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“Nous n’héritons pas de la terre de nos parents, nous l’empruntons à nos enfants”.

“We don’t inherit the land of our parents, we borrow it from our children”.
Antoine de Saint Exupery (1900-1944)

“To speak of sustainability in architecture means conceiving constructions for the future, not only in terms of the physical durability of the building, but also the durability of the planet and energy resources.”

(Source: Ecological Architecture, Bioclimatic Trends and Landscape Architecture in the Year 2001)

7. Conclusion

In the very near future, new regulations in Hong Kong and all over the world will (or already has in certain countries) consider the problem of C&D waste generation and its disposal. Therefore the consideration of waste minimization will become a significant part of the issues and approaches in a project.

This guidebook presents design measures and concepts to reduce the generation of waste.

The concept of reuse, recycle and salvage materials and structures is one of the most important issues of the waste minimization concept. Priority must be given to reusing as it is a more environmentally friendly option in terms of energy consumption in processing compared to recycling. The concept is financially beneficial. In fact, new markets can be developed in Hong Kong where there are real potentials and opportunities to promote reuse and recycle due to the high-rise buildings. Also benefits are not only in waste minimization but also environmental impacts such as extending the lifespan of landfills, reduction of transportation and therefore reduced emissions of carbon dioxide and many other factors that affect our surrounding environment, and at a larger scale our planet. Benefits are made also in terms of total cost of the building project as materials from the existing site can be reused, recycled and salvaged, hence fewer natural resources are required.

This requires early planning and decisions, cooperation and communication. It also requires the consideration of appropriate demolition techniques such as selective demolition and careful handling of materials is essential to reuse them. Also demolition must be integrated in the design process to plan in advance and maximize the opportunities to reuse and recycle materials on site. It can be feasible as communication and material sourcing can be promoted through the Internet to find local supplies from other sites.

Reusing structures is another issue that the government tries to promote to conserve historical architectural heritage. Rehabilitation is very common in Europe where space is not a problem as in Hong Kong. Architects should consider more frequently to minimize the generation of demolition waste in Hong Kong. This should be considered as a priority before demolition.

Design can promote waste prevention by reducing waste before it is generated which is believed to be the best option and the cheapest. Designers play a key role in the waste minimization process and therefore can influence all parties involved in the building process. A change in the traditional design approaches and techniques must be considered to achieve a good reduction in waste. Capacity of fast adaptability in time is essential as the rate of development of new technologies and materials is increasing. Effort should be shown by all parties to adapt constantly their knowledge (through research, readings, internet, etc) and approach in architecture.

Team attitude to promote team work, and communication between all parties involved in the building process is essential to exchange knowledge and experience. The "charrette" design concept can be very helpful to avoid linear design processes.

Also a variety of knowledge is required for the designers and architects to promote waste minimization. In fact it is essential to consider further buildability when designing at the design stage to provide better and early detailing to enable proper planning of the construction stage, avoid errors and abortive works during construction.

Designing deconstruction is also a major issue in the waste minimization concept at the design stage. Designers and architects should acquire the knowledge of designing to assemble, disassemble and promote easy replacement of building components, and therefore facilitate and encourage reuse and recycle.

A very important issue in the design, which is mentioned in Chapter 4, is to optimize building life. By extending the lifespan of the building, waste stays away from the waste cycle for as long as possible. Hong Kong has a fast rate of construction and demolition, which generates C&D waste in enormous quantities and therefore should be reconsidered. The concept of optimizing building life can be achieved through design measures such as allowing flexibility, design for disassembly and much more (as mentioned in Chapter 4), and promote adaptive reuse of building function and structure.

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Also materials and construction method selection can definitely affect the generation of C&D waste, which are important considerations throughout the waste minimization process. Material selection follows the same concept as the design, such as durability, assembly and disassembly to allow reuse and recycle (detailed in chapter 5). Construction method selection to allow the use of low waste technologies can be carried out on-site as well as off-site, promoting the use of prefabrication in order to move on-site construction to off-site fabrication in factories.

It is essential that waste minimization should be considered at an early stage and by all parties involved in the building process. Waste reduction must be a constant process to allow better accomplishment of targets. The sooner it is considered the better it is. In fact, if waste is considered at an early stage before its generation, waste minimization is easier and less expensive to deal with than after its generation. Waste minimization must become a goal of the building process and targets must be set up by all parties.

To conclude, a vision of the future is very important for the building industry in Hong Kong. Designers and architects must design and build with consideration for the future and the impacts that may be caused to the environment. Buildings should be built for a better future and consider a wide angle of sustainable design.

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Therefore efforts must be done to change and improve the existing situation of waste.

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