General					
	Base Cabinets	\$155.53	/lnft	12	lnft	1,866
	Transaction Top	\$224.54	/lnft	0	lnft	0
	Countertops	\$162.18	/lnft	12	lnft	1,946
	-Cantilevered	\$179.44	/lnft	40	lnft	7,178
	-Toilet Vanities	\$181.84	/lnft	116	lnft	21,094
	Upper Cabinets	\$117.10	/lnft	6	lnft	703
	Adjustable Shelving	\$24.12	/lnft	300	lnft	7,235
	Window Stools-solid surface	\$35.93	/lnft	0	lnft	0
	Partition Caps	\$51.08	/lnft	0	lnft	0
	Closet Shelf, Cleat & Pole	\$25.53	/lnft	42	lnft	1,072
	Kitchenettes-Green Rooms (2)	\$434.81	/lnft	20	lnft	8,696
	Installation	25.00%	/\$\$	49,791	\$\$	12,448
	Architectural Woodwork					100,424
07111	Self-Adhered Sheet Waterproofing					
	Foundation & Retaining Walls					
	Prep, Primer and Membrane	\$8.03	/sqft	2,528	sqft	20,297
	Protection Layer	\$1.99	/sqft	2,528	sqft	5,022
	Miradrain	\$2.11	/sqft	2,528	sqft	5,337
	Insulation	\$3.13	/sqft	2,528	sqft	in Div 2
	Elevator Pits					
	Prep, Primer and Membrane	\$9.96	/sqft	608	sqft	6,053
	Protection Layer	\$2.46	/sqft	608	sqft	1,498
	Miradrain	\$2.62	/sqft	608	sqft	1,592
	Insulation	\$3.13	/sqft	0	sqft	in Div 2
	Self-Adhered Sheet Waterproofing					39,798
07240	Aluminum Composite Panel					
	Preformed Aluminum Panels-soffits	\$48.99	/sqft	249	sqft	12,200
	-framing	\$11.50	/sqft	249	sqft	2,864
	Aluminum Composite Panel					15,064
07531	Membrane Roofing					
	Removal of Existing Roofing-assumed no ACM	\$2.32	/sqft	0	sqft	0
	Fully Adhered 60 mil TPO-Whiter-25 year Warranty	\$4.93	/sqft	7,672	sqft	37,820
	Dens-deck sheet-5/8"	\$2.24	/sqft	7,672	sqft	17,155
	2 layers 2" ISO Insulation	\$3.94	/sqft	7,672	sqft	30,240
	-pitched insulation	\$2.56	/sqft	2,148	sqft	5,496
	Standing Seam 'look' Ribs	\$2.36	/sqft	0	sqft	0
	Parapet Flashing	\$7.15	/sqft	0	sqft	0
	Counter Flashing	\$20.00	/lf	308	lf	6,160
	Coping Flashing	\$16.64	/lf	0	lf	0
	Edge Flashing	\$14.83	/lf	437	lf	6,481
	RTU Flashings	\$19.76	/lf	602	lf	11,896
	Fan Curb Flashing	\$22.10	/lf	48	lf	1,061
	Skylight Curb Flashing	\$22.10	/lf	280	lf	6,188
	Expansion Joints	\$24.44	/lf	308	lf	7,528
	Snow Guards-including individual blocking to decking	\$72.80	/each	0	each	0
	Roof Drains-4"	\$126.88	/each	4	each	508
	-6"	\$119.90	/each	2	each	240
	Overflow Drains-4"	\$193.44	/each	4	each	774
	-6"	\$182.80	/each	2	each	366
	Vents	\$130.00	/each	3	each	390
	Utility Penetrations	\$119.60	/each	0	each	0
	Walkway Pads-2' x 3'	\$47.84	/each	126	each	6,004
	Membrane Roofing				18.03	138,303
07720	Roof Accessories					
	Stage Smoke Vents	\$2,196.48	/each	0	each	Existing
	Unit Skylights-5'0 x 5'0	\$2,052.96	/each	14	each	28,741
	Roof Scuttle for Ship's Ladder 2'6 x 8'0	\$933.42	/each	1	each	933
	Roof Accessories					29,675
07842	Spray-On Fireproofing					

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Area (nsf) Unit Measure	34,726 Extention
	3/4" cementitious coating all structural seet except Back of House-ML	\$2.89	/sf	10,743	sf	31,060
	Canvans Protection	\$0.55	/sf	6,300	sf	3,473
	Spray-On Fireproofing					34,532
07841	Through-Penetration Firestop Systems					
	Allow all trades	\$12,480.00	/allo	1	allo	12,480
	Through-Penetration Firestop Systems					12,480
07842	Fire resistive Joint Systems					
	Allow all trades	\$8,320.00	/allo	1	allo	8,320
	Acoustical Concerns	\$15,600.00	/allo	1	allo	15,600
	Fire resistive Joint Systems					23,920
07900	Joint Sealants					
	Joint Sealers	\$18,720.00	/allo	1	allo	18,720
	Joint Sealants					18,720
08110	Steel Doors and Frames					
	Single 3'0" x 7'0"-4' head	\$157.49	/each	0	each	0
	-2" head	\$134.16	/each	58	each	7,781
	Double 6'0" x 7'0"-double egress	\$310.69	/each	0	each	0
	Double 6'0" x 7'0"-standard pair	\$215.88	/each	35	each	7,556
	Double 6'0" x 7'0"-standard pair-4" head	\$259.56	/each	0	each	0
	Single 3'0" x 7'0"-partial sidelite	\$209.61	/each	0	each	0
	Single 3'0" x 7'0"-full height sidelite-18" wide	\$448.19	/each	0	each	0
	-36" wide	\$638.94	/each	0	each	0
	Borrowed Lites-custom dimensions	\$19.76	/sf	296	sf	5,849
	Premium Costs-exterior to be galvanized-single	\$24.96	/each	3	each	75
	-double	\$40.56	/each	0	each	0
	-for electricification back-box	\$13.00	/leaf	8	leaf	104
	-allow for rating by leaf	\$10.14	/leaf	20	leaf	203
	Hollow Metal Doors			128		
	Single 3'0" x 7'0"-flush	\$267.28	/each	54	each	14,433
	- with slit glazing	\$333.84	/each	68	each	22,701
	-with upper half glazed	\$383.76	/each	0	each	0
	-with upper & lower glazed	\$489.84	/each	6	each	2,939
	Premium Costs-exterior to be galvanized	\$23.92	/leaf	3	leaf	72
	-for electricification	\$19.99	/leaf	24	leaf	480
	Steel Doors and Frames			128	485.88	62,192
08211	Wood Doors					
	Single 3'0" x 7'0"-flush	\$244.40	/each	0	each	0
	-with slit glazing	\$307.84	/each	0	each	0
	-with upper half glazed	\$332.80	/each	0	each	0
	Premium Costs-rating	\$79.04	/leaf	0	leaf	0
	-for electricification	\$20.12	/leaf	0	leaf	0
	Wood Doors					0
08211	Overhead Doors					
	Secitional Insulated Door-12'0 wide by 14'0 high	\$32.24	/sf	168	each	5,416
	-electrically operated	\$2,678.00	/each	1	each	2,678
	Overhead Doors					8,094
08410	Aluminum Entrances & Storefronts					
	Remove & Dispose of Existing Windows & Storefront	\$4.12	/sf	0	sf	0
	Aluminum Storefront System					
	-Aluminium Framing w/ laminated glas	\$71.21	/sf	276	sf	19,654
	w/ insulating glass	\$81.15	sf	1,802	sf	146,234
	w/ panels-exterior	\$49.92	sf	270	sf	13,478
	-interior	\$44.51	sf	729	sf	32,449
	-Aluminium Doors-AL-1 panic	\$2,689.44	/leaf	6	leaf	16,137
	-AL-2 push/pull	\$2,473.12	/leaf	4	leaf	9,892
	Sunscreen attached to Aluminum Framing	\$89.65	/sqft	0	sqft	0
	Window by Type-Transom nominal 3'0 high 4'0 wide-fixed	\$73.84	/sqft	276	sqft	20,380
	'Double Hung' nominal 4'0 wide 7'0 wide-fixed	\$75.92	/sqft	476	sqft	36,138
		\$0.00				
	'Sallyport' nominal 1'0 wide 5'0 wide-fixed	\$89.44	/sqft	20	sqft	1,789
	Aluminum Entrances & Storefronts					296,151

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Area (nsf) Unit Measure	34,726 Extention
08710	Finish Hardware					
	By Hardware Type					
	Toilet Room-Single	\$425.36	/each	18	each	7,656
	-Double	\$873.60	/each	0	each	0
	Toilet Room-Privacy-Single	\$774.80	/each	3	each	2,324
	-Double	\$1,619.28	/each	0	each	0
	Exit-Exterior-Single	\$774.80	/each	3	each	2,324
	-Double	\$1,619.28	/each	0	each	0
	Exit-Interior-Single	\$459.68	/each	16	each	7,355
	-Double	\$1,165.84	/each	15	each	17,488
	Classroom-Single	\$459.68	/each	0	each	0
	-Double	\$660.40	/each	0	each	0
	Storage-Single	\$459.68	/each	12	each	5,516
	-Double	\$730.08	/each	8	each	5,841
	Stair-Single	\$774.80	/each	4	each	3,099
	-Double	\$1,619.28	/each	12	each	19,431
	Office-Single	\$386.88	/each	2	each	774
	-Double	\$584.48	/each	0	each	0
	Acoustically Rated Door-Single	\$2,548.00	/each	2	each	5,096
	Allow for Existing Doors & Frames	\$400.40	/each	21	each	8,408
	ADA Door Operators	\$3,224.00	/leaf	0	leaf	0
	Finish Hardware		151	564.99	/leaf	85,313
08800	Glazing					
	Glazing @ Sidelights-wire above/laminated below	\$292.48	/each	0	each	0
	Glazing @ Hollow Metal Vision Panels-lan/temp. -wire 1 hr	\$17.79	/sqft	0	sqft	0
		\$22.04	/sqft	224	sqft	4,936
	Glazing @ Door Vision Panels	\$103.13	/each	74	each	7,631
	Special Glazing in Alum Frames-Projection Booth	\$81.12	/sqft	144	sqft	11,681
	Glazing					24,249
09250	Gypsum Board & Plaster					
	Plaster Repair-Walls	\$4.27	/sqft	20,011	sqft	85,535
	-Ceilings	\$7.26	/sqft	12,838	sqft	93,194
	-Scaffolding-walls	\$2.20	/sqft	12,000	sqft	26,458
	-ceilings	\$0.30	/cuft	144,000	cuft	43,088
	6" Gypsum Partitions-high impact-2 hr rating	\$10.52	/sqft	0	sqft	0
	-1 hr rating	\$9.88	/sqft	6,500	sqft	64,220
	-0 hr rating	\$9.47	/sqft	4,268	sqft	40,432
	3" Chase Partition	\$5.36	/sqft	1,460	sqft	7,820
	Wall furring	\$4.56	/sqft	1,680	sqft	7,653
	Exterior Framing					
	Column Covers-full	\$42.75	/lf	375	lf	16,033
	-pilasters	\$27.36	/lf	120	lf	3,283
	Installation of HM Frames-single	\$83.20	/each	58	each	4,826
	-double	\$110.24	/each	35	each	3,858
	-ticket window	\$192.40	/each	2	each	385
	-borrowed lite	\$3.64	/sf	296	sf	1,078
	Gypsum Board & Plaster					397,862
09310	Ceramic Tile					
	Ceramic Tile-Flooring	\$8.52	/sqft	2,908	sqft	24,769
	-waterproofing	\$7.51	/sqft	2,068	sqft	15,528
	-Walls-5'0	\$9.14	/sqft	3,672	sqft	33,568
	-Base	\$9.28	/lf	1,000	lf	9,277
	Entry & Landing 'Stone' Flooring	\$9.46	/sqft	340	sqft	3,218
	Base	\$11.66	/lf	1,136	lf	13,244
	Stair Treads-remove	\$6.80	/lf	0	lf	0
	-replace/new	\$41.50	/lf	472	lf	19,586
	Threshold	\$156.00	/each	15	each	2,340
	Ceramic Tile					121,530
09511	Acoustical Treatment					
	2x2 ACT Ceilings	\$3.33	/sqft	2,231	sqft	7,425
	2x4 ACT Ceilings-standard	\$2.92	/sqft	0	sqft	0
	-abuse resistant	\$3.22	/sqft	0	sqft	0
	-moisture resistant	\$3.99	/sqft	0	sqft	0
	Gypsum Ceilings-standard	\$9.36	/sqft	3,520	sqft	32,947

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Area (nsf) Unit Measure	34,726 Extention
	-acoustical	\$14.40	/sqft	0	sqft	0
	-Fascias	\$8.22	/sqft	268	sqft	2,202
	-Light Cove	\$11.66	/lf	96	lf	1,119
	Acoustical Treatment					43,693
09661	Resilient Tile Flooring, Wall Base & Accessories					
	VCT- three (3) color pattern	\$3.08	/sqft	2,413	sqft	7,428
	- standard	\$2.43	/sqft	2,150	sqft	5,232
	Rubber Floor at Fire Stairs-treads	\$20.69	/lf	1,289	lf	26,664
	-nozings only	\$7.29	/lf	0	lf	0
	-landings & ramps	\$6.91	/sqft	920	sqft	6,353
	Rubber Base-VCB & VSB for All Flooring	\$2.14	/lf	5,012	lf	10,738
	Resilient Tile Flooring					56,415
09680	Carpeting					
	Allow	\$46.80	/sy	1,503	sy	70,349
	-premium for stairs & risers	\$14.56	/sy	339	sy	4,934
	Carpeting					75,283
09800	Acoustical Treatments					
	Fabric Wrapped Panels-2" fiberglass per JaffeHolden Memo 10.30.08	\$23.07	/sqft	3,558	sqft	82,067
	Acoustical Treatments					82,067
09900	Painting					
	Paint Gypsum Partitions-new	\$0.74	/sqft	7,691	sqft	5,679
	-existing	\$0.69	/sqft	60,876	sqft	41,785
	Paint CMU-new to 8'0 AFF	\$0.93	/sqft	5,552	sqft	5,139
	-existing to 8'0 AFF	\$0.88	/sqft	5,980	sqft	5,286
	Paint Drywall/Plaster Ceilings, Fascias and Light Cove	\$1.30	/sqft	3,884	sqft	5,049
	-Orchestra & Balcony	\$1.51	/sqft	5,685	sqft	8,573
	Allow for Decorative Painting	\$10,000.00	/ls	1	ls	10,000
	Paint Exposed Structure-high	\$1.27	/sqft	6,852	sqft	8,694
	-standard	\$1.09	/sqft	16,222	sqft	17,714
	Paint Stair Underside treads,risers & landings	\$1.09	/sqft	3,360	sqft	3,669
	Paint Guardrails	\$7.12	/lf	722	lf	5,144
	Paint Wall railings	\$3.12	/lf	639	lf	1,994
	Paint HM Doors (Wood Doors prefinished)	\$116.48	/eaf	149	leaf	17,356
	Painted/Sealed Concrete	\$2.08	/sqft	6,669	sqft	13,872
	Paint Frames-single	\$86.01	/each	79	each	6,795
	-double	\$106.39	/each	35	each	3,724
	-single with sidelite	\$117.47	/each	2	each	235
	-hollow metal vision panels	\$9.38	/sqft	296	sqft	2,777
	Painting					163,483
10155	Toilet Partitions					
	Standard Toilet Partition - Solid Plastic-Phenolic Core	\$1,281.28	/each	16	each	20,500
	ADA Toilet Partition - Solid Plastic-Phenolic Core	\$1,453.92	/each	9	each	13,085
	Urinal Screen - Solid Plastic-Phenolic Core	\$796.64	/each	7	each	5,576
	Shower/Drying Enclosures	\$1,223.04	/each	2	each	2,446
	Dressing Enclosures	\$1,385.28	/each	0	each	0
	Toilet Partitions					41,608
10100	Visual Display Boards					
	Marker Board-6' wide	\$520.00	/each	2	each	1,040
	-10' wide	\$820.56	/each	1	each	821
	-4' wide	\$419.12	/each	1	each	419
	Tackboard -6' wide	\$428.48	/each	6	each	2,571
	-4' wide	\$312.00	/each	4	each	1,248
	Visual Display Boards					4,851
10200	Louvers & Vents					
	Louvers and Vents-6'0 diameter FAI & Spill-new	\$100.72	/sqft	0	sqft	0
	-replace existing	\$74.98	/sqft	120	sqft	8,998
	Louvers & Vents					8,998
10425	Signs					
	By Schedule-Type per frame	\$116.48	/each	114	each	13,279
	-Building Mounted Letters	\$286.00	/each	40	each	11,440
	-Retaining Wall Sign Box	\$2,340.00	/each	1	each	2,340

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Area (nsf) Unit Measure	34,726 Extention
	-Dedication Plaque-Bronze	\$4,149.60	/each	1	each	4,150
	-Gound Mounted Signage Statement	\$10,000.00	/each	1	each	10,000
	-Flags & Banners	\$1,450.00	/each	5	each	7,250
	Signs					48,458
10522	Fire Protection Accessories					
	Wall mounted fire extinguisher	\$92.92	/each	20	each	1,858
	Fire Extinguisher Cabinet-recessed-fire-rated	\$233.32	/each	0	each	0
	-recessed	\$202.12	/each	8	each	1,617
	-semi-recessed-fire rated	\$252.04	/each	0	each	0
	-semi-recessed	\$215.64	/each	8	each	1,725
	-surface mounted	\$212.52	/each	0	each	0
		\$63.70	/hr	45	hr	2,867
	Fire Protection Accessories					8,067
10505	Lockers					
	Players' Locker-18" x 18" x 36" Double Tier	\$191.94	/each	60	each	11,517
	Music Instrument Lockers- 18" x 30"x 84"	\$717.60	/each	0	each	Not Req'd
	Premium for sloped top	\$116.48	/each	30	each	3,494
	Locker Base		by others	68	sf	0
	Lockers					15,011
10800	Toilet & Bath Accessories					
	Soap Dispenser	\$32.24	/each	53	each	1,709
	Mirror 24" x 36"	\$136.50	/each	47	each	6,416
	36" Grab Bar	\$31.82	/each	12	each	382
	42" Grab Bar	\$43.01	/each	12	each	516
	Swing Down Grab Bar	\$314.76	/each	12	each	3,777
	Shower ADA Set	\$264.49	/each	2	each	529
	Toilet Paper Dispenser	\$327.60	/each	28	each	9,173
	Sanitary Napkin Dispenser	\$297.44	/each	6	each	1,785
	Sanitary Napkin Receptor	\$198.64	/each	6	each	1,192
	Paper Towel Dispenser/Disposal	\$572.00	/each	8	each	4,576
	Custodial Accessories	\$219.44	/each	6	each	1,317
	Installation	\$63.70	/hr	151	hr	9,600
	Toilet & Bath Accessories					40,970
116000	Theatre and Stage Equipment					
116113	Acoustical Shell-Wenger Forte (Alt:Diva) System or equal	\$185,625.00	/ls	1	ls	185,625
116125	Tiered Platforms-portable	\$7,809.00	/ls	1	ls	7,809
116133	Stage Rigging per Outline Specification	\$204,800.00	/ls	1	ls	204,800
116143	Stage Drapery per Outline Specification	\$46,300.00	/ls	1	ls	46,300
116153	Stage Dimming & Controls-installation in Electrical	\$124,394.00	/ls	1	ls	124,394
116163	Stage Lighting Fixtures	\$68,696.00	/ls	1	ls	68,696
116173	Miscellaneous Stage Equipment per Outline Specification	\$4,479.00	/ls	1	ls	4,479
	Theatre and Stage Equipment					642,103
11132	Audio Visual Systems & Equipment					
	Audio & Visual Systems-installed per Outline JaffeHolden Spec.	\$500,000.00	/ls	1	ls	500,000
	Electrical Systems to support the above systems	\$220,000.00	/ls	1	ls	in Div 16
	White Markerboards	\$15.17	/sqft	0	sqft	0
	Tackboards	\$10.01	/sqft	0	sqft	0
	Audio Visual Systems & Equipment					500,000
11452	Residential Equipment					
	Electric Range	\$598.00	/each	0	each	0
	Range Hood	\$327.60	/each	0	each	0
	Microwave Oven	\$369.20	/each	2	each	738
	Refrigerators-freezer over	\$1,451.84	/each	2	each	2,904
	-undercounter	\$634.40	/each	0	each	0
	Dishwashers	\$613.60	/each	2	each	1,227
	Garbage Disposal	\$130.00	/each	2	each	260
	Washer	\$1,950.00	/each	0	each	0
	Dryer	\$1,664.00	/each	0	each	0
	Installation	\$51.22	/hr	12	hr	615
	Residential Equipment					5,744
12484	Entrance Mats					
	Entrance Mats	\$39.26	/sqft	450	sqft	17,667

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Area (nsf) Unit Measure	34,726 Extension
Entrance Mats						17,667
12491 Window Treatment						
	Exterior Windows	\$4.52	/sqft	538	sqft	2,434
	Door Sidelites	\$63.32	/each	0	each	0
	Black-Out Mecho Roller Shade-electricfied	\$37.44	/sqft	645	sqft	24,153
	Borrowed-Lites	\$7.22	/sqft	168	sqft	1,213
Window Treatment						27,799
12612 Fixed Audience Seating						
	Remove Existing	\$21.84	/seat	950	seat	20,748
	Per Outline Specifications with COM Fabric	\$275.60	/seat	900	seat	248,040
	Loose Seating	\$166.40	/seat	42	seat	6,989
Fixed Audience Seating						248,040
14200 Elevators						
Rear ADA Elevator						
	Vertical Travel in Hoistway	\$838.57	/vlf	22.33	vlf	18,725
	Entrances-in-line-Painted Hollow Metal	\$7,274.80	/each	3	each	21,824
	-Rear-Painted Hollow Metal	\$7,274.80	/each	2	each	14,550
	2,100 lbs Platform	\$7.28	/lbs	2,100	lbs	15,288
	Size 5'5 1/2" x 6'8"					
	Cab Allowance	\$13,874.64	/ls	1	ls	13,875
	Premium for Roped Hydraulic	\$4,680.00	/ls	0	ls	0
	Extended Warranty 12 to 16 mos.	\$109.20	/mo	4	mo	437
	One (1) year Service	\$300.30	/mo	12	mo	3,604
Rear ADA Elevator						88,302
Front Elevators						
	Eleavtor Controller	\$6,760.00	/ls	1	ls	6,760
	Vertical Travel in Hoistway	\$838.57	/vlf	48.25	vlf	40,461
	Entrances-in-line-Stainless Steel	\$7,274.80	/each	1	each	7,275
	-Rear-Stainless Steel	\$7,274.80	/each	5	each	36,374
	2,500 lbs Platform	\$7.20	/lbs	2,500	lbs	17,992
	Size 5'11 1/2" x 6'8"					
	Cab Allowance	\$14,557.92	/ls	1	ls	14,558
	Premium for Roped Hydraulic	\$5,184.40	/ls	0	ls	0
	Extended Warranty 12 to 16 mos.	\$114.40	/mo	4	mo	458
	One (1) year Service	\$307.84	/mo	12	mo	3,694
	Second Elevator in Tandem					124,975
Front Elevators						252,547
	ADA Lift to Upper Control Booth					None
Elevators						340,849
15300 Fire Protection						
	Incoming Sprinkler Service Trimed Incl Backflow Preventer from 6" AF Siamase	\$21,289.44	/ls	1	ls	21,289
	-temporary siamase	\$5,435.22	/each	1	ls	5,435
	Electric Fire Pump 1,000 gpm w/jockey pump (60HP)	\$4,160.00	/ls	1	ls	4,160
	Test Header	\$35,880.00	/ls	0	ls	Not Req'd ?
	Division Valves in Main-6"	\$7,166.64	/ls	0	ls	Not Req'd ?
	Sprinkler Tap Assemblies	\$1,100.49	/ea	0	ea	0
	Fire Valve Cabinet-2 1/2", 1 1/2" cap & chain	\$1,479.59	/ea	3	ea	4,439
	Inspectors test drain-2"-vertical	\$2,532.40	/ea	4	ea	10,130
	Inspectors test drain-2"-horizontal	\$30.92	/lf	72	lf	2,226
	Standpipe Riser-typical of -4"	\$35.15	/lf	82	lf	2,885
	Standpipe Horizontal-typical of -4"	\$37.37	/lf	32	lf	1,196
	Sprinkler Riser-typical of -2"	\$41.07	/lf	134	lf	5,503
	Sprinkler Riser-typical of -3"	\$29.88	/lf	0	lf	0
	Sprinkler Riser-typical of -4"	\$33.22	/lf	130	lf	4,319
	Sprinkler Riser-typical of -6"	\$37.37	/lf	164	lf	6,129
	Sprinkler Riser-typical of -8"	\$48.36	/lf	0	lf	0
	Sprinkler Horizontal-typical of -2"	\$59.93	/lf	0	lf	0
	Sprinkler Horizontal-typical of -3"	\$32.84	/lf	224	lf	7,356
	Sprinkler Horizontal-typical of -4"	\$36.51	/lf	0	lf	0
	Sprinkler Horizontal-typical of -6"	\$41.07	/lf	0	lf	0
	Sprinkler Horizontal-typical of -8"	\$53.14	/lf	0	lf	0
	Sprinkler Horizontal-typical of Class 52 underground-4"	\$65.86	/lf	0	lf	0
	-6"	\$56.30	/lf	0	lf	0
		\$65.23	/lf	0	lf	0
Renovation of Existing System						17,819 sf

Spec				Area (nsf)	34,726
Section	Description	Unit	Unit	Quantity	Unit
		Cost	Measure		Extention
	Wet Pipe Sprinkler Head-pendant-concealed-flush-new	\$184.03	/ea	58	ea
	-existing	\$274.67	/ea	64	ea
	Wet Pipe Sprinkler Head-upright	\$157.76	/ea	213	ea
	Wet Pipe Sprinkler Head-upright-high	\$258.09	/ea	45	ea
	Wet Pipe Sprinkler Head-upright-with guard-attic (4,866 sf)	\$267.92	/ea	26	ea
	Wet Pipe Sprinkler Head-elevator	\$0.00	/ea	2	ea
	Wet Pipe Sprinkler Head-premium for on-off	\$0.00	/ea	0	ea
	Coring/Sleeving	\$139.73	/ea	16	ea
	Testing	\$3,640.00	/ls	1	ls
	New Construction			16,907	sf
	Wet Pipe Sprinkler Head-pendant-concealed-flush	\$274.67	/ea	32	ea
	Wet Pipe Sprinkler Head-upright	\$267.39	/ea	103	ea
	Wet Pipe Sprinkler Head-upright-high	\$314.75	/ea	0	ea
	Wet Pipe Sprinkler Head-upright-with guard	\$326.73	/ea	20	ea
	Wet Pipe Sprinkler Head-elevator	\$321.28	/ea	5	ea
	Wet Pipe Sprinkler Head-premium for on-off	\$67.94	/ea	0	ea
	Coring/Sleeving	\$139.73	/ea	16	ea
	Testing	\$2,080.00	/ls	1	ls
	FM-200-MDF	\$6,857.50	/ls	0	ls
	FM-200-IDF	\$0.00	/ls	0	ls
	Pre-Action System	\$0.00	/ls	0	ls
	Cut, Cap & Make Safe-Demolition	\$63.44	/hr	124	hr
	Building Permit-City & State	0.18%	%	215,780	\$\$
	Performance & Payment Bond	1.56%	%	224,035	\$\$
	SubContractor Overhead & Profit	15.50%	%	227,530	\$\$
	Budget Adjustment				
	Fire Protection			7.92	275,000
	15400 Plumbing				
	Incoming Water Service trimed incl backflow preventer from 6" AFF	\$5,250.47	/ls	1	ls
	Domestic Hot Water Generation-Gas Fired-80 gal	\$7,020.00	/ls	1	ls
	Domestic Hot Water Heaters-40 gal Electric	\$2,298.54	/ea	0	ea
	Domestic Hot Water Heaters-under sink electric	\$1,038.43	/ea	0	ea
	Domestic Hot Water Pumps	\$2,196.48	/ls	1	ls
	Water Distribution-CW-4" Underground-Class 52	\$71.04	/lf	0	lf
	Water Distribution-CW/HW-4" Horizontal	\$57.99	/lf	40	lf
	Water Distribution-CW/HW-3"	\$49.00	/lf	140	lf
	Water Distribution-CW/HW-2 1/2"	\$41.78	/lf	0	lf
	Water Distribution-CW/HW-2"	\$38.16	/lf	160	lf
	Water Distribution-CW/HW-1 1/2"	\$32.47	/lf	180	lf
	Water Distribution-CW/HW-11/4"	\$28.24	/lf	200	lf
	Water Distribution-CW/HW-1"	\$26.44	/lf	120	lf
	Water Distribution-CW/HW-3/4"-recirculate	\$23.00	/lf	225	lf
	Water Distribution-CW/HW-4" Vertical	\$51.32	/lf	12	lf
	Water Distribution-CW/HW-3"	\$43.37	/lf	50	lf
	Water Distribution-CW/HW-2 1/2"	\$36.97	/lf	0	lf
	Water Distribution-CW/HW-2"	\$33.77	/lf	50	lf
	Water Distribution-CW/HW-1 1/2"	\$28.74	/lf	0	lf
	Water Distribution-CW/HW-11/4"	\$24.99	/lf	0	lf
	Water Distribution-CW/HW-1"	\$23.40	/lf	0	lf
	Water Distribution-CW/HW-3/4"	\$20.36	/lf	50	lf
	Tempering Valves	\$484.58	/ea	0	ea
	Water to HVAC equipment	\$437.54	/ea	4	ea
	Sanitary Mains-underground to 5'0 outside building -8"	\$54.09	/lf	20	lf
	Sanitary Mains-underground to 5'0 outside building -6"	\$44.34	/lf	24	lf
	Sanitary Mains-underground to 5'0 outside building -4"	\$39.67	/lf	80	lf
	Sanitary Mains-underground to 5'0 outside building -3"	\$32.67	/lf	36	lf
	Sanitary Mains-above ground-verticals-8"	\$50.75	/lf	18	lf
	Sanitary Mains-above ground-horizontals-8"	\$52.38	/lf	16	lf
	Sanitary Mains-above ground-verticals-6"	\$44.13	/lf	54	lf
	Sanitary Mains-above ground-horizontals-6"	\$45.55	/lf	128	lf
	Sanitary Mains-above ground-verticals-4"	\$36.17	/lf	84	lf
	Sanitary Mains-above ground-horizontals-4"	\$37.34	/lf	88	lf
	Sanitary Mains-above ground-verticals-3"	\$29.81	/lf	124	lf
	Sanitary Mains-above ground-horizontals-3"	\$33.09	/lf	140	lf
	Sanitary Mains-above ground-verticals-2"	\$27.00	/lf	0	lf
	Sanitary Mains-above ground-horizontals-2"	\$29.97	/lf	0	lf
	Vent piping-verticals-4"	\$31.50	/lf	164	lf

