Chapter 8

End Pages

8.1. Glossary

- **Authorized Person:** An architect who has passed a viva examination to be enrolled into the Government's Authorized Persons Register". Which is a professional licensing system that was introduced in the 1970s to share the government's administrative duties and site inspection roles in the control of private property development. (Professional Practice for Architects in Hong Kong).

- **Biodiversity**: Refers to the variety and variability among living organisms and the ecological complexes in which they occur. Diversity can be defined as the number of different items and their relative frequencies. For biological diversity, theses items are organized at many levels, ranging from complete ecosystems to the biochemical structures that are the molecular basis of heredity. Thus, the term encompasses different ecosystems, species, and genes. (EPA).

- **Buildability:** The design and detailing which recognize the problems of the assembly process in achieving the desired result safely and at minimal cost to the client. (Illingworth).

- **Building maintenance**: The actions of ensuring that a building remains in working condition by preserving it from deterioration, decline, or failure. (Dictionary of Architecture & Construction, Cyril M. Harrys, 2000).

- **Building rehabilitation**: The returning of a building to a useful state by repair, alteration and modifications. (Dictionary of Architecture & Construction, Cyril M. Harrys, 2000).

- **Building restoration**: The accurate re-establishment of the form and details of a building, its artifacts, and the site on which it is located, usually as it appeared at a particular time; may require the removal of later work which had been removed. (Dictionary of Architecture & Construction, Cyril M. Harrys, 2000).

- **Building system**: This includes design rules and a product system whose parts have compatible interfaces thus permitting the use of several alternative components and assemblies. The compatibility of the components and assemblies is assured by means of dimensional and tolerance system as of connections and joints.

- **By-product**: Material, other than the principal product, generated as a consequence of an industrial process or as a breakdown product in a living system. (EPA).

- **Climate change**: A regional change in temperature and weather patterns. Current science indicates a discernible link between climate change over the last century and human activity (especially the burning of fossil fuels).

- **Construction and Demolition (C&D) waste:** Mixture of surplus materials arising from any site clearance, excavation, construction, refurbishment, renovation, demolition and road works. Over 80% of C&D material are inert and are known as public fill. Public fill includes debris, rubble, earth and concrete which is suitable for land reclamation and site formation. When sorted properly, materials such as concrete and asphalt can be recycled for use in construction. The remaining non-inert substances in C&D materials are called C&D waste which includes bamboo, timber, vegetation, packaging waste and other organic materials. In contrast to public fill, C&D waste is not suitable for land reclamation and is disposed of to landfills. (EPD, 1998).

- **Contamination**: Introduction into water, air, and soil of microorganisms, chemicals, toxic substances, wastes, or wastewater in a concentration that makes the medium unfit for its next intended use. Also applies to the surfaces of objects, buildings, and various household and agricultural use products. (EPA).

- **Deconstruction:** A process similar to disassembly but with thought towards reusing the components. (BRE).

- **Design for disassembly:** Designing the whole object in such a way that it can easily be disassembled and recycled or reused once its useful life is over.

- **Dimensional coordination:** It is a system of arranging the dimensional framework of a building so that components can be used within a framework in a inter-related pattern of sizes. (D. Osbourn).

- **Disassembly:** A process of taking apart components without damaging them, but not necessarily to reuse them. (BRE).

- **Disposal**: Final placement or destruction of toxic, radioactive, or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous material from removal actions or accidental releases. Disposal may be accomplished through use of approved secure landfills, surface impoundments, land farming, deep-well injection, ocean dumping or incineration. (EPA).

- **Environmentally friendly**: Said of a process or a product that is not destructive to the environment. (Dictionary of Architecture & Construction, Cyril M. Harrys, 2000).

- **Environmental impact statement:** A detailed analysis of the profitable environmental consequences of proposed federal legislation, major federal actions, or large-scale construction making use of federal funds, likely to have significant effects on environmental quality; such as statement is required by the National Environmental Policy Act of 1969. (Dictionary of architecture & construction, Cyril M. Harrys, 2000).

- **Excavation waste (Building):** Waste arising as a result of construction, demolition and excavation work (including waste arising from improvement, repair or alteration to property).

