

MECHANICAL SYSTEMS

GENERAL

This narrative provides a brief summary of the proposed mechanical systems. The information contained in this document will be used during the design process.

CODES AND REGULATIONS

The following construction codes and regulations are understood as requirements for this project:

- 2020 Edition of the Building Code of New York State.
- 2020 Edition of the Energy Conservation Code of New York State.
- 2020 Mechanical Code of New York State.
- 2020 NYS Energy Conservation Code.

PRIMARY DESIGN ASSUMPTIONS

1.1.1 Climactic Design Conditions:

ASHRAE 0.4% cooling and 99.6% heating design conditions for Fayetteville, New York.

Summer 89.1 F DB / 73.1 F WB

Winter -1.5F

1.1.2 Space Environmental Requirements:

Occupied Set Point: Summer 72 F Winter 70 F

Unoccupied Set Point: Summer 76 F Winter 65 F

Mechanical and Electrical Space: Summer 85 F Winter 60 F

VENTILATION

Mechanical ventilation will be achieved through the means of mechanical ventilation in accordance with the 2020 Mechanical Code of New York State.

PROPOSED MECHANICAL SYSTEMS

Lower Level Spaces (Police) – RTU-1 & 2

1. All spaces on the lower level will be served by (2) two 25-ton packaged air source heat pump rooftop units equipped with MERV-13 filtration, insulated roof curb, energy recovery wheel, back-up electric heating coil, double-wall cabinet construction, plenum fan with integral VFD, economizer with enthalpy controls and will consist of supply air distribution ductwork terminated with ceiling mounted grilles or lay-in diffusers to provide cooling, heating and ventilation as required. Unit return shall be a ceiling plenum return. Each RTU will serve multiple zones by dedicated VAVs with electric reheat coils controlled by a zone temperature sensor. Tamper proof grilles will be provided where applicable. Units shall be by Trane, AAON, Daikin or equal.
2. A dedicated roof mounted exhaust fan with a 24" insulated roof curb will provide the required exhaust airflow for locker rooms, rest rooms, showers (if applicable),

janitor's closet, evidence rooms and all applicable spaces requiring exhaust air. The exhaust fan will consist of air distribution ductwork and lay-in diffusers or ceiling mounted grilles. Fans shall be by Greenheck, Loren Cook or equal.

3. Maintenance garage(s) will consist of a dedicated exhaust fan , CO/NO2 sensors and air distribution ductwork and duct mounted grilles. The exhaust system will be connected to a control panel that will monitor CO/NO2 levels within the space(s). Means of make-up air will consist of an exterior louver, wall sleeve and automatic air damper. The automatic air damper will be controlled by associated exhaust fan operation. An electric unit heater(s) will provide conditioning during winter months. CO/NO2 system shall be by Macurco or equal.
4. Rooms such as, but not limited to, interview rooms, holding cells, booking room(s), etc., will be provided with tamper proof supply/return grilles and required devices.
5. Provide an electric wall heater in building lobby.
6. All miscellaneous rooms (elec rm, mechanical rm, etc.) will be provided with either an electric unit heater or electric cabinet unit heater.

First Floor Spaces (Town Hall and Courthouse) – RTU-3 & 4

1. All spaces on the first floor will be served by (2) two 25-ton packaged air source heat pump rooftop units equipped with MERV-13 filtration, insulated roof curb, energy recovery wheel, back-up electric heating coil, double-wall cabinet construction, plenum fan with integral VFD, economizer with enthalpy controls and will consist of supply air distribution ductwork terminated with ceiling mounted grilles or lay-in diffusers to provide cooling, heating and ventilation as required. Unit return shall be a ceiling plenum return. Each RTU will serve multiple zones by dedicated VAVs with electric reheat coils controlled by a zone temperature sensor. Units shall be by Trane, AAON, Daikin or equal.
2. A dedicated roof mounted exhaust fan with a 24" insulated roof curb will provide the required exhaust airflow for locker rooms, rest rooms, showers (if applicable), janitor's closet and all applicable spaces required. The exhaust fan will consist of air distribution ductwork and lay-in diffusers or ceiling mounted grilles. Fans shall be by Greenheck, Loren Cook or equal.
3. Rooms such as, but not limited to, courtroom, IP holding, jury room, etc., will be provided with tamper proof supply/return grilles and required devices.
4. Provide an electric wall heater in building lobby.
5. All miscellaneous rooms (elec rm, mechanical rm, etc.) will be provided with either an electric unit heater or electric cabinet unit heater.
6. IT space will be served by a dedicated wall mounted split system with associated air cooled condenser located on the roof.

ALTERNATE MECHANICAL SYSTEMS

Geothermal System

1. The geothermal system will consist of an approximate wellfield of 40-50 bores roughly 500'-0" in depth, location to be determined. The geothermal system will also consist of (2) two inline or end suction pumps with necessary piping accessories and distribution piping. The system pumps that will operate in a lead/standby sequence and each pump will be sized to operate at full flow/capacity. Proposed system descriptions for the lower level and first floor will also apply to the alternate geothermal system. In lieu of air source heat pump rooftop units provide ground source heat pump rooftop units.
2. Geothermal Piping:
 - Below Grade Piping
 - a. Below grade geothermal supply and return piping shall be HDPE DR 11 for 2" and smaller and HDPE DR 15.5 for 2-1/2" and larger. Fittings shall be molded HDPE and connections shall be heat fused per ASTM D2657.
 - Above Grade Piping
 - a. Above grade geothermal supply and return piping shall be schedule 40 black steel or copper for 2" and smaller and schedule 40 black steel for 2-1/2" and larger. Fittings shall be grooved end for black steel piping and wrought copper or cast bronze for copper piping. Piping shall be insulated with 1" thick fiberglass insulation. All exposed piping shall have PVC jacketing.

DUCTWORK

1. All ductwork shall be lock forming quality, galvanized steel or stainless steel where noted. Supply ductwork shall be provided with 1-1/2" thick duct wrap. Supply ducts exposed in spaces they serve will not be insulated. Exhaust ducts shall be insulated with 1-1/2" thick duct wrap within 15ft of the exterior penetration. All transfer duct, if necessary, will be provided with 1" duct liner.

SYSTEM CONTROL

1. All equipment serving the proposed building shall be controlled by a DDC system. System head end will be centrally located within the building.