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(for information)

Building Energy Codes

Introduction

This paper aims to brief members on the current development of the Building Energy Codes.

Background

2. The Government's policy on energy efficiency and conservation is to promote such practices as far as possible without impeding either economic growth or improvement in the community's standard of living. The Energy Efficiency Advisory Committee (EEAC) was established in 1991 under the chairmanship of the Secretary for Planning, Environment and Lands to promote energy efficiency and conservation. An Energy Efficiency Office (EEO) was set up in 1994 in the Electrical and Mechanical Services Department (EMSD) as the executive arm of the EEAC. The functions of the EEAC have now been absorbed by the Energy Advisory Committee established in July 1996.

3. The Government's energy efficiency and conservation programmes mainly involve promoting public awareness of, and providing advice on, energy saving opportunities and benefits through education and publicity programmes and establishing energy saving standards for the design of buildings and building services. We have put much emphasis on the commercial sector because it is the largest consumer accounting for more than 50% of electricity consumption in the territory. We have been developing a set of Building Energy Codes, which will set minimum energy efficiency standards for building designs and installations of all the most energy consuming building services in the commercial sector. The comprehensive set of Building Energy Codes will include the following parts :

- Overall Thermal Transfer Value (OTTV)
- Lighting Installations
- Air-conditioning Installations
- Electrical Installations
- Lifts & Escalators
- Centralised Control & Monitoring Systems

Overall Thermal Transfer Value (OTTV)

4. The first code developed was the Code of Practice for Overall Thermal Transfer Value (OTTV) in Buildings, which was given statutory effect on 21 July 1995. The code requires the external walls and roofs of a commercial or hotel building to be designed and constructed to suitable OTTV. When building plans are submitted to the Buildings Department, they must be accompanied by information and calculations on OTTV filled in standard forms.

Lighting Energy Code (Lighting Code)

5. The Lighting Code was drafted by the Lighting Code Sub-working Group (LCSWG), which was a dedicated sub-working group formed in July 1994 under the New Buildings Working Group of the then EEAC. The LCSWG comprised representatives from professional institutions, utility companies, lighting suppliers and relevant government departments in order that a wide range of experiences and expertise could be tapped in the drafting of the Lighting Code.

6. The requirements of the Lighting Code, in broad terms, are expressed in *luminous efficacy*, *lamp controlgear loss* and *lighting power density*.

- *Luminous efficacy* is a measure of the effectiveness of lamp in converting electricity to visible light output. The code sets out the minimum allowable luminous efficacy, in terms of lumen per watt, for ten commonly used lamp types in lighting installation.
- Lamp controlgear is required for fluorescent lamps as well as most types of discharge lamps. The code sets out *the maximum allowable lamp controlgear loss*.
- The *lighting power density* of a lighting installation is the electrical power consumed by lighting installation, including lamp controlgear loss, in terms of watts per square metre of the illuminated space. The code sets out *the maximum allowable lighting power density* for different space types depending on their usage.

7. The standards for the above requirements are based on the results of two surveys conducted during the development of the Code. They are the "Survey on Design Values of Lighting Power Densities for Buildings in Hong Kong" conducted among major representative consultants and government departments concerned in January 1995, and the "Survey on General Characteristics of Components of Lighting Installations" conducted among major lighting equipment suppliers and manufacturers in March 1995. The proposed standards are pitched at a level which is already met by 80% of current lighting design and equipment performance in Hong Kong. It is considered appropriate to set the initial standards at a level which is not very difficult to achieve to avoid too much impact on the building industry and to gain ready public acceptance. The standards will be reviewed after some implementation experience.

8. The draft Lighting Code (Annex A) was completed in October 1995 and endorsed by the EEAC in December 1995. It was issued for consultation with interested parties from early February to end June 1996. Comments are now being consolidated and collated by EMSD.

Air-conditioning Energy Code (AC Code)

9. The AC Code was drafted by the AC Code Sub-working Group (ACSWG), which was another dedicated working group formed in January 1995 under the New Buildings Working Group of the EEAC. The ACSWG comprised representatives from professional and tertiary institutions, utility companies, AC suppliers, AC contractors and relevant government departments.

10. The requirements of the AC Code, in broad terms, are expressed in *design parameters, control criteria and equipment efficiency* :

- *Design parameters*

Suitable design parameters are set out in the Code to achieve the minimum acceptable standard for energy efficiency in AC installation. However, designers are also encouraged to design AC installations with energy efficiency standards higher than those specified in the Code.

- *Control Criteria*

Proper control methods, e.g. off-hours control, for achieving energy-efficient control without sacrificing comfort and health are specified.

- *Equipment Efficiency*

The most energy consuming part of an AC installation is the cooling media producing part, i.e. the chiller. The Code sets out minimum values of Coefficient of Performance (COP - ratio of the rate of heat removal to the rate of energy input) for AC equipment.

11. The standards for the above requirements are based on the results of two surveys conducted during the development of the Code. They are the "Survey On Design Parameters For Air-conditioning Systems for Buildings in Hong Kong" conducted among major representative consultants and government departments concerned in July 1995, and the "Survey On Air-conditioning Equipment Efficiency for Buildings in Hong Kong" conducted among major AC equipment suppliers and manufacturers in October 1995. The proposed standards are pitched at a level which is already met by over 90% of current AC design and equipment performance in Hong Kong. It is considered appropriate not to set the standards too high at the initial stage to minimise the impact on the building industry. The standards will be reviewed after some implementation experience.

12. The draft AC Code (Annex B) was completed in March 1996 and endorsed by the EEAC in April 1996. The Code was issued for consultation with interested parties in April 1996 for a period of four months.

Electrical Energy Code (Electrical Code)

13. The Electrical Code is being drafted by a dedicated task force convened by the Energy Efficiency Office of EMSD. The task force comprises representatives from professional and tertiary institutions, utility companies, electrical equipment suppliers, electrical contractors and EMSD.

14. The task force held its first meeting on 4 July 1996 and agreed on the framework of the Electrical Code. EMSD is preparing the draft Code which is expected to be completed by end 1996.

Implementation

15. Ways of implementing the Building Energy Codes are under consideration. EMSD has convened a dedicated task force with members drawn from both the LCSWG and ACSWG to develop and recommend the most cost-effective means of implementing the code, such as by mandatory, voluntary, or other administrative approaches. In the Lighting Code and AC Code consultation documents, we have also invited views from interested parties on ways of implementing the codes. These views will be taken into consideration by the task force when formulating the implementation strategy. We expect to draw up the proposed implementation mechanism by early 1997 for consultation with interested parties.

Electrical & Mechanical Services Department
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