- **Extension:** A wing or structure added to an existing building.

- **Fossil fuel**: A fuel, such as coal, oil, and natural gas, produced by the decomposition of ancient (fossilized) plants and animals.

- **Global warming**: Increase in the average temperature of the earth's surface. (See greenhouse effect).

- **Greenhouse effect**: The process that raises the temperature of air in the lower atmosphere due to heat trapped by greenhouse gases, such as carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, and ground level ozone.

- **Inert waste**: Waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be significant. (Taken from COM (97) 105 final, a proposal for a Council Directive on the landfill of waste).

- **In-situ**: In place.

- **Land formation:** Set of rocks and strata with common characteristic to form land.

- **Land reclamation:** The attempt to make land suitable for building. In Hong Kong, land reclamation is generally the extension of land over sea.

- **Landfill:** 1. Sanitary landfills are disposal sites for non-hazardous solid wastes spread in layers, compacted to the smallest practical volume, and covered by material applied at the end of each operating day.
  2. Secure chemical landfills are disposal sites for hazardous waste, selected and designed to minimize the chance of release of hazardous substance into the environment. (EPA).

- **Life cycle assessment**: The comprehensive examination of a product's environmental and economic aspects and potential impacts throughout its lifetime, including raw material extraction, transportation, manufacturing, use and disposal.

- **Life cycle cost**: The amortized annual cost of a product, including capital costs, installation costs, operating costs, and disposal costs discounted over the lifetime of a product.

- **Life cycle of a product:** All stages of a product's development from extraction of fuel for power to production, marketing, use and disposal.

- **Modular architecture:** Refers to the design of any system composed of separate components that can be connected together. The beauty of modular architecture is that you can replace or add any component (module) without affecting the rest of the system.

- **Open building concept**: The term "open building" describes a set of principles and techniques developed in the 1960s by John Habraken, a Dutch architect. It was developed in response to a lack of choice and costumer involvement in the 1960s mass housing schemes. The theory proposes that there are numbers of levels of activity within buildings processes which relate to different customers, requirements, and life cycles".

- **Oversizing:** To increase beyond the usual size, or the required size. Usually oversizing components occur to provide an extra margin of safety in the design.

- **Ozone**: 1. *Stratospheric ozone*: In the stratosphere (the atmosphere layer beginning 7 to 10 miles above the earth), ozone is a form of oxygen found naturally which provides a protective layer shielding the earth from ultraviolet radiation harmful effects on humans and the environment. 2. *Ground level ozone*: Ozone produced near the earth's surface through complex chemical reactions of nitrogen oxides, volatile organic compounds, and sunlight. Ground level ozone is the primary component of smog and is harmful to humans and the environment.

- **Ozone Depletion**: Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halous), which break down when they reach the stratosphere and then catalytically destroy ozone molecules. (EPA).

- **Packaging**: The assembly of one or more containers and any other components necessary to ensure minimum compliance with a program's storage and shipment packaging requirements. Also, the containers, etc., involved. (EPA).

- **Precycling**: Making purchasing decisions that will reduce waste such as buying goods with less packaging (e.g., goods in bulk or concentrated form), choosing products that will last longer, and avoiding single-use or disposable products. (http://www.ciwmb.ca.gov/WPW/Define.htm).

- **Products miles concept**: Consideration of the product weight, distance and means of transport. (Building materials which are imported from other countries involve energy use in transportation, disturbance over long distances if carried by road or air, and leave a trail of pollution across continents), (Brian Edwards, Green Building Pays).

- **Public fill:** Disposal area for inert portion of construction and demolition waste which is suitable for land formation and reclamation use.

- **Reclaimed material:** Material extracted from the waste stream of construction and other industries and used, either in its original form (reuse) or following processing (recycling).

- **Recycled material:** The material that is processed to produce a derived product.

- **Recycling:** Collecting and separating materials from waste and processing them to produce marketable products. (http://www.ciwmb.ca.gov/WPW/Define.htm) The process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.

- **Reuse:** Putting objects back into use so that they do not enter the waste stream. (http://www.ciwmb.ca.gov/WPW/Define.htm) is the recovery or reapplication of a package or product for uses similar or identical to its originally intended application, without manufacturing or preparation processes that significantly alter the original package or product.

