EAST POINT GEORGIA

CIVIC AUDITORIUM

17 JANUARY 2020

ENGINEERING NARRATIVE

MOODY•NOLAN

SCHEMATIC DESIGN

EASTPOINT AUDITORIUM

NARRATIVES FOR:
MECHANICAL SYSTEMS
PLUMBING SYSTEMS
FIRE PROTECTION SYSTEMS
ELECTRICAL SYSTEMS
DATA/COMMUNICATION SYSTEMS
SECURITY SYSTEMS
SUSTAINABILITY & ENERGY PERFORMANCE

GENERAL

APPLICABLE CODES AND REFERENCES

- International Building Code, 2018 Edition, with Georgia Amendments (2020)
- International Fire Code, 2018 Edition, with Georgia Amendments (2020)
- International Plumbing Code, 2018 Edition, with Georgia Amendments (2020)
- International Mechanical Code, 2018 Edition, with Georgia Amendments (2020)
- International Fuel Gas Code, 2018 Edition, with Georgia Amendments (2020)
- National Electrical Code, 2017 Edition (No Georgia Amendments)
- International Energy Conservation Code, 2015 Edition, with Georgia Supplements and Amendments
- National Green Building Standard, 2008 Edition, with Georgia Amendments (2011)
- NFPA 101, 2012 Life Safety Code with State Amendments (2013)
- State, County, and City Health and Building Codes
- ANSI A117.1-1992 Accessible and Usable Building and Facilities
- The Americans with Disabilities Act (ADA), Accessibility Guidelines for Building and Facilities - 1991

MECHANICAL

GENERAL DESIGN CRITERIA

A. General Design Criteria - Design Conditions for Eastpoint, Ga (Atlanta Hartsfield Airport) (ASHRAE 1%/99%):

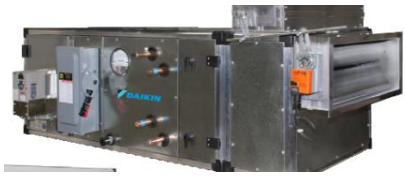
- Summer Outdoor: 91.6°F DB / 73.8°F WB
- Winter Outdoor: 26.5°F
- Summer Indoor: 74°F
- Winter Indoor: 70°F
- Chilled water temp 45°F
- Chilled water return 57°F

HVAC SYSTEMS

Cooling.
Chilled water supplied by an air cooled chiller located between the library and the parking lot adjacent to the pad mounted transformer. The chiller package will include acoustic attenuation features with acoustic wrap compressor and quiet fans. The required variable speed chilled water pump will be supplied with the chiller and mounted therein.

YCAL Scroll Chiller
15-65 TR (50-225 kW)

Download Product Specifications



Central Station Chilled Water AHU

Alternatively, each of the units could be direct expansion refrigerant (DX) split system with air cooled condensers. The condensers would either be on the side of the building or on the roof of the connecting structure to be built behind the stage. Roof top package DX unitary units are similarly and option as well.

Acoustic Design.
Acoustic considerations in HVAC design will be integral to the final installation. The acoustical design begins with specification and the selection of each component to achieve NC 25 in the auditorium.

Ventilation air.
Ventilation air will be pre conditioned with a separate unit prior to being ducted to the other zones. The dedicated outside air unit will be dual coil, Dx and chilled water, or DX to allow operation when to keep the space conditioned and dry when full cooling is not required. This unit is anticipated to be mounted on or in the structure to be built between the auditorium and the library.

Chilled water piping.
Chilled water will be piped underground from the chiller in either sealed encapsulated insulated 3" ASTM A53 ERW schedule 40 pipe or HDPE chilled water piping to from the building. Chilled water piping in the building will be A53 ERW schedule 40 black steel prime with corrosion inhibiting primer and insulated with 1 ½"- 2" foam glass or closed cell elastomeric or poly-olefin insulated with Pitt-wrap™ seal or equivalent. The chilled water will be treated with glycol as freeze protection of the fluid and cooling coils. The chilled water pump will be 75 gpm, 65 Ft w.g. head 3-5 HP pump provided with the chiller on that skid.

Heating.
The heat for the building will be via electric resistance heat, SCR controlled in the AHUs and terminal units.

Electric wall heat will be considered installed in the walls below the windows of the main auditorium to offset window wash drafts. The proposed mounting would be at the opening where the through the wall AC units had been previously installed.

Zoning. The temperature control zones shall be as follows:

- The main Auditorium will be supplied with two central station units, vertical or horizontal.
- The stage area will be conditioned with a dedicated single or a pair of air handling units.
- The basement area below the auditorium will be conditioned from a single air handling unit
- The second level spaces on the balcony will have a dedicated air handling unit to serve them.
- The entrance lobby area will be conditioned by one or more air handling units located in the space at the landing of the stairs.

