

Implementation of ISO 14001 in Architectural Services Department

Introduction of ISO 14001 in ArchSD

Architectural Services Department (ArchSD) is responsible for the design, procurement and maintenance of all community facilities, except public housing, in Hong Kong. In 2000, 93 projects were completed with an expenditure of HK\$9,000M. Value of projects under design and construction amounts to HK\$60,000M. A total of 25,000,000 m² building floor area of properties were maintained / improved with an expenditure of HK\$3,700M.

In the daily operations such as facilities design and construction, it is inevitable that the environment is impacted in many ways. To ensure that proper consideration is given to environmental protection, ArchSD has adopted an environmental management system (ISO 14001) to improve the environmental quality of its buildings and to enhance sustainability in its developments.

The Certification Process

ArchSD is the first government department obtaining ISO 14001 certification. Prior to receiving ISO 14001 certification in March 1998, the department is already certified under ISO 9001 in 1995. Since both systems have compatible elements under the respective international standards, an integrated approach has been adopted. The same set of manuals are used to incorporate the ISO 9001 and 14001 clauses and integrated audits are conducted to minimise the resources required.

Preparation for certification was mainly done in-house by the concerted efforts of the department's own staff, based on the experience of previous ISO 9001 certification. The time taken from implementation to certification was approximately one and a half years. Resources required for certification are :-

- (a) The ISO 14001 Working Group with approximately 12 members from various disciplines. They are mostly senior professionals who advised on the ISO 14001 matters apart from their day-to-day duties on project administration.
- (b) The Quality Assurance Unit with 3 working staff : a senior architect, a senior property services manager and a senior executive officer.

The Implementation Strategy

In accordance with ISO 14001's requirement, the following essential elements are incorporated into the system to improve ArchSD's environmental performance :-

- (a) Set up an Environmental Policy
- (b) Identify the environmental aspects of ArchSD's activities, products or services which have significant impacts on the environment such as air, water, noise etc.
- (c) Establish environmental objectives and targets
- (d) Provide environmental training to staff
- (e) Set up operational controls to ensure environmental considerations are included in project design and other administrative activities
- (f) Conduct management review for continual improvement

Apart from the procedures described above which are specific to ISO 14001, other general requirements (listed below) are already catered for in the existing ISO 9001. Such facilities could therefore be extended to cover the requirements in the combined system :-

- (a) Set up an organisational structure (i.e. the Quality Management Committee and the Quality Assurance Unit) to oversee and monitor the overall implementation
- (b) Document control for proper filing of records
- (c) Internal and external audits (twice per year for each) to ensure effectiveness of the system

Benefits of ISO 14001 to ArchSD

ISO 14001 enables ArchSD to improve and monitor its environmental performance in a more systematic manner. Its benefits can be summarised as follows :-

- (a) Enhanced Environmental Performance
- (b) Increased awareness of staff on environmental protection

- (c) Reduced pollution to the environment
- (d) Savings in recurrent maintenance cost and utility bills
- (e) Provide a lead to the construction industry in the promotion of environmental protection

Environmental Achievements

In 1999, the Public Records Office is assessed with “Excellent” rating under the HK-BEAM (Hong Kong Building Environmental Assessment Method).

The North Point Government Offices was among the first group of 14 buildings which have been successfully registered under the “Hong Kong Energy Efficiency Registration Scheme for Buildings” developed by EMSD for recognition of their adoption of measures to save energy.

ArchSD would establish environmental objectives and targets each year to ensure continual improvement in environmental performance. The target performance of the department in recent years are :-

- In 1999, a total of 34 environmental targets were set and 30 targets have been achieved with better results. Two involving research and data collection are on-going. The remaining 2 targets on saving papers cannot be fully met due to the establishment of new branch offices in Kai Tak and Shui On Centre.
- In 2000, 42 targets were set. Of these, 8 were 1999 on-going targets, 17 were 1999 enhanced targets and 17 were new targets.

Samples of ArchSD’s environmental targets are :-

- To improve energy efficiency by reducing electricity demand from air-conditioning through better OTTV (overall thermal transfer value) which is a measure of energy consumption of a building envelope.
- To minimise construction waste through the use of more factory-made components in the provision of building services installations
- To reduce the use of depletable material, i.e. timber, by substituting the traditional timber formwork with precast construction and metal formwork

- To ensure contractors’ compliance with environmental legislations through setting up administrative procedures on site for monitoring and reporting contractor’s environmental performance in construction works.

The followings are some sample projects incorporating environmental features in design

(a) Refurbishment of existing toilets

- Enhanced natural lighting and ventilation by raising the ceiling height and providing more windows at high levels. Inclusion of skylight wherever possible. Provision of louvres and canopies to reduce direct solar heat gain



Before Refurbishment



After Refurbishment

(b) Sheung Shui Slaughter House

- Convenience to rail and purpose built railway siding for off-loading livestock directly to the lairages, thus minimising the noise and odour nuisance caused to the surrounding environment



- Use of renewable energy (450 solar panels) to preheat water



- Acoustic louvres installed to contain the noise level
- Innovative waste water system which treats water using bacteria and other micro-organisms. The 5,000 m3 of effluent generated daily is treated by the biochemical waste water treatment plant to normal domestic waste water standards

Committments Required for ISO 14001 Implementation

According to the department's experience, implementation of ISO 14001 system would require commitment of resources to :-

- Address the expectation of all interested parties and the public at large.
- Communicate the relevant environmental control procedures to its partners at work, i.e. in the case of ArchSD : its clients, consultants, suppliers and contractors.
- Provide relevant training to all the employees to ensure that each individual is aware of the environmental significance of his work.
- Ensure continual improvement of performance standard.

In 1999, the resources used in the maintenance of ISO 14001 in ArchSD is HK\$ 7 million. This includes the cost of time spent by the staff in implementing the system (eg. members of ISO 14001 and Quality Management Committee etc.), staff training hours, environmental training costs, internal and external audits, certificate, environmental report and others.

For a large organisation like ArchSD with approximately 2000 professional and technical staff, the percentage of resources spent on ISO 14001 is relatively small. However, for a small and medium sized firm, the implications of cost, time and resources would comparatively be more significant.

An organisation could minimise the expenditure by self-declaring rather than becoming registered under ISO 14001. This however, would not have the advantage of giving the company an internationally recognised environmental label.

Possible Prospect of ISO 14001 in the Hong Kong Construction Industry

Under the present government policy, it is not a requirement for the contractor to be ISO 14001 certified. Since ArchSD has taken the lead to promote environmental protection through ISO 14001 implementation, this would encourage everyone to consider following its approach. As an incentive to ArchSD's contractors, a "Green Contractor Award" scheme will be implemented to promote environmental awareness and to acknowledge contractors that have demonstrated commitment in environmental management on site. In the department's assessment of technical submissions for tender prequalification or "design & build" tenders, credits will be given to the contractors who have demonstrated efforts in supporting environmental improvements in project design and/or construction.

According to the department's observation, the number of companies getting ISO 14001 is gradually increasing. It is apparent that the ISO 14001 environmental management system will become more common in the local construction market.