- **Salvage:** The utilization of waste materials.

- **Selective demolition:** The organized treatment and/or removal of certain materials and components prior to the demolition of the main structure. Materials may be removed because of their own economic value, or because of failure to treat and/or remove them will contaminate or otherwise subtract value from the resultant demolition waste. (Final Report, Feb. 1999, Symonds Group Ltd).

- **Sustainable**: The condition of being able to meet the needs of present generations without compromising those needs for future generations. Achieving a balance among extraction and renewal and environmental inputs and outputs, as to cause no overall net environmental burden or deficit. To be truly sustainable, a human community must not decrease biodiversity, must not consume resources faster than they are renewed, must recycle and reuse virtually all materials, and must rely primarily on resources of its own region. (Sustainable Building Technical Manual, 1996).

- **Waste generation:** The weight or volume of materials and products that enter the waste stream before recycling, composting, land filling, or combustion takes place. Also can represent the amount of waste generated by a given source or category of sources. (EPA).

- **Waste minimization:** Any technique, process or activity which either avoids, eliminates or reduces waste at its source or allows reuse or recycling of the waste for benign purposes. (Crittenden and Kolaczkowski, 1992).

- **Waste prevention:** Any action undertaken by an individual or organization to eliminate or reduce the amount or toxicity of materials before they enter the municipal solid waste stream. This action is intended to conserve resources, promote efficiency, and reduce pollution. (http://www.ciwmb.ca.gov/WPW/Define.htm).

- **Waste reduction:** It has two components: reducing the amount of waste produced, and reducing the hazard of the waste produced.
  (EPA) using source reduction, recycling, or composting to prevent or reduce waste generation.

- **Waste stream:** The total flow of solid waste from homes, businesses, institutions, and manufacturing plants that is recycled, burned, or disposed of in landfills, or segments thereof such as the "residential waste stream" or the "recyclable waste stream". (EPA).

8.2. Acronyms

- **ASD** Architectural Services Department
- **ASTM** American Society for Testing and Materials
- **BD** Buildings Department
- **BEC** Business Environment Council
- **BRE** Building Research Establishment
- **BS** British Standards
- **C&D** Construction and Demolition
- **CET** Center of Environmental Technology
- **CIOB** The Chartered Institute of Building
- **CIRIA** Construction Industry Research and Information Association
- **CIWMB** California Integrated Waste Management Board
- **DDC** Department of Design and Construction
- **DETR** Department of the Environment, Transport and the Regions
- **EEA** European Environment Agency
- **EPA** United States Environmental Protection Agency
- **EPD** Environmental Protection Department
- **ETC/W** Environmental Topic Center on Waste
- **HK-BEAM** Hong Kong Building Environmental Assessment Method
- **HKIA** Hong Kong Institute of Architects
- **HKSAR** Hong Kong Special Administrative Region
- **HMSO** Her Majesty's Stationery Office
- **ILCD** Integrated Life-Cycle Design
- **ISO** International Organization for Standardization
- **LCA** Life Cycle Analysis
- **LEED** Leadership in Energy and Environmental Design
- **NAHB** National Association of Home Builders
- **OECD** The organization for Economic Cooperation and Development
- **PFA** Pulverized Fuel Ash
- **PNAP** Practice Notes for Authorized Persons
- **PNRC** Practice Notes for Registered Contractors
- **RIBA** Royal Institute of British Architects
- **RILEM** Réunion Internationale des Laboratoires d'Essais et de Recherches sur les Matériaux et les Contructions, The International Union of Testing and Research Laboratories for Materials and Structures.
- **SP** Special Publication
- **USGBC** United States Green Building Council
- **WB** Works Bureau
- **WRC** Waste Reduction Committee
- **WRFP** Waste Reduction Framework Plan

