

GENERAL:

The scope of this document is to provide general requirements for electrical work.

Ensure construction drawings include details for all the proposed firestopping systems that could be encountered on the project based on the construction type and rating of the assemblies being penetrated. A specific Division 26 firestopping spec can be inserted, or reference related section 078400 for details.

DESIGN GUIDELINES:

1. Typical installation:

1.1 Service Entrance – Switchboard in a separate enclosed section with bolted-on breaker and remote operator. Switchgear with draw out breakers in a separate enclosed section and remote operator may be used with approval of Project Manager.

1.2 Main Distribution – Switchboards with bolted-on breakers feeding panels, motor loads or transformers. Switchgear with draw out breakers may be used with approval of Project Manager.

2. All electrical systems to buildings will be oversized for future requirements. A minimum of 20% spare capacity should be provided within each breaker assembly. Spare Capacity is defined as additional continuous load and space for installing future circuit breakers or fused switches within the panel.

3. Only UL or equivalent approved appliances and equipment shall be specified.



4. Electrical kilowatt-hour meters will be provided in new buildings.

5. Electrical switchboards, switchgear, transformers and distribution equipment shall be located in dedicated lockable rooms. Electrical panels can be in a lockable closet.

6. Electrical loads, excluding emergency systems, shall be fed from distribution panels located on the same floor as the load itself. Feeding power loads from floors above or below the connected load will not be permitted unless approved by the Project Manager.

7. Provide all electrical end use equipment with a local disconnecting means.

8. Power and control wiring systems including low voltage shall be provided using raceways as outlined in these guidelines. Bus Duct is not permitted unless approved by the Project Manager.

9. Exterior handicapped ramps will be electrically heated with self-regulating heat trace cable for snow/ice melting and monitored and controlled by the Building Automation System.
10. Provide expansion fittings at expansion joints. Treat expansion joints as seismic joints for seismic movement and bracing purposes.
11. Distribution of power, lights, fire alarm, telephone, and miscellaneous signals will be in raceway as required by applicable codes and standards. (Threaded IMC shall not be used.)
12. All electrical systems must be designed as fully rated. Series rated systems are only allowed if approved by the UM - University Engineer.
13. Service Entrance:
 - 13.1 In new installations, only one disconnect per voltage will be installed per service entrance or a double ended w/tie breaker setup may be installed, unless approved by the Project Manager.
 - 13.2 Where the service entrance main breaker frame size is 1,200 amps or larger, adopted NEC article 240.87 requires arc energy reduction by listed methods. The preferred method is the energy-reducing maintenance switch. Alternative methods may be considered on a case by case basis. Coordinate with University Project Manager.
 - 13.3 All 480-volt service entrance main breakers or fused switches that are rated 1,000 amps or higher are required to have Ground Fault Protection (GFP). This equates to 665 KVA with a single main breaker of standard design.
 - 13.4 Where the service entrance disconnect is equipped with GFP, the consultant shall provide time and current setting for the GFP. The service entrance GFP will coordinate with feeder circuits that have GFP and small feeder breakers (such as 20 or 30 amps) to ensure the feeder circuit will open before the GFP can trip the main breaker. Where the service entrance disconnect has GFP, all feeder breakers in the main distribution panel shall have GFP.
 - 13.5 The service entrance disconnect will include sensing for a single-phase condition on the power system. A single-phase detection relay will have an adjustable time delay of 1 to 10 seconds before opening the main breaker and shall not operate for loss of voltage on all three phases. The relay setting shall only open the service entrance disconnect after loss of voltage to one phase has been detected for 10 seconds.
14. Reference design guidelines section 210100 for design of the fire and jockey pump.
15. Unless otherwise stated in the specifications, all electrical assemblies shall be tested per the requirements of the InterNational Electrical Testing Association Inc (NETA), current edition.