Spec Section	Description	Unit Cost	Unit Measure	Quantity	Area (nsf) Measure	34,726 Extention
	Vent piping-horizontals-4"	\$36.17	/lf	48	lf	1,736
	Vent piping-verticals-3"	\$28.00	/lf	64	lf	1,792
	Vent piping-horizontals-3"	\$31.50	/lf	120	lf	3,780
	Vent piping-horizontals-2"	\$28.00	/lf	226	lf	6,329
	Vents thru Roof	\$408.37	/ea	3	ea	1,225
	Roof Drainage-new construction only			7,672	sf	
	Roof Drainage-Drains-3"	\$638.56	/ea	0	ea	0
	Roof Drainage-Drains-4"	\$800.79	/ea	4	ea	3,203
	Roof Drainage-Drains-5"	\$905.84	/ea	0	ea	0
	Roof Drainage-Drains-6"	\$1,041.14	/ea	2	ea	2,082
	Roof Drainage-Overflow Drains-3"	\$568.32	/ea	2	ea	1,137
	Roof Drainage-Overflow Drains-4"	\$712.71	/ea	4	ea	2,851
	Roof Drainage-Overflow Drains-5"	\$806.20	/ea	2	ea	1,612
	Roof Drainage-Overflow Drains-6"	\$926.62	/ea	2	ea	1,853
	Vertical Piping-8"	\$47.87	/lf	72	lf	3,447
	Vertical Piping-6"	\$37.91	/lf	66	lf	2,502
	Vertical Piping-5"	\$28.72	/lf	0	lf	0
	Vertical Piping-4"	\$23.02	/lf	24	lf	552
	Vertical Piping-3"	\$20.40	/lf	0	lf	0
	Horizontal-above grade-8"	\$23.02	/lf	42	lf	967
	Horizontal-above grade-6"	\$53.30	/lf	298	lf	15,883
	Horizontal-above grade-5"	\$41.70	/lf	0	lf	0
	Horizontal-above grade-4"	\$25.32	/lf	84	lf	2,127
	Horizontal-above grade-3"	\$22.81	/lf	0	lf	0
	Horizontal-below grade-12"	\$66.33	/lf	0	lf	0
	Horizontal-below grade-10"	\$56.30	/lf	0	lf	0
	Horizontal-below grade-8"	\$50.17	/lf	48	lf	2,408
	Horizontal-below grade-6"	\$44.34	/lf	34	lf	1,507
	Horizontal-below grade-4"	\$39.67	/lf	0	lf	0
	Architectural Discharge Casting thru wall at 12' AFF	\$463.53	/ea	2	ea	927
	Insulation on piping & drain bowls	20.00%	/%	43,060	\$\$	8,612
	Water Closet-ADA	\$1,982.93	/ea	12	ea	23,795
	Water Closet-standard	\$1,874.77	/ea	16	ea	29,996
	Urinal-ADA & standard	\$1,454.15	/ea	8	ea	11,633
	Lavatory-wall mounted-ADA	\$1,341.66	/ea	0	ea	0
	Lavatory-wall mounted	\$941.82	/ea	0	ea	0
	Lavatory-counter mounted-ADA	\$1,107.93	/ea	47	ea	52,073
	Lavatory-counter mounted	\$879.80	/ea	0	ea	0
	Classroom Sink/ Kitchen Sink	\$1,219.81	/ea	0	ea	0
	Janitor Sinks	\$1,722.07	/ea	6	ea	10,332
	Electric Water Cooler-double ADA type	\$3,593.31	/ea	8	ea	28,747
	Exterior Drinking Fountains	\$2,012.40	/ea	0	ea	0
	Shower Valve-standard	\$359.97	/ea	0	ea	0
	Shower Valve-ADA	\$393.20	/ea	2	ea	786
	Shower Drain	\$1,015.04	/ea	2	ea	2,030
	Eye Wash Stations with Shower	\$1,074.37	/ea	1	ea	1,074
	Floor Drains with trap primer-3"	\$1,119.78	/ea	12	ea	13,437
	Floor Drains with trap primer-4"	\$1,244.94	/ea	0	ea	0
	Floor Drains with trap primer & sediment bucket	\$1,390.04	/ea	2	ea	2,780
	Floor Sinks-all types-Kitchen	\$1,614.08	/ea	0	ea	0
R	Wall Hydrant	\$850.64	/ea	3	ea	2,552
	Laundry Outlet	\$640.19	/ea	1	ea	640
	Kitchen Equipment Connections (no trim)	\$1,237.60	/ea	0	ea	0
	Grease Interceptor	\$12.48	/gal	0	gals	0
	Special Piping-gas manifold system & valving	\$4,979.52	/ls	1	ls	4,980
	Special Piping-gas-6"	\$50.03	/lf	120	lf	6,004
	Special Piping-gas-4"	\$42.33	/lf	200	lf	8,466
	Special Piping-gas-3"	\$38.39	/lf	164	lf	6,295
	Special Piping-gas-2"	\$32.62	/lf	0	lf	0
	Special Piping-gas-1 1/2"	\$28.78	/lf	40	lf	1,151
	Special Piping-gas-1"	\$21.89	/lf	0	lf	0
	Special Piping-gas-soleniod LGCV-1	\$859.50	/ea	0	ea	0
	Special Piping-ca equipment & manifold system	\$5,893.68	/ls	1	ls	5,894
	Special Piping-compressed air-2"	\$32.67	/lf	88	lf	2,875
	Special Piping-compressed air-1"	\$21.89	/lf	64	lf	1,401
	-outlets	\$130.00	/ea	6	ea	780
	Coring/Sleeving	\$124.05	/ea	120	ea	14,886
	Demolition & Cut, Cap & Make Safe	\$60.20	/hr	80	hr	4,816
	Fixture Permit-City of Bristol	\$57.20	/ea	120	ea	6,864

Spec		Unit	Unit	Quantity	Area (nsf)	34,726
Section	Description	Cost	Measure		Unit	Extention
	Building Permit-State only	0.18%	%	397,074		715
	Performance & Payment Bond	1.50%	%	404,653		6,070
	SubContractor Overhead & Profit	17.50%	%	410,722		71,876
	Budget Adjustment					17,401
	Plumbing			4,098	14.40	500,000
15500	Heating, Ventilating & Air Conditioning					
	Condensate Pumps	\$8,782.80	/ea	2	ea	Existing
	Values, Trim & Fittings	\$10,244.00	/ls	1	ls	Existing
	Heating-Hot Water (Steam) Generation-Boilers	\$15.06	/MBTU	9,000	MBTU	Existing
	-Miscellaneous Piping Steam & Co	\$49.92	/lf	200	lf	Existing
	-Heat Exchange to Hot Water-The	\$49.92	/lf	100	MBTU	4,992
	Heating-Hot Water Generation-Secondary VFD Pump Sets	\$2,761.20	/ea	1	ea	2,761
	Boiler Breeching-vertical 16" dia	\$12.64	/lbs	840	lbs	Existing
	-horizontal 10" dia	\$13.00	/lbs	395	lbs	Existing
	-insulation	\$18.72	/sf	494	sf	Existing
	Glycol Feed System-tank, pump & controls to Hot Water	\$6,760.00	/ls	0	ls	0
	Hot Water Heating Distribution-8"-horizontal	\$97.24	/lf	0	lf	0
	Hot Water Heating Distribution-8"-vertical	\$86.55	/lf	0	lf	0
	Hot/CW Water Distribution-6"-horizontal	\$81.04	/lf	0	lf	0
	Hot Water Heating Distribution-6"-vertical	\$72.12	/lf	0	lf	0
	Hot/CW Water Distribution-4"-horizontal	\$66.72	/lf	192	lf	12,810
	Hot/CW Water Distribution-4"-vertical	\$56.37	/lf	42	lf	2,367
	Hot/CW Water Distribution-3"-horizontal	\$55.22	/lf	0	lf	0
	Hot/CW Water Distribution-3"-vertical	\$47.16	/lf	0	lf	0
	Hot/CW Water Distribution-2 1/2"-horizontal	\$46.02	/lf	410	lf	18,867
	Hot/CW Water Distribution-2 1/2"-vertical	\$40.26	/lf	32	lf	1,288
	Hot/CW Water Distribution-circuit setters	\$504.40	/ea	28	ea	14,123
	Hot/CW Water Distribution-valves	\$153.92	/ea	60	ea	9,235
	New Equipment			38,000	cfm	
Theatre	Air Handling Equipment-Theatre-RTU Gas Fired-DX Cooling CV Heat	\$4.38	/cfm	20,000	cfm	87,568
N. Classro	Air Handling Equipment-Stage-RTU Gas Fired-DX Cooling CV	\$3.98	/cfm	8,000	cfm	31,866
Concourse	Air Handling Equipment-Performance-RTU Gas Fired-DX Cooling VA	\$4.44	/cfm	6,000	cfm	26,645
N. Classro	Air Handling Equipment-Lobby-RTU Gas Fired-DX Cooling CV	\$4.06	/lbs	4,000	cfm	16,251
	Sound Attenuation-supply	\$0.87	/cfm	20,000	cfm	17,472
	-return	\$0.72	/cfm	18,400	cfm	13,204
	Relocated Existing Equipment-Locker Room	\$6,760.00	/ea	3	ea	20,280
	-ductwork riser form roof	\$10.40	/lbs	5,880	lbs	61,152
39,986	Ductwork-Medium Pressure-ductmate-supply-insulated	\$9.99	/lbs	3,575	lbs	35,697
1	Ductwork-Low Pressure-supply insulated	\$9.56	/lbs	21,076	lbs	201,465
	-re-work existing-attic	\$12.48	/lbs	1,825	lbs	22,773
	Ductwork-Medium Pressure-Spiral supply-double wall	\$9.36	/lbs	750	lbs	7,020
	Ductwork-Low Pressure-Spiral return	\$8.67	/lbs	540	lbs	4,679
	Ductwork-Low Pressure-return insulated	\$7.88	/lbs	12,221	lbs	96,349
	-re-work existing-attic	\$11.44	/lbs	1,040	lbs	11,899
	Ductwork-Low Pressure-return uninsulated	\$7.88	/lbs	11,181	lbs	88,153
	-re-work existing-attic	\$10.14	/ea	231	lbs	2,344
	Humidification	\$16,224.00	/ea	0	ea	0
	Fancoil Units-2,000 cfm	\$4,120.12	/ea	0	ea	0
Ex. Classr	Fancoil Units-700 to 1,000 cfm	\$3,745.56	/ea	0	ea	0
Elev Room	Fancoil Units-200 cfm	\$1,294.02	/ea	0	ea	0
	Terminal Devices-FCU Units-S & R piping-branch only-4 pipe & cond.	\$29.94	/lf	0	lf	0
	Terminal Devices-VAV Units-fan powered-5,000 cfm	\$4,039.53	/lf	0	ea	0
	Terminal Devices-VAV Units-fan powered-3,000 cfm	\$2,524.70	/ea	0	ea	0
	Terminal Devices-VAV Units-fan powered-1,800-2,200 cfm	\$1,937.45	/ea	1	ea	1,937
	Terminal Devices-VAV Units-fan powered-900-1,300 cfm	\$1,363.15	/ea	2	ea	2,726
	Terminal Devices-VAV Units-fan powered-450-700 cfm	\$1,174.23	/ea	5	ea	5,871
	Terminal Devices-VAV Units-fan powered-400 cfm	\$1,010.10	/ea	0	ea	0
	Terminal Devices-VAV Units-fan powered-200 cfm	\$819.00	/ea	0	ea	0
	Terminal Devices-VAV Units-reheat piping-branch only	\$22.91	/lf	400	lf	9,164
	Terminal Devices-VAV Units-supply diffusers-ceiling	\$219.56	/ea	70	ea	15,370
	Terminal Devices-VAV Units-supply diffusers-industrial	\$577.20	/ea	42	ea	24,242
	Terminal Devices-VAV Units-supply diffusers-linear	\$337.53	/ea	60	ea	20,252
	Terminal Devices-VAV Units-return grilles-plenum	\$209.15	/ea	14	ea	2,928
	Terminal Devices-VAV Units-return grilles-ducted	\$224.26	/ea	56	ea	12,558
	Terminal Devices-VAV Units-return grilles-central	\$884.00	/ea	10	ea	8,840
	Sound Traps internally lined	\$378.42	/ea	12	ea	4,541
	Hot Water Reheat Coils	\$1,678.40	/ea	0	ea	0
	Reheat Coil Piping	\$22.91	/lf	0	lf	0

Spec Section	Description	Unit	Unit Measure	Quantity	Area (nsf)	34,726
		Cost			Unit Measure	Extention
	Terminal Devices-baseboard radiation incl covers-straight-pedestal	\$89.08	/lf	70	lf	6,236
	Terminal Devices-baseboard radiation incl covers-curved	\$105.84	/lf	0	lf	0
	Terminal Devices-radiant panel	\$80.52	/lf	0	lf	0
	Terminal Devices-cabinet heaters-floor mounted	\$1,064.07	/ea	2	ea	2,128
	Terminal Devices-cabinet heaters-ceiling mounted	\$1,161.84	/ea	4	ea	4,647
	Terminal Devices-unit heaters-hydronic	\$903.02	/ea	3	ea	2,709
	-electric	\$824.95	/ea	0	ea	0
	Terminal Devices-Radiant Panel & UH & CUH-piping-branch only	\$22.91	/lf	1,195	lf	27,385
	Toilet Exhaust-Fans	\$1,179.10	/ea	2	ea	2,358
	Toilet Exhaust-ductwork	\$8.05	/lbs	2,115	lbs	17,031
	Toilet Exhaust-exhaust registers	\$195.56	/ea	20	ea	3,911
	Toilet Exhaust-transfer ducts	\$539.34	/ea	4	ea	2,157
	General Exhaust-Fans	\$1,179.10	/ea	4	ea	4,716
	General Exhaust-ductwork	\$8.05	/lbs	3,024	lbs	24,350
	General Exhaust-exhaust registers	\$195.56	/ea	12	ea	2,347
	Special Exhaust-Fans-Kichen	\$5,096.00	/ea	0	ea	0
	-Dishwasher	\$1,861.60	/ea	0	ea	0
	Special Exhaust-ductwork-black iron	\$11.96	/lbs	0	ea	0
	-Stainless Steel	\$12.74	/lbs	0	lbs	0
	Special Exhaust-exhaust registers	\$382.20	/ea	0	ea	0
	Split Air Cooled DX Systems- 1.0 tons	\$5,187.00	/ea	0	ea	0
	- 1.5 tons	\$5,746.65	/ea	1	ea	5,747
	- 2.0 tons	\$6,216.73	/ea	1	ea	6,217
	Special Rigging-Helicopter/Crane	\$5,314.40	/ea	2	ea	10,629
	Demolition, Cut, Cap & Make Safe	\$61.36	/hr	198	hr	12,149
	Building Permit-State only	0.18%	%	1,054,411		1,898
	Performance & Payment Bond	1.50%	%	1,056,309		15,845
	SubContractor Overhead & Profit	15.50%	%	1,072,153		166,184
	Budget Adjustment					1,663
	Heating, Ventilating & Air Conditioning				35.71	1,240,000
15952	Instrumentation & Controls-proprietary	\$22,880.00	/ls	1	ls	22,880
	Estimate by Points-heating plant	\$304.07	/pt	6	/pt	1,824
	Estimate by Points-cooling plant	\$304.07	/pt	0	/pt	0
	Estimate by Points-air distribution	\$281.54	/pt	8	/pt	2,252
	Estimate by Points-air handling units	\$255.95	/pt	90	/pt	23,036
	Estimate by Points-heat recovery units	\$281.54	/pt	0	/pt	0
	Estimate by Points-humidifiers	\$281.54	/pt	0	/pt	0
	Estimate by Points-fan coil units	\$255.95	/pt	0	/pt	0
	Estimate by Points-vav units	\$255.95	/pt	32	/pt	8,191
	Estimate by Points-cabinet heaters	\$414.12	/pt	24	/pt	9,939
	Estimate by Points-unit heaters	\$255.95	/pt	6	/pt	1,536
	Estimate by Points-radiation & radiant panels	\$255.95	/pt	13	/pt	3,242
	Estimate by Points-toilet exhaust	\$353.32	/pt	12	/pt	4,240
	Estimate by Points-summer fan system	\$348.09	/pt	0	/pt	0
	Estimate by Points-special exhaust	\$304.07	/pt	0	/pt	0
	Estimate by Points-laboratory exhaust	\$350.85	/pt	0	/pt	0
	Estimate by Points-CO2 system	\$304.07	/pt	8	/pt	2,433
	Estimate by Points-CO2 Sensors	\$305.76	/ea	0	/pt	0
	Estimate by Points-thermostats	\$327.60	/ea	17	/pt	5,569
	Estimate by Points-humidistats-3 averaging	\$354.90	/ea	0	/pt	0
	Estimate by Points-Control Valves	\$334.05	/ea	30	ea	10,021
	Building Permit-State only	0.18%	%	95,163		171
	Performance & Payment Bond	1.50%	%	95,334		1,430
	SubContractor Overhead & Profit	15.50%	%	96,764		14,998
	Adjustment					3,237
	Instrumentation & Controls				3.31	115,000
16000	Electrical			180,364	5.19	
	New Service Conductors in Site Conduit from Vault to Pad Mount TX	\$44.46	/lf	68	lf	3,023
	New-Service-HV Cable Splices	\$522.08	/ea	8	ea	4,177
	New Service Vault Mounted Dry Transformer	\$19.76	/ea	750	kVA	CL&P
	New Service-rigid conduit 5" 600 MCM	\$102.28	/lf	248	lf	25,366
	empty	\$28.07	/lf	124	lf	3,481
	New Service-1,600 amp 120/208 v 3ph 4 wire	\$13,450.00	/ls	1	ls	13,450
	Distribution Panels-208/120 v-1,000 amp	\$9,518.44	/ea	0	ea	0
	Distribution Panels-208/120 v-600 amp-theatre	\$4,321.20	/ea	1	ea	4,321
	Distribution Panels-208/120v-400 amp-bulding	\$2,881.79	/ea	1	ea	2,882
	Distribution Panels-208/120v-225 amp	\$2,434.61	/ea	3	ea	7,304

Spec				Area (nsf)	34,726
Section	Description	Unit	Unit	Quantity	Unit
		Cost	Measure		Extention
	Distribution Panels-208/120v-100 amp	\$2,069.42	/ea	3	ea
	Distribution Panels-208/120v-60 amp	\$1,345.12	/ea	0	ea
	Panel Board Distribution at 1,000 amp	\$188.79	/lf	0	lf
	Panel Board Distribution at 800 amp	\$133.90	/lf	0	lf
	Panel Board Distribution at 600 amp	\$103.00	/lf	212	lf
	Panel Board Distribution at 400 amp	\$85.12	/lf	248	lf
	Panel Board Distribution at 225 amp	\$40.26	/lf	225	lf
	Panel Board Distribution at 100 amps	\$28.76	/lf	445	lf
	Panel Board Distribution at 60 amps	\$22.98	/lf	0	lf
	Motor Loads-Chiller	\$6,902.02	/ea	0	ea
	Motor Loads-Boiler, Hot Water Heaters	\$946.68	/ea	2	ea
	Motor Loads-Pump Sets	\$1,265.38	/ea	3	ea
	Motor Loads-AHU's-large	\$1,851.20	/ea	0	ea
	-humidifiers	\$3,224.00	/ea	0	ea
	-small VAV,Fans,UH,Cab Htrs,AC	\$379.78	/ea	17	ea
	-RTU-large	\$7,956.00	/ea	1	ea
	-medium	\$5,309.20	/ea	3	ea
	Motor Loads-Elevators	\$2,760.82	/ea	3	ea
	Motor Loads-Kitchen Equipment	\$789.50	/ea	0	ea
	Motor Loads-Telcomm & Security	\$517.65	/ea	2	ea
	LIGHTING			291,093	8.38
	1 x 4 Prismatic Troufer Fluorescent	\$245.70	/ea	0	ea
	2 x 4 Prismatic Troufer Fluorescent	\$258.80	/ea	0	ea
	2 x 2 Basket Indirect Fluorescent	\$242.42	/ea	0	ea
	1 x 4 Industrial Surface Mounted Fluorescent	\$234.78	/ea	0	ea
	1 x 8 Industrial Surface Mounted Fluorescent	\$394.43	/ea	0	ea
	4' Surface mounted Fluorescent -2 lamp wrap-around	\$211.85	/ea	0	ea
	4' Surface mounted Fluorescent -3 lamp wrap-around	\$223.86	/ea	0	ea
	Recessed Compact Fluorescent-4"	\$250.07	/ea	0	ea
	Recessed Compact Fluorescent-8"	\$275.18	/ea	0	ea
	Recessed Compact Fluorescent-12"square	\$348.35	/ea	0	ea
	HID Metal Halide 1000 w with quartz restrike	\$713.96	/ea	0	ea
	250 w wall sconce	\$474.65	/ea	0	ea
	Pendant Mounted Direct Indirect Fluorescent 4'0 long	\$340.70	/ea	0	ea
	Decorative Cove Light-type B Toilets & Sinks-4 ft	\$440.08	/ea	0	ea
	Decorative Up & Down Wall Sconce-large	\$433.64	/ea	0	ea
	-small	\$385.37	/ea	0	ea
	Decorative Uplight-Elliptipar	\$548.08	/ea	0	ea
	Pendant Mounted Direct/Indirect Fluorescent-8 ft	\$652.59	/ea	0	ea
	-4 ft	\$366.62	/ea	0	ea
	Wall Mounted Direct/Indirect Fluorescent	\$410.59	/ea	0	ea
	Display Accent Lighting	\$416.00	/ea	0	ea
	Die Cast Aluminum Exterior Fixture 2 @ 42 w PL	\$467.38	/ea	0	ea
X	Single Faced LED Exit Sign	\$259.90	/ea	0	ea
X1	Double Faced LED Exit Sign	\$306.85	/ea	0	ea
XE	Single Faced LED Exit Sign-Exterior	\$329.78	/ea	0	ea
	Emergency Lighting at Exits	\$275.60	/ea	0	ea
	Track Fixtures	\$100.46	/ea	0	ea
E	Dual Head Emergency Lighting Fixture	\$334.15	/ea	0	ea
	Allow for dimming ballast	\$0.00	/sf	0	ea
	Switching-allow	\$132.37	/ea	0	ea
M	Motion Sensors-OC	\$169.26	/ea	0	ea
	Light Control Sensors	\$267.05	/ea	0	ea
	Emergency Lighting Inverter-single phase	\$784.16	/kVA	0	kVA
	Theatre Dimming System-Consulatnts Allowance	\$49,920.00	/ls	0	ls
	Theatre Power Outlets-dedicated 20 amp	\$286.00	/ea	0	ea
	Theatre Lighting & Accessories at Stage	\$36,400.00	/ls	0	ls
	Lobbies	\$8.32	/sf	7,190	sf
	Corridors	\$6.80	/sf	4,922	sf
	Stairs	\$6.03	/sf	3,360	sf
	Theatre	\$12.48	/sf	8,522	sf
	Stage	\$7.28	/sf	1,624	sf
	Program	\$7.84	/sf	2,522	sf
	MEP & Support	\$6.03	/sf	1,250	sf
	Toilets/Showers	\$7.01	/sf	2,604	sf
	Storage	\$5.04	/sf	2,732	sf
	LOW TENSION POWER			48,881	1.41
	Lower Tension- Outlets-wall-duplex	\$122.57	/ea	0	ea
	Lower Tension- Outlets-wall-gfi	\$142.64	/ea	0	ea

Spec Section	Description	Unit	Unit Measure	Quantity	Area (nsf)	34,726	Extention
	-wp	\$229.65	/ea	0	ea		0
	Lower Tension- Outlets-wall-plumbing-ada lav & ewc	\$149.53	/ea	0	ea		0
	Lower Tension- Outlets-wall-computer	\$146.96	/ea	0	ea		0
	Lower Tension- Outlets-wall-double duplex	\$205.74	/ea	0	ea		0
	Lower Tension- Outlets-ceiling outlet-duplex	\$207.48	/ea	0	ea		0
	Lower Tension- Wire Mold 4000	\$29.81	/lf	0	lf		0
	-Outlets-duplex	\$104.18	/ea	0	ea		0
	-Outlets-double duplex	\$174.88	/ea	0	ea		0
	Floor Boxes	\$450.50	/ea	0	ea		0
	Bus Duct 120/208 v 50 amp	\$54.22	/lf	0	lf		0
	-bus plugs 20 amp	\$343.98	/ea	0	ea		0
	Lobbies	\$1.16	/sf	7,190	sf		8,375
	Corridors	\$1.14	/sf	4,922	sf		5,631
	Stairs	\$0.89	/sf	3,360	sf		3,005
	Theatre	\$1.51	/sf	8,522	sf		12,851
	Stage	\$2.66	/sf	1,624	sf		4,324
	Program	\$2.08	/sf	2,522	sf		5,246
	MEP & Support	\$2.86	/sf	1,250	sf		3,575
	Toilets/Showers	\$1.61	/sf	2,604	sf		4,198
	Storage	\$0.61	/sf	2,732	sf		1,676
	TELECOMMUNICATIONS			97,761	2.82		
	Communication Raceway-wall telephone outlet-60"aff	\$160.49	/ea	0	ea		0
	Communication Raceway-wall telephone outlet-18"aff	\$162.34	/ea	0	ea		0
	Communication Raceway-floor telephone outlet	\$228.80	/ea	0	ea		0
	Communication Raceway-wall computer outlet	\$162.34	/ea	IN ABOVE	ea		0
	Communication Raceway-ceiling computer outlet	\$203.42	/ea	0	ea		0
	Communication Raceway-CATV Raceway-1 1/2" conduit	\$17.21	/lf	0	lf		0
	-TV Outlets & Brackets	\$406.52	/ea	0	ea		0
	Communication Raceway-Incoming to New MDF Room	\$41.99	/lf	0	lf		0
	Communication Raceway-Inter-building Raceways-2"	\$21.74	/ea	0	ea		0
	Communication Raceway-Inter-building Raceways-4"	\$33.44	/lf	0	lf		0
	Communication Raceway-Backboards	\$169.26	/ea	0	ea		0
	Communication Raceway-Cable Tray Distribution-24" wide	\$38.40	/ea	0	ea		0
	-18 " wide	\$32.92	/ea	0	ea		0
	-12 " wide	\$27.87	/ea	0	ea		0
	Communication Raceway-Grounding Distribution-bus	\$1,035.30	/ea	0	ea		0
	Communication Raceway-Grounding Distribution-conduit	\$20.71	/lf	0	lf		0
	Cabling incl wire and punchdown-telephone	\$218.14	/ea	0	ea		by Owner
	-data-2 each	\$405.18	/ea	0	ea		by Owner
	Telecommunications Equipment	\$0.00	/ls	0	ls		by Owner
	Conduit & Boxes						
	Lobbies	\$1.16	/sf	7,190	sf		8,375
	Corridors	\$1.14	/sf	4,922	sf		5,631
	Stairs	\$0.89	/sf	3,360	sf		3,005
	Theatre	\$1.51	/sf	8,522	sf		12,851
	Stage	\$2.66	/sf	1,624	sf		4,324
	Program	\$2.08	/sf	2,522	sf		5,246
	MEP & Support	\$2.86	/sf	1,250	sf		3,575
	Toilets/Showers	\$1.61	/sf	2,604	sf		4,198
	Storage	\$0.61	/sf	2,732	sf		1,676
	Cabling & Punchdown						
	Lobbies	\$1.16	/sf	7,190	sf		8,375
	Corridors	\$1.14	/sf	4,922	sf		5,631
	Stairs	\$0.89	/sf	3,360	sf		3,005
	Theatre	\$1.51	/sf	8,522	sf		12,851
	Stage	\$2.66	/sf	1,624	sf		4,324
	Program	\$2.08	/sf	2,522	sf		5,246
	MEP & Support	\$2.86	/sf	1,250	sf		3,575
	Toilets/Showers	\$1.61	/sf	2,604	sf		4,198
	Storage	\$0.61	/sf	2,732	sf		1,676
	FIRE ALARM-proprietary			112,105	3.23		Existing
	Fire Alarm- Pull Stations	\$278.38	/ea	8	ea		2,227
	Fire Alarm- Speaker & Strobe	\$333.60	/ea	26	ea		8,674
	-with guard	\$369.64	/ea	2	ea		739
	-wp	\$333.60	/ea	0	ea		0
	Fire Alarm- Horn & Strobe	\$333.60	/ea	0	ea		0
	Fire Alarm- Ceiling-supplemental	\$254.23	/ea	0	ea		0
	Fire Alarm- Wall-supplemental	\$254.23	/ea	16	ea		4,068
	Fire Alarm- Smoke Damper	\$274.06	/ea	0	ea		0

