

**INTERPRETATION IC 90.1-2007-23 OF
ANSI/ASHRAE/IESNA STANDARD 90.1-2007
Energy Standard for Buildings Except Low-Rise Residential Buildings**

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Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IESNA Standard 90.1-2007, Sections 3, 8.4.1.1 and 8.4.1.2, regarding feeder conductor voltage drop.

Background: An issue has arisen on a multi-building development lot with regard to interpretation of where feeder conductor voltage drop calculations should commence as required by Section 8.4.1.1 of ASHRAE/IESNA Standard 90.1-2007. The definition of service entrance equipment is primarily what is in question. The components included in the ASHRAE/IESNA Standard 90.1 definition of *service equipment* are "circuit breakers or switch and fuses and accessories". Service equipment is "provided to disconnect all under-grounded conductors in a building or other structure from the service entrance conductors". For a development in question, these components are located in different locations throughout the development. Below grade feeder conductors of this multi-building development enter the development at various points along its lot boundary. Feeders entering the lot first run through power company transformers and then run underground an additional 5 meters into small enclosed structures owned by the developer. The power company is responsible for the 5 meter run from the transformer to the each of the structures. These structures (that serve a maximum of 2 buildings on the lot), house utility meters and main shutoff devices that can independently cutoff power supply to each building. Feeders then run underground from the structures to main circuit breaker panels within each of the buildings. The sub grade electrical distribution from the structures to the buildings are also developer-owned and designed by MEP firms hired by the developer. In many cases, the distances from the structures to the buildings they serve will be significant.

Interpretation No.1: The circuit breaker panels within each of the building structures are the points at which voltage drop calculations should begin.

Question No.1: Is this interpretation correct?

Answer No.1: No. As defined, the point of voltage loss calculation should commence at the point of main supply cut-off under owner control as defined by the standard definitions under 'Service Equipment'.

Interpretation No.2: The main electrical cutoff devices housed within the developer-owned structures outside the buildings are the points at which voltage drop calculations should commence. Taking into account the sub-grade electrical distribution to each building.

Question No.2: Is this interpretation correct?

Answer No.2: Yes. See Interpretation No.1.

Interpretation No.3: Utility company transformers at the lot boundary are where voltage drop calculations should commence. Taking into account all sub-grade electrical distributions on the entire lot. (Whether or not the developer is responsible for their installation)

Question No.3: Is this interpretation correct?

Answer No.3: No. See Interpretation No.1.

Interpretation No.4: The entire lots electrical distribution (including within the buildings) is exempt for voltage drop requirements due to the special circumstances it's configuration presents. (Given that the definition of "service entrance equipment" is not valid for the developments electrical distribution configuration)

Question No.4: Is this interpretation correct?

Answer No.4: No. Only the AHJ has the authority to provide relief from requirements.

Interpretation No.5: If the 2% and 3% voltage drop requirement in ASHRAE/IESNA Standard 90.1 is based on a footnote recommendation from the National Electric Code, (that also states that a total voltage drop of 5% from service entrance equipment to loads is acceptable), then the 5% total voltage drop option can be utilized. (i.e. the 2% and 3% requirements are interchangeable so long as the sum is 5%)

Question No.5: Is this interpretation correct?

Answer No.5: No. Standard 90.1-2007 is the standard for energy performance

Interpretation No.6: The scope of ASHRAE/IESNA Standard 90.1 applies solely to buildings and therefore all buildings systems and equipment not located within each buildings' enclosed structure needs not comply with the standards' requirements.

Question No.6: Is this interpretation correct?

Answer No.6: No, various sections of Standard 90.1 do cover installations outside the building (e.g. exterior lighting).