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http://www.info.gov.hk/bd
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http://www.BREbookshop.com
- **BS, British Standards**
http://www.bsi.org.uk
- **CIOB, The Chartered Institute of Building**
http://www.ciob.org.uk
- **CIRIA, Construction Industry Research and Information Association**
http://www.ciria.org.uk
- **CIWMB, California Integrated Waste Management Board**
http://www.ciwmb.ca.gov
- **DDC, The New York City Department of Design and Construction**
http://www.ci.nyc.ny.us
- **DETR, Department of the Environment, Transport and the Regions**
http://www.detr.gov.uk
- **EBN, Environmental Building News**
http://www.buildinggreen.com
- **EEA, European Environment Agency**
http://www.eea.eu.int
- **EPA, Environmental Protection Agency**
http://www.epa.gov
- **EPD, Environmental Protection Department**
http://www.info.gov.hk/epd/
- **ETC/W, Environmental Topic Center on Waste**
http://www.etc-waste.int/
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http://www.hkia.org
- **Integer Hong Kong, Intelligent & Green**
http://www.integer.com.hk
- **King County Solid Waste Division, Seattle**
http://www.metrokc.gov
- **Low Waste Building Technologies**
http://www.cse.polyu.edu.hk/~cecspoon/lwbt
- **NAHB, National Association of Home Builders**
http://www.nahb.com
- **OECD, Organization for Economic Cooperation and Development**
http://www.oecd.org
- **RIBA, Royal Institute of British Architects**
http://www.riba.org
- **RILEM, Réunion Internationale des Laboratoires d'Essais et de Recherches sur les matériaux et les Contructions, The International Union of Testing and Research Laboratories for Materials and Structures.**
http://www.rilem.org
- **USGBC, US Green Building Council**
http://www.usgbc.org
- **Works Bureau of the HKSAR**
http://www.wb.gov.hk
- **WRC, Waste Reduction Committee**
http://www.info.gov.hk/wrc
- **WRTF, Waste Reduction Task Force for the Construction Industry**
http://www.info.gov.hk/epd/waste/cdm

For other references on Green Design and sustainable architecture:
http://www.lib.berkeley.edu/ENVI/GreenAll.html
For any research on the Internet:
http://www.google.com

8.4. Appendices

Sensitive Construction Techniques

Sensitive Construction Techniques

- Avoid compacting soil around vegetation
- Restrict the impact area (area of land affected by driveways, parking lots, buildings, etc.) for the lot
- Restrict the overall building size as well
- Specify the protection of trees, topsoil, etc.
- Try to avoid altering the topography of the ground, instead use terraces to maintain the original grade
- Do not remove old stumps unless absolutely necessary
- Consider native ground cover
- Using a narrow staging area would increase building costs but decrease landscaping costs
- Introduce penalties for damaging existing vegetation on site
- Install contaminant "sinks" (such as carpets, ceiling tiles, furniture, etc.) after VOC's have had time to release: i.e. it is a good idea to air these items out wherever possible
- Block ventilation ducts from dust and compounds during the construction process so they don't reside there during use
- Reduce the need for on-site storage with just in time (JIT) delivery of construction materials and equipment
- Ensure that wastes are properly separated on-site - while aiming to reduce waste generated
- Use obvious mechanical fasteners for future disassembly or renovation
- Run HVAC to flush toxins out of building before occupancy
- It is important that design professionals educate contractors on green building materials and systems that may be relatively unknown to them
- Specific regulations should be followed regarding detection and abatement of hazardous materials on-site
- Protect natural resources wherever possible
- Identify organic debris that is free of disease and chemical contaminants, that are suitable to be recycled on-site
- Where vegetation must be removed for construction, coordinate to avoid loss of top soil and the contamination of nearby waterways
- Protect trees from damage during construction by fencing off the "drip line"
- Avoid the construction of private docks and other waterfront development to help protect the marine ecosystem

Recycling Construction Waste

- Virtually all materials generated on a construction site can be recycled, subject to local opportunities. Wastes must be kept clean and separated to ensure opportunities for reuse or recycling
- Prior to construction, planning must be done
- Cardboard packaging can be broken down and recycled
- Top soil can be saved and reused on site for landscaping or sold to nurseries
- Metals can be recycled
- Carpeting can be recycled
- Offering scrap material to the workers, that would have otherwise gone to a landfill, is an effective method of recycling
- Paper from trailers and offices can be easily recycled into a fine paper bin
- The use of glass mugs and metal teaspoons reduces the amount of waste produced by the workers
- It has been suggested that materials be separated according to:
    1. Timber
    2. Metals
    3. Masonry
    4. Plastics
    5. Plaster
- Wood can easily be recycled and used for various crafts, stakes for gardening, pieces for dog houses, doll houses, and the list goes on
- A little consideration during the construction phase will produce more "reusables"
- Briefly train workers prior to the job about waste minimization goals
- Centralize cutting operations to reduce waste and simplify the sorting process
- Set up clearly marked bins or trashcans for different types of usable waste: i.e. wood for wood chips in flower beds, sawdust for compost, etc.