Spec				Area (nsf)	34,726
Section	Description	Unit	Unit	Quantity	Unit
		Cost	Measure		Extention
	Fire Alarm- Firemans' MIC	\$218.56	/ea	3	ea 656
	Fire Alarm- Smoke Detectors-ceiling	\$189.81	/ea	11	ea 2,088
	Fire Alarm- Smoke Detectors-duct/AHU	\$381.92	/ea	8	ea 3,055
	Fire Alarm- Heat Detectors	\$186.35	/ea	6	ea 1,118
	Fire Alarm- Door Hold Open	\$294.49	/ea	6	ea 1,767
	Fire Alarm- Flow Switch intergal with valve	\$218.56	/ea	3	ea 656
	Fire Alarm- Tamper Switch intergal with valve	\$218.56	/ea	3	ea 656
	Fire Alarm- Call-for-Aid-light & switch	\$218.56	/ea	0	ea 0
	Fire Alarm- Nurse's Call-for-Aid-light & switch	\$339.89	/ea	0	ea 0
	Fire Alarm- plenum rated cable-conduit to cable tray	\$6.60	/lf	4,416	lf 29,163
	Fire Alarm- plenum rated cable	\$5.09	/lf	4,416	lf 22,472
	Fire Alarm- FACP	\$21,840.00	/ea	0	ea Existing
	Fire Alarm- Programming, Check, Test & Certify	\$17,524.00	/ls	1	ls 17,524
	Fire Alarm- Voice Component-premium	\$9,360.00	/ls	1	ls 9,360
	Fire Alarm- Aux Panel	\$7,883.20	/ea	1	ea 7,883
	SECURITY			49,906	1.44
	Security Raceway System-Main Panel & Programing	\$12,480.00	allo	0	ls Existing
	Security Raceway System-Equipment	\$9,360.00	/ls	1	ls 9,360
	Security Raceway System-Camera-raceway	\$598.18	/ea	3	ea 1,795
	Security Raceway System-Door Contacts-raceway	\$189.81	/leaf	12	leaf 2,278
	Security Raceway System-Motion Sensors-raceway	\$258.83	/ea	6	ea 1,553
	Security Raceway System-Glass Break Sensors-raceway	\$460.13	/ea	0	ea 0
	Security Raceway System-Card Readers to Elect. Lock/Strike-raceway	\$316.34	/ea	2	ea 633
	Security Raceway System-Security Sirens-raceway	\$460.14	/ea	0	ea 0
	Security Raceway System-ADA Toilet Safety Devices-raceway	\$316.34	/ea	1	ea 316
	Security Raceway System-CCTV	\$316.34	/ea	2	ea 633
	Security Raceway System-Cable Tray or Wire Management	\$51.77	/lf	24	lf 1,242
	Security Raceway System-Conduit & Wire	\$12.99	/lf	2,470	lf 32,097
	Area of Refuge System				
	-Head End & Programming	\$10,348.00	/ls	0	ls Not Req'd
	-Local Intercom	\$951.08	/ea	0	ea 0
	-Plenum Rated Cable	\$12.99	/lf	0	lf 0
	Central Clock & Paging System			0	0 Not Req'd
	-Head End & Programming	\$8,840.00	/ls	0	ls 0
	-Clocks with intergal speaker	\$496.16	/ea	0	ea 0
	-Clocks only	\$221.99	/ea	0	ea 0
	-Speakers-ceiling	\$159.33	/ea	0	ea 0
	-Conduit	\$6.60	/lf	0	lf 0
	-Plenum Rated Cable	\$6.87	/lf	0	lf 0
	Lightning Protection System			0	0 Existing ?
	Lightning Protection-counterpoise & building ground	\$1,007.34	/ea	0	ea Not Req'd ?
	-roof ariels	\$113.57	/ea	0	ea 0
	-connection to grid	\$21.13	/lf	0	ea 0
	-modifications to existing	\$7,800.00	/ls	0	ea 0
	-master label re-certification	\$0.36	/%	0	\$\$ 0
	Site Electrical				
	Site Lighting Fixtures-Parking Lot-singles	\$2,301.00	/ea	0	ea Site
	-doubles	\$2,983.50	/ea	0	ea Site
	-bollards	\$1,811.55	/ea	0	ea Site
	-flagpole	\$936.00	/ea	0	ea Site
	-street scape	\$598.00	/ea	0	ea Site
	-building accent	\$806.00	/ea	0	ea Site
	Concrete Bases & Ex/BF in Site Work	\$0.00			Site
	Conduit & Wire	\$11.99	/lnft	0	lnft Site
	Electrical Support of A/V Systems & Equipment (Net Cost)	\$192,320.00	/ls	1	ls 192,320
	Testing & Balancing	\$7,800.00	/ls	1	ls 7,800
	Temporary Power & Lighting	\$0.94	/sf	34,726	sf 32,504
	Demolition, Cut, Cap & Make Safe	\$2.18	/sf	34,726	sf 75,842
	Building Permit State & No City	0.18%	/ls	1,088,575	\$\$ 1,959
	Performance & Payment Bond	1.50%	/ls	1,090,535	\$\$ 16,358
	SubContractor Overhead & Profit	12.50%	/ls	1,106,893	\$\$ 138,362
	Adjustment				24,746
	Electrical				36.57 1,270,000

Memorial Boulevard School

Project Team

SCHOENHARDT



William D. Clegg, FIIDA, Principal-in-Charge, Interiors

Bill Clegg has been involved in creating the built environment since 1974. His expertise in interior design and project management is a valuable asset to Schoenhardt. Bill joined the firm in 1990 to establish the interior design practice. The practice has greatly flourished—our interior design services now constitute about 50% of the firm's total practice.

As Principal of Interiors, Bill shares his enthusiasm with the Schoenhardt staff and our clients. He enjoys hand-on contacts with clients and takes pride in leading the design process for many complex, high-profile interior design projects.

Bill provides leadership for all aspects of the firm, particularly marketing and design. Bill is also very involved in the International Interior Design Association, interior designers' leading professional organization. He is committed to the interior design profession and fosters the mentoring of Schoenhardt's junior designers. Bill's enthusiasm for design is palpable. Leadership, passion, and commitment to providing the highest quality design and service: these are the strengths that Bill brings to each project.

Education: Wentworth Institute of Technology



Mark A. Hopper, AIA, NCARB, Principal-in-Charge, Architecture

As an architect, Mark Hopper is committed to translating the needs and desires of his clients into unique physical architecture that is a pleasure to experience and yet effectively achieves the goals and objectives of each individual project. Mark strives to understand the way people live, play, work, and learn in order to create spaces that provide function as well as inspiration.

Mark's approach to project delivery is a collaborative process between architect and client with a goal of achieving a singular architectural expression. It is a process that expands as other professionals are added to the project team and is designed to encourage the thoughtful exchange of ideas and expertise of all. Each project is approached anew, with no preconceived notions of function, style, or form, because each client has a unique set of goals and needs. Mark's buildings evolve as his understanding of each project grows.

Along with Schoenhardt's leadership, Mark believes in fostering the firm as an organization that is greater than the sum of its parts – an organization that provides each of its members the opportunity to learn from each other while actively participating in the creation of architecture and interior design.

Education:

Master of Architecture, Charles E. Daniel Center for Foreign Study (Genoa, Italy)
Bachelor of Science, Architectural Design, Clemson University

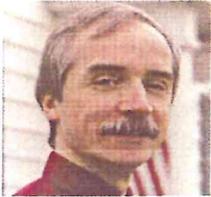


Schoenhardt

Memorial Boulevard School

Project Team

SCHOENHARDT



Valerio Giadone, AIA, Project Architect

Valerio Giadone brings many years of diversified design experience to Schoenhardt. An architect since 1989, he has worked on a broad range of projects including schools, libraries, corporate office interiors, commercial building design, theaters, healthcare facilities, retail, and residences. At Schoenhardt, he gives each project his trademarks of design quality, clear communication, and personal dedication.

Understanding clients' needs is the first step toward a successful project, according to Valerio. Careful examination of the program and of the site lays the groundwork for understanding the project scope and developing the design concept. Throughout each project, he maintains ongoing dialogue with our clients to review options and to develop strategies for accomplishing a successful design. Valerio is responsive, thorough and personable, which enables him to work effectively with all of our clients.

Valerio believes that all aspects of the project should enhance the overall design concept. He strives to make each of his buildings serve their inhabitants well, to have a sense of place, and to make a positive contribution to its surroundings.

Education:

Bachelor of Architecture, Pratt Institute
Associate in Science, Hartford State Technical College



Marguerite Carnell Rodney, M. Phil., Project Historian & Preservationist

Marguerite Carnell Rodney brings a unique talent to Schoenhardt: she combines the research skills of a professional historian with the hands-on practicality of a designer. An interior designer since 1986, Marguerite has extensive experience in contemporary design for a wide range of project types. In all of her work she endeavors to help her clients articulate their needs and, after careful listening, she translates their ideas into design solutions.

In addition to her interior design work, Marguerite provides research and design for historic preservation projects ranging from authentic restorations to adaptive re-use of older buildings. She has served as an independent historical consultant to museums and has published several articles. She continues to keep abreast of historic preservation theory and practice by regularly attending conferences and lectures. With these dual talents Marguerite offers her clients a holistic approach to design that respects the past, meets present needs, and anticipates the future.

A love and respect of history is evident in the caring manner with which Marguerite approaches her projects. She strives to create timeless designs that fully serve the needs of the people who use them, and to provide them with functional, comfortable, and beautiful interior spaces.

Education:

Master of Philosophy, American Civilization, George Washington University
Bachelor of Science, Interior Design, University of Connecticut, Summa cum laude



Memorial Boulevard School

Project Team

SCHOENHARDT



Jamie L. Clegg, IIDA, Project Interior Designer

As an interior designer and a project manager, Jamie L. DiPinto brings many years of experience to Schoenhardt. Her design experience and project management skills have proven to be a great asset to our firm. Since 1988 Jamie has specialized in educational design and regularly attends conferences to stay current in this specialty.

In addition, Jamie is experienced in municipal and corporate projects, including hospitals, libraries, police departments, banks, and major corporations. She has also developed standards for furniture, fixtures, and equipment and interior design specifications.

Personable and warm, Jamie's style reflects an honest desire to understand her clients' needs. She spends time learning everything she can about them and she values input from many people in order to fully understand how to approach the design of their new environment.

Education: Bachelor of Fine Arts: Interior Design, Syracuse University



Steven Therault, Project Designer

Stephen joined the Schoenhardt team with over 18 years of experience in architecture, construction management and real estate consulting with roles including, project designer, project engineer, and development specialist; focusing on mixed-use and retail projects. Borrowing on a rich and diverse career, Mr. Therault brings a unique perspective to his work spirited by collaboration and entrepreneurship.

As a Senior Architectural Designer at Schoenhardt, Steve's primary responsibility is to develop the overall architectural design of his projects - to translate concepts into solutions, to integrate and coordinate all consulting disciplines into the building project and to insure quality control of the design function.

Education:

Bachelor of Science, Construction Management, Central Connecticut State University
Boston Architectural Center



Memorial Boulevard School

- Acoustic Drapery –** Drapery which is specially constructed to absorb excess sound energy as a means of controlling volume, reverberation and echo in the auditorium. It is usually hung from traveler tracks or rolls along the sides and rear of the auditorium to provide adjustability by the users.
- Arena Stage –** A staging arrangement where the actors are surrounded by the audience.
- Backdrop or Drop –** A cyclorama that has been painted with a specific scene.
- Batten –** A bar, usually steel pipe, from which scenery, lights and stage curtains are hung. Battens are suspended over the stage by the rigging system.
- Black Box –** A flexible type of theatre where the stage and seating are easily reconfigured as desired for each production.
- Border–** A full-stage width piece of drapery that defines the upper visual limit of the stage setting and masks the lighting, unused scenery and rigging. Borders are usually used in conjunction with Legs.
- Center Line –** The upstage/downstage line that divides the width of the proscenium arch.
- Control Booth–** A room, usually at the rear of the audience seating, from which the lighting and sound operators can observe the stage while controlling their equipment. The stage manager may also be located in this room.
- Crossover –** The area behind the scenery or cyclorama where actors can pass from one side of the stage to the other without being seen. This is often a hallway behind the upstage wall.
- Cyclorama–** The curtain at the rear of the stage (upstage). Usually of white, pale grey or sky blue seamless fabric.
- Downstage–** Toward the front of the stage. Toward the audience.
- Fire Curtain –** A flameproof curtain immediately behind, and attached to, the proscenium. The curtain is automatically released to seal off the proscenium opening if a fire is detected.
- Fly –** To raise or lower by means of the stage rigging system. Items raised are *flown out*. Items lowered are *flown in*.



OUR PHILOSOPHY

At Studio T+L we believe that theatres designed by creative, talented professionals who keep the needs of the theatre company in mind result in the most exciting, successful and vital performance spaces. By listening to our client's desires and collaborating with the architect we develop a holistic design that makes the most of each project's practical requirements and aesthetic goals. As theatre practitioners, we bring a knowledge of current practices, a theatrical sensibility, and an extensive history of successful projects to every design we undertake.

At Studio T+L, we also believe that the design of a theatre is as much a *process*, requiring the active involvement of the theatre's staff, as it is a *product* delivered to the theatre company at the end of construction. The success of the design is directly tied to theatre's participation in that process. We seek out our client's requirements and desires, their input and opinions, and their review and feedback throughout the design and construction process.

At Studio T+L several fundamental principals guide us. They remind us why we do the work we do, what we offer our clients and collaborators, and what we expect in return.

We realize one of our firm's most unique characteristics is our ongoing theatre production work, which keeps us in touch with current practices and new technology. We combine that knowledge with our creative energy to maintain an innovative, solution-oriented perspective.

We put our client's best interests first and collaborate with the entire project team to uphold those interests. Throughout the process, we seek cooperation, feedback, and consensus. We educate the client and the team on our choices, our needs, and our related requirements. We ask for and establish expectations, provide timely responses, and deliver on any promise we make.

Studio T+L exists because we are passionate about what we do. We pride ourselves on fruitful collaborations with our clients and our fellow consultants - collaborations that produce superior theatres.

JASON LIVINGSTON
USA 829
LC IES IALD
PRINCIPAL
LEAD DESIGNER

With over 20 years of experience as a theatrical and architectural lighting designer and theatre consultant, Jason directs our consulting at Studio T+L and is responsible for the overall planning, programming and design of our projects. He has designed and managed projects ranging from 99-seat black box theatres to 4,100-seat municipal theatres. His theatrical credits include over 150 Off-Broadway, Regional, Industrial and University productions for theatre, opera, and dance. Jason's architectural lighting design work ranges from high-end retail, university libraries, and performing arts centers to private residences and LEED buildings. He was awarded a 2003 Lumen Award by the New York Section of the IES, and a 2003 International Illumination Design Award by the IESNA for his work on *Rewarding Lives* for American Express in New York City. His work has been profiled in *Lighting Design + Application* and *Lighting & Sound America*.

Jason has taught theatrical and architectural lighting design in New York City since 1993. He currently teaches architectural lighting design at Parsons School of Design and Pratt Institute. He also taught stage lighting at New York University for 10 years and architectural lighting at Fashion Institute of Technology for 5 years.

Jason holds a BFA in Theatre Arts from University of Miami and an MFA in Lighting Design from New York University. He is a member of United Scenic Artists Local 829, Illuminating Engineering Society, International Association of Lighting Designers and is Lighting Certified by the National Council on Qualifications for the Lighting Professions.

Studio T+L	Principal + Lead Designer	2006 - present
P.C. Richard & Son Theatre	New York, NY	Meridian Design
Levoy Theatre	Millville, NJ	David Rudzenski Architects
Bristol Memorial Theatre	Bristol, CT	Schoenhardt
Dixon Place	New York, NY	Meyer/Gifford Architects
Union City Demonstration Project High School	Union City, NJ	RSC Architects
Greenfield Community College	Greenfield, MA	Baer Architecture Group
Elmwood Playhouse	Nyack, NY	
Clarkstown High School	New City, NY	Metropolis Architects
Paley Center for Media	New York, NY	Lee H. Skolnick Partnership
Temple Beth Emeth	Brooklyn, NY	
Kenneth Cole	New York, NY	Kenneth Cole Productions
Charles Cosler Theatre Design	Project Manager + Lead Designer	2003 - 2005
Alexander Kasser Theatre	Montclair, NJ	HillierArchitecture
Watchung Hills Regional HS	Warren, NJ	Feitlowitz & Kosten
Middletown High School	Middletown, CT	DeCarlo & Doll
Signature Theatre	Arlington, VA	VOA Architects
Milwaukee Auditorium	Milwaukee, WI	VOA Architects
Chapin Hall	Montclair, NJ	HillierArchitecture
East Campus Recital Hall	Kean University, Union, NJ	KSS Architects
Rewarding Lives	San Francisco + Los Angeles, CA	The Moderns

LENORE DOXSEE
USA 829
ASSOCIATE
DESIGNER

Lenore is an accomplished lighting designer of opera, dance, theatre and museums. She is the resident lighting designer for Target Margin Theater where she received an Obie Award for their production of *Mamba's Daughters* in 1998. Regionally and abroad she has designed for Indiana Repertory Theatre, Syracuse Stage Company, Virginia Stage Company, La Jolla Playhouse, Singapore Repertory Theatre, and many others. Her designs for opera have been seen at Houston Grand Opera, New York City Opera, Glimmerglass Opera, Lyric Opera of Chicago, Pittsburgh Opera, Spoleto USA and elsewhere. She has also designed for choreographers Miguel Gutierrez, Jennifer Monson, Karen Sherman, Morgan Thorson and others.

Lenore designed the first two seasons of the New School for Social Research MFA Repertory at Circle in the Square Downtown. She created a repertory light plot and designed over 150 productions in this legendary thrust theatre.

Since 1998, Lenore has been a lighting design assistant at the Solomon R. Guggenheim Museum in New York City where she has assisted in designing and implementing many exhibits including *Brazil*, *Frank Gehry*, *Armani* and *Louise Bourgeois*. At the Guggenheim, Lenore is responsible for fixture and lamp choices, fixture research and design mock-ups. She has also worked at the Cooper Hewitt Museum and on the *America's Smithsonian* National Tour.

Since 1992, Lenore has dedicated part of her career to training the next generation of designers. She teaches design at New York University in the Department of Drama at Tisch School of the Arts and has taught design at Williams College and the University of Massachusetts at Amherst.

Lenore holds a BA in Theatre from Williams College and an MFA in Lighting Design from New York University. She is a member of United Scenic Artists Local 829.

Studio T+L	Designer	2006 - present
Levoy Theatre	Millville, NJ	David Rudzenski Architects
Bristol Memorial Theatre	Bristol, CT	Schoenhardt

Selected Lighting Designs

A Pied Piper Fantasy	Brooklyn Philharmonic at BAM	David Herskovits
A Hard Heart	Epic Theatre Ensemble	Will Pomerantz
Psyche	Boston Early Music Festival	Gilbert Blin
Faustus, The Last Night	Spoleto Festival USA	David Herskovits
Cunning Little Vixen	Houston Grand Opera	Leslie Halla
La Donna del Lago	Minnesota Opera & NYC Opera	Chas Rader-Shieber
Great Expectations	Theatreworks at Lucille Lortel Theatre	Will Pomerantz
Arabian Night	Play Company at Classic Stage Co.	Trip Cullman
Difficult Bodies (Bessie Award)	Dance Theater Workshop	Miguel Gutierrez
Private Lives	Indiana Rep & Syracuse Stage	Michael Edwards
Miss Julie	Kimmel Center, Philadelphia	Chas Rader-Shieber
Orlando	Glimmerglass Opera	Chas Rader-Shieber
Amadeus	Indiana Repertory Theater	Michael Edwards
Going to St. Ives	La Jolla Playhouse	Maria Mileaf
Mamba's Daughters (Obie Award)	Target Margin Theater	David Herskovits

Company Profile

JaffeHolden delivers acoustical consulting and audio/video system design services that result in successful design, planning and construction of performing, visual and fine arts facilities. For 50 years, JaffeHolden has led the field with innovative solutions that exceed expectation by matching the vision of the client and audience with the resources available for each project. We provide consulting services for facilities of all types including: performing arts, house of worship, educational/universities, museums, entertainment facilities, opera houses, concert halls, multiple-use theatres, cruise ships, historic renovations and legislative buildings.

Our consultants are professional in acoustics, sound management, music, theatre, electronic enhancement systems, engineering, physics, architecture and arts management. The team is able to provide the highest quality technical expertise and sensitivity. Our collaborative manner is underscored as the reason why our facilities are so intimate, innovative and timeless.

In design, we find the very best approach in addressing the needs of our client. The solutions are customized for the particular project. Working with the client from the very beginning, we listen carefully to the objectives before commencing design. We work throughout the design and construction phases of the project, ensuring that the client's expectations are reflected throughout the completed structure.

JaffeHolden offers consulting services that cover all phases: pre-design, design & construction and post-opening, which includes: environmental noise measurement and analysis, architectural room acoustics, building sound isolation, noise control and vibration isolation, mechanical system noise control, sound reinforcement, sound/communication systems, audio-visual systems and custom integrated sound design for museum exhibits.

JaffeHolden has offices in Norwalk, Connecticut, Santa Monica, California and Houston, Texas. We have 18 professional consultants and 6 administrative associates. We maintain acoustical measurement equipment that allows us to perform acoustic surveys and analysis for all projects. Our acoustic laboratory has a sound isolated semi-anechoic room in which we can test acoustical devices, experiment with the latest acoustical materials and create acoustical simulations and demonstrations for our clients.

We have an on going and viable method of ensuring that our design philosophies, approaches and standards are uniformly applied across all projects. We have created JaffeHolden University, our in-house design communication tool for teaching all of our associates about the company's history, past and current projects and discussion groups on the latest acoustical news and developments.

JaffeHolden.com

Northeast: 114–A Washington Street, Norwalk, CT 06854 • tel: 203.838.4167 • fax: 203.838.4168
West: 1453 Third Street Promenade, Suite 335, Santa Monica, CA 90401 • tel: 310.319.1333 • fax: 310.319.1344



Mark Reber, P.E. <mreber@JaffeHolden.com>
Principal, Acoustics

Mark Reber joined JaffeHolden in 2001 with more than 15 years of consulting experience encompassing all aspects of acoustic design related to buildings, including room acoustics, sound isolation, mechanical systems noise and vibration control, and environmental assessments.

Mark has led the JaffeHolden team as project manager on the following assignments:

- Davis Performing Arts Center, Georgetown University, Washington, DC
- Performing Arts Center at Texas A&M University, Corpus Christi, Texas
- Globe News Center for the Performing Arts, Amarillo, Texas
- IMAGINON Children's Learning Center, Charlotte, North Carolina
- Western Carolina University Fine and Performing Arts Center, Cullowhee, North Carolina
- John F. Kennedy Center for the Performing Arts, Family Theater, Washington, DC

- Bethel Woods Center for the Arts, Bethel, New York

Current project management assignments include:

- Film Society of Lincoln Center, New York City
- Henry Miller's Theater, New York City
- Yale University Dwight Hall Chapel Renovation, New Haven, Connecticut

Prior to joining JaffeHolden, Mark was a Senior Associate with design and project management assignments on projects ranging from residences and retail spaces to airports, convention centers, and museums. Some project highlights include:

- Rose Center for Earth and Space at The American Museum of Natural History, New York City
- The Rock & Roll Hall of Fame and Museum, Cleveland, Ohio
- Gannett / USA Today Corporate Headquarters, McLean, Virginia
- Denver International Airport, Denver, Colorado
- Manila Stock Exchange, Manila, Philippines
- ABC TV-1 Studios, New York City

Mark's responsibilities at JaffeHolden also include management of the firm's business operations.

Mark has presented technical papers to the American Management Association, the American Society of Heating, Refrigerating, and Air Conditioning Engineers, and the Acoustical Society of America. Mark holds a Bachelor of Science degree in Engineering from the University of Hartford, West Hartford, Connecticut. He is also a registered Professional Engineer in New York.

"I would like to take this opportunity to say 'thank you' to each and every one for your efforts...It is an honor and pleasure to work with such a great team."

David Carlucci
*President and
Executive Director
Bethel Woods
Center for the Arts*



Mark A. Wilcox <mwilcox@JaffeHolden.com>
Consultant, Acoustics

Mark Wilcox joined JaffeHolden as a consultant in 2005, upon graduation from the University of Hartford in Hartford, CT. He received his Bachelor of Engineering Science degree in Acoustics and Music, summa cum laude. This innovative undergraduate program allowed Mark to combine his interests in music and science through a program of study focused on a combination of engineering, acoustics, and conservatory level musical instruction. As an undergraduate, Mark spent two summers as an intern at Jaffe Holden, and was president of the Hartford student chapter of the Acoustical Society of America. He also received a commendation award in the 2005 Acoustical Society of America National Student Design Competition which involved planning and acoustic design for an urban mixed-use development containing a repertory theatre company.

Mark's current projects at JaffeHolden include:

- Juilliard School of Music, New York City
- Kennedy Center Eisenhower Theater, Washington, DC
- American Museum of Natural History - Hall of Human Origins, New York City
- Museum of the Moving Image, Astoria, New York
- Mark Taper Forum, Los Angeles, California
- New York Times Hall, New York City
- East Carolina University, Greenville, North Carolina
- Radford University, Richmond, Virginia
- Texas Women's University - Hubbard Hall, Denton, Texas
- Oxford High School, Oxford, Connecticut

Ben Bausher

Audio and Video Systems Acoustic Designer

Ben Bausher brings a wide variety of professional experience to the Audio & Video Systems Group at JaffeHolden. He incorporates experience and broad theoretical knowledge into his work. Mr. Bausher joined the JaffeHolden team in 2005, and has designed a wide range of systems for a diverse range of users. Recent projects include Eastern Illinois University's Doudna Fine Arts Center and City College San Francisco's New Performing Arts Building. These are multi-venue performing arts complexes that include a wide variety of performance venues, from proscenium theaters to lecture halls, as well as rehearsal facilities. The integration of these venues with central recording control rooms requires intricate audio and video routing technologies, an area in which Ben Bausher excels.

