National Audubon Society Headquarters
225 Varick Street
New York, NY

Mechanical, Electrical, Plumbing, and Fire Protection

Description of Systems

-REVISED-

Prepared for:

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I. TENANT HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS

A. Design Criteria

1. Codes and Standards

The heating ventilation and air conditioning systems shall comply with the requirements of the New York Building regulations and all related governing agencies including:

NFPA 30
NFPA 85A
NFPA 90A and 90B
NFPA 101

2. Design Criteria

The building HVAC systems shall be capable of maintaining the following environmental standards:

a. Air Conditioned Areas:

Outside design: (ASHRAE 2.5%)

Summer	Winter
91^0F DB	5^0F db
74^0F WB	15 MPH winds

Inside conditions:

Summer	Winter
76^0F DB	72^0F db
50% RH	-

b. Ventilation Rates:

Outside air will be provided at the rate of 20 cfm per person.

Kitchen (Apt.)	Min. 120 CFM
General Exhaust	As required to maintain proper pressurization.
Telephone & Electric Closets:	15 air changes/hour

c. Load Densities (Heat Rejection Rate) for cooling:

Capacity will be included in the air conditioning units and condenser water systems for the following load densities.

(1) Typical Offices:

Lighting	1.5 watts/ft^2
Equipment	1.5 watts/ft^2

B. Description of System

1. Cooling, water cooled

a. Cooling Source: The cooling source will be a packaged water-cooled screw compressor chilled water assembly, Multistack Model MS70 or equivalent. Heat rejection will be provided by a single cell cooling tower, mounted on roof, complete with three (3) end suction pumps with variable frequency drives for condenser water and chilled water and associated piping. Condenser water will run through four inch (4") pipe riser from roof to the chiller, located on 8th floor MER. The condenser water riser will be installed into existing building shaft. The chilled water pump will be sized to provide 164 gpm of chilled water flow against an estimated ~~80 feet~~ **30 feet** of wat~~at~~er column head. The condenser water pump will be sized to provide 210 gpm of condenser water flow also against an estimated ~~80 feet~~ **30 feet** of water column head. The spare pump is a stand-by pump, 200 GPM, with variable speed, as a back-up for both condenser and chilled water.

b. A 4,000 CFM, variable speed, outside air handling unit, with MERV ~~15~~**14** filters, ~~gas-fired,~~ heating section ~~-340 MBH, low temperature flue discharge (100-120°F). Flue discharge will be on side of building on 7th floor~~, chilled water coil and outside air louver. ~~Gas will be delivered through the building gas piping. Gas meter will be provided.~~ Outside air will be conditioned to 50F summer/winter and supplied to four (4) air towers. Return and outside air handling dampers will be provided upstream of the heating and cooling coils. Damper position will be controlled by a demand controlled ventilation system incorporating a carbon dioxide sensor in the outside air intake, and carbon dioxide sensors in the main office area and in the large conference room. The outside and recirculating air dampers will be modulated to maintain a constant ~~470~~**550** ppm carbon dioxide concentration differential between the room sensors and the outside air sensor. Outside air will be conveyed through sheet metal ductwork to the

inlet of each column fan. Branch ducts for each column fan will be nominal 16" by 10" with external insulation.

c. A gas fired, hot water condensing boiler, of 300 MBH heating capacity, with low temperature flue discharge (100-120°F). Gas will be delivered through the new gas piping; as meter will be provided. Flue discharge will be one side of the building on 7th floor.

~~c.~~**d.** Four (4) ~~7,000~~**8,000** CFM air towers (vertical column fans) with MERV 14 filters, chilled water coils will provide 62 DegF cool air to the underfloor plenum for space cooling. Fans will include VFD drives. A differential pressure sensor will modulate the supply fan speed to maintain a fixed positive static pressure differential in the supply plenum. Thermostats for each air tower located approximately six feet AFF on a column within the area served by the air tower, will control the supply air temperature of the tower.

~~d.~~**e.** Temperature control for the space will be provided by approximately 130 thermostat controlled automatic damper swirl diffusers with thermostats, and approximately 100 manually adjusted swirl diffusers.

~~e.~~**f.** Space cooling for the computer room will be provided by one five (5) ton vertical floor-mounted water-cooled DX computer room air conditioning unit, similar to the Liebert Challenger 3000. A separate pump will be provided for the condenser water loop serving the computer room unit.

2. Heating, steam heated

   a. The existing perimeter radiation system will remain in place,. New thermostatic control valves will be provided for temperature control.

3. Exhaust

   a. Provide Ducted exhaust connection to Copy room (8"by 8") and Pantry (8" by 8") connecting to common 10" by 10" duct at entry to stairwell access corridor. Common duct accesses central well through corridor, with fire smoke damper at door to well access. Common duct rises through well to roof level. Provide in-line centrifugal exhaust fan at roof level to deliver 550 cfm exhaust against 1.25" static pressure.

III. TENANT ELECTRICAL SYSTEMS

B. GENERAL

Electrical systems including power distribution, grounding, fire alarm and emergency lighting shall be installed and or augment the base building systems to meet requirements of local, codes and regulations as well as sound engineering practices.

C. BASE BUILDING SYSTEMS

1. Utility Power System

225 Varick Street is supplied electricity at 208Y/120V, 3 phase, 4 wire by the Con Edison distribution system which is distributed through the building via multiple wiring and conduit.