Waste Management Action Plan

The Canada Mortgage and Housing Corporation developed the following action plan for the residential housing industry, but it can easily be adopted and modified for larger projects.

1. Designate a person responsible for waste management
   - Oversee that the waste management system is running efficiently
   - Ensure that contamination is not occurring
   - Ensure that the appropriate people are cleaning up their wastes
   - Coordinate the storage of materials on site so that theft and damage do not occur

2. Examine design details of building to ensure efficient use of materials
   - Favour designs using standard sizes
   - Favour the use of materials which are made from recycled materials and are recyclable
   - Favour durable materials which are energy saving
   - Reuse materials from renovation or demolition sites
   - Look for opportunities to reuse materials on site

3. Evaluate materials ordering and storage procedures on site
   - Identify how materials are wasted on site
   - Investigate storage methods in terms of preventing damage from careless handling or weather

4. Evaluate site layout
   - Analyze where new, reusable and waste materials can be stored on site
   - The size and location of the site will significantly impact how wastes can be managed – are regular pick-ups required?

5. Estimate waste production on site
   - Estimate the types and amounts of recyclable and non-recyclable wastes which are expected to be generated

6. Investigate waste disposal options
   - Identify local landfill bans and regulations
   - Identify local waste recycling companies

7. Investigate waste separation, storage, and transportation systems

Approaches	Pros and Cons
Bins or piles for separated wastes	Costlier to sort, but you benefit from lower tipping fees. Separated loads must be transported by a waste hauler or company truck to recycling depots.
Mixed bins sorted off site	Materials are recycled, but there is generally minimal or no cost saving on disposal fee because of the sorting required off site.
Removal of waste by subcontractors	Subcontractors usually generate a specific type of waste. If waste is cleaned up and separated as it is generated, recycling should be easy. Enforcing subcontractors to clean up can be a problem. A clause should be written into the contract before work begins.
Clean up and removal of waste by a specialized waste hauler	Some specialized waste haulers will clean up and sort wastes from around a site. This saves the time of on site workers from sorting the wastes. Contamination is also minimized since the hauler has direct control over what is loaded onto the truck.

8. Develop a system of worker incentives
   - Throw a party with the money recovered from selling recyclable materials
   - Reward workers who come up with environmentally friendly ideas
   - Institute a system of warnings and penalties for non-compliance
   - Back charge any trades who fail to comply with contract requirements to clean up or manage waste
   - Suggest to contractors that you may only deal with workers who manage their waste in environmentally sound ways

9. Choose a strategy for each stage of construction
   a) Landclearing
      - Minimize disruption to existing vegetation and soils
      - Limit the use of heavy machinery which damage soils and vegetation
      - Excavated soils and tress can be used for final landscaping
   b) Excavation
      - Limit the amount of excavation-need to limit the soil disturbance
      - Excavated materials can be used as backfill or landscaping
   c) Foundation work
      - Specify reusable forms
   d) Framing
      - Design using standard sizes to reduce cutting waste
      - Use prefabricated wall, roof, and floor systems
      - Use timber which has been recovered from demolished buildings
      - Send waste wood to recycling facility to make chips for pulp, composite wood products, etc.
   e) Metalwork HVAC/wiring
      - Use second hand materials (e.g. Used circuit breaker boxes from used building material supply stores)
      - Send scrap metals to be remelted
   f) Plumbing
      - Reuse fixtures from old buildings
   g) Insulation
      - Use prefabricated wall systems with insulation already included
      - Use blown in cellulose in walls
      - Use scrap insulation to insulate the attic or for sound proofing interior walls
   h) Drywall
      - Design using standard sizes
      - Send scrap materials to a recycling depot
   i) Paint
      - Use leftover paint as undercoating at next job
      - Send excess paints and solvents to a recycling plant
   j) Exterior finishing
      - Cut and measure carefully
      - Store materials carefully to avoid damage
      - Salvage bricks and blocks from demolition projects
      - Broken bricks and blocks can be used as backfill in some situations
      - Send vinyl and aluminum siding to recycling facilities
   k) Roofing
      - Send asphalt shingles to a local recycling facility (if one exists)
   l) Demolition
      - Favour renovation over demolition where appropriate
      - Strip home of fixtures, hardwoods, large dimensional timbers, and anything else with resale value
10. Count your money and time and build on your successes
    - Records of time and costs should be evaluated against previous practices
    - Will help identify areas that need improvement