Prior to working at JaffeHolden, Mr. Bausher worked for Artec Consultants in New York City where he was the system designer for the House of Music in Aalborg, Denmark (another multi-venue facility) and Cornell University's Bailey Hall. He was educated at the University of Miami with a Bachelor of Fine Arts in Theater Sound Design.

Outside of consulting work, his experience as a sound designer and engineer has brought him to such diverse locations as Skywalker Sound, the Philadelphia Folk Festival, and a host of performance venues in the northeast. He has toured with Northern Blues recording artist David Jacobs-Strain, and has lent his live engineering expertise to diverse artists such as Jerry Herman, Ben Lee, Kaki King, and Honor Society – and other bands rarely heard of. Ben Bausher's theatre sound designs include the world premiere of *Smithereens*, by Mario Diament, at the New Theatre of Miami. In 1998, he was the recipient of the All New England Sound Engineer award from the New England Theatre Council for his work as a sound designer and engineer.

Ben Bausher's Project Highlights:

- Barnard College Nexus, New York City
- Merkin Hall at the Kaufman Center, New York City
- Richmond Hill Theatre, Richmond Hill, Ontario
- Westchester Reform Temple, Scarsdale, New York
- Visiting Nurse Services Headquarters, New York City
- Wylie Municipal Complex, Wylie, TX

Relationships • Resources • Results

###

FIRM OVERVIEW

Purcell Associates today is the result of years of continuous growth and adaptation to our clients' needs.

Since its establishment in 1959, Purcell Associates has served clients in both the public and private sectors with a wide variety of civil engineering services. The firm has successfully completed thousands of assignments in the northeastern region of the United States in addition to several major projects on the international scene.

Our staff, exhibiting a special pride in their work, are experts in their respective fields and also in collaborating on multi-discipline design teams to achieve project goals. Through their ability to employ professional project management techniques, assignments are completed on time and within budget.

Purcell Associates' philosophy is to provide high quality, client-responsive services to a select group of long-term clients. We currently have a staff of more than 50 engineering professionals in our Glastonbury, Connecticut headquarters and regional office in Boston, Massachusetts. The range of services offered by the firm includes:

STRUCTURAL ENGINEERING

Total Staff = 10, Prof. Engineers = 10

- Preconstruction Surveys
- Structural Investigations & Testimony
- Bridge Inspections & Ratings
- Bridge Design
- Dams & Related Structures



• Construction Services

- Building Design, Rehabilitation and Expansion

CIVIL & SANITARY ENGINEERING

(Part of Site Engineering Group)

Total Staff = 8, Prof. Engineers = 6

- Environmental Studies
- Drainage Studies & Systems
- Coastal Protection & Facilities
- Environmental Permitting
- Utility Coordination and Design



• Water Distribution Systems

CONSTRUCTION SERVICES

Total Staff = 6, Prof. Engineers = 2

- Procurement Administration
- Periodic or Full-Time Inspection
- Construction Scheduling & Management
- Contract Administration



SITE & FACILITIES PLANNING

Total Staff = 8, Prof. Engineers = 6

- Site Selection & Utilization
- Facilities Analysis & Programming
- Planning & Zoning Evaluations
- Environmental Impact Reviews
- Development of Master Plans



• Implementation

LAND SURVEYING

Total Staff = 6, Licensed Surveyors = 2

- Boundary and Topographic Surveying
- Roadway and Building Stakeout
- Geographic Information Systems
- Construction Surveys



TRANSPORTATION ENGINEERING

Total Staff = 12, Prof. Engineers = 6

- Highways & Urban Streets
- Traffic Signal Systems
- Airports
- Parking Facilities
- Local Roadway Reconstruction



• Intersections & Traffic Signals

- Traffic Impact Studies

CHRISTOPHER M. CIGNOLI, P.E.

Principal-in-Charge

Mr. Cignoli's role as Principal-in-Charge of Purcell Associates' assignments consists of identification of overall project scope, development of design tasks, coordination of internal and sub-consultant manpower allocations, continuous monitoring of design and construction schedules and budgets, monitoring of third-party permitting requirements and approval schedules, and overall client satisfaction.

Mr. Cignoli has acted as Principal-in-Charge, Project Manager and/or Lead Designer for projects on Higher Education Campuses throughout New England. Some of the locations where Mr. Cignoli has provided various engineering services include:

- **University of Massachusetts – Amherst**
- **Amherst College**
- **University of Connecticut – Storrs**
- **University of Connecticut – Avery Point**
- **Yale University**
- **Eastern Connecticut State University**
- **Central Connecticut State University**
- **Three Rivers Community College**
- **Western Connecticut State University**
- **Southern Connecticut State University**
- **Norwalk Community College**
- **Berkshire Community College**

In his role as Principal-In-Charge and/or Project manager, Mr. Cignoli has been responsible for the overall quality and client satisfaction on many secondary school design projects throughout Connecticut and Massachusetts in the recent past. Mr. Cignoli has been responsible for the execution of land surveying, site design, stormwater management, environmental permitting, structural engineering, and off-site improvements. Some of the projects, which Mr. Cignoli has been involved in:

- **Bristol Middle School – Bristol, CT**
- **Pathways Magnet School – Hartford, CT**
- **Danbury Elementary School – Danbury, CT**
- **Wethersfield High School Athletic Field Improvements – Wethersfield, CT**
- **Greater Hartford Classical Magnet School – Hartford, CT**
- **Cromwell Elementary School – Cromwell, CT**
- **Kaynor Vocational Technical High School – Waterbury, CT**
- **American School for the Deaf Environmental & Site Design – West Hartford, CT**
- **Brien McMahon High School – Norwalk, CT**
- **Simsbury High School – Simsbury, CT**
- **Old Saybrook Schools – Old Saybrook, CT**
- **Silas Deane Middle School Expansion – Wethersfield, CT**
- **Simsbury High School Expansion – Simsbury, CT**
- **Lawrence Middle School Renovations – Middletown, CT**
- **Southwest Elementary School – Torrington, CT**
- **Simsbury High School Planning Study – Simsbury, CT**

- **East Haven High School** – East Haven, CT
- **Northampton High School** – Northampton, MA
- **Alcott Middle School Septic System** – Wolcott, CT
- **Kravis Hall at Loomis Chaffee School** – Windsor, CT
- **Montville Middle School** – Montville, CT
- **Killingly Intermediate School** – Killingly, CT
- **East Haddam High School** – East Haddam, CT
- **Plainville High School Athletic Field Renovations** – Plainville, CT
- **Long Lane School Renovations** – Middletown, CT

Education: BSCE – University of Hartford

Licenses: Registered Professional Engineer; State of Massachusetts – #36417; State of Connecticut – #25279

Societies: American Society of Civil Engineers
American Public Works Association

ROBERT A. JARVIS, P.E.

Chief Civil Engineer

Mr. Jarvis has over 28 years of civil engineering experience. Much of his experience has been in the planning and design of a broad spectrum of site development and public works improvement projects including education and athletic facilities, commercial/industrial facilities, hospitals, public safety facilities; and municipal, postal and housing facilities. He has performed these services for clients in the private sector and in all areas of local, state, tribal and federal governments while on the staff of professional consulting firms in Connecticut, New York and Colorado. Mr. Jarvis has specific expertise in the design of stormwater management systems, site grading and infrastructure improvements, preparation of cost estimates, contract documents and specifications and permitting. He is skilled in the presentation of designs at public forums and to commissions and approval agencies. Specific projects include:

- **Bristol Middle School – Bristol, CT:** Site design for a 170,000 sq.ft. Middle School including grading, innovative infiltration design for stormwater management, and erosion and sedimentation control plan. Facilities include 3 ball fields, flood control beam and parking areas for 250 vehicles.
- **South End School – Southington, CT:** Project Manager for the design, permitting and construction of site improvements including stormwater management, and utilities for a new elementary school and athletic fields.
- **Southington High School – Southington, CT:** Project Manager for site engineering and utility design for high school and athletic field additions.
- **Hop Brook School – Naugatuck, CT:** Project Manager for design of site improvements for additions and alterations to elementary school, including parking areas and playing fields.
- **Plainville High School Athletic Field Renovations, Plainville, CT:** Project Manager for utility and drainage design and permitting for renovations to athletic fields and parking.
- **Municipal Field – Waterbury, CT:** Project Manager for the preparation of construction documents and construction administration for a new synthetic turf field to replace an aging natural turf field.
- **Kaplanis Field – Danbury, CT:** Project Manager for the design of improvements related to the construction of a new artificial turf football field for the Danbury Parks and Recreation Department.
- **Cromwell Elementary School – Cromwell, CT:** Project Manager for the permitting and design of site, drainage, traffic, athletic field and utility improvements for a new 3-5 elementary school.
- **Brien McMahon High School – Norwalk, CT:** Project Manager for the permitting and design of site, drainage, athletic fields and utility improvements for the additions and alterations to a high school and center for global studies.
- **Seymour Middle School – Seymour, CT:** Project manager for design of site, athletic field, drainage and utility improvements for a new middle school.
- **Ellis Technical & Vocational School Track Replacement, Danielson, CT:** Project Manager for civil engineering services for the design of a new 400m track, soccer/football field, and field event venues. Also analysis of drainage outfall and design of stream enclosure
- **Helen Keller School – Easton, CT:** Project Manager for design of site, drainage, septic system and other utility improvements for additions and alterations to a middle school.
- **Roberts Lane Elementary School – Danbury, CT:** Project Manager for the design of site, drainage, playing field and utility improvements for the construction of the Roberts Avenue Elementary School.

- **Region 10 School Improvements – Burlington, CT:** Project Manager for the design of site, playing field, drainage and septic system and other improvements for a 100,000 s.f. addition to a 5-12 regional school.
- **Bennet Middle School – Manchester, CT:** Project Manager for the design of site, drainage, playing field, traffic and utility improvements for additions and improvements to an existing middle school.
- **Avon High School and Middle School – Avon, CT:** Project Manager for site engineering and design of utility improvements for school additions and alterations.
- **South Windsor High School – South Windsor, CT:** Project Manager for design of site, athletic field and utility improvements for school additions and alterations.
- **Oliver Wolcott Regional Vocational Technical School – Torrington, CT:** Project Manager for design of site and utility improvements for additions and alterations to education facility. The project included reconstruction of baseball, soccer and utility fields.
- **Snow School – Middletown, CT:** Project Manager for design of site improvements for additions and alterations to elementary school and associated playing fields.
- **Pathways to Technology Magnet School – Hartford, CT:** Project Manager for survey, site/civil design and traffic for the new Pathways to Technology Magnet School in Hartford.
- **Greater Hartford Classical Magnet School – Hartford, CT:** Project Manager for the design and permitting of site, drainage and utility improvements, related to the construction of a \$24m, 9-12 magnet school.
- **Kaynor Regional Vocational Technical School Expansion – Waterbury, CT:** Project Manager for the survey, storm drainage and utility design, and environmental permitting and traffic engineering services for the \$40m renovation and 211,700 s.f. expansion of the existing facility.
- **Norwalk Community College - West Campus Addition - Center for Health and Science – Norwalk, CT:** Project Manager for master plan verification, survey, traffic, site engineering and permitting services for construction of a 35,000 s.f. building expansion for classrooms, seminar rooms and faculty offices.

Education:

- **BS Civil and Environmental Engineering – Clarkson University**

Licenses:

- Registered Professional Engineer
 - State of Connecticut – #16443
 - State of Massachusetts – #46815

Societies:

- American Society of Civil Engineers

ROBERT S. NEWTON, P.E.
LEED® Accredited Professional

Project Engineer

Mr. Newton has over 14 years of civil engineering experience with a majority of his career spent working on site and roadway design and hydraulic analyses for municipalities, private entities, the Connecticut DOT, and the Massachusetts Highway Department (MHD). Mr. Newton is well versed in all aspects of site and roadway design including site planning, drainage design, stormwater management, site utility design, sedimentation and erosion control plans, and local and state permitting. Mr. Newton is also an approved hydraulics engineer with the Connecticut DOT.

Mr. Newton has been involved with site layout and design of campus master plans and industrial park layouts providing roadway/walkway patterns, recreational facilities, and proposed subdivision layouts. He is skilled in the presentation of designs at public forums and to local commissions and approval agencies.

Mr. Newton's experience includes hydraulic analyses for site development studies, and roadway and parking lot storm drainage networks. He has also been involved with the analysis and design of retention basins for stormwater management. He has developed site layout designs, storm drainage networks, and sanitary sewer and water system designs for:

- **Bristol Middle School – Bristol, CT:** Site design for a 170,000 sq.ft. Middle School including grading, innovative infiltration design for stormwater management, and erosion and sedimentation control plan. Facilities include 3 ball fields, flood control beam and parking areas for 250 vehicles.
- **South End School – Southington, CT:** Design of site layout, grading, drainage, and utilities for a new elementary school and athletic fields. Phased construction to allow for the existing school on the property to be occupied during construction.
- **Plainville High School Athletic Fields – Plainville, CT:** Replaced sanitary sewer force main from Town pump station, in conjunction with field drainage system.
- **Kaplanis Field – Danbury, CT:** Design of site layout, drainage, and utilities for a new synthetic turf field and support building for the Danbury Parks & Recreation Department.
- **Municipal Field – Waterbury, CT:** Design of site layout, drainage, and utilities for a new synthetic turf field to replace an aging natural turf field.
- **University of Connecticut Avery Point Campus – Groton, CT:** Campus wide site layout, water system, sewer system, and drainage system with special consideration to environmentally sensitive Long Island Sound surrounding the campus. Phased construction of improvements to maintain uninterrupted campus operation.
- **American School for the Deaf – West Hartford, CT:** Expansion and upgrade of the site utilities, including: storm, sewer, and water systems for the entire school campus.
- **Connecticut Valley Hospital Recreational Facilities – Middletown, CT:** Site layout and grading to provide areas for volleyball, tennis, basketball and a picnic area.
- **University of Connecticut Biology Building – Storrs, CT:** Developed site drainage plan, along with water and sanitary sewer service connections to existing campus facilities for new academic building.
- **Ansonia High School – Ansonia, CT:** Designed site drainage system, including underground detention system for new high school.
- **Second Hill Lane School – Stratford, CT:** Design of site drainage and utility improvements for school renovations and addition.

- **University of Connecticut Business School – Storrs, CT:** Developed site drainage plan, along with water and sanitary sewer service connections to existing campus facilities for new academic building.
- **Southwest Elementary School – Torrington, CT:** Design of site drainage and utility improvements for addition and renovations to an elementary school.
- **Connecticut Juvenile Training School – Middletown, CT:** Design of site drainage and utilities, including aboveground detention for new juvenile training school campus.
- **Seymour Middle School – Seymour, CT:** Design of site drainage and utilities, including aboveground detention for a new middle school.
- **East Lyme Middle School – East Lyme, CT:** Design of site drainage and utilities, including underground infiltration basin for a new middle school.
- **Connecticut Police Academy – Meriden, CT:** Design of site layout, drainage and utilities for the additions and renovations to the CT Police Academy.
- **Silas Deane Middle School – Wethersfield, CT:** Design of site drainage and utility improvements for addition and renovations to the middle school.
- **H. H. Ellis Regional Vocational Technical School – Danielson, CT:** Design of replacement track and infield, including drainage and utility improvements for the school.
- **Eastern Connecticut State University, Science Building – Willimantic, CT:** Design of site drainage and utilities, including aboveground detention/treatment bio-swale for a new classroom building.
- **Cromwell Elementary School – Cromwell, CT:** Design of site layout including parking and driveway layout, athletic fields, drainage, and utilities for a new elementary school.
- **Foxwoods Resort and Casino – Mashantucket, CT:** Design of site layout, stormwater detention, drainage, and utilities for a new casino and convention center complex.
- **Annie Fisher Magnet School – Hartford, CT:** Design of drainage and utilities for the expansion and renovation of the existing school and athletic fields.

Professional Licenses/Registrations/Certifications:

Registered Professional Engineer – State of Connecticut
LEED® Accredited Professional

Education: BS Civil Engineering – Union College

Societies: American Society of Civil Engineers

STEPHEN R. ULMAN, P.E.

Senior Traffic Engineer

Mr. Ulman has a unique blend of traffic signal system hardware and intersection design experience. Prior to joining Purcell Associates, he served as a signal systems engineer with the Automatic Signal Division, a Mark IV Company. Using his computer expertise, he has written several custom programs for traffic engineering applications. He has also assisted in the customization of the AUTOCAD environment for use in roadway and traffic design.

With Automatic Signal, a leading manufacturer of traffic signal controllers, he designed intersection control systems, controller cabinets, special sequence logic and system integration strategies. He also assisted customers throughout the country in meeting sequencing and systems coordination needs and in interfacing Automatic Signal equipment with computerized signal systems. He assisted in the research and development of the company's plans and specifications to develop computerized signal systems.

Mr. Ulman's work with Purcell Associates has included providing Project Management and Project Engineering roles for traffic capacity and parking analyses, evaluation of existing signal equipment, and the design of traffic signal and geometric improvements at intersections throughout Connecticut and Massachusetts. He has experience using signal system analysis programs and has analyzed numerous signal systems, existing and proposed, in conjunction with various projects.

Mr. Ulman's Project Management and Project Engineering experience in the study, improvement planning and design of intersection improvements, signal and signal system design include work on the following projects:

- **Route 2 Corridor Improvements MGM Grand Resort and Casino – Ledyard & North Stonington, CT:** Realignment of a 2 mile section of Route 2 at Foxwoods Resort/Casino, including the creation of 2 interchanges with 7 Signalized Intersections.
- **Glenbrook Cables – Traffic Management Study and Traffic Management Plans for Northeast Utilities:** Traffic study for an underground electric transmission proposed to be constructed on State and Local Roads in the Towns of Stamford, Darien and Norwalk. Maintenance and Protection of Traffic strategies were prepared for the construction of the project including heavily traveled Rt. 1.
- **Reconstruction of I-84 – Cheshire-Southington, CT:** Reconstruction of a 3.5 mile section of existing I-84, including 4 interchanges, and 5 Signalized Intersections.
- **Routes 7/15 Interchange – Norwalk, CT:** Completion of the existing Routes 7 and 15 interchange, including 3 coordinated traffic signals.
- **Routes 82 & 85 Spot Safety Improvements – Salem/Montville, CT:** Reconstruction of 4.5 miles of including 3 signals.
- **Statewide Traffic Signal Upgrade – Connecticut:** Upgrade and Reconstruction of 44 traffic signals located in 4 communities, \$6 million construction cost.
- **Post Office Park Improvements –** Reconstruction of the access to a park with 2 signals along Route 20 in Wilbraham, MA
- **The Shoppes at Farmington Valley Improvements –** 4 signals along Rt 44 in Canton & Simsbury
- **Rainmaker Casino Expansion Improvements –** 5 signals in Mashantucket, CT
- **I-95 Corridor Emergency Vehicle Preemption at 270 Intersections –** Southwestern CT
- **Park Avenue Signal System –** 11 signals in Bridgeport's computerized signal system
- **Brighton Avenue Improvements –** 5 signals in Boston's computerized signal system
- **Blue Hills Avenue Improvements –** 7 Signals in Boston's computerized signal system

- **34 Signalization and Intersection Improvements** – Ansonia, Derby and Shelton, CT
- **Route 6 Farmington Roadway Improvements** – 7 signals in a close loop signal system along Rt. 6
- **I-95 Exit 42 Interchange** – 4 signals in the states computer system along Rt 162 in West Haven, CT
- **Southington Stop & Shop Roadway Improvements** – 2 signals in Southington, CT
- **North Street Improvements** – 2 signals in Stamford, CT
- **Ansonia Stop & Shop Roadway Improvements** – 3 signals in Ansonia, CT
- **Western Connecticut Correctional Center Roadway Improvements** – 2 signals in Newtown, CT
- **Housatonic Community Technical College** – 2 signals in Bridgeport, CT

Mr. Ulman has extensive experience in performing traffic impact studies requiring both local and state regulatory agency approvals:

- **MGM Grand Resorth and Casino** – Mashantucket, CT
- **The Shoppes at Farmington Valley** – Canton, CT
- **Milford Crossing** – Milford, CT
- **Cascade Trails Mobile Home Park** – Milford, CT
- **Fairfield Avenue Stop & Shop** – Bridgeport, CT
- **Route 1 Stop & Shop** – Stamford, CT
- **St. Francis Hospital Expansion** – Hartford, CT
- **Stamford Court Complex Traffic Study** – Stamford, CT
- **Middletown Court Complex Traffic Study** – Middletown, CT
- **New Britain Government Center Traffic Study** – New Britain, CT
- **The Bushnell Expansion Traffic Study** – Hartford, CT
- **Western Connecticut Correctional Center Traffic Study** – Newtown, CT
- **Mansfield CVS Traffic Study** – Mansfield, CT
- **ECSU Master Plan Traffic Study** – Windham, CT
- **Windham Middle School Traffic Study** – Windham, CT
- **Review of Traffic Study for the UConn Football Stadium** – East Hartford, CT
- **Ansonia High School Traffic Study** – East Haven, CT
- **Freshwater Commons Shopping Center Traffic Study and Improvements** – Enfield, CT
- **Traffic Engineering Services for SWRPA** – Greenwich, Stamford, Norwalk, Weston, Westport, and Wilton, CT

Due to his extensive background in the design of traffic signal equipment hardware and intersection design, Mr. Ulman has been instrumental in the inventory of existing traffic signal hardware on the following projects:

- **I-95 Corridor Emergency Vehicle Preemption at 270 Intersections** – Southwestern Connecticut
- **Statewide Signal Equipment Inventories & Design, 250 Intersections** – Massachusetts

Education: BEEE – Manhattan College

Licenses: Registered Professional Engineer



**MICHAEL HORTON
ASSOCIATES, INC.**

Consulting Structural
Engineers

151 Meadow Street
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FIRM DESCRIPTION

Michael Horton Associates, Inc. provides consulting structural engineering services to architects, owners and developers as part of its basic practice.

Michael Horton Associates, Inc. has earned a reputation among its clients for the firm's ability to produce sensitive structural design that responds to the needs of the individual client. The partners are actively involved in the design and construction phases of all firm projects because of their belief that continuity of involvement is important to the integrity of the firm's service to its clients.

The firm's experience encompasses a broad range of construction techniques and materials. Projects vary in size from residential investigations to multi-million dollar facilities. Major types of projects include commercial and office buildings, performing arts facilities, institutional facilities and residential buildings for universities and hospitals, residential single and multi-family structures, and parking garage structures.

The firm's excellence as structural consultants has been recognized on numerous award winning projects.

YSM Sterling Hall C Wing and I Wing 2007 CBC Small Project Teamwork Award
New Haven, Connecticut

John S. Martinez Elementary School 2006 Architectural Portfolio Recognized for
New Haven, Connecticut Educational Design Excellence in
American School and University
2005 CBC K-12 Project Teamwork Award

**Schwab Center for Information Technology
at Norwalk Community College** 2004 Louis I. Kahn Citation by
Norwalk, Connecticut American School and University

Daniel Hand High School 2003 CBC Large Project Teamwork Award
Madison, Connecticut 2004 American School and University

Vanderbilt Hall - Yale University 2003 AIA Connecticut Design Award
New Haven, Connecticut Historic Preservation

ACES Educational Center for the Arts
New Haven, Connecticut 2003 NSBA Exhibition of School Architecture

The Bushnell Center of the Performing Arts
Hartford, Connecticut 2002 AIA New England Design Award
2002 AGC Build CT Award
New Large Construction
2002 Building Design and Construction
Building Team Award
2001 CT Department of Economic and
Community Development –

Gillette Castle Restoration 2002 AIA Connecticut Design Award
East Haddam, Connecticut

MHAI

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C. MICHAEL HORTON, P.E.

Background:

Michael Horton's previous position as Chief Engineer and Principal of a multi-disciplined engineering firm, as well as design engineer for other firms, has earned him the distinction of being not only a consummate design engineer, but an accomplished administrator as well. He brings 30 years of experience in document production, administration and field inspection. Projects range from residential facilities to multi-million dollar institutional designs, including the design of many complex multi-use facilities.

Professional Registrations:

Connecticut, New York, New Jersey,
Pennsylvania

Education:

Iowa State University of Science and
Technology
B.S. Architectural Engineering, 1967

Post-Graduate Training:

Seismic Design, New England, 1990
Masonry Restoration, 1990
CADD Design and Production, 1985
Roofing Systems Design and Construction,
1980
Deep Foundation Design, 1976
Plastic Design of Steel, 1970
Fallout Shelter Analysis, 1968

Professional Organizations:

American Concrete Institute
Pre-stressed Concrete Institute
Post-tensioned Concrete Institute
National Society of Professional Engineers
Restore

Years with Firm:

14, including predecessor firm

MHAI

**MICHAEL HORTON
ASSOCIATES, INC.**

Consulting Structural
Engineers

ALFRED D. LOMBARDI, JR.

- Background:** Al Lombardi is positioned as Partner of the firm with over 20 years of experience in design, document preparation and site inspections. Mr. Lombardi's project experience ranges from residential buildings to multi-million dollar facilities, including projects in both the public and private sectors.
- Education:** Platt Vocational Technical School
Architectural Construction, 1981
- Post-Graduate Training:** Business Administration,
University of New Haven, 1994
Masonry Design and Construction, 1997
Masonry Design and Construction, 1998
American Concrete Institute Certification,
2000
- Professional Organizations:** American Society of Civil Engineers
American Institute of Steel Construction,
Professional Member
American Concrete Institute
American Institute of Architects,
Affiliate Member
- Years with Firm:** 14, including predecessor firm

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DOUGLAS H. McCLOSKEY, P.E.

Background: Douglas McCloskey is positioned as a Partner of the firm with 25 years of experience in design, document preparation and site inspections. Mr. McCloskey's project experience ranges from residential buildings to multi-million dollar facilities, including projects in both the public and private sectors as well as projects for the U.S. Armed Services. Mr. McCloskey's engineering accomplishments also includes published work by the American Concrete Institute.

Professional Registrations: Connecticut

Education: University of Connecticut
B.S. Civil Engineering, 1978

Post-Graduate Training: Advanced Structural Engineering, Design and Analysis, Rutgers University, 1984
Precast Concrete Design, 1986
Wood Design Seminar, 1992
Contemporary Seismic Design Requirements, 1993
Advances in Structural Steel Design, 1995
Weld Quality Control, 1998
Masonry Design and Construction, 1998
Masonry Engineering, 2006

Years with Firm: 9, including predecessor firm

Leach Consulting Company, LLC

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www.leachconsultingllc.com

DESIGN TEAM**Kevin T. Leach - Principal**

Kevin is a Professional Engineer with 37 years of experience. He has a Bachelor of Science Degree in Civil Engineering from Lehigh University and completed his Graduate Studies at Hartford Graduate Center. Kevin's professional affiliations include the Associated General Contractors of America, the American Society of Professional Engineers, the Connecticut Society of Professional Engineers, as well as, inclusion in the "Who's Who in the East" and is a Member of the University of Hartford's Masters Architectural Program Advisory Board. During Kevin's career in the industry he has worked with the Pike Company, as Vice President in their Hartford Region offices and successfully operated his own business, giving him the opportunity to work with many well-respected clients.

Thomas G. Leach - Estimator

Tom has over 15 years of experience in the industry. During his career he has worked as a laborer, superintendent and project engineer. Most of his positions required him to work on-site, performing duties including, but not limited to purchasing materials and labor for projects using project budgets as a guideline. Understanding the project scope of work and conditions such as weather, economics and availability helped Tom to accomplish success in the financial position of his projects. Tom continues his pursuit of studies in the industry.

Nancy J. Gibbons – Accounting / Administrative

Nancy has 28 years in the construction business, ranging from marketing to project management. Her role within LCC encompasses all of her experiences and utilizes her throughout each assignment. Nancy assists with meeting coordination, verbal and written communications between team members, assembles financial information for proposal budgets as well as estimates, publishes the final products and produces the client's billings.

LEACH

Leach Consulting Company LLC
1010 Wethersfield Avenue
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COMPANY PROFILE

Leach Consulting brings with it thirty-seven years in the construction industry specializing in University, Institutional, Educational, Corporate, Commercial and Health-Care markets. We work with clients in, both, the public and private sectors and are consistently able to adjust the level of services we offer to accommodate the individual needs.

Leach Consulting has specific expertise in the Master plan and Pre-Construction Phase Development, integrating Design and Budget control to maximize the clients' program without sacrificing program or aesthetics.

The firm's Principal, Kevin Leach, a Professional Engineer, has a Bachelor of Science Degree in Civil Engineering from Lehigh University and completed his Graduate Studies at Hartford Graduate Center. Kevin's professional affiliations include the Associated General Contractors of America, the American Society of Professional Engineers, the Connecticut Society of Professional Engineers, as well as, inclusion in the "Who's Who in the East" and is a Member of the University of Hartford's Masters Architectural Program Advisory Board.

