

ELECTRICAL SYSTEMS

GENERAL

This narrative provides a summary of the proposed electrical 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.
- 2017 National Electric Code (NEC).
- 2020 Edition of the Fire Code of New York State

ELECTRICAL DISTRIBUTION

Electric Service:

Building electrical service will be provided by National Grid. The utility company will provide a 208/120V, 3-phase, 4-wire pad-mounted transformer, primary feeders, and primary terminations. The transformer will be located outside on grade near the building. The contractor shall provide a transformer pad grounding, containment & bollards per National Grid specifications. The contractor shall provide conduit for the primary feeders. The location of the utility meter will be at the pad mount transformer. The electrical contractor shall coordinate the installation of the primary electrical service with the utility company. The electrical contractor shall provide the secondary service from the new pad-mounted transformer to the building main switchboard. The anticipated NEC calculated demand load for the building, based on an anticipated square footage of 40,000sq ft is anticipated to be 420kVA (1200A).

Normal Power Distribution:

The main service entrance for the building will be 208/120V, 3-phase, 4-wire. The main switchboard (MSWB) will be rated 1600A, 65kAIC, 120/208V, 3-phase, 4-wire and shall be protected by a 1600A main circuit breaker. All distribution circuit breakers will be provided with long time, short time, and instantaneous trip settings for device coordination. Spare circuit breakers and additional bussed space will be provided. The MSWB will have copper bus bars. MSWB will be freestanding type and installed on a raised concrete housekeeping pad. A Surge Protection Device (SDP) will be connected to the MSWB by way of a circuit breaker disconnect.

All panelboards and sub-distribution panels shall have copper bus bars. All distribution and branch panel circuit breakers will be bolt-in molded case type. 25% spare breakers/breaker spaces will be provided in every panelboard.

All conductors shall be copper and will be pulled in conduit with steel fittings. Metal clad cable will be utilized only for under counter luminaires and wiring for whips to office furniture. All circuiting will be routed in conduit. Minimum conduit size shall be 1/2". All above grade feeders and branch circuits will consist of THHN/THWN copper conductors in EMT conduit. All below grade feeders and branch circuits will consist of XHHW in PVC. Exposed exterior conduits shall be rigid galvanized Wire sizes for branch circuit power and lighting will be a minimum of #12 AWG. Separate

neutral and ground conductors will be provided for each circuit. All receptacles and switches shall have a phenolic label indicating which circuit is feeding that device. All panelboards, transformers, disconnect switches, etc. shall be labeled using an engraved nameplate.

Tamper resistant receptacles shall be utilized in all public spaces.

Circuits/power wiring shall be provided to equipment by other trades/divisions of work including wiring of all associated equipment control devices. (HVAC equipment, plumbing equipment, elevators, etc.)

Emergency Power Distribution:

One 200kW, 208V, 3-phase, 4-wire standby rated, diesel emergency will be provided. The generator will be located outside the building in a weatherproof 75dB at 21 feet sound rated enclosure and will be equipped with a skid mounted radiator. The generator shall have a sub-based #2 diesel belly fuel tank capable of supplying emergency power for 48 hours. The fuel tank shall have leak detection means. The generator will be provided with a remote annunciator panel and a remote start/stop.

The generator will feed a 800A emergency distribution board located in the emergency main electrical room. The emergency distribution board will feed the emergency branch automatic transfer switches. Bussed space will be provided in the emergency distribution board to allow for future growth capacity.

The automatic transfer switches (ATS) for the emergency branches shall be located in the emergency main electrical room. The transfer switch feeding the elevator shall be equipped with an elevator pre-signal contact for interface with the elevator controllers. Remote ATS annunciator panels will be provided.

Grounding:

A grounding electrode system will be installed that will meet the requirements for a grounding system as outlined in the National Electric Code. A main ground bus bar, located in the main electrical room will be bonded to the main switchboard frame and ground bus using a ground conductor sized in accordance with the NEC. The grounding system shall consist of a grounding connection to the cold-water pipe at the service entrance, a grounding connection to the building steel, and a grounding connection to driven ground rods. Secondary ground bars will be provided in all electrical and communication rooms.

Site Features requiring Underground Electrical Systems:

Underground electrical distribution to Level 2 EV charging stations will be provided consisting of dedicated GFCI protected circuits to support a minimum 40-ampere, 208-volt branch circuit for each EV parking space.

Underground electrical distribution to electrical hook ups for nine (9) police/emergency response vehicles consisting of dedicated GFCI protected circuits.

Underground distribution to two (2) support/garage structures.

LIGHTING SYSTEMS

The use of building space requires and interior lighting system that provides adequate lighting levels and provides for good visibility and comfortable surroundings. Lighting levels for each space will be designed to conform to the Illuminance Selection Tables appearing in the Illuminating

Engineering Society (IES) Lighting Handbook. Specific influences of glare, task complexity, surface reflectance characteristics, ceiling brightness and user age will be considered when specifying lighting.

Vandal-proof lighting shall be provided in areas in high abuse applications that minimize the risk of tampering.

Interior Lighting & Controls

Lighting will be LED type and will have automatic, daylighting and manual control per the International Energy Code.

Exterior Lighting & Controls

Exterior lighting will conform to the criteria recommended in the IESNA Guideline for Security Lighting for People, Property and Public Spaces. Exterior lighting shall be provided at all building entrances, pedestrian walkways, service yards and parking lot areas. 1-foot candle will be provided for all parking lot areas, pedestrian walkways, and service yards. 5-foot candles will be provided at all building entrances. Exterior fixtures shall be selected to enhance the aesthetic look of the building and surroundings. Exterior lighting control will be accomplished through utilizing a photocell and astronomical time clock control.

FIRE ALARM

The fire alarm system used in this building will be microprocessor-based 24VDC, electrically supervised, addressable “intelligent” fire alarm system. The system shall be UL 864, 9th Edition listed and labeled. The system shall include all control equipment, power supplies, signal initiating and indicating devices, conduit, wire, fittings, and all other accessories necessary for a fully functional code compliant fire alarm system.

LOW VOLTAGE SYSTEMS

Power shall be provided to all low voltage system distribution head end equipment. Conduit and boxes will be roughed-in and conduit stubbed into accessible ceiling spaces for low voltage cabling to be installed by others. Pull-wire will be provided in all empty conduits. Low voltage systems shall include but not be limited to horizontal cabling distribution, security, audio/visual systems, sound/paging system, CATV, and wireless communication system.