Area Served	**No. Units**	**Air Flow** (CFM) ea.	**Cooling Capacity** (MBH) ea	**Heating Capacity ea.** (MBH)/(kW)	**Location**
Auditorium	2	5000	120	135 / 40	TBD with distribution above ceiling
Stage	1 (2)	2000 (1000 ea.)	60 (30)	54 / 16	In Mech. space behind stage
Below Stage	1	1600	48	44 / 12 ½	In Mech. space behind stage
Balcony Spaces	1	2000	42	54/ 16	In balcony area
Entrance Lobby & Pre Function	1	2500	48	64 / 18 ½	Off stair landing
Dedicated Outside Air System Unit	1	3000	190	170 / 50	In Mech. space behind stage

The space will be conditioned by variable speed Air Handling Units with chilled water cooling coils and heat by SCR controlled electric resistance heating coils. Each Air Handling unit (ahu) shall be of insulated, double wall construction with MERV 11 filters, cooling coils of not more than 500 fpm air velocity, GPS air ionization bars ahead of the cooling coils and UVC lights down steam of the cooling coil, with insulated, stainless steel condensate drain pans, plenum fans, and SCR controlled electric heat. Fans will either have variable frequency drives or be ECM drive.

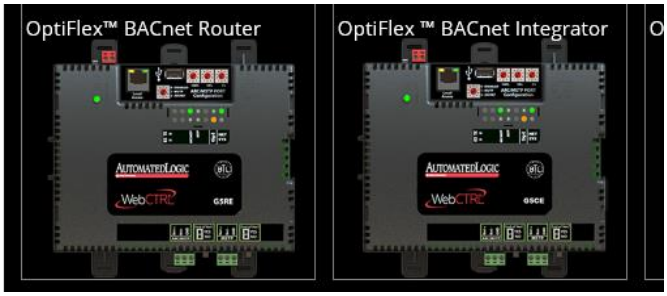
The DOAS unit will have dual Dx and Chilled water coils for 24/7 dehumidification operation when not in operation

The goal of the location will be for both acoustical attenuation and serviceability.

Air Distribution.

The air distribution will be in insulated low pressure metal duct with insulated flexible duct runouts to the diffusers. Ventilation air duct will be insulated medium pressure duct. The air diffusers and return grilles will be selected for NC 25. The back of the supply air diffusers will be insulated and vapor sealed for better condensation control. The type, style and location of the air diffusion devices will be coordinated with the lighting and architecture.

Controls.
The building HVAC will be controlled with a direct digital control system for scheduling and control of temperature, humidity, and ventilation. Vendors of the systems are numerous but include Atlanta Based Automated Logic, Johnson Controls, Siemens Buildings Technologies, Honeywell Tridium Niagara™, and Trane. The system will be specified to be fully ASHRAE/ANSI BACNet IP compliant.



Smoke Venting
Given the stage area is >1,000 SF IBC 410.3.7 requires the installation of two or more smoke vents in the ceiling of area equal or greater than 5% of the stage area. Rounding up the stage area to 1,600 SF, the area of the two fusible link activated smoke vents must be a minimum of 80 SF.

Click to view a larger image

Quad Door AcousticMAX™ 48 Smoke Vent

Block the intrusion of exterior environmental noise with Babcock-Davis' new STC 48 Quad Door Acoustical Smoke Vent. Designed for performing arts centers and theaters, every detail has been designed with precision.

Features

- STC 48 - OITC 36
- Innovative Sound Control
- Superior Thermal Performance
- Pre-Finished Black Interior

Sweets ProductTAG

PLUMBING

Plumbing Fixtures

Plumbing fixtures will be as required by ADA and the facility. Water closets shall be floor mounted with 1.28 GPF, hard-wired, sensor operated flushometers. Urinals shall be wall hung with 0.125 GPF, hard-wired, sensor operated flushometers. Public lavatories shall be under mount, vitreous china with hard-wired, sensor operated flushometers. ADA lavatories provided with protective ADA wrap on drain assembly and supplies. Wall mounted fixtures will be provided as indicated on the architectural floor plans. Wall mounted lavatories will be provided with floor mounted carriers capable of supporting a 250 pound load on front rim. Lavatory faucets shall have a flow rate of 0.35 GPM. Each restroom will be provided with an emergency floor drain.