During Kevin's career in the industry he has worked with the Pike Company, as Vice President in their Hartford Region offices and successfully operated his own business, giving him the opportunity to work with many well-respected clients:

- DuBose Associates
- Herbert S. Newman and Partners
- Kaestle-Boos Associates
- Amenta Emma Architects
- Moser Pilon Nelson
- Aetna Corporation
- Siemen's
- Traveler's Insurance
- United Technologies Corporation
- State of CT, DPW State of CT, DPW
- CT Center For Advanced Technologies
- Yale University
- UCONN
- Mt. Holyoke College
- Loomis Institute
- Williams College
- Tufts University
- City Of Htfd, Board of Education
- CT Historical Society Museum
- Caterpillar Corporation
- Fletcher Thompson Architects
- E.S.P.N.

Memorial Boulevard School

- Followspot Booth** – A room, usually located above the audience seating, where followspots are positioned and operated.
- Grid or Lighting Grid** – A horizontal set of pipes, set at right angles to one another and regularly spaced, from which lights, drapery and scenery are hung. Usually found in black box, thrust and arena theatres
- House** – The auditorium or audience chamber.
- House Curtain** – The drapery located upstage of the proscenium arch which is opened at the start of a performance.
- House Left** – Toward the left side of the auditorium from the audience's point-of-view.
- House Right** – Toward the right side of the auditorium from the audience's point-of-view.
- Leg** – A tall piece of stage drapery that defines the side visual limits of the stage setting and masks the wings from the audience's view. A pair of legs (one stage left and one stage right) is usually used in conjunction with a Border.
- Mask** – To hide from the audience's view.
- Masking** – The scenic elements or curtains used to hide backstage areas from the audience's view.
- Offstage or Off** – Away from the centerline of the stage. Toward the wings.
- Onstage or On** – Toward the centerline of the stage.
- Plaster Line** – The line of the upstage side of the proscenium wall.
- Proscenium** – The wall that separates the audience chamber from the stagehouse.
- Proscenium Arch** – The opening in the proscenium wall through which the audience views the stage.
- Quarter Lines** – In dance, the upstage/downstage lines that divide the space between the center line and the proscenium arch, thus dividing the stage into four upstage/downstage areas of equal width.
- Raked Stage or Rake** – A sloped stage, which is lower at its downstage edge and higher at its upstage edge.



Memorial Boulevard School

- Scrim –** A full-stage width curtain made from an open weave fabric. It appears solid when lit from the front and almost invisible when lit from behind. It is usually black, but may be painted with a scene. It is most often used to control the light bouncing off of the cyclorama or to create a “bleed through” effect.
- Sound/Light Lock –** Antechambers to the theatre through which actors and audience must pass. They prevent external sound and light from intruding on the performance.
- Spot Rigging –** A flexible, temporary rigging system designed to be easily installed and removed. It is usually made up of pulleys and rope.
- Stage Left –** Toward the left from the actor's point-of-view.
- Stage Right –** Toward the right from the actor's point-of-view.
- Thrust Stage –** A staging arrangement where the audience is seated on three sides of the stage.
- Traveler or Traveler Curtain –** A curtain suspended from a track so that its position can be adjusted. There are two types of traveler curtains, walk-along and draw. Draw curtains may be manual or motorized.
- Translucency or Translucent Drop –** A Backdrop painted with dye or watery paint to allow light to pass through the fabric, producing a glowing effect. Most often used for scenic effects such as sunsets. Translucencies are lit from the front and the back.
- Upstage or Up –** Toward the rear of the stage. Away from the audience.
- Wings –** The areas left and right of the performance area.



Memorial Boulevard School

STRUCTURAL SYSTEMS

DESIGN CRITERIA

Governing Building Code: State of Connecticut Building Code/2005 Connecticut Supplement

International Building Code/2003

Minimum Live Loads:

Offices: 50 psf

Classrooms: 40 psf

Storage: 125 psf

Corridors (First floor): 100 psf

Corridors (Second floor): 80 psf

Lobbies: 100 psf

Stairs: 100 psf

Partitions: 20 psf

Roof Snow Load ($P_f = 0.7C_e \times C_t \times I \times P_g$): Use 30 psf

C_e (Exposure Factor): 1.0

I (Importance Factor): 1.1

P_g (Ground Snow Load): 35 psf

Snow Drift Load:

In accordance with Section 1608.7

Wind Loads:

Basic Wind Speed ASCE 7: 95 mph

Exposure Classification: B

I (Importance Factor): 1.15

Wind Loads: In accordance with Section 1609.0.

Earthquake Loads:

Seismic Use Group II

Seismic Performance Category C

Importance Factor: 1.25

Soil Site Class D

0.2 Second Spectral Response Acceleration: 25%

1.0 Second Spectral Response Acceleration : 8%

Site Coefficient F_a (Assumed pending Soils Report): 1.6

Site Coefficient F_v (Assumed pending Soils Report): 2.4

Seismic Use Group II

R: 5.0 (Moment Frames of Steel)

R: 4.0 (Intermediate Reinforced Masonry Shear Walls)

Seismic Loads: In accordance with Section 1610.0

Snow loads: use 80% reduction



Memorial Boulevard School

STRUCTURAL SYSTEM CRITERIA

The scope of structural work and the systems described in this report for the building addition and renovations are based on the following assumptions:

Spread footing foundations are assumed, in conjunction with soil boring data and soils report to be generated for the building by the Geotechnical Consultant. A Geotechnical Report has not been completed at this time.

Stiffening or strengthening of existing structures will not be required for conformance with current building code sections pertaining to lateral loads.

Alterations, additions or repairs to existing structures shall be done in accordance with the State of Connecticut Building Code/2005 Connecticut Supplement and International Building Code/2003.

SCOPE OF STRUCTURAL WORK

The scope of structural work is shown on the preliminary structural drawings, and described in this narrative. Use the narrative in conjunction with the drawings. These are not final drawings and may not indicate all possible areas of structural scope. The narrative and drawings attempt to indicate the structural requirements for conditions that may be encountered in the existing building renovations and the new construction. The portions of the renovations that require structural work are as follows:

NEW CONSTRUCTION

Foundations: Foundations will consist of exterior reinforced concrete walls on continuous spread wall footings. Exterior columns will be supported on reinforced concrete piers supported on reinforced concrete spread footings. Interior columns will be supported on isolated reinforced concrete piers and isolated reinforced concrete spread footings.

Slab on grade: 5" thick concrete slab reinforced with 6x6-W2.9xW2x.9 welded wire fabric placed over 4" of 3/8" stone over the vapor retarder on a minimum of 6 inches of compacted gravel fill.

Supported Floor Construction: 3" normal weight concrete floor slab on 2 inch, 20 gage galvanized composite metal floor deck (total slab depth = 5") reinforced with 6x6-W2.9xW2x.9 welded wire fabric, on steel framing consisting of composite steel beams and girders supported by new steel columns.

Roof Structure: The roof shall consist of 20 gage, 1-1/2 inch galvanized metal roof deck on steel beams supported on steel roof girders on columns.

Exterior Walls: Wall construction will consist of a 4" veneer with reinforced concrete masonry (CMU) backup (assume 8" CMU). Refer to the Architectural Drawings for locations.

LATERAL SUPPORT

Seismic separation/expansion joints will be provided between the existing structure and the new additions. Lateral stability in the Performance Support Space Addition shall be provided by reinforced concrete masonry shear walls. Lateral stability in the Lobby Addition shall be provided by moment frames of steel.



Memorial Boulevard School

RENOVATIONS

Remove and Replace the Existing Floor Framing for New Stairs: Remove existing floor framing and replace with new concrete slab construction to provide a new stair from the exterior lobby elevation to the existing floor elevation. New floor construction shall consist of a 5" normal weight reinforced concrete floor slab, supported by the existing bearing walls. New steel lintels and columns will be required to support the existing bearing walls at the new openings.

The new elevator shaft will require the partial underpinning of the existing wall footings. Supported floor levels will require supplemental steel framing to support existing adjacent floor construction. Refer to the plans and sections on the Structural Drawings.

Infill Abandoned Penetrations Through the Existing Floor Slabs: Provide concrete infill at existing floor penetrations that will be abandoned. Larger penetrations may require new steel framing to support the slab edges.

Recommendations for Penetrations Through Existing Bearing Walls and Floor Framing: Provide recommendations for the location of proposed penetrations through existing bearing walls and floor slabs for the passage of new mechanical, plumbing and electrical requirements. New penetrations through existing bearing walls for mechanical, plumbing and electrical work should be coordinated to be located between the existing floor beams, in order to avoid the beam bearings and the possible shoring of the existing floors to place new lintels.

New Lintels for Proposed Wall Penetrations: Provide new lintels for the proposed openings in existing load bearing and non-load bearing walls. Lintels will be required at all penetrations through these walls.

Reconstruction of Balcony Seating: New floor construction shall consist of a 3" lightweight reinforced concrete floor slab, supported by cold formed steel stud construction. Refer to the typical detail on the Structural Drawings.



Memorial Boulevard School

MEP EXECUTIVE SUMMARY

MECHANICAL

The general condition of the existing equipment serving the school is in poor to fair condition. The existing boilers are in fair condition; however it appears that they have met the end of their serviceable life expectancy. Steam piping seems to be in fair condition but it is recommended that piping is ultrasonically tested to determine if the pipe wall thickness is in serviceable condition. Condensate is pumped back to the boiler from a relatively new condensate pump. We recommend that sections of the condensate pipe be tested similar to that of the main steam pipe.

Air handling units serving the facility have reached the end of their useful life expectancy and should be replaced as part of any major renovation. The air conditioning unit serving the indoor pool appears to be good condition and should be routinely maintained.

ELECTRICAL

The 1600 Ampere service equipment and main distribution board are in good condition and does not require replacement. The distribution system is comprised of approximately thirty year old panelboards to very new panelboards. A heat scan of the system is recommended to verify if any connections have come loose or if feeders are failing.

FIRE ALARM

The fire alarm system is an EST system and appears in excellent condition and working properly.

EMERGENCY LIGHTING

The emergency lighting system in the school is comprised of dedicated fixtures that are not energized when there is utility power but do energize upon power failure. These should be tested for proper operation.

EXIT SIGNS

Low height exit signs should be installed in the theater's egress doors and also in the cafeteria and its egress doors, if the cafeteria accommodates 300 people or more.

EMERGENCY POWER SYSTEM

The emergency generator appears to be approximately thirty years old. It should have a load bank test performed to verify its ability to provide rated power. The related automatic transfer switch had a humming noise that should be investigated, as with the normal power system this system should be heat scanned when the generator is operating to verify the condition of the connections and feeders.



Memorial Boulevard School

MECHANICAL – EXISTING HVAC SYSTEM

HEATING PLANT

The buildings heating system consists of two oil fired boilers manufactured by HB Smith Model M450L. Boilers are constructed of cast iron with 21 sections per boiler. Each boiler is rated for 4,177 MBH of steam. The boilers appear to have been installed approximately 25-30 years ago and are in fair condition. It does not appear that combustion air for the boilers is being provided. There are no combustion efficiency reports located at the boiler. An underground oil tank with a 10,000 gallon storage capacity was recently installed to serve the boilers. Oil is supplied to the burners from a duplex pump set located in the boiler room. Steam is supplied throughout the facility serving heating and ventilation units, perimeter radiation and unit heaters. Condensate is pumped back to the boiler via a condensate pump manufactured by Skidmore with four ½ HP pumps.

An additional cast iron boiler manufactured by Burnham Model FD12LLVOT with a gross output of 439 MBH is used to provide heat for the indoor pool. Hot water from the boiler is pumped to a heat exchanger located in the pool equipment room (adjacent to the boiler room) to heat the pool water. This boiler appears to have been recently installed and is in good condition.

HVAC SYSTEMS

The building is served by several heating and ventilation units (H&V) which supply air throughout the building. Access to these units were limited, however from the units which were visible they appear to be in poor condition and are over 30 years old. Heating to the H&V units is from the main boiler plant.

The auditorium is served by a gas fired heating with DX cooling packaged rooftop unit. There was no information on the unit (i.e. unit data tag), based on the size of the DX cooling coil the unit appears to be capable of delivering 20,000 CFM which is approximately 50 Tons of cooling capacity. According to the maintenance staff this unit has not been operating properly. Distribution from the package rooftop unit is via overhead ductwork which is located in an attic space directly above the auditorium. From a visual inspection the ductwork appears to be in good condition and insulation is intact. Heat is also provided at the perimeter of the auditorium from baseboard steam radiation. Each radiator is provided with an independent thermostatically controlled valve.

The indoor pool is served by two units located at grade (directly above the pool locker room and pool deck) with distribution to a single supply register at each end and a return at each end. Only one of the pool air conditioning units is operational. This unit is manufactured by AAON model number RK-08 with a nominal cooling capacity of 7 1/2 Tons. The unit is provided with a gas fired furnace for heating and an air cooled DX coil for cooling. Distribution from the unit is via exposed ductwork at grade before dropping down to supply the pool. The construction of the ductwork is of galvanized steel and is not insulated.

The gymnasium is served by heating and ventilation units which at the time of the survey were not accessible. However, based on existing drawings these units appear to have been installed as part of a renovation back in 1976.



Memorial Boulevard School

HVAC RECOMMENDATIONS

HEATING PLANT

The existing boilers have met the end of their useful life expectancy and should be replaced with new boilers. In replacing the boilers there are two options which should be considered. Option one is to provide two new oil fired cast iron boilers and reconnect to the existing steam distribution. Each boiler should be sized for 4,500 MBH which is approximately 67% of the entire building's heating capacity with the additions and renovations.. This would allow for some redundancy in the event that one of the boilers is down for maintenance. All existing steam traps would require repair/replacement to ensure that condensate is capable of returning back to the boilers. It appears that the steam mains in the steam room are in fair condition and can continue to operate. However, as part of Option One the mains should be ultrasonically tested to determine the extent of corrosion due to the many years of steam transportation. The tests will determine if the wall thickness is still suitable for future steam distribution.

Option Two is replacing the boilers with the same cast iron boilers as in Option One, however in lieu of distributing steam to the entire facility a steam to hot water convertor would be utilized. The convertor would be a shell and tube heat exchanger rated for an input of 5 PSI steam and an output of 6,000MBH. New hot water distribution would serve all heating equipment via two base mounted end suction pumps located in the boiler room. Each pump shall be sized for approximately 585 GPM at 100 feet of head, and configured in a lead/lag configuration. This option would minimize the maintenance and control issues associated with a steam distribution system.

Regardless of which option is selected, means of introducing combustion air to the boiler room is essential. In order to meet code a minimum of two combustion openings are required within the boiler room, each opening shall be sized for one square inch of free area for every 4,000 BTU of input at the boilers. Combustion air openings shall be provided with motorized dampers that are scheduled to open when any boiler is schedule to operate.

HVAC SYSTEMS

All systems serving the existing facility, auditorium and gymnasium have met the end of their useful life expectancy and should be replaced as part of any major renovation. New air handling units and ductwork should be installed to provide adequate distribution and cooling capacity. Fresh air should be implemented for all new units in order to satisfy the minimum code requirements of the building code. Furthermore, economizer should be implemented for all new units so that free cooling as required by code can be achieved during optimal ambient conditions. New units can be configured as gas fired heating/DX cooling packaged rooftop units or can be part of a new chilled water system. Implementing a chilled water system with a water cooled chiller would allow for new systems to be of higher efficiency than that of packaged rooftop units.



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INDOOR POOL

With only one of the indoor pool units functioning we would recommend that the non-functioning unit be replaced. The new unit should be constructed specifically for pool environments. Reheating for dehumidification should be provided using hot gas heat rejection from the refrigerant, additional refrigerant heat rejection can be used to supplement the pool's water heating. Any remaining heat from the refrigeration process will be rejected to the outside through the unit's mounted condensing unit.

Pool unit should be sized to provide a minimum ventilation requirement of 1/2 cu. ft. of outdoor air per minute per square foot of pool and deck area and 7 CFM per person for spectator areas will be provided. All existing ductwork should be replaced with new ductwork constructed of aluminum and fully insulated.

RENOVATIONS – AUDITORIUM/STAGE

The auditorium air handling unit should be replaced with a new unit in the same location as the existing. The new air handling unit shall be rated for a minimum cooling capacity of 50 Tons via four stages of DX cooling and utilize gas for heating. An energy recovery wheel due to the large amount of ventilation air required would be implemented into the unit as well as hot gas re-heat and bypass. Unit shall be constructed as 2" double wall with foam insulation and a perforated interior lining. Unit shall be provided with an inlet and discharge sound attenuating plenum. A vibration isolated roof curb shall be utilized to mount the unit on the roof. An air quality sensor in the return ductwork will monitor the carbon dioxide levels in the space and control the amount of outside air required to the space accordingly. A 100% outside air economizer will be required in order to satisfy the Energy Codes.

Existing ductwork distribution can possibly be reused to serve the renovated auditorium. Coordination between the mechanical and acoustical engineer will be required to determine if the velocity in the existing ductwork with the new anticipated airflow will satisfy the requirements set forth by the acoustical engineer.

The Stage should be served by a dedicated rooftop air handling unit with a nominal cooling capacity of 20 Tons via two stages of DX cooling and utilize gas for heating. Unit shall be provided with hot gas reheat and hot gas bypass. Unit shall be constructed as 2" double wall with foam insulation and a perforated interior lining. Unit shall be provided with an inlet and discharge sound attenuating plenum. A vibration isolated roof curb shall be utilized to mount the unit on the roof. New distribution to the stage will be required with supply air routed as low to the stage area as possible at low velocities.



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NEW ADDITION – PERFORMANCE SUPPORT SPACE

Towards the rear of the Stage area a new two story high structure will be constructed to house performance support space. Support spaces shall include dressing rooms, rehearsal room, scene shop and associated back of house spaces. This new structure shall be served by a dedicated rooftop air handling unit with a nominal cooling capacity of 15 Tons via DX cooling and utilize gas for heating. Unit shall be provided with hot gas reheat and hot gas bypass. Areas served by this unit shall be controlled via variable air volume (VAV) boxes with hot water re-heat coils. A total of 8 VAV boxes will be required. Air shall be distributed via overhead concealed ductwork to ceiling mounted diffusers.

The Scene Shop shall be provided with a wood dust collector sized to handle the wood working equipment scheduled for this space. If the wood dust collector is greater than 1500 CFM in capacity it will need to be located outdoors to comply with NFPA 664.

NEW ADDITION – LOBBY

Towards the front of the Auditorium will be a new two story high Lobby constructed of mainly glass. This new structure shall be served by a dedicated rooftop air handling unit with a nominal cooling capacity of 10 Tons via DX cooling and gas for heating. Unit shall be provided with hot gas reheat and hot gas bypass. Air shall be distributed via overhead concealed ductwork to ceiling mounted diffusers. At the perimeter, air shall distribute via linear slot diffusers to "wash" the glass so that condensation does not occur. Furthermore, perimeter hot water baseboard radiation shall be used to help offset the internal heat loss thru the building's envelope.

Two new elevators will be installed as part of the Lobby Addition; the elevator machine rooms associated with these elevators should be mechanically cooled via a ductless split air conditioning unit. The split DX unit shall be sized for 2 Tons of cooling with the condensing unit located at the roof level.

MECHANICAL SPECIFICATIONS – GENERAL

Comply with all current Federal, State, City and local codes, standards and ordinances including Connecticut State Building Code including supplements, NFPA, utility company standards, insurance carrier requirements, and local authorities.

The contractor will be responsible to give all necessary notices, obtain all permits and pay all taxes and fees necessary to obtain approvals and complete the work herein. Obtain all required certificates of inspection and deliver same to Owner.

The Mechanical, Electrical, Plumbing and Fire Protection systems will be designed to comply with all Current State and Local Codes including associated supplements and seismic requirements.

The work includes all labor, materials, equipment and services necessary to complete the work as shown on the drawings and specified herein.



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COORDINATION

Coordinate the work, with work of other trades and field conditions. Carefully check space requirements and utilities to insure all equipment can be installed in the spaces allotted thereto and coordinate all necessary utility service requirements. Coordinate, protect and schedule work with work of other trades in accordance with the required construction sequence. Install all work in accordance with equipment manufacturer's installation instructions.

Coordinate the work, with work of other trades and field conditions. Carefully check space requirements and utilities to insure all equipment can be installed in the spaces allotted thereto and coordinate all necessary utility service requirements. Coordinate, protect and schedule work with work of other trades in accordance with the required construction sequence. Install all work in accordance with equipment manufacturer's installation instructions.

WARRANTY

The Contractor warrants that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted, that the Work will be free from defects not inherent in the quality required or permitted, and that the work will conform with the project requirements. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. Contractor shall warranty all work for a period of one year from Owner acceptance unless specified otherwise in which case longer equipment warranties may apply.

SPECIAL WARRANTY

Manufacturer's standard form in which manufacturer agrees to repair or replace the following components of furnaces that fail in materials or workmanship within specified warranty period:

Warranty Period, Commencing on Date of Substantial Completion:

Refrigeration Compressors: 10 years.

Evaporator and Condenser Coils: Five years.

SUBMITTALS

Contractor shall submit; shop drawings, product data, samples, record documents (as-builts) and operation and maintenance manuals in accordance with the Contract requirements and particular specification section requirements.



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ACCEPTABLE PRODUCTS

Acceptable Manufacturers. Provide the specified product or submit the equal product from the list of acceptable manufacturers for approval.

Acceptable Manufacturers:

Air Handling Units: Ingenia, Mammoth, Innovent

Air Filters: Filtration Group, Viledon, Flanders.

Diffusers and Grilles: Price, Metal-Aire, Titus.

Fans: Loren Cook, Greenheck.

Flexible Ductwork: Flexmaster.

Insulation: Owens-Corning, Certainteed, Knauf, Schuller, Pittsburgh-Corning.

Sound Attenuators: Vibro-Acoustics, VAW.

Vibration Isolation/Seismic Restraints: Mason Industries, Amber Booth, Vibration Mountings.

PRIMARY EQUIPMENT

Air Handling Units.

Pre and Final Filters.

Economizer Outside, Return and Relief Air Dampers.

Minimum Outside Air Dampers.

Sound Attenuation - Supply and Return 5'-0" long.

Heating Coil.

DX Cooling Coil.

Supply Fan.

Variable Speed Drive Unit(s).

Return Fan.

Sound Attenuator

Supply and Return Fan Acoustical Plenums.

Two speed motor.

Pressure independent electronically controlled VAV boxes.



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ENERGY RECOVERY WHEEL

Cooling Coils shall be eight rows, copper tube with aluminum fins. Coil frames and drain pans shall be entirely of Type 304 stainless steel.

Supply fans shall have five inches of static pressure. Return fans shall have one and one-half inch static pressure with the same CFM as the supply.

Vane Axial Fan Manufacturer: Flakt, Joy, Woods.

ELECTRICAL COMPONENTS

Electric motors shall be constant speed 1800 rpm, squirrel cage type and shall comply with NEMA standards high efficiency type IEEE standard 112, test method B.

Enclosure type shall be open drip proof for indoor use, guarded drip proof where indoors and exposed to contact by personnel or weather protected type totally enclosed fan cooled for outdoor use.

Fractional horsepower motors shall be capacitor start, induction run or split phase type, 1/3hp and less and shall be 120 volt, single phase, 60 Hz, AC service factor 1.35. Motors 1/2 HP and larger shall be 208 or 480 volt, three phase 60 Hz, AC and service factor 1.15.

Two speed motors shall be dual winding type.

Motor Controllers: Comply with NEC, NFPA 70 and UL. FVNR for motors 1/3hp and less, 120 volt, 1-phase, 60hz, AC with pilot light, toggle switch, thermal overload and lockout type disconnect switch.

FVNR magnetic across-the-line combination type with fused disconnect switch for motors 1/2hp and greater, 208 or 480 volt, 3-phase, 60hz, AC with hand-off-auto switch, 120 volt control transformer and control circuit, pilot light, two sets of auxiliary contacts, 3-phase ambient temperature compensated thermal overload relays with manual reset push button.

Provide reduced voltage auto transformer dual winding open delta type starters for motors 50 hp and larger.

Enclosures shall be NEMA type 1A for indoor applications, NEMA type 3R for outdoor applications and NEMA type 4 for locations subject to water spray or high humidity.

Motor Efficiency: All motors shall be premium efficiency and shall comply with local utility company requirements.



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DUCTWORK

Submit sheet metal shop standards for review. Construct of galvanized steel ASTM A 527 with G90 coating, in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible dated 1985. Seal all joints with approved sealer.

Ductwork shall be sized not to exceed 800 FPM in mains and 500 FPM max velocity in branch runs to outlets. The use of flex duct shall be limited to 3'-0" and used for alignment purposes only. Flex ductwork shall not be used to create a change of direction.

Acoustic duct liner shall be installed on interior of ducts a minimum of 15 feet on inlet and discharge side of air handling equipment.

Air chambers and plenums shall be double wall 20 gauge galvanized steel with 4" thick 6 lb. density fiberglass insulation board.

Install volume dampers upstream of all supply air outlets and inlets, volume dampers shall have locking quadrants and two end bearings.

INSULATION

Insulation shall be provided on all ductwork and piping. Duct wrap insulation shall be provided with a vapor barrier and thickness in compliance with 2003 International Energy Code. All piping valves and fittings shall be insulated per the requirements set forth in 2003 International Energy Code. All pipe insulation shall be provided with a Vapor barrier.

All exposed ductwork on the roof shall be provided with 2" mineral fiber insulation with a 3/4 lb. density. Ductwork shall be wrapped weather and water tight.

PIPING

Comply with ASME standard 31.9 "Building Services Piping" ANSI standard B31.1 Standard for "Power Piping" and B16.5 for welding.

Pipe and tubing materials, fittings and joints.

Copper tubing: ASTM B-88, Type L with wrought copper fittings ANSI B16.22, solder joints ASTM B32 95-5 tin-antimony. Copper shall be used for pipe sizes 1 1/2" and below.

Steel piping: ASTM A-120 or ASTM A-53 grade B, schedule 40, seamless, black steel pipe with cast iron threaded fittings ANSI B16.4 class 125 or 250, malleable iron threaded fittings ANSI B16.3 class 150 or 300, steel welding fittings ASTM A234, flanged fittings ANSI B16.5, or flanged fittings. Steel pipe shall be used for piping 2" and below.

Refrigerant piping: Copper type ACR with silver soldered or brazed joints.



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Provide manufacture's provided balancing manifolds for all loops. Manifold assemblies shall include and not be limited to supply and return thermometers, automatic air vent on supply, drain valve and fill cock, supply module fitting with integral shut off valve, and return manifold with 12 position integral flow balancing and regulating valve. After installation of tubing and before the placement of the insulation, all radiant floor piping and manifold accessories shall be pressure air or water tested to a minimum of 60 psig for a 24-hour period.

Comply with MSS-90 requirements for support of piping and BOCA National Building Code for seismic requirements.

Pipe hanger spacing and support loading shall be in accordance with Table 1 & 2 requirements. Where concentrated loads of valves, fittings and components occur space hangers closer as necessary based on the weight to be supported and the maximum recommended loads for the hanger support system.

Pipe hangers shall be of the clevis type, unless piping fluid is above 215°F where axial movement occurs use roller type hangers.

Hydro statically test piping in accordance with ANSI B31.9 requirements at 1-1/2 times system working pressure.

EXAMINATION

Inspect site conditions before starting preparatory work and verify that actual conditions are known and acceptable before starting work. Inspect areas where equipment will be installed and verify adequate space is available for access, service, and removal of equipment. Coordinate with the Work of other Sections.

SHEET METAL WORK

All sheet metal work shall be done in a neat and workmanlike manner with ductwork following building lines and in straight lines with smooth transitions and offsets as required to suit actual installation. Sheet metal work, which does not conform to Drawings and/or Specifications or is poorly done shall be repaired and/or replaced as directed by the Architect.

All pre-fabricated duct sections shall be cleaned prior to storage on the site and be provided with protective covering on all openings to maintain the interior of the ductwork clean and free of dust and other materials prior to installation. Field-assembled duct sections shall be cleaned during assembly and similarly protected until installation.

PIPING SYSTEMS INSTALLATION

Install piping straight, plumb and form right angles on parallel lines with building walls. Locate groups of pipes parallel to each other. Provide sufficient spacing for insulation and valve access.

Pipe shall be free from scale and dirt. Protect open ended pipe ends to prevent debris from entering. All piping shall be reamed free of burrs.



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Joining and bending of copper tubings shall be in accordance with the Copper Development Association Copper Tube Handbook.

Piping shall be worked into place without springing or forcing.

Water systems piping shall be pitched in direction of flow. Drain valves shall be located at all system low points. Provide manual air vents at all system high points.