Tropical Hardwood Timber

Concern is mounting that unless action is taken soon, the world's tropical rainforests will be destroyed. The finger has been pointed at Hong Kong as a major user of timber from the rainforests.

2. It is claimed that Hong Kong is one of the top ten importers of tropical timber and most of that timber is used by the construction industry. To make things worse it is further claimed that a large proportion of this timber is used so wastefully that after minimal use it is discarded as construction waste and ends up in landfill sites.

3. Clearly Hong Kong has a large part to play in saving the world's rainforests. However, this does mean that we must be prepared to accept changes to many of the traditional methods of construction that we are used to in Hong Kong.

4. Government is taking a lead with these changes and is encouraging contractors to seek alternatives to hardwood.

5. The Buildings Ordinance Office is looking at its requirements with a view to changing procedures and requirements which directly, or indirectly encourage the use of hardwood timber. An exercise is underway to make the necessary amendments to legislation and Practice Notes in this respect. However, whilst this is proceeding you are encouraged to actively seek methods to reduce the amount of tropical hardwood timber used in your building projects.

Hoardings

6. A large quantity of tropical timber is consumed for use as hoardings and you are therefore encouraged to consider using other materials for this purpose. Steel is an obvious alternative, and although possibly more expensive initially, it can be reused many times. The Architectural Services Department and the Housing Department have already started to require hoardings to be constructed of steel on their sites. You are encouraged to follow their example.

Covered Walkways

7. Please consider whether it is necessary to provide a covered walkway, because it is not an essential precautionary measure on every site, particularly when buildings are set back from the site boundary.

cont'd/.....

Temporary Formwork

8. Formwork is by far the largest single consumer of tropical timber on construction sites and therefore an obvious area where substantial savings can be made. There are many alternatives to the traditional temporary formwork construction. Before commencing your next building project using traditional reinforced concrete construction, why not consider other alternatives such as :

(a) profiled steel sheeting as a permanent formwork to support the wet concrete and as a reinforcement in the hardened concrete;

(b) precast concrete units rather than placing concrete insitu;

(c) structural steel rather than reinforced concrete for the building framework;

(d) steel formwork instead of timber formwork; and

(e) replace timber props with proprietary steel props to support formwork.

9. Many other alternatives are available which you may also wish to investigate.

Internal Finishes

10. Tropical hardwood is also widely used for internal finishes and again alternatives are available. For example non load bearing built-in wall panels are often framed in hardwood timber, whereas there are many non timber framed proprietary wall panel systems available on the market.

11. Similarly there are also many alternatives to hardwood timber for doors, door frames, skirtings and architraves, especially as often these fittings are painted anyway.

Reuse of Timber

12. Apart from reducing the use of hardwood timber there is also a need to reduce as much as possible the wastage of any hardwood timber which is used on site. To achieve this, contract specifications could be written so that all hardwood timber waste is separated and reused wherever possible, rather than being dumped with other site rubbish.

Renewable Sources

13. Where no alternative to the use of hardwood timber can be found, the contract specification could be written to require hardwood timber to be obtained from renewable sources.

cont'd/....

Long Term Solutions

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14. These moves are intended to engender a wider awareness of the problem and to achieve some significant reduction in use of hardwood timber. However, long term changes in the methods of construction of buildings will need to be brought about, and in this respect BOO will now be consulting widely with the building industry, before finalizing how these changes should be made.