2. Fire Alarm System

The base building fire alarm system is a Class E fire detection and alarm system with devices installed for the core and shell portion of the building. Audubon spaces will be augmented with new fire alarm and smoke detection devices and connected to the base building system.

D. ELECTRICAL DISTRIBUTION SYSTEM

1. Distribution

a. The main service switchgears are installed in the basement level. Existing feeders currently serve the 7th floor. An existing 400A dedicated riser and an existing 600A shared riser with a 200A tap for the 7th floor. Both services will be reused and reconfigured for the new tenant loads. Each will be electronically sub-metered.

b. A new closet will be provided to serve the 7th floor with new panelboards.

c. A new feeder will be extended to the new rooftop cooling tower.

2. Typical Office Floor Branch Wiring

a. Option 1: The office/work stations with access flooring will be provided with flush mounted floor boxes with power and telecom outlets.

b. Option 2: The office/work station installed on existing slab will be serviced by either poke-thrus (after permission from building owner) or power poles placed on the floor to distribute power and telecommunications.

c. Receptacles for all computer controlled equipment, including PC's and printer stations will be circuited separately from all other receptacles and will be connected with a continuous ground conductor to the ground bus in the branch circuit panelboard supplying the equipment.

d. Ground fault circuit interrupter outlets shall be provided in all private toilet rooms, and for all receptacles and equipment located near running water, such as electric water coolers, pantries, etc., in accordance with code requirements.

e. All branch circuits will be installed in EMT conduit.

3. IT Room Circuiting

a. Equipment in the IT room will be served by a new UPS system.

b. Each equipment rack within the IT room that requires power will be provided with two (2) dedicated 20 amp, 120 volt circuits originating from UPS based upon the requirements of the IT consultant.

c. Branch circuits serving all IT equipment shall include a dedicated neutral and isolated ground.

4. Uninterruptible Power System (UPS)

a. Audubon will have a dedicated and isolated UPS system sized at 30KVA. The UPS systems will be a single module system. The system will consist of sealed valve regulated batteries with a total system battery back-up of 20 minutes.

b. The system will provide UPS power to the following Audubon loads:

(1) IT equipment loads.

(2) Audubon telecommunications system.

(3) Security system loads

5. Fire Alarm System

a. The base building system will be extended to incorporate the following:

(1) All current code requirements which must be satisfied for compliance including ADA requirements.

(2) Hardware/software upgrade as required relating to system modifications.

b. Early warning smoke detection will be provided for the following:

(1) IT room – at ceiling.

(2) Duct smoke detectors required for air conditioning units.

(3) Electrical and mechanical rooms

(4) Smoke detection below the raised floor

c. Smoke detectors shall be placed on the ceiling surface in the IT room. Ceiling mounted devices will be placed on a 30' x 30' grid.

d. Speaker/strobe units will be installed to accommodate the fitout layout on Audubon floor in addition to the base building speaker/ strobes around the core.

6. Lighting

a. General

(1) Lighting control/switching will comply with the latest requirements of the State of New York Energy Codes.

(i) Enclosed offices and conferences rooms shall be provided with occupancy sensors.

(ii) Open office areas will be controlled via the time clock for occupied/unoccupied operation. An after hours override switch will be provided at the elevator lobbies.

(iii) Daylighting sensors will be used at the perimeter.

(2) Electronic energy savings ballasts and energy efficient lamps will be provided for all lighting fixtures.

(3) All emergency lighting will be provided by battery packs, integral with the lighting fixture.

b. Mechanical/ Telephone/ Storage Areas

(1) Industrial type fluorescent luminaries mounted to coordinate with the equipment in the space will be utilized.

c. Exit lighting will utilize energy efficient LED type exit signs. These will be provided at all exits, along the path of egress on every floor, and where required by code. Emergency lighting will be accomplished using battery packs integral with the exit light.

III. TENANT PLUMBING AND FIRE PROTECTION SYSTEMS

1. Domestic Water Supply

   a. Water Service/ (Cold Water) will be provided from the base building piping system via valved capped outlets for tenant occupancy use, i.e. pantry's and bathrooms. Local filtration will be provided for drinking water use.

   b. Domestic Hot water for the pantry and bathroom areas will be supplied from electric storage type hot water heaters and will be supplied at 120°F. The piping system will include a hot water recirculation system with circulation pump to maintain water temperature during off peak periods.

   c. Booster pump will be supplied to provide make up water to cooling towers on roof.

   d. Sanitary and Vent System:

      (1) Sanitary and vent piping shall be connected to all plumbing fixtures, floor drain etc. Fixtures shall flow by gravity and connect to capped sanitary and vent outlets located the floor from base building sanitary and vent risers.

   e. Floor drains will be provided at minimum, in accordance with the following.

      (1) Mechanical equipment rooms (with water systems only).

2. Natural Gas System

   a. Low pressure gas (4" w.c.) will be supplied to the space by the existing gas riser. The service shall be metered separately for mechanical use.

   b. One meter shall be installed, gas piping will be extended and connected to the mechanical equipment.

~~1.~~**2.** Fire Protection:

a. Demolition:

(1) Remove existing sprinkler piping and re-install per contract documents.

b. New sprinkler System:

(1) Automatic wet sprinkler system shall be provided throughout Audubon floor areas. The system shall be supplied from the building floor sprinkler rig located within the space.

(2) The sprinkler system shall consist of a main sprinkler loop circumventing the core area with sprinkler branch supplies connected to the sprinkler loop main.