Locate valves for easy access and operation. Valve stems shall be above horizontal.

Provide complete dielectric isolation between ferrous and non-ferrous metals.

Piping connections to coils and equipment shall be made with offsets provided with unions or flanges arranged so that equipment can be serviced or removed without dismantling.

Provide for expansion and contraction in all piping systems to prevent undue strains on piping or equipment. Provide double off-sets at risers to take up expansion.

Run piping concealed above ceilings and within furred spaces. Piping in mechanical rooms shall be exposed.

Support vertical piping at every floor independently of connected horizontal piping. Pipe hangers shall be placed within 12 inches of each horizontal elbow.

INSULATION APPLICATION REQUIREMENT

Install insulation, mastics, adhesives, coatings, covers, and weather-protection in accordance with manufacturer's recommendations.

Remove dirt, scale, oil, rust, and other foreign matter from surfaces to be insulated. All surfaces shall be clean and dry prior to installation of insulation.

Insulation shall not be applied to piping systems and related equipment until the completion of pressure testing.

Insulation shall not be applied to duct systems and related equipment until ductwork has been sealed in accordance with specifications.

Piping and ductwork insulation shall be full thickness through all penetrations of non-fire-rated construction.

Equipment nameplates, labels, and access doors shall be exposed with insulation edges finished.

Valves shall be insulated to top of bonnets.

Anchors, hangers, and other projections shall be insulated and vapor-sealed to prevent condensation. All openings and punctures shall be sealed with vapor barrier compound.



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Flexible blanket insulation shall be installed with ends tightly butted. Install so that insulation is not excessively compressed at duct corners. Seams shall be stapled 6 inches on-center with outwardly clinching staples. Seal with pressure-sensitive vapor barrier tape. Where rectangular ducts are 24 inches in width or greater, duct wrap insulation shall be secured to bottom of duct with mechanical fasteners such as pins and speed clip washers, spaced on 12-inch centers and not over 3 inches from edges of insulation joints.

Duct insulation liner shall be adhered to sheet metal with 90 percent coverage of adhesive and all exposed leading edges and transverse joints coated with adhesive. Duct liner shall be additionally secured with mechanical fasteners. Fasteners shall be impact driven or weld secured with mechanical fasteners. Fastener spacing shall be in accordance with manufacturer instructions. Refer to SMACNA HVAC DUCT CONSTRUCTION STANDARDS, Figure 2-22, Flexible Duct Liner Installation.

PROTECTION & CLEAN-UP

The Contractor shall be responsible for maintenance and protection of all materials and equipment furnished by him during the construction period from loss, damage or deterioration until final acceptance by the Owner. All materials and equipment on the job site shall be stored and protected from the weather. All piping and equipment openings shall be temporarily closed during construction to prevent obstruction and damage.

All equipment with damaged finished surfaces shall be cleaned and repainted with the same paints as were factory applied.

Clean-Up: Keep the job site free from the accumulation of waste materials and rubbish daily. At the completion of the work, remove all rubbish, construction equipment and surplus materials from the site and leave the premises in a clean condition.

TEST, ADJUST & BALANCE

Test, adjust and balance all air and water systems/equipment in accordance with AABC or NEBB requirements.

Tab agency to be certified by AABC or NEBB.

Submit typed report of final measurements and equipment operational performance data.



Memorial Boulevard School

ELECTRICAL – EXISTING ELECTRICAL SYSTEMS

ELECTRIC SERVICE & DISTRIBUTION

At present, there is a 1600 Ampere electric service distribution board which is in good condition. The downstream electrical distribution system is comprised of original panelboards, disconnects and feeders and relatively new panelboards and disconnects.

LIGHTING

The theater portion of the building is comprised of surface mounted fixtures and wall sconces in the main seating area. The lighting levels in the building appeared adequate for the most part. Presently, the staff practices energy saving by being conscientious in turning off the fixtures throughout the building.

Exterior lighting is provided by floodlights mounted on the north side of the roof lighting the front parking lot. These lights are controlled by a roof mounted photocell.

EMERGENCY LIGHTING

The emergency lighting system is comprised of dedicated fixtures that are not energized when there is utility power but do energize upon power failure.

EXIT SIGNS

Exit signs are located throughout the theater and in the school building and appear to be in good condition. They have self contained batteries and should be tested form operation on battery.

FIRE ALARM SYSTEM

The fire alarm system is an EST IRC-3 addressable system and appears in excellent condition and working properly. The system utilizes booster power supplies to energize notification devices. There is a smoke detector in front of the elevator and appears to be for elevator recall.

EMERGENCY POWER SYSTEM

The emergency generator is a 35kW 208/120 volt 3Ø, 4 wire, diesel fuel generator and appears to be approximately thirty years old. The related automatic transfer switch had a humming noise.

It appears that the pullbox above the automatic transfer switch has normal power feeders and emergency power feeders in it. It should be verified that there is a barrier between the two feeders, if not one should be installed or a pullbox with a barrier should replace the existing one to comply with the National Electric Code.



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ELECTRICAL – RECOMMENDATIONS

ELECTRIC SERVICE & DISTRIBUTION

The older panelboards and their related feeders should be heat scanned to determine if there is any connection or operational issues.

The electrical distribution system for this area will be comprised of a 208/120 volt 3Ø, 4W, 600A main distribution switchboard. This switchboard will contain a 125A, 3 pole circuit breaker to energize a 208/120 volt 125A panelboard on the lower gym and upper gym levels and a 208/120 volt 3Ø, 4W, 225A panelboard for the auditorium level and a 110A circuit breaker to energize a roof top unit. The switchboard shall have copper bussing throughout, NEMA 1 enclosure with bolt on circuit breakers.

The panelboard located on the lower and upper gym levels will energize the lighting, general purpose receptacles, computer receptacles on each floor. The panelboard on the auditorium level will energize the lighting, general purpose receptacles, computer receptacles, shop equipment. The panelboards shall have copper bussing throughout, NEMA 1 enclosure with bolt on circuit breakers. The feeders for these panelboards and rooftop unit shall be copper conductor in EMT conduit.

LIGHTING

Scope of lighting work shall include controls for all areas and lighting fixtures in all areas. Lighting design shall be comprised of energy efficient T5 and T8 fluorescent lamps, compact fluorescent lamps where applicable.

Lighting Control: Provide room occupancy sensors in each room except the shop areas where manual switches shall be utilized for safety reasons.

Lighting in office areas shall comply with the International Energy Codes requirements of 1 watt per square foot or better. Lighting in performing practice areas shall comply with the International Energy Codes requirements of 1.6 watt per square foot or better.

EMERGENCY LIGHTING

The emergency lighting system shall be comprised of certain lighting fixtures located throughout the spaces, alternating stairwell fixtures all connected to a 2KW, 208/120 volt 3Ø, 4W central inverter with an integral panelboard.

FIRE ALARM

The fire alarm system in this area shall be an extension of the existing Edwards System with pull stations at each floor's exit doors, horn/strobes in corridors, monitoring of the fire protection system, duct detectors for systems 2000cfm or larger including fan shutdown. The horn strobes will be energized by a new booster power supply.

RECEPTACLE DEVICES

Locate one receptacle per wall in each room. Coordinate with owner the receptacle requirement for the shop areas. Two weatherproof, ground fault type receptacles shall be located on the exterior of the addition.



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NEW ADDITION – LOBBY

ELECTRIC DISTRIBUTION

The electrical distribution system for this area will be comprised of a 208/120 volt 3Ø, 4W, 400A main distribution switchboard. This switchboard will contain a 125A, 3 pole circuit breaker to energize a 208/120 volt 125A panelboard for the entry/auditorium level and two 110A shunt trip circuit breakers for the new elevators and a 60A circuit breaker to energize a roof top unit. The switchboard shall have copper bussing throughout, NEMA 1 enclosure with bolt on circuit breakers.

The panelboard located on the lower level for the lobby will energize the lighting, general purpose receptacles, computer receptacles on the floor. The panelboard shall have copper bussing throughout, NEMA 1 enclosure with bolt on circuit breakers. The feeder for this panelboard and rooftop unit shall be copper conductor in EMT conduit.

LIGHTING

Scope of lighting work shall include controls for all areas and lighting fixtures in all areas. Lighting design shall be comprised of energy efficient T5 and T8 fluorescent lamps, compact fluorescent lamps where applicable.

Lighting Control: Provide room occupancy sensors in each area.

Lighting in office areas shall comply with the International Energy Codes requirements of 1 watt per square foot or better. Because of the curtain wall in the lobby daylight harvesting will be investigated to maximize energy reductions.

EMERGENCY LIGHTING

The emergency lighting system shall be comprised of certain lighting fixtures located throughout the spaces, alternating stairwell fixtures all connected to a 1KW, 208/120 volt 3Ø, 4W central inverter with an integral panelboard.

FIRE ALARM

The fire alarm system in this area shall be an extension of the existing Edwards System with pull stations at each floor's exit doors, horn/strobes in corridors, monitoring of the fire protection system, duct detectors for systems 2000cfm or larger including fan shutdown. The horn strobes will be energized by a new booster power supply. Elevator recall smoke detectors located in each lobby, top and bottom of the elevator shaft, elevator machine room will be included. Heat detectors shall be located at the top and bottom of the elevator shaft and elevator machine room for shunt tripping and shall be coordinated with the sprinkler system.

RECEPTACLE DEVICES

Locate one receptacle per wall in each room. Two weatherproof, ground fault type receptacles shall be located on the exterior of the addition.



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The following shall apply to all building additions:

GROUNDING

Provide a system ground and all necessary bonding as required by the NEC. Provide separate insulated ground wire with each branch circuit and feeder.

WIRING DEVICES

All equipment and receptacles shall be labeled indicating panel and circuit breaker.

Receptacles shall be installed with ground pin up.

Switches and receptacles shall be specification grade.

HVAC WIRING

Provide all necessary disconnects, wiring/raceways for all exhaust fans, pumps, and air units including air conditioning. Motor controllers for HVAC equipment are by mechanical. Provide electrical service to all mechanical control transformers and control panels.

TELEPHONE & DATA SYSTEM WIRING

Telephone and Data systems indicated in this section shall consist of conduit, backboxes and backboard. Telephone and Data systems and wiring is to be provided by separate communications contractor.

Project scope includes raceways for the telephone and data distribution.

SECURITY SYSTEM WIRING

Security system indicated in this section shall consist of pathways, conduit and backboxes.

System shall include motion sensors and door detectors.

CALL FOR AID

Provide complete call for aid signaling system in all single stall handicap bathrooms including pull cord and hall dome light.

WIRE & INSULATION APPLICATIONS

Feeders: Type THHN/THWN, in raceway.

Branch Circuits: Type THHN/THWN, in raceway.

Metal clad cables are permitted only for lighting switching legs in dry walls and for whips not exceeding 6 feet in length from a junction box to light fixtures in ceiling.

Branch circuits and home runs shall not use MC cables.

Fire Alarm Circuits: Type THHN/THWN, in raceway.



Low voltage, 100V maximum, circuits for sound and security systems: Power-limited tray cable, in cable tray or raceways.

Plenum Spaces: Use plenum rated cables in plenum spaces.

Class 1 Control Circuits: Type THHN/THWN, in raceway.

Class 2 Control Circuits: Type THHN/THWN, in raceway.

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CONDUIT APPLICATION

Indoors: Use the following wiring methods:

Exposed areas not subject to physical damage: Electric Metallic Tubing.

Exposed areas subject to physical damage: Rigid Metallic Conduit.

Areas subject to physical damage include, but limited to, attic, mechanical rooms, boiler and chiller rooms, sprinkler room and like utility rooms.

Concealed: Electric Metallic Tubing.

Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except in wet or damp locations, use LFMC.

Metal clad cables are permitted only for lighting switching legs in dry walls and for whips not exceeding 6 feet in length from a junction box to light fixtures in ceiling.

Damp or Wet Locations: Rigid steel conduit.

Plenum Spaces: Wiring methods in plenum spaces shall conform to the requirements of NEC Section 300-22. All conduits shall be metal. Exposed cables, where used, shall be listed and approved for use in plenum.

Boxes and Enclosures: NEMA 250, Type 1, except as follows:

Damp or Wet Locations: NEMA 250, Type 4, stainless steel.

RENOVATION – AUDITORIUM/STAGE

ELECTRICAL DISTRIBUTION SYSTEM

The existing distribution system will be modified to provide power to the two new lifts located at the edge of the stage area.

LIGHTING

The existing lighting fixtures shall be disconnected and removed and cleaned, relamped and reinstalled.

FIRE ALARM

The existing fire alarm system shall remain as is.



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PLUMBING – EXISTING PLUMBING SYSTEMS

OVERVIEW

Four story theater and office building, consisting of a cellar, orchestra level, balcony level, third floor office space and partial fourth floor office space. The building is approximately 100 years old and many of the mechanical systems are original. Piping has excessive coats of paint, many control valves appear to be inoperable.

DOMESTIC WATER SERVICE

The building incorporates a 2" domestic water services served from a municipal main. The water service is provided with a water meter, but does not incorporate any means for backflow prevention. Pressure reducing valves are provided. The water service is located in a crawlspace below a metal stair in the mechanical room. Accessibility to service this equipment is not provided with this configuration. Pressure gauges are provided, but are not operational and should be replaced. A reduced pressure backflow preventer installed on each service in accordance with water authority requirements is recommended. Additionally, main shut-off valves for the water services appear to be at the end of their useful life and should be replaced. Access to the water service and equipment most likely does not meet local utility requirements. The water service should be relocated and provided with all necessary equipment, valving, gauges, etc. in accordance with the International Plumbing Code and local utility requirements.

Water piping appears to be a combination of original threaded copper / brass and copper type L with wrought solder fittings. There was insulation missing a various locations throughout the building. Valves and piping original to the building in most cases are original and have reached the end of their serviceable life.

Water piping is not provided with insulation in most cases.

Domestic hot water is generated by a side arm heater off of the boiler system located at the Cellar level Mechanical Room. The domestic water heating system capacities were not readily available.

Valving and piping to the storage water heaters appear to be newer, however the water heating system appears to be at the end of their serviceable life. Leaks were observed in the steam piping which serves the hot water heaters coils and should be repaired.

SANITARY DRAINAGE SYSTEM

The building supports a sanitary waste and vent system throughout piped to plumbing fixtures. The building appears to discharge by gravity the street by means of a cast iron combined Sanitary and Storm piping. Materials generally consist of original cast iron hub and spigot. Piping generally appears to be in poor to fair condition and most likely original.

STORM DRAINAGE SYSTEM

Roof drainage appears to be adequate and in working order, although most likely original to the building. Staff indicated that a current project will provide major renovation of the roof and that new roof drains and overflow drain provisions will be provided.



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The cellar mechanical room is provided with a duplex sump pump assembly. The discharge appears to be PVC piping.

POOL EQUIPMENT

The current pool is serviced by equipment located within a room in the cellar mechanical and a confined space below the pool structure. As part of the future renovation, the pool, pool equipment and associated piping is to be removed.

FUEL GAS SYSTEMS

Gas is provided through a 2" gas service located in a Basement mechanical room and appears to be high pressure. The gas service is arranged with a pressure regulator and gas meter (1000 cfh) (Yankee Gas Meter # 465865) Gas is piped to the building's domestic water heating plant, kitchen and HVAC equipment.

PLUMBING FIXTURES

Plumbing fixtures throughout the facility generally appear to be in good condition. Fixtures generally consist of the following:

- Waterclosets: vitreous china floor mounted flush valve.
- Lavatories: vitreous china with chrome plated supply faucet and trim.
- Emergency eyewash
- Wall mounted electric water coolers

It does not appear that there have been any ADA provisions provided.

PLUMBING – RECOMMENDATIONS

The plumbing infrastructure has not been substantially upgraded and in most cases, systems appear to be original to the building. The condition of the plumbing system infrastructure that was visually observed ranges from fair to poor and should most likely be addressed prior to a failure. Specific recommendations are as follows:

Plumbing systems in the building appear to be original and should be replaced as projects are executed.

Conduct a camera and material inspection of the existing sanitary piping. Replacement of the system may be required given the age, use and properties of the discharge water

Conduct piping material evaluation for life expectancy and serviceability. Water distribution piping appears to be serviceable condition from visible observation at miscellaneous locations, but could most likely be in need of complete replacement.

It is recommended that piping and valving are replaced as building projects are executed.

Install a reduced pressure backflow preventer on domestic water supply in accordance with Municipal Water Authority requirements.

Provide ADA accessible plumbing fixtures in accordance with local code requirements.

Install new domestic water heating equipment.



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GENERAL

Comply with all current Federal, State, City and local codes, standards and ordinances including CT State Building Code, International Plumbing Code, including supplements, utility company standards, insurance carrier requirements, and local authorities.

The contractor will be responsible to give all necessary notices, obtain all permits and pay all taxes and fees necessary to obtain approvals and complete the work herein. Obtain all required certificates of inspection and deliver same to Owner.

The Mechanical, Electrical, Plumbing and Fire Protection systems will be designed to comply with all Current State and Local Codes including associated supplements.

Plumbing fixtures will be provided based upon the architectural program complete with trimmings, fittings, faucets, supplies, stops, traps, tailpieces, waste plugs, casings, hangers, and supports, will be provided and located as indicated on architectural floor plans. Provisions for the physically handicapped will be include insulated traps and water piping below lavatories and sinks, faucets and fixture selections in accordance with code requirements. All fixtures will comply with water conservation code requirements. Emergency eyewash and showers with a tempered water supply will be provided for all shop areas and laboratory classrooms.

All work shall be coordinated with the owner and owner's insurance companies as well as phasing schedule and requirements prior to installation.

CENTRAL PLANT

Existing underground domestic water service main, meter and associated piping connected to the existing street water main to be removed. Remove existing domestic water heating equipment and associated piping.

Provide a new 4" domestic water service main, fed from a municipal site main. The water service will enter the building into the basement mechanical room. The domestic water service will incorporate a reduced pressure backflow preventer and a common water meter.

Domestic Water Systems: Domestic hot and cold water will be distributed to each area of the existing building and the new architectural program. Hot and cold water will be distributed serving all plumbing fixtures. Exterior freeze proof hose bibbs will be provided around the exterior at locations per the direction of the Architect. All portions of the domestic hot and cold water systems will be protected against cross connections with approved devices in accordance with the Local and State Codes.

Alternate: Domestic water pressure shall be boosted by a variable drive duplex water booster pump assembly located within the water service room.

Domestic Water Heating: The primary source for domestic hot water will be generated by two (2) commercial gas fired, storage type water heating equipment piped in parallel to deliver two temperature hot water to the facility. The instantaneous gas fired water heaters shall be si – **THERE ARE WORDS MISSING HERE!!!**



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temperature hot water to the facility. The instantaneous gas fired water heaters shall be similar to PVI Turbopower series. New equipment shall incorporate a re-circulated main to maintain temperature.

Provide domestic make-up water supply connections for HVAC equipment including boilers and gas fired rooftop units. All make-up water supplies will be protected against cross connection with approved backflow prevention devices in accordance with building code requirements.

Sanitary Drainage System: Sanitary drainage waste and vent systems will be provided serving all plumbing fixtures, floor drains and equipment within the new addition. All floor drains will be equipped with automatic electronic trap priming systems. New sanitary house drains will run by gravity to the existing site sanitary sewer. Any fixtures located below the gravity house sewer will be pumped up into the gravity house drain by a duplex sewage ejector. Existing to remain building piping will be modified to accommodate new construction and fixture locations. A new exterior double compartment FRP grease interceptor and shall be installed to serve the Food Labs. Science laboratories and lab prep rooms will be provided with point of use acid neutralization equipment serving all sinks and drains. Floor drains within Wood/Mechanics and Garage areas shall be piped to an oil/water separator prior to discharge to the sanitary sewer.

Plumbing Fixtures: Provide and install plumbing fixtures as indicated on the architectural drawings and as specified in architectural sections. Provide valves for the drainage of exterior fixture water systems.

Gas Service: A metered gas service will be served from a municipal high pressure gas main. Gas meter will be arranged as one meter serving the boiler and domestic water heating equipment. Gas meters will be located on the exterior of the building and installed in accordance with Local Gas Company requirements. All gas piping within building shall be installed and sized in accordance with NFPA 54.

NEW ADDITION – PERFORMANCE SUPPORT SPACES

Domestic hot and cold water will be distributed to each bathroom group fixtures. Hot and cold water will be distributed serving all plumbing fixtures. All portions of the domestic hot and cold water systems will be protected against cross connections with approved devices in accordance with the Local and State Codes.

Sanitary: Provide new sanitary, waste and vent piping serving new plumbing fixtures. Sanitary and storm building drains will discharge by gravity to the municipal sewer.

Storm: Roof, terrace and areaway drainage will be piped independent of the sanitary sewer and discharge to the municipal storm sewer.

Program Plumbing Systems: Central compressed air system with valved supply drops at each point of use. The system will incorporate related air dryers, regulators, filters, lubricators, valves, quick disconnect couplings, and drains. The compressed air systems will be rated to provide 100 psi service.



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Emergency shower and eyewash.

Flammable liquid storage cabinets with vents to the exterior

Hot and cold water washdown hose stations

Sinks

Handwash sinks

Floor / trench drainage with oil/water separator

NEW ADDITION – LOBBY

Domestic hot and cold water will be distributed to each bathroom group fixtures. Hot and cold water will be distributed serving all plumbing fixtures. All portions of the domestic hot and cold water systems will be protected against cross connections with approved devices in accordance with the Local and State Codes.

Sanitary: Provide new sanitary, waste and vent piping serving new plumbing fixtures. Sanitary and storm building drains will discharge by gravity to the municipal sewer.

Storm: Roof, terrace and areaway drainage will be piped independent of the sanitary sewer and discharge to the municipal storm sewer.

RENOVATION – AUDITORIUM/STAGE

Domestic hot and cold water will be distributed to each bathroom group fixtures. Hot and cold water will be distributed serving all plumbing fixtures. All portions of the domestic hot and cold water systems will be protected against cross connections with approved devices in accordance with the Local and State Codes.

Sanitary: Provide new sanitary, waste and vent piping serving new plumbing fixtures. Sanitary and storm building drains will discharge by gravity to the municipal sewer.

Storm: Roof, terrace and areaway drainage will be piped independent of the sanitary sewer and discharge to the municipal storm sewer.

PLUMBING SPECIFICATION

ENERGY CONSERVATION

Energy conservation requirements as set forth in the State of Connecticut Building Code will be included. Additional energy conserving methods will be considered to further affect higher energy savings.

Potable water supply will be protected against backflow, back-siphonage, cross connection and other unsanitary conditions.



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STORM DRAINAGE

Scope: Roof drains (primary and secondary) serving flat roof areas piped to interior rain leaders and underground storm drain piping. All downspouts and rain leaders will drain to the site storm sewer system. Secondary or emergency roof drainage serving flat roof areas will be piped independently to the building's exterior above grade.

Design Criteria: 2003 International Plumbing Code, based on 3.0 in/hr rainfall.

Disposal: connect into site drainage system separate from sanitary sewer.

Piping Materials: Storm piping above ground (up to and including 10" size) within building: Hubless cast iron pipe with no hub fittings and 4-band "Husky" or "Clamp-All 125" clamps. Alternate: Schedule 40 PVC.

Storm piping below ground (all sizes and above slab over 10" size) within building: service weight cast iron pipe and fittings with hub and spigot ends, ASTM A74. Seal: one-piece neoprene rubber gaskets matching the internal configuration of the hub. Alternate: Schedule 40 PVC.

Storm Pipe Insulation: piping within building insulated with 1" minimum thickness fibrous glass insulation and pre-formed fibrous glass fittings with fire retardant vapor barrier jacket. Include sound attenuation insulation and wrap.

Interior Roof Drains: cast iron body, cast iron dome strainer, sump pan, flashing and under deck clamps.

SANITARY DRAINAGE

Scope: Drainage of plumbing fixtures and floor drains piped to sanitary building drain. Venting of fixtures and drains to atmosphere. Kitchen waste will discharge independently to the site grease trap and municipal sewer.

Design Criteria: 2003 International Plumbing Code.

Disposal: Connect to the municipal sanitary sewer separate from storm sewer system.

Piping Materials - General:

Sanitary, waste and vent piping above ground (up to and including 10" size) within building: Hubless cast iron pipe with no hub fittings and heavy duty 4-band "Husky" or "Clamp-All 125" clamps.

Alternate: Schedule 40 PVC.

Sanitary, waste and vent piping below ground (all sizes and above slab over 10" size) within building: service weight cast iron pipe and fittings with hub and spigot ends, ASTM A74. Seal: one-piece neoprene rubber gaskets matching the internal configuration of the hub. Alternate: Schedule 40 PVC.



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Sump pump and sewage ejector discharge piping above ground: Schedule 40 galvanized steel ASTM A 106. Fittings (sizes up to and including 2"): threaded cast iron fittings, 150 PSI, ANSI B16.4. Fittings (sizes 3" and larger): class 125 flanged fittings ANSI B16.1. Alternate: Schedule 80 PVC.

Drains

General: Provide all poured in place drains with 24" x 24" flashing.

Drains - General:

Floor drain mechanical rooms: heavy duty floor drain with, cast iron body, bottom outlet, 9" diameter cast iron top, trap primer connection, seepage pan and combination membrane flashing clamp.

Roof drain: heavy duty drain with, 15" diameter cast iron body, bottom outlet, 12" diameter cast iron dome, roof sump receiver, under-deck clamp, extension collar, and combination membrane flashing clamp/gravel guard.

Areaway drain: heavy duty drain with, cast iron body, bottom outlet, 15" diameter cast iron top, seepage pan and combination membrane flashing clamp.

Terrace drain: heavy duty drain with, cast iron body, bottom outlet, 14" square cast iron heel proof grate, seepage pan and combination membrane flashing clamp.

Provide general floor drains in each apartment toilet and shower area.

DOMESTIC WATER

Scope: Water piped to plumbing fixtures, hose bibbs, and sinks. Hot water piped to plumbing fixtures, sinks and laundry.

Design Criteria: Pipe sizing in accordance with the 2003 International Plumbing Code based upon friction loss charts with a maximum of 6 feet per second velocity.

Source: New metered water service.

Insulation

Insulation shall be provided on all piping. All piping valves and fittings shall be insulated per the requirements set forth in 2003 International Energy Code. All pipe insulation shall be provided with a Vapor barrier. Piping within building shall be insulated with 1" minimum thickness fibrous glass insulation and pre-formed fibrous glass fittings with fire retardant vapor barrier jacket.



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Water Heating Equipment

General: Water heaters shall conform to all applicable A.S.M.E. Standards and approved by the National Sanitation Foundation, and in compliance with ASHRAE 90 (latest edition).

Water heater: commercial gas fired water heater. Aerco series.

Thermometer (TH): adjustable angle type, mercury or liquid actuated, constructed with non-corrosive internal mechanism and recalibration adjustment; assembled in minimum 3-1/2 inch diameter gasket sealed, glass faced stainless steel case; equipped with stainless steel bracket assembly, separable socket, 30 to 240 degrees F. water temperature range.

Manufacturer: Trerice L80030.

Pressure and temperature relief valve - P&T: ASME rated, bronze body, non-corrosive trim, automatic reseating, extension thermostat, test lever, threaded inlet and outlet; 75 to 150 psi adjustable pressure range, set at 125 psi, 210 degrees F. water.

Piping Materials:

Domestic hot water, cold water, hot water recirculating, condensate, and indirect waste piping above ground: hard drawn seamless Type L copper tubing ASTM B88 with wrought copper solder fittings A.N.S.I. B16.22 and "Bridgit" or other no lead content solder joints ASTM B32-83, alloy Grades SN96 or SB5. Solder flux lead content-zero percent.

Valves:

Two and one half inch and smaller: all bronze, full port, 400 psi WSP rated 2 piece valves.

Three inch and larger: IBBM flanged gate valve.

Pipe Insulation: piping within building insulated with 1" minimum thickness fibrous glass insulation and pre-formed fibrous glass fittings with fire retardant vapor barrier jacket.

Reduced pressure backflow preventer: Watts 909 Series.

PIPING SUPPORTS

Scope: support of piping from building structure including seismic restraint.

Design Criteria: Manufacturers Standardization Society (MSS) Standard Practice SP-69, SMACNA, International Plumbing Code.



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SLEEVES, ESCUTCHEONS, FIRE STOPPING

Scope: sleeves and fire stopping for piping passing through walls and partitions. Escutcheons for piping exposed to view.

Design Criteria: size sleeves for continuous pipe insulation.

Fire / smoke seals: Provide and install UL listed fire / smoke seals for required penetrations.

Pipe Markers and Valve Tags

Scope: vinyl plastic pipe markers and flow arrows, brass valve tags, valve charts and diagrams.

