



#### 20.5.1 Contractor Supplied Materials

Following specifications 651.2 and 670.2, all products supplied by the contractor should conform to specification requirements on the department's approved product list. For materials not on the approved list, refer to Standard Specification 670.3.3.1.

#### 20.5.2 Communication Requirements

Communication between the DMS and control center allows information to be disseminated on a real-time basis, providing up-to date information to the motorist. The Operations Center can communicate with the DMS via a voice-grade telephone line, either standard wire based or cellular. Dedicated communications, such as a state owned fiber optic cable, state owned copper twisted pair cable, spread spectrum radio, or a combination of the three, could also be used to provide communications between the DMS and the Operation Center. Chapter 50, Communication Systems provides additional information on communication types and requirements.

#### 20.5.3 Power Requirements

Consistent with the design practice recommended in the National Electric Code, the electrical service and power distribution system should be designed for a maximum of a 3% voltage drop between the electrical service location, which may be a utility connection point or a dedicated circuit in an adjacent installation such as a lighting distribution cabinet, and the DMS or other field cabinet. When calculating the voltage drop, it is important that the ultimate potential power draw is considered. Good design practice dictates that the sum of the size of the circuit breakers within the cabinet be used as the potential draw. In most cases for ITS design this will mean a 50-Amp power draw should be used as most ITS cabinets come with 2-25-Amp circuit breakers.

A 100 Amp, 2-Circuit, 120/240 volt, single phase, three wire underground electrical service is the most commonly used and preferred electrical service for DMS cabinets, or any ITS field cabinet; however, other systems must be considered in instances where the electrical service location is of such a distance from the field cabinet that maintaining the above described 3% maximum voltage drop is not possible.

Power distribution conductors must be sized appropriately to design for the above-mentioned 3% maximum voltage loss with a maximum conductor size of 1/0 AWG.

Due to WisDOT safety regulations, voltage in excess of 120V must not be brought into ITS field cabinets. Rather, step-down transformers must be installed adjacent to the field cabinets with only the 120V conductors installed into the cabinet. For further clarification, it is not acceptable to "split" the 240V service into two 120V circuits in the field cabinet.

The electrical service will be furnished and installed by the local power company up to a demarcation point, typically an electrical service (meter) pedestal. The electrical service must conform to the requirements of the local power company. **The location of the electrical service pedestal must receive approval from the utility company.** The electrical service will include two 50-amp circuit breakers rated at 22,000 AIC. The requirements for power cable between the electrical service and controller cabinet can be found in 20.3.3.7 Cable Routing.

At locations which require a remotely located electrical service or which require an adjacent step-down transformer, a 100 Amp outside rated breaker box with space for 6 circuits, but no main breaker, will be attached to the side of the cabinet so that the cabinet may be shut down without entry into the higher voltage step-down transformer. Also, a 50 Amp single circuit breaker rated at 22,000 AIC will be installed within the breaker box to serve as a local electrical service disconnect point. Remote service should be labeled in the field as ITS with State Traffic Operations Center's phone number.

#### 20.5.4 DMS Construction Standards

Construction details, Standard Detail Drawings, and Special Provisions can be found in Appendix 70.