Lower level (Backstage) restrooms will be provided with manual operated water closets, lavatories and showers. Showers will be a prefabricated, acrylic, accessible unit with fold-up seat, grab bars and pressure balanced shower valve with positive shut-off.

Janitor's closets will be provided with molded fiberglass type service sink and faucet. Stainless steel wall splash guards will be provided. Each room will include floor drain.

Hose bibs will be provided in major mechanical areas and loading dock. Hose Bibs will be provided backflow prevention device and check valves.

Domestic Water System

Preliminary domestic water calculations indicate a total flow 76 GPM, requiring a 2" domestic water service.

Domestic water service to the building will be provided with a reduced pressure backflow preventers, located inside the building. Additional backflow preventers will be provided within the facility as required by the International Plumbing Code.

Domestic hot water for Level 1 Public Restrooms will be provided with electric instantaneous water heaters, one for each restroom. Domestic hot water for the Lower level will be generated by a 50-gallon, "low-boy" water heater mounted above service sink in janitor's closet. Hot water will be stored at 140°F. Master mixing (HI/LO) valve will be provided to deliver 120°F to the Lower Level. ASSE 1070 point of use mixing valves or faucets will be provided at each lavatory or group of lavatories to limit the water temperature to 110°F. Hot water circulating system is not anticipated at this time.

Domestic cold and hot water will be insulated by 1" rigid fiberglass jacketed insulation.

Piping Material:

1. CPVC Pipe: CPVC Socket Fittings: ASTM F 439 for Schedule 80.

Sanitary Waste/Vent and Storm Drainage

Sanitary sewer load for the proposed building is 106 drainage fixture units, approximately 53 GPM. A 4" sanitary connections will be provided. Vent piping and vent thru roof will be provided as required.

Existing storm drainage is provided with existing downspouts. Minimal storm drainage work will be required at new building addition. Storm drainage is anticipated to be accommodated by exterior downspouts to match the existing building.

Condensate drainage will be collected and discharge to roof drains or hub drains located in Mechanical Rooms and Janitor's Closets. Condensate piping shall be insulated with 1" closed-cell elastomeric or mineral fiber thermal insulation.

Piping Material:

1. Below ground piping: Polyvinyl Chloride (PVC DWV) Pipe and Fittings: ASTM D2665-88. Joints: ASTM D2855-83, solvent weld.
2. Above ground piping: Cast Iron Pipe: CISPI 301-85, ASTM A888, hubless. Fittings: Cast iron. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies.
3. Copper Drainage Piping (indirect drainage): ASTM B302 81, drainage waste, and vent type. Fittings: ANSI/ASME B16.29, wrought copper. Joints: ANSI/ASMI B32, solder, Grade 95TA, containing no lead.

FIRE PROTECTION:

WET-PIPE SPRINKLER SYSTEM

Building will be provided with a new wet-pipe sprinkler system. Auditorium (excluding stage and proscenium) restrooms, lobby area, restrooms similar spaces will be protected as a Light Hazard Occupancy with a sprinkler design density of 0.10 GPM per square foot. Storage rooms, Mechanical rooms, Electrical Rooms and similar spaces will be protected as an Ordinary Hazard (Group 1) Occupancy with a sprinkler design density of 0.15 GPM per square foot. Stage and proscenium will be protected as an Ordinary Hazard (Group 2) Occupancy with a sprinkler design density of 0.20 GPM per square foot.

Piping Material:

1. Standard-pressure, wet-pipe sprinkler system, 2-inch and smaller shall be Schedule 40, black-steel pipe with threaded ends.
2. Standard-pressure, wet-pipe sprinkler system, 2-1/2-inch and larger shall be Schedule 10, black-steel pipe with grooved ends.

SPRINKLER HEADS

Sprinkler heads shall be quick-response type heads installed in an upright or semi-recess pendent position base on the proposed ceiling plans. Sprinkler heads located in conditioned spaces shall be ordinary temperature. Sprinkler heads located within 8'-0" of high heat producing equipment or piping shall be intermediate temperature.

ELECTRICAL

Electrical Service and Distribution

Electrical service to the facility shall be fed from the existing utility padmounted transformer located outside, at the northwest corner of the building. The transformer will feed the new electrical distribution system via underground conduit to a new electrical room in the northwest corner of the building in the basement or first floor. The new distribution system will consist of a main 208/120V, 1200A panel to feed the new major HVAC loads, a theatrical lighting rack and a second panel to feed other building lighting, receptacle and miscellaneous equipment loads.

All panelboards shall be provided with bolt on molded case circuit breakers with thermal-magnetic trip elements, copper buses, main circuit breaker or main lugs only as required.