Design Criteria: ANSI A13.1.

CLEANOUTS

Scope: accessible cleanouts to permit "snaking" of drainage piping, and other buried non-pressure piping. Cleanout plates for buried piping.

Design Criteria: cleanouts at base of vertical stacks and leaders, at ends of horizontal runs, at each change in direction greater than 45°F., approximately 50 feet apart on piping runs.

Floor plates: cast iron body, appropriate brass cover plate.

Wall plates: stainless steel.

Plumbing Fixtures

Fixtures: new, complete with trimmings and fittings, including faucets, carriers, supplies, stops, traps, tailpieces, waste plugs, casings, hangers, plates, brackets, anchors, supports, and hardware and fastening devices.

Stainless steel: type 302, 304, 316, or 317, as noted, sound deadened.

Trimmings and fittings: construct of forged, cast, rolled or extruded brass or bronze with monel and other suitable non-corrosive parts: designed with easily renewable parts that is subject to wear or deterioration. No die castings and stampings other than brass or stainless steel. Plumbing trim shall consist of:

Exposed surfaces: chrome plated.

Pipe: copper type L.

Pipe fittings: threaded bronze.

Supply stops: chrome plated bronze, stuffing box, renewable seat washer.

Waste tailpiece: minimum #17 gage brass.

Escutcheons: one-piece chrome plated cast brass or stainless steel.

Fixtures: As selected by the Architect. Fixtures shall be low flow, 1.28 GPF HET for the toilets and 1.0 GPM for the shower heads. Specifying these type of fixtures will contribute to LEED points.

Testing

Perform tests in accordance with building code requirements in the presence of the authorities having jurisdiction.



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WATER SERVICE – EXISTING CONDITIONS: OBSERVATIONS

The building fire protection system is served by an existing 6" water service fed from a municipal main on site. The water service enters the main building within a limited access space below the pool. A 4" backflow preventer (Watts) are provided on the water service. Existing pressure gauges indicated a street side supply pressure of approximately 125 psi.

The currently installed backflow preventer appears to be a reduced pressure style which is typically not used for fire protection services. The relief valve for the backflow preventer currently discharges improperly to the floor and there are no provisions for the discharge of the relief valve.

The fire protection water shutoff valves appear to be provided with electronic supervision.

A 2-way wall mounted siamese fire department connection is provide at the exterior of the building.

The existing fire service is located within a space that is labeled as a "confined space". The atmosphere is of high humidity and the fire protection equipment, piping, valves, etc. shows severe signs of deterioration.

WATER SERVICE – RECOMMENDATIONS

Confirm that currently installed backflow preventer and strainer are in accordance with local water utility requirements.

As part of this project, the pool and pool building are scheduled to be demolished. The fire protection service currently is located within this scope of work. The fire protection service, valves, piping, alarms, etc. should be removed and replaced as part of this project. The new location of this service and equipment shall be coordinated with the proposed architectural program.

WET SPRINKLER SYSTEMS – EXISTING CONDITIONS: OBSERVATIONS

The facility appears to be sprinklered throughout with wet pipe sprinkler system in all areas. Two (2) alarm valve assemblies are provided in the crawlspace mechanical room. Tamper and flow switches provide electronic supervision of the sprinkler system. System nameplate data indicated that the system is hydraulically calculated.

Sprinkler head layout and distribution in some locations does not appear to be installed in accordance with code requirements and should be corrected.

Sprinkler heads have been located with consideration for obstructions (ie: ductwork) in accordance with code. Sprinkler heads installed below ductwork in the basement are in contact with the insulation of the ductwork and appear to obstruct proper discharge of the sprinkler head.

Sprinkler valves have been subject to the same conditions as described above and are most likely at the end of their serviceable life because of the amount of deterioration that has occurred.



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WET SPRINKLER SYSTEMS – RECOMMENDATIONS

Conduct a water and material analysis to determine the condition and the serviceability of the existing piping system.

Make modifications to the existing system as required by the hydraulic calculations or replace system components as necessary based upon the water and material analysis.

Install full supervision of system components in accordance with NFPA 13 and insurance company requirements.

Relocate existing code deficient sprinkler heads.

Replace existing piping in areas as required for architectural modifications.

Add Alternate: Provide a complete dry sprinkler system for the attic spaces, including sprinkler heads, piping, fittings, etc.

STANDPIPE SYSTEMS – EXISTING CONDITIONS: OBSERVATIONS

Hose racks are located on each side of the stage.

Existing hose rack assemblies have been abandoned in place.

STANDPIPE SYSTEMS – RECOMMENDATIONS

Confirm that standpipes are not required in accordance with local building code requirements.

If required, install new standpipe protection throughout the entire facility arranged as a Class 1 fire standpipe system in accordance with NFPA 14 (and 20, "Fire Pumps" if required).

DESIGN CRITERIA

The following are recommended design densities for the fire protection water supply:

Sprinkler and standpipe systems shall be hydraulically calculated to Connecticut State Building Code, NFPA standards and the Owner's Insurance Company requirements, whichever is most stringent. The following are Code minimum NFPA 13 densities:

General Areas, Wet Pipe, Light Hazard

Density - 0.10 gpm/s.f. over the most remote 1,500 s.f. area with 100 gpm added for hose streams. Sprinkler heads rated at 165° spaced at 225 s.f. per head (maximum).

Mechanical and Electrical Equipment Rooms - Ordinary Hazard Group 1

Density - 0.15 gpm/s.f. over the most remote 1,500 s.f. area with 250 gpm added for hose streams. Sprinkler heads rated at 165° spaced at 130 s.f. per head (maximum).

Storage Rooms - Ordinary Hazard Group 2

Density - 0.20 gpm/s.f. over the most remote 1,500 s.f. area with 250 gpm added for hose streams. Sprinkler heads rated at 165° spaced at 130 s.f. per head (maximum).

Fire Pump (Add Alternate)

Provide and install an electric fire pump assembly with controllers, automatic transfer switch, jockey pump, jockey pump controller and required trim valves and fire department connections in accordance with NFPA and the Owners insurance company.



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FIRE PROTECTION WATER SUPPLY

All incoming main fire protection equipment appears to have significant corrosion. In addition, the location is difficult for servicing and the existing equipment does not provide adequate control to the facilities new and existing fire protection systems for both routine maintenance and during potential activation. Because of this we recommend the following:

Re-route the existing underground fire protection main (connected to the existing street water main). Once inside the main building, the fire protection supply shall be routed through a new double check detector assembly and supply riser check valve assemblies (control valves, tamper switches and flow switches) and a dry pipe valve assembly (control valve, galvanized piping, tamper switches, air compressor and pressure switches). The riser check valve assembly shall supply new and existing wet sprinklers / standpipes throughout all heated areas. This wet pipe system shall incorporate sprinkler control assemblies as required to make zones more manageable. The new dry pipe valve assembly shall supply new exposed uprights and dry concealed pendants throughout all unheated areas. Provide and install a new fire department connection as required to supply all new and existing fire sprinkler / standpipe systems.

Contractor shall provide and install concealed pendant sprinklers in areas with finished ceilings and exposed uprights in unfinished areas. Contractor shall also provide additional drain valves including galvanized drain piping (piped to the exterior) as necessary to completely drain the system.

RENOVATED AUDITORIUM/STAGE

The existing auditorium / stage sprinkler system shall be properly removed and disposed of, including existing fire standpipe system. New sprinkler main piping shall be installed (connected to existing main sprinkler supply piping) supply concealed sprinklers within finished areas and exposed upright sprinklers within unfinished areas. All exposed piping and sprinklers shall have custom color. New Class III fire department valves (2 ½" valve with reducer cap and chain above 1 ½" valve with cap and chain) within cabinets shall be installed on either side of the stage.

NEW ADDITION – PERFORMANCE SUPPORT SPACES

New sprinkler main piping (connected to existing main sprinkler supply piping) shall supply concealed sprinklers within finished areas and exposed upright sprinklers within unfinished areas.

All exposed piping and sprinklers shall have custom color. New Class I fire department valves (2 ½" valve with reducer cap and chain) within cabinets shall be installed as required.

NEW ADDITION – LOBBY

New sprinkler main piping (connected to existing main sprinkler supply piping) shall supply concealed sprinklers within finished areas and exposed upright sprinklers within unfinished areas. All exposed piping and sprinklers shall have custom color. New Class I fire department valves (2 ½" valve with reducer cap and chain) within cabinets shall be installed as required.



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GENERAL SPECIFICATIONS

Comply with all current Federal, State, City and local codes, standards and ordinances including CT State Building & Fire Code including supplements, NFPA, utility company standards, insurance carrier requirements, and local authorities.

The contractor will be responsible to give all necessary notices, obtain all permits and pay all taxes and fees necessary to obtain approvals and complete the work herein. Obtain all required certificates of inspection and deliver same to Owner.

The Mechanical, Electrical, Plumbing and Fire Protection systems will be designed to comply with all Current State and Local Codes including associated supplements.

All work shall be coordinated with the owner and owner's insurance companies as well as phasing schedule and requirements prior to installation.

The entire renovation shall be fully sprinklered including utilizing concealed pendent sprinklers within finished areas and exposed upright sprinklers in unfinished areas.

All materials and system components shall comply with the Owners Insurance Company and be installed in accordance with the CT State Building and Fire Codes, including NFPA 13 and all referenced standards.

Contractor shall document (in schematic way) in which renovated area is supplied including pipe sizes, overall length of piping, etc. as necessary to perform hydraulic calculations.

Contractor shall document and verify new underground fire protection water supply is sufficient to supply the new sprinkler system in accordance with NFPA 13 and local codes (provide hydraulic calculations and 3-way water flow test, less than 1 year old). Once waterflow data is determined, contractor shall provide a pressure reducing valve, pilot operated, as necessary to maintain pressure below 175psi.

Contractor shall provide and install additional steel in order to hang sprinkler piping from structural members and not steel decking, typical, verify locations in field.

Fire protection system shall consist of but not be limited to: Verifying extent of existing sprinkler system, isolating and cutting into existing sprinkler supply piping, installation of new control valves, connection of all electric fire protection equipment (tamper switches, flow switches, etc.) to fire alarm panel. Care should be taken to reduce "downtime" of sprinkler / standpipe systems in adjacent areas (because of "connecting to existing"). Fire watch shall be provided as required by AHJ, owner, owner's insurance company, etc.

Sprinklers

The entire building shall be fully sprinklered in accordance with NFPA 13R, including utilizing concealed pendent sprinklers within finished areas and exposed upright sprinklers in unfinished areas. All residential areas shall incorporate residential type sprinklers. Unheated areas shall be protected by dry pipe valve assemblies, galvanized piping and concealed dry pendent / exposed upright sprinklers.



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Standpipes

Install a manual wet Class I standpipe system throughout the building, including: 2 ½" fire department valves, 2 ½" x 1 ½" reducers, cap and chain, within recessed cabinets within each stair, on each floor landing and as otherwise required.

Install wet CLASS III FIRE HOSE RACK CABINETS (on either side of the stage area) including: a fire hose rack assembly, capable of enclosing: 1 ½" fire department valve, 100' of lined hose & nozzle, above 2 ½" fire department valve, 2 ½" x 1 ½" reducer, cap & chain.

Fire Sprinkler Densities

Design Criteria: Owners insurance requirements and NFPA 13, 14 and 20 Standards. Systems to be hydraulically calculated systems based upon the following information with area adjustments for dry and attic systems as required by NFPA 13.

General Areas, corridors: Wet Pipe, Light Hazard

Density - 0.10 gpm/s.f. over the most remote 1,500 s.f. area with 100 gpm added for hose streams. Sprinkler heads rated at 165° spaced at 168 s.f. per head (maximum) with protection of all combustible concealed spaces.

Storage Rooms, Mechanical and Electrical Equipment Rooms - Ordinary Hazard Group 2

Density - 0.20 gpm/s.f. over the most remote 1,500 s.f. area with 250 gpm added for hose streams. Sprinkler heads rated at 165° spaced at 130 s.f. per head (maximum).

Piping Materials:

Wet Pipe System:

Mains - Schedule 10 lightwall pipe and Victaulic fittings. For pipe diameters - 2-1/2 inches and above.

Branches - Schedule 40 black steel pipe and threaded fittings for pipe diameter - 2 inches and below.



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Dry pipe system

Schedule 40 galvanized steel seamless pipe with galvanized fittings.

Provide class 250 piping and fittings as required in order to avoid excessive pressure in accordance with NFPA 13 & 14.

Sprinkler Equipment

Sprinkler heads: UL listed/FM approved automatic type; upright, concealed pendent, pendent, or sidewall to meet conditions, and of proper temperature rating. Deflector to be marked to indicate position.

Upright and sidewall heads: bright chrome plated bronze, glass bulb.

Pendent heads: concealed piping: bright chrome plated bronze, glass bulb, with two piece sprinkler cup escutcheon assembly.

Concealed heads: concealed piping, bronze, glass bulb with ceiling plate to match ceiling color.

Head guards: required for heads subject to mechanical injury.

Spare heads: not less than 12, total number based on one spare head of each type and rating per each 100 similar heads, or part thereof, installed.

Spare head cabinet: baked enameled steel cabinet, hinged cover, of adequate size to contain heads and wrench.

Head wrench: provide at least one, with suitable openings.

Division (Zone) Valves: spaced to isolate specific areas within buildings and hose supplies.

Alternate Fire Pump Assembly

Electric driven, 1000 gpm, horizontal split case fire pump assembly.

Include: automatic transfer switch, controllers, jockey pump, fire pump test header, etc. in accordance with NFPA 20.



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Dry Pipe Valve Assembly

UL/FM automatically operated differential type valve rated for 175 psi working pressure, factory hydrostatically tested to 350 psi. Valve to include galvanized basic trim, priming chamber, and fill line attachments, electric sprinkler alarm switch and drains. Similar to Reliable Model D dry pipe valve assembly with complete trim assembly.

Air compressor: UL/FM, single stage, oil-less, permanently lubricated, direct drive, one air filter per cylinder, safety relief valve, thermal protection, base plate mounted with NFPA approved automatic air maintenance device. Size dictated by system volume. Coordinate electrical requirements with electrical contractor. Air compressor/ air maintenance device: General model no. OL-335 1/2 H.P. 115V AC, 1 phase.

Siamese (Fire Department Connection):

Polished flush wall type - sized, labeled and located per local requirements.

Double detector check valve: FDA approved epoxy coated cast iron body

Bronze seat and disc holder, stainless steel trim, tight seating check valve discs, bronze body ball valve test cocks, UL/FM OS&Y inlet and outlet valves, equipped with detector trim, water meter and backflow preventer. Watts Model Number 709DCDA.

2 1/2" Fire Department Valve

2 1/2" Cast Brass angle Valve, Rough brass angle body, polished trim and red cast iron wheel handle, 300 PSI, WWP. - Approved equal to POTTER-ROEMER 4065

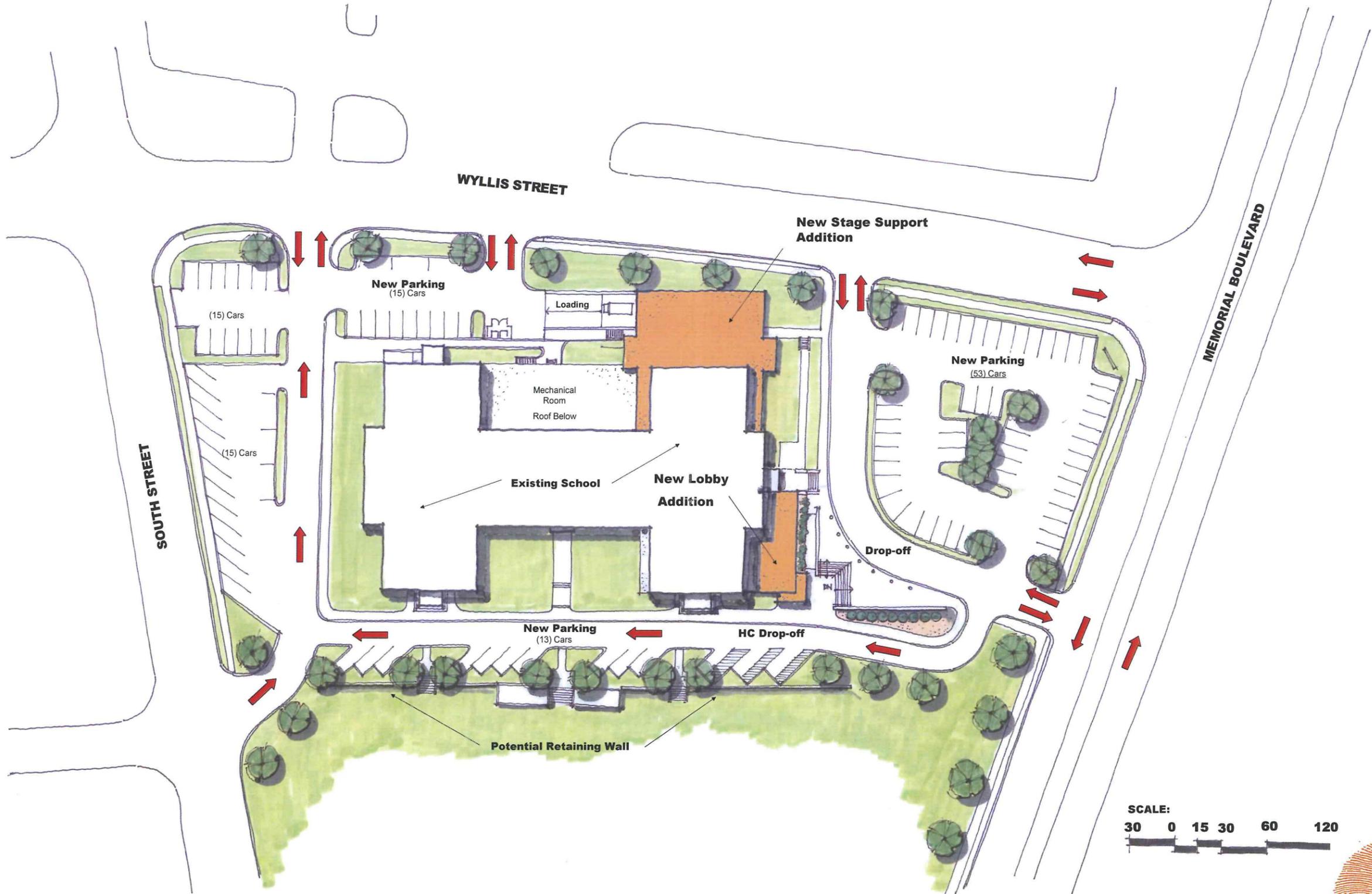
Recessed mounted cabinet sized for (1) 2 1/2" valve Approved equal to: POTTER-ROEMER 1810

Valve Supervisory Devices

Valve supervisory devices: UL/FM approved tamper proof signaling initiating switch arranged to detect closed valve position. Electrical rating: 120VAC.



Site Plan



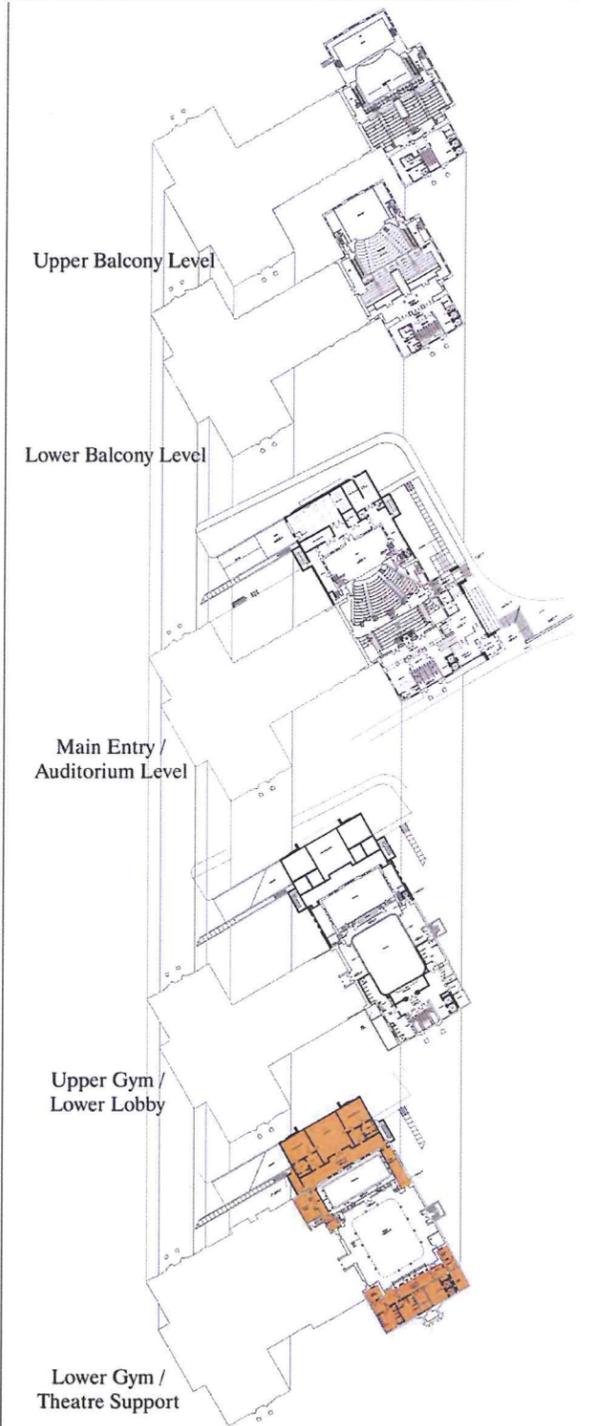
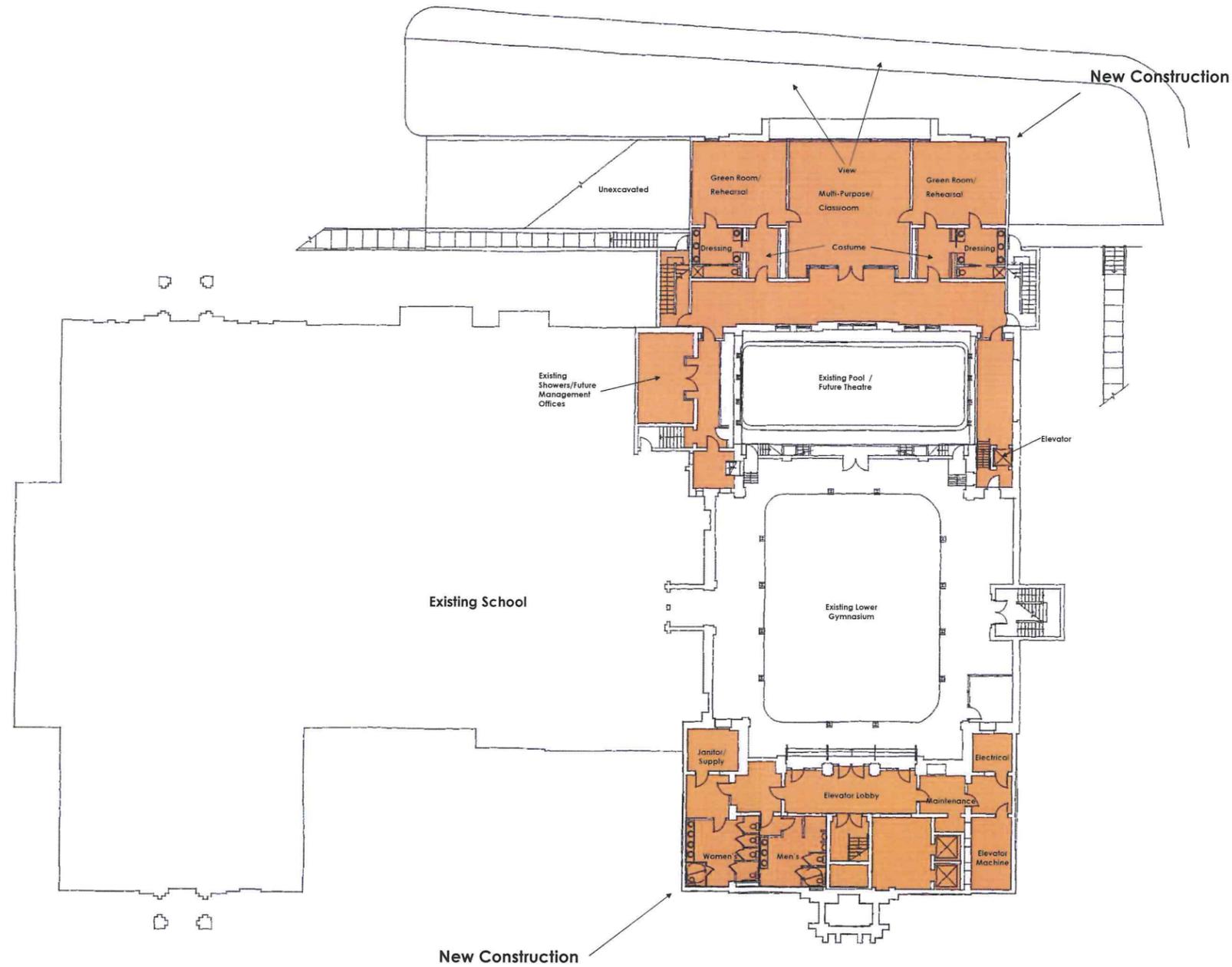
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Lower Gym / Theatre Support Floor Plan



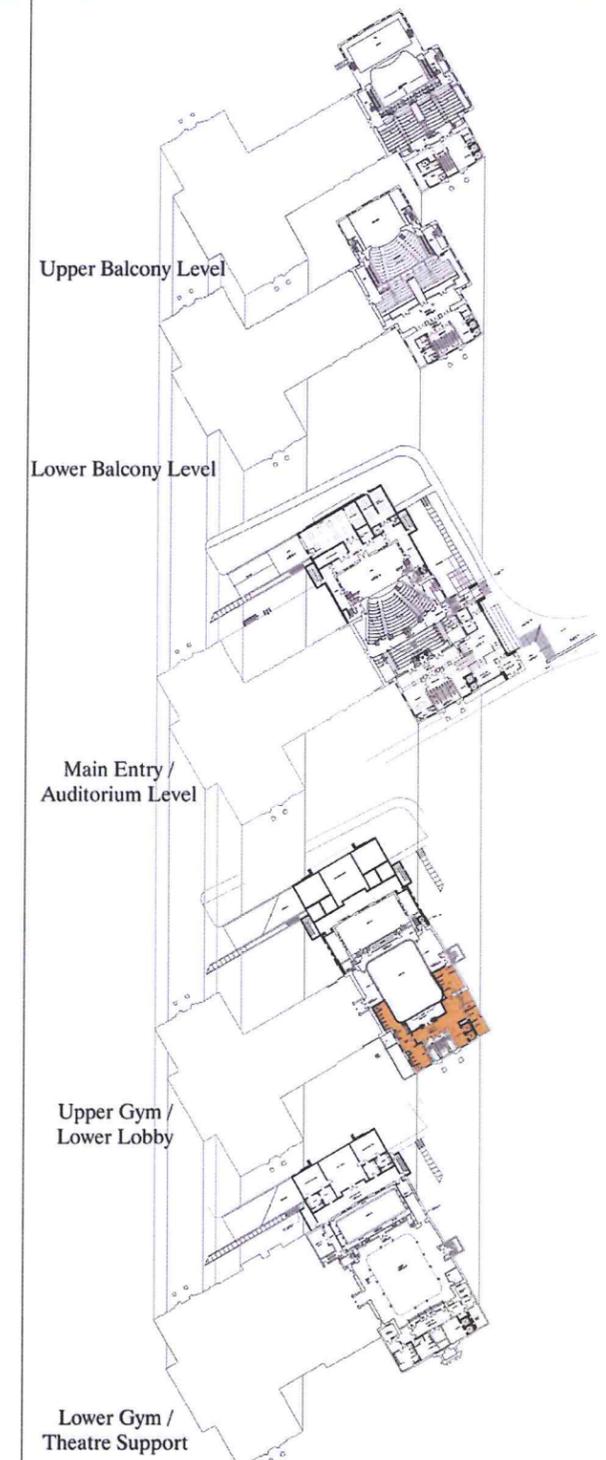
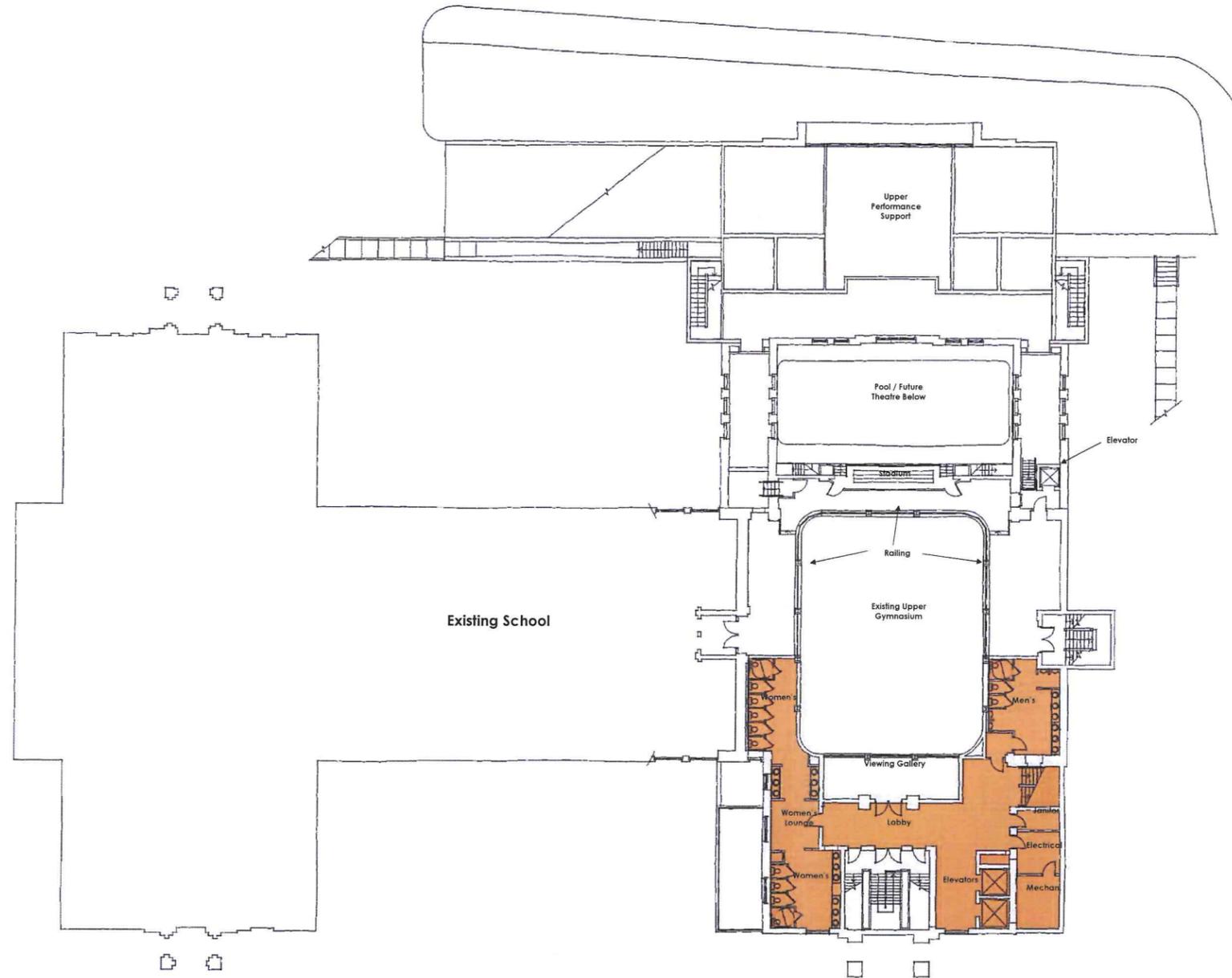
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Upper Gym / Lower Lobby Floor Plan