(Darwin Chen)
Building Authority

Ref. : BLD(B) GR/ENV/18

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Index under : Rainforest Timber
Tropical Hardwood Timber

Construction and Demolition Waste

Introduction

The landfills used for disposal of solid waste are being filled up at an alarming rate. Of particular concern is the increasing amount of construction and demolition (C&D) materials being dumped at the landfills. More than one quarter of the total solid waste disposed of in landfills is generated from building construction. Careful consideration given to waste generation and management at the planning stage of a building development will lead to less waste later on for disposal at landfills.

Waste Minimization

2. Waste prevention not only reduces the need for landfill space, but also conserves natural resources and reduces pollution. Opportunities to prevent waste can be identified during both the project planning and design stage as well as construction stage. Measures may include :

Planning and Design

i) Precast and prefabrication including modular design, precast façade, precast staircase, precast slab, prefabricated external elements, precast bridge-decks or footbridges, precast blocks for pavement paving, prefabricated kitchen or bathroom accessories, proprietary doorset and partition wall;
ii) Sprayed plaster;
iii) Balancing cut and fill;
iv) Use of pulverised fuel ash in concrete for substructure, superstructure and streetwork;
v) Combine services trenches to reduce excavation;
vi) Purchasers' choice for finishes and fittings;
vii) Minimised use of timber from non-sustainable sources; and
viii) System formwork.

Construction and Site Management

i) Waste Management Plan;
ii) Non-timber hoarding;
iii) Metal formwork and metal falsework;
iv) On-site sorting of C&D materials;
v) On-site water conservation;
vi) Recycling of concrete for use as fill or hardcore;

/vii) .. ..

vii) Recycling of aggregate for concrete for non-structural work;
viii) Identification of available recycling facilities for waste materials generated; and
ix) Installation of underground mechanical spray wheel wash.

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Waste Management Plan

3. As a Waste Management Plan (the Plan) is a useful tool in ensuring that measures are taken during the construction stage to reduce C&D materials, it is recommended that you advise your client to require the contractor to submit such a plan to you for agreement. The following are the areas that may be covered in the Plan :

i) the types of waste and their estimated quantities;
ii) the timing of waste arising;
iii) measures for reducing waste generation;
iv) on-site waste separation;
v) on-site and off-site material reuse;
vi) areas for waste storage;
vii) quantities of waste requiring off-site disposal;
viii) disposal outlets;
ix) monitoring and auditing programme;
x) organisation structure for waste management;
xi) a list of materials to be reused or recycled with estimated quantities;
xii) implementation of the trip ticket system (see paragraph 5 below for reference);
xiii) method of processing, storing and disposal of hazardous waste; and
xiv) method of dealing with packaging material.

4. For projects that produce more than 300,000 cu.m. of construction and demolition material, the Director of Environmental Protection has indicated that he is prepared to offer advice to you prior to your acceptance of the Plan. The Public Fill Committee of Civil Engineering Department is also prepared to offer advice to AP & RSE on the management and beneficial reuse of C&D material.

Trip Ticket System

5. The problem of illegal dumping has attracted adverse publicity and most illegally dumped materials are generated from construction activities. For more effective control, the Works Bureau has established a Trip-ticket System in public works contracts for the proper disposal of construction and demolition (C&D) material at public filling facilities or landfills. This policy is promulgated under the Works Bureau Technical Circular (WBTC) No.5/99, which is effective on 1 July 1999. The policy is that all public fill (being the inert portion of C&D material) shall be disposed of at designated public filling facilities managed by Civil Engineering Department (CED), and all C&D waste (being the non-inert portion of C&D material) shall be disposed of at designated landfills managed by Environmental Protection Department (EPD). A brief description of the Trip-ticket System is described in Appendix A.

/6. .. ..

6. The system has been adopted by the Housing Authority and the Works Departments. The same system could be applied to the disposal of C&D material in private sector projects. The project administrators for private developments could apply, through CED and EPD, for designated public filling facilities and landfills for the disposal of the public fill and C&D waste respectively. The Building Authority strongly recommends that the system be implemented in private sites for better control of the C&D material disposal.