Transient voltage surge suppression will be provided throughout the electrical distribution system as recommended by ANSI/IEEE, U.L. publications and as required by local building codes. The surge suppression will be provided to protect critical electronic equipment, electronic drivers, motors, and VFD controllers, fire alarm system and distribution equipment. Surge protection devices shall be provided on the main entrance panelboard, as well as any branch circuit panel that services interior loads.

Emergency System

Emergency lighting for the building will be provided with battery backed up light fixtures and exit lights. Other emergency equipment will have integral battery backup systems, i.e. fire alarm system.

Interior Lighting

All interior spaces in the building will be provided with energy efficient light sources and fixtures to enhance the aesthetics and are most suitable for the application. The illumination levels of the interior lighting system will be consistent with the current standards as defined by the Illuminating Engineering Society of North America (IESNA) Lighting Handbook.

All interior lighting shall be LED. Lobby, pre-function, restrooms, meeting, back-of-house and auxiliary spaces will be controlled with occupancy sensors or timed controllers to extinguish lighting when the space is not in use for energy conservation.

Specialty theater and house lighting shall be provided in the auditorium audience area as well as lighting for the auditorium stage. LED theatrical lighting will be provide with fixtures, controls, connector strips provided by ETC as a basis of design. ETC Sensor3 CE power system and rack, with Congo Jr Console with DMX controls is the basis of design.

Exit lighting fixtures specified with energy efficient LED light sources will be provided at all exits and paths of egress per NFPA codes as required. Exit and emergency lighting fixtures will be powered with integral battery backup.

Exterior Lighting

Exterior lighting at building paths of egress only will be provided. These fixtures will be provided with integral battery backup.

Power Systems

All distribution feeders and branch circuit wiring shall be copper with thermoplastic insulation and shall be installed in 3/4” minimum electrical metallic tubing (EMT). Connections to vibrating equipment shall be seal-tight, flexible metallic conduit. Final connections to lighting fixtures shall be flexible metallic conduit. MC cable will not be allowed for this project.

Receptacles shall be provided throughout the building as required to serve equipment and for general use as follows.

Lobbies, corridors, auditorium seating area and stage - 15 ft. on center for general purpose.

Mechanical and electrical rooms – at least one per room.

Restrooms and areas adjacent to sinks - GFCI type at each sink.

Communications and equipment rooms - double duplex on every wall.

Conference rooms – A multiple service floor poke-through (Legrand 6-inch Evolution Series is basis of design) to be provided at each table location.

A multi-service, 12-gang floor box will be added at the back row of the auditorium seating to serve a sound and/or lighting control board location. Legrand RFB is basis of design for floor box.

Receptacles in general, will be duplex specification grade 20A, 125V, 2P, 3W (NEMA 5-20R). Other NEMA configurations will be provided as required for the equipment to be served.

Receptacles shall be provided as necessary to adequately support the equipment and shall be surface or flush mounted as necessary to coordinate with the room type and furnishings. All normal receptacles shall be color as selected by Owner/Architect with thermoplastic faceplates in offices and common areas. Devices and cover plates for receptacles on emergency shall be red.

Grounding and Bonding

A building-wide grounding system will be provided to assure that all equipment is properly grounded in accordance with the NEC and other applicable codes, as well as to limit the possibility of potential-differences between systems. A copper grounding conductor shall be provided in all feeder and branch circuits, to form a complete building wide grounding system. In general, an equipment grounding bar will be provided in all electrical and communications rooms.

Fire Alarm System

A complete addressable, voice evacuation fire alarm detection system will be provided in accordance with NFPA-72 and NFPA –101. The main fire alarm control panel will be located in the main electrical room on the west end of the building. A remote annunciator panel shall be located in the main lobby at the front of the building. The system will fully comply with all NFPA requirements.

Alarm initiating devices shall be fully addressable and shall include manual pull stations, automatic ceiling mounted smoke detectors, automatic duct mounted smoke detectors, automatic heat detectors and tamper and flow switches.

Alarm signaling devices shall include audible speaker and flashing strobes compliant with the ADA.

Pull stations will be located at all egress doors. Audible/visual (A/V) alarms will be located in all corridors with a maximum spacing of 100 feet. Additional visual only alarms will be located per the A.D.A. requirements. Smoke detectors will be within five feet of all magnetically held doors. Duct detectors will be installed in the supply and return of all air-handling units. Control functions shall include the release of electromagnetically held-open doors and shut down of all air handling units.

Emergency power to support the system shall be provided by integral battery backup.

Lightning Protection System

A lightning protection risk assessment per NFPA 780 shall be performed and lightning protection provided if determined necessary.