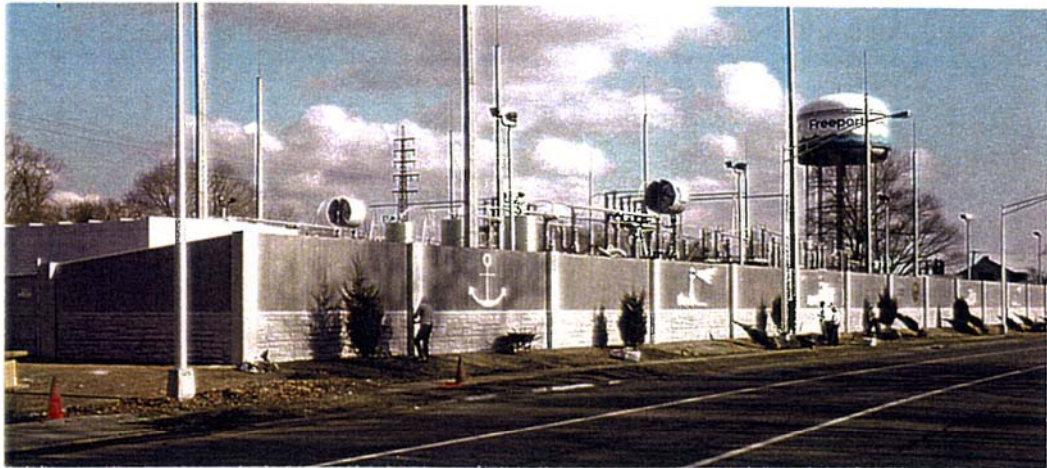


Duke and Mass. Electric take top honors

Adapted from an original report by Wayne Beaty, Technical Editor

The 138/13.8 kV substation

connecting Long Island Lighting Co's transmission system to the Village of Freeport, N.Y., was an engineering challenge for the design/build team. Photo courtesy of Mass. Electric Construction Co.



Duke Engineering & Services, Inc. took top honors in the Aesthetic Design competition, and Mass. Electric Construction Co. won First Place in the Engineering/Operations Design category in *Electric Light & Power's* 8th annual substation design contest.

Engineering/Operations Design

Mass. Electric Construction Co., Boston, MA, submitted the winning entry for the Engineering/Operations Design category. PLM Electric Power Engineering, Hopkinton, MA, was also part of the design/build team. The 138/13.8 kV substation provides the Village of Freeport, N.Y., access to Long Island Lighting Co.'s 138 kV transmission system. The former 33 kV supply lines were inadequate to meet their present load of 53 MW, with projected load of 70 MW by the year

2020. Nor was Freeport able to take full allocation for low-cost hydropower from the New York Power authority (NYPA). The municipal electric system is now interconnected through a completely underground, looped 138 kV pipe-type cable circuit to Lilco's system. The design has two line breakers, a bus-tie breaker, and two load breakers connected to two 43/58/72 MVA, 138/13.8 kV step-down transformers. Sixteen feeder positions are arranged in double-protected aisle switchgear configuration.

The substation is sandwiched between a major thoroughfare (Sunrise Highway) and the Long Island railroad and was further encumbered, from a land-use position, by an active well abutting the site. The design team had to be concerned with clearances, vehicular

access, vandalism, lightning and other issues. High-resistivity soil made the 2 ohm ground grid design criteria a difficult technical challenge. Michael Murrin, project manager, and the PLM design team developed a highly detailed zero-sequence model and a successful design approach to mitigate the soil resistivity problem.

Dennis DaRu Jr., Mass. Electric Construction Co. senior project manager, said "Because of the restrictive time element, we streamlined the construction process by utilizing techniques that provided scheduling benefits throughout the project." Design duties for this fast-tracked project were directed by Charles Marsland, principal of PLM. Sam McKnight, PLM principal engineer, supervised the design team.

CONTEST JUDGES

Electric Light & Power wishes to thank the Institute of Electrical and Electronics Engineers/Power Engineering Society Substation Committee for judging this year's entries.