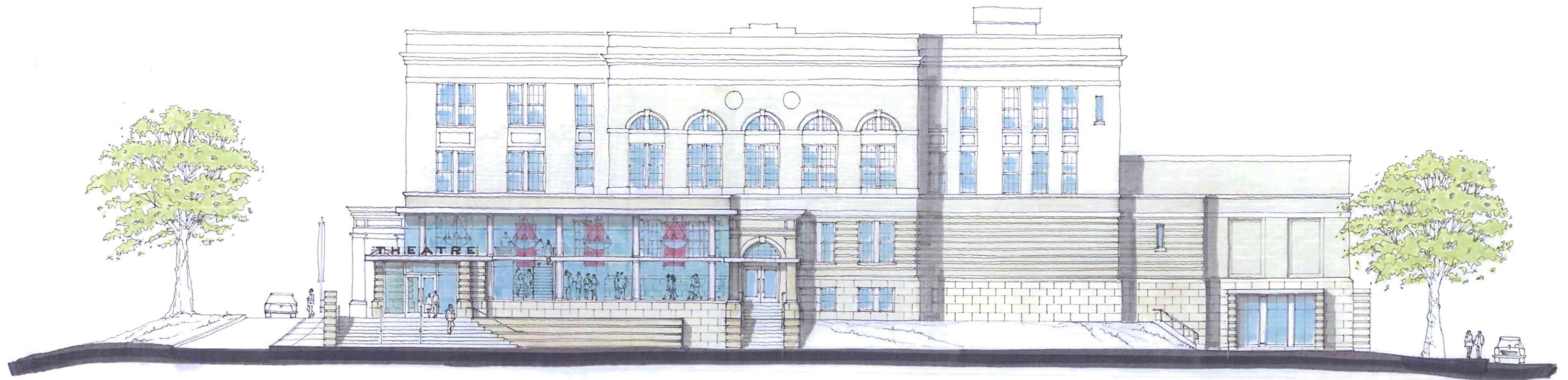


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North Elevation



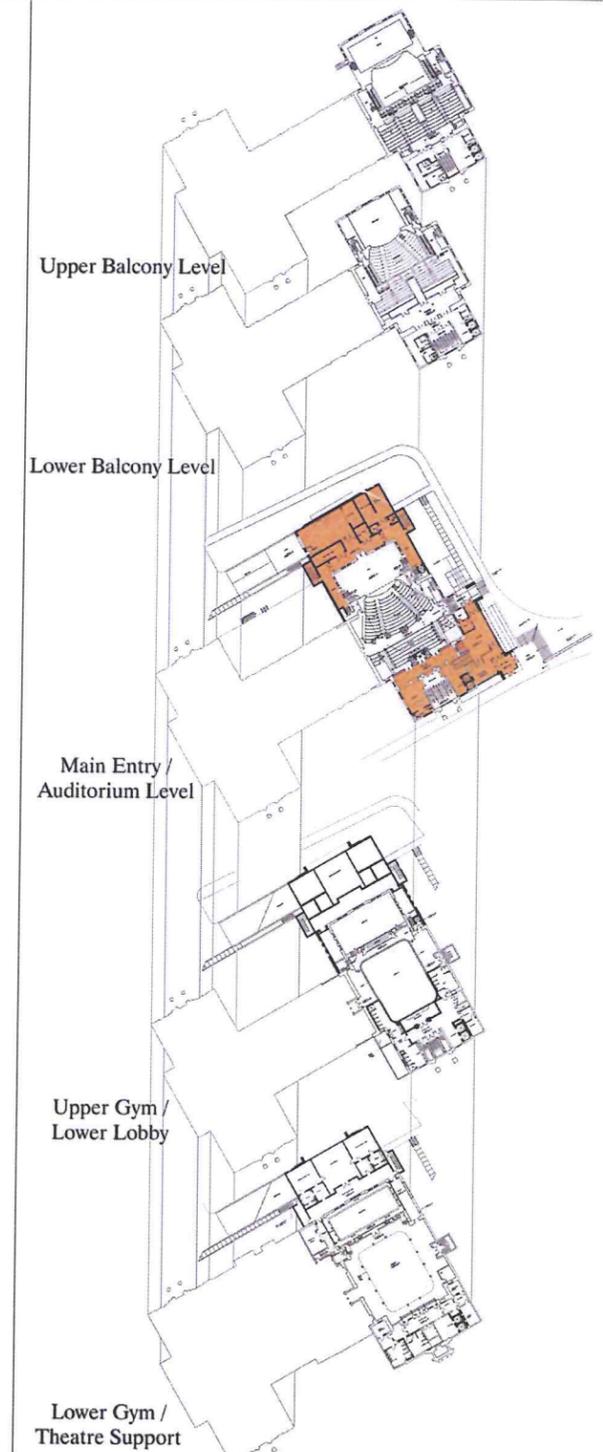
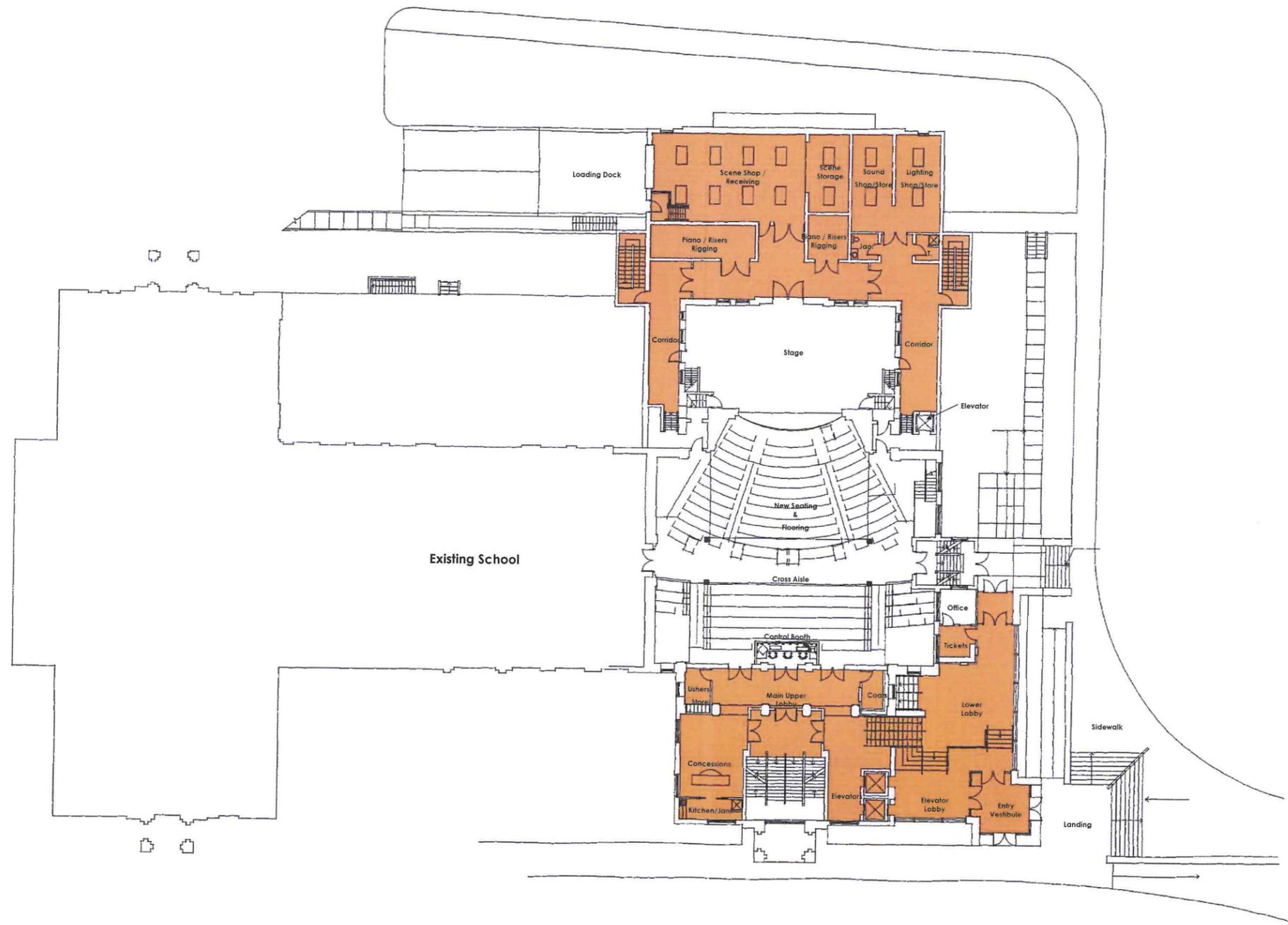
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Main Entry / Auditorium Floor Plan



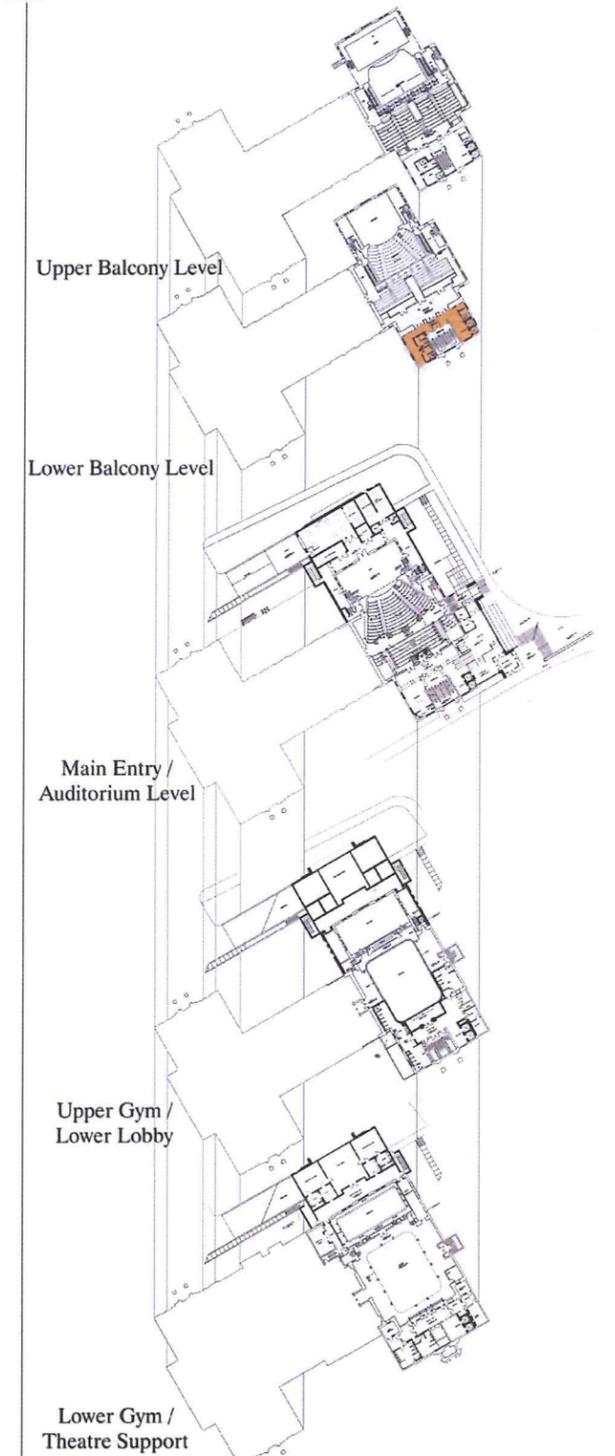
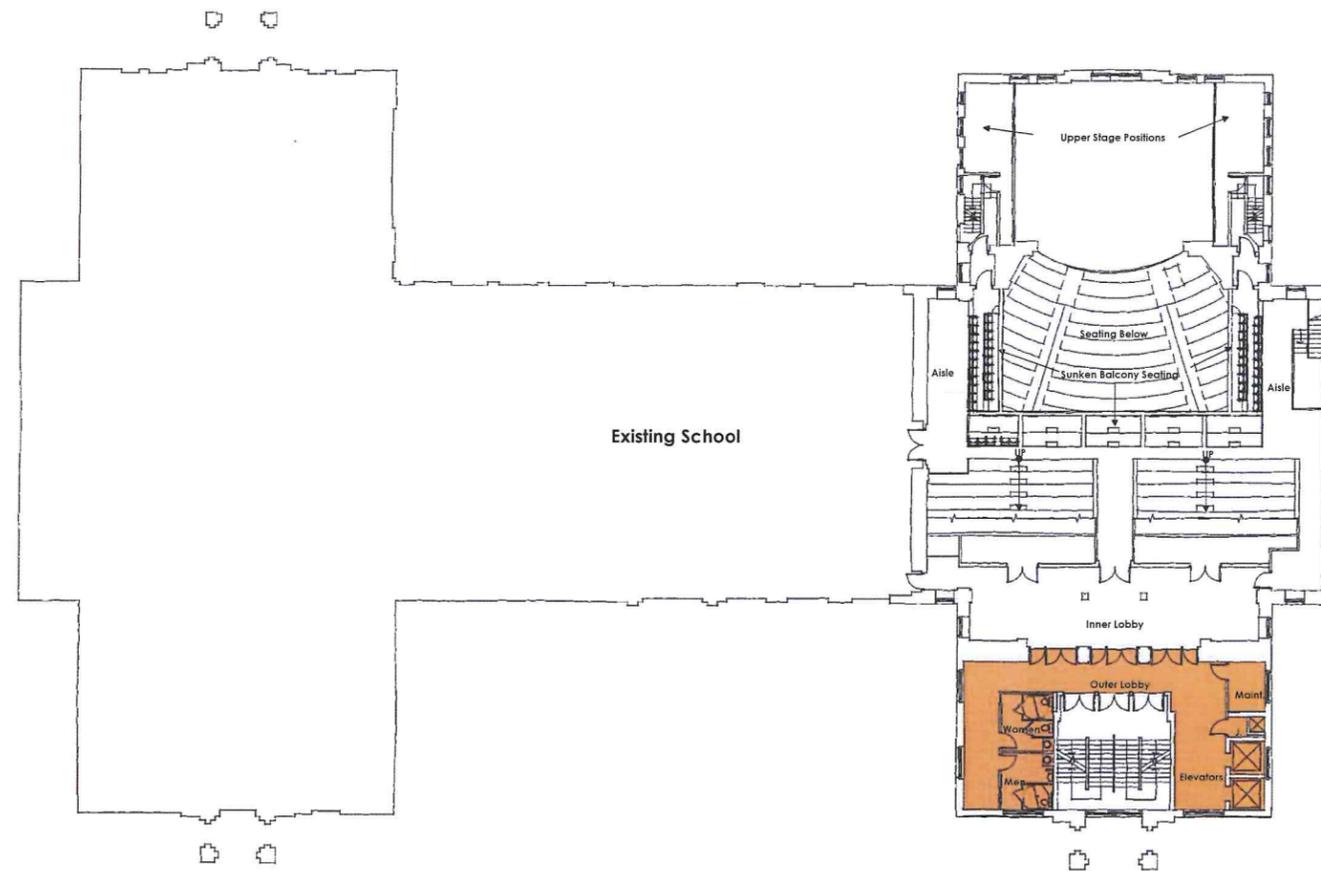
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Lower Balcony Floor Plan

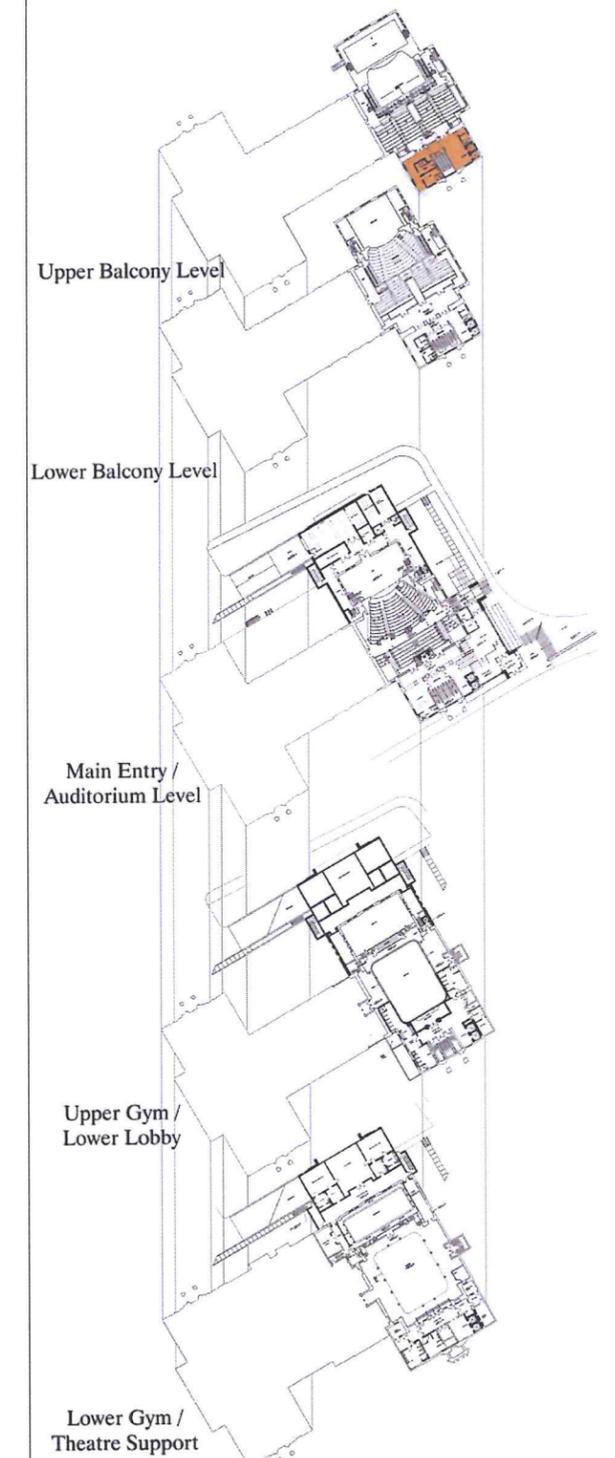
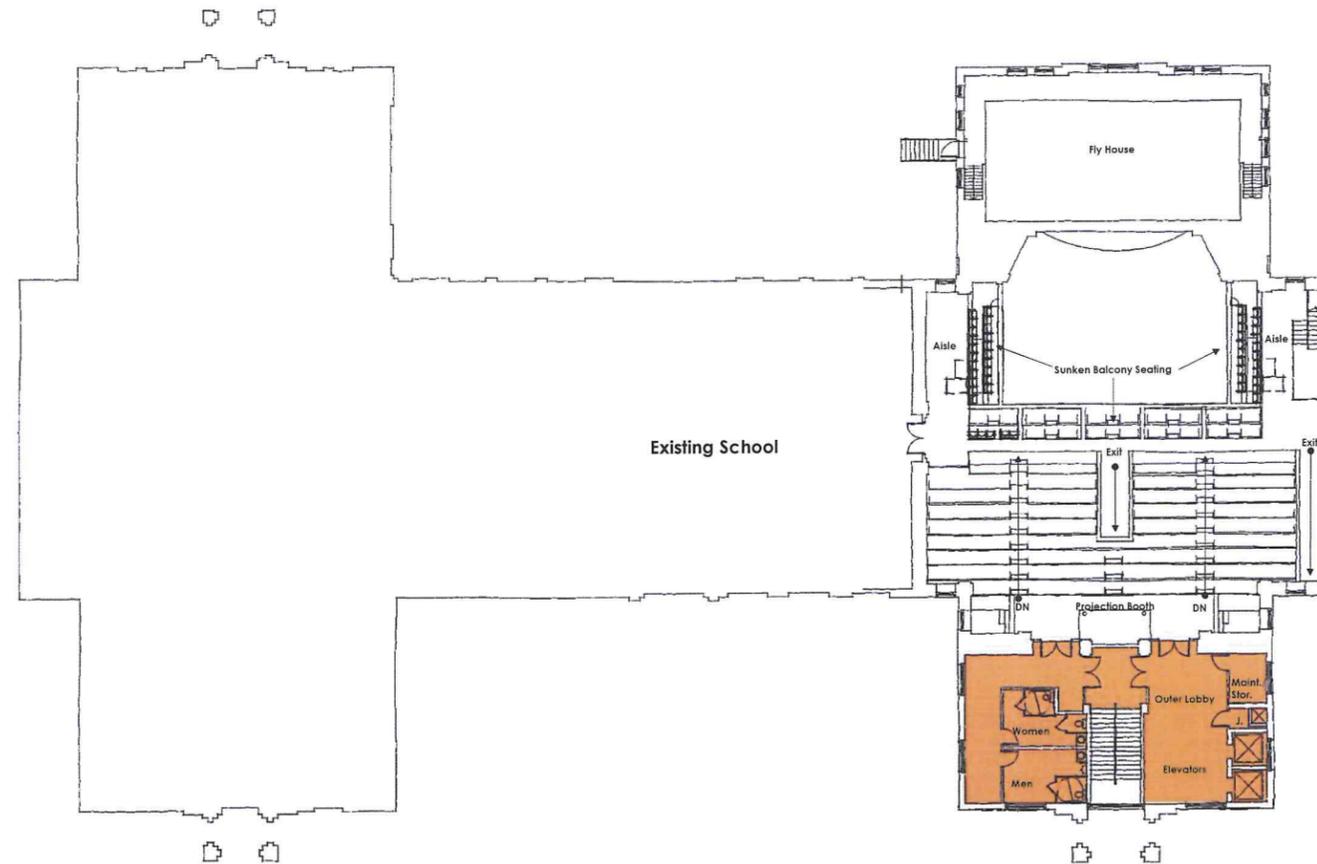


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Upper Balcony Floor Plan



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West Elevation



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East Elevation



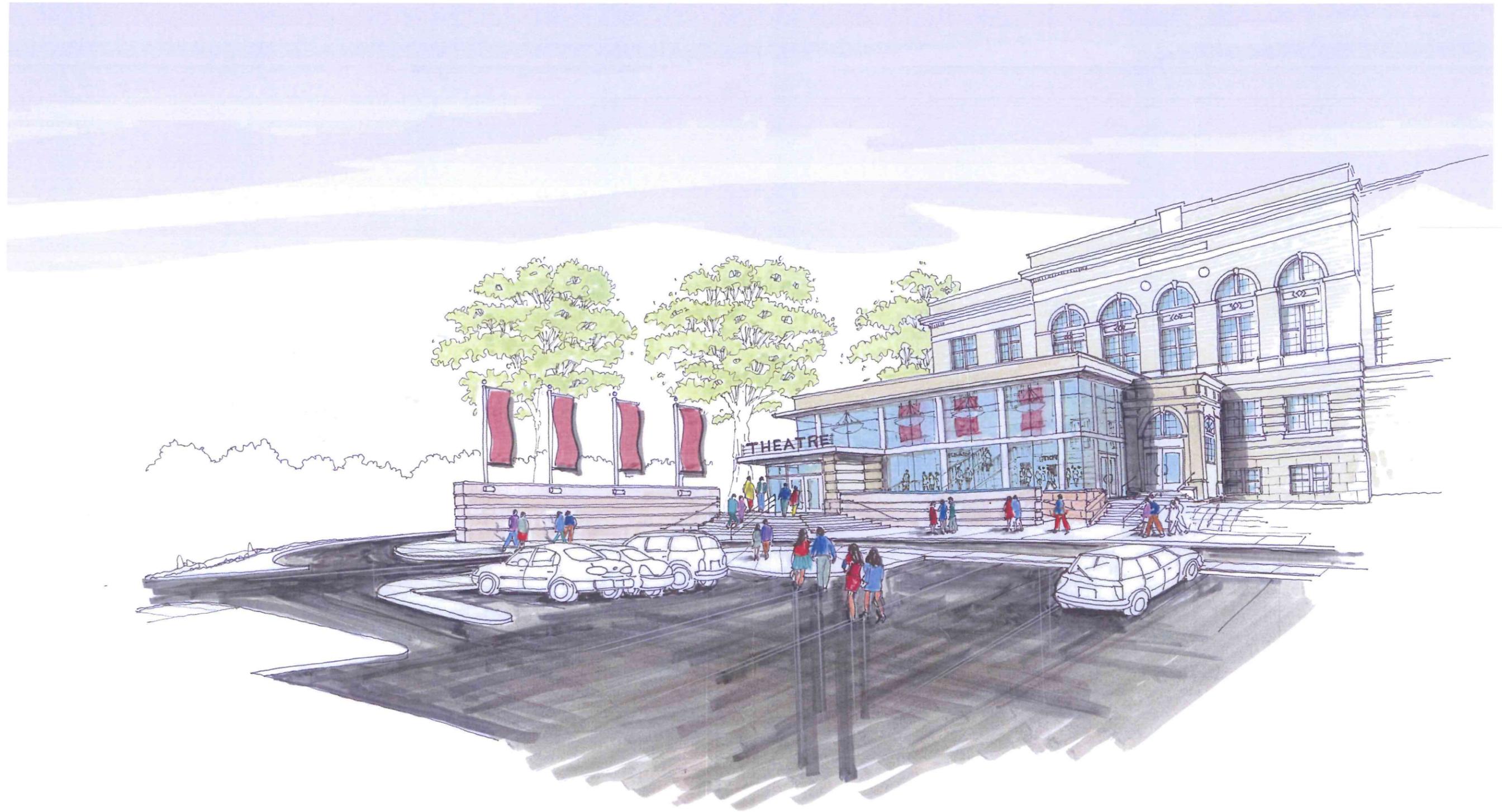
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View From Memorial Boulevard



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