7. For details of the WBTC No.5/99, please go to the web site of Works Bureau @ http://www.wb.gov.hk. For details on the disposal of public fill, please refer to the web site of CED @ http://www.info.gov.hk/ced and the notes at Annex I of Appendix A.

(C M LEUNG)
Building Authority

Ref : BD GP/BREG/RC/3

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Index under : Construction waste
Demolition waste
Trip-ticket system
Waste management plan

Appendix A
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Trip Ticket System

(i) At the planning stage of a contract, the project officer seeks confirmation from CED (Public Fill Committee) whether public filling facilities are available for disposal of the public fill, and from EPD (Facilities Management Group) whether landfills are available for disposal of the C&D waste.

(ii) The project officer shall provide the following information to CED and EPD in the application for designated disposal outlets:

(a) Contract number and title;
(b) Site location;
(c) Anticipated quantities of disposal;
(d) Programme for disposal;
(e) Recommended disposal arrangement in Environmental Impact Assessment/Contamination Assessment Report, if any;
(f) Test results identifying the type and level of contaminants present, if any;
(g) Types of the public fill and/or C&D waste;
(h) Contact details of the project officer.

(iii) CED and EPD will designate the public filling facilities and landfills respectively for the project and advise the project officer the acceptance criteria of the respective facilities. As a general policy to conserve the limited landfill void space, public fill (such as soil, rock, concrete, bricks, bituminous materials etc.) should be delivered to public filling facilities instead of to landfills (see Annex I regarding disposal of public fill).

(iv) The project officer then specifies the names of the facilities and acceptance criteria in the tender documents.

(v) A trip ticket (i.e. a Disposal Delivery Form) is required for each truckload delivered to the public filling facilities and landfills. (Sample of the Form is shown in Annex II and also available in the WBTC No.5/99).

(vi) Upon commencement of construction, the Contractor shall carry the trip ticket (Disposal Delivery Form) issued by the project officer for every vehicular trip transporting the public fill and C&D waste to the designated public filling facilities and landfills respectively.

(vii) For each vehicular trip on arrival at the disposal facility, the Contractor shall present the Form at the entrance gate, proceed with the disposal operation and then obtain a receipt from the operator of the public filling facility or landfill at the exit gate. The Contractor is required to submit the original receipt to the Engineer's/Architect's Representative of the project office. The project office then approaches CED or EPD for a monthly report of the relevant transaction records and carries out the reconciliation for compliance checking.

Annex I of Appendix A
PNAP 243

Disposal of Public Fill

(a) For each truckload delivered to the public filling facilities a trip ticket (i.e. a Disposal Delivery Form) is required. Please see Annex II.

(b) The dump trucks should also have valid Dumping Licences issued by CED. Dump trucks without Dumping Licences will be rejected.

(c) Application form for Dumping Licence and the associated conditions as stipulated in the Dumping Licence can be collected from the Port Works Division, 5/F., Civil Engineering Building, 101 Princess Margaret Road, Homantin, Kowloon or downloaded from CED's web site at http://www.info.gov.hk/ced/. A sample is at Annex III.

(d) The inert construction and demolition (C&D) materials to be delivered to the public filling facilities should be in accordance with the conditions as stipulated in the Dumping Licence (copy attached).

(e) The normal opening hours of the public filling facilities will be from 8:30 a.m. to 12:00 noon and then from 1:00 p.m. to 6:00 p.m.

(f) All public filling facilities are open to the public free of charge for land delivery of inert construction and demolition material by vehicles.

Annex II of Appendix A
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Construction and Demolition Material Disposal Delivery Form

Department : _____ Contract No. : _____

Contractor : _____

Contract Title : _____

Location of Site : _____

Location of Public Filling Facility/Landfill * : _____

_____

Vehicle Registration No. : _____ Date : _____

Approximate Load : Full / three quarter / half / one quarter *

Remark : _____

_____

_____

_____

_____

_____

Time of Departure : _____ _____

Authorised Chop of
Engineer's Representative/
Architect's Representative *

** Delete whichever inappropriate*

Annex III
PNAP 243

傾卸泥土執照申請表格(每輛運配車須領一張執照)
APPLICATION FOR DUMPING LICENCE (ONE LICENCE FOR EACH VEHICLE)

(申請人必須是車輛的登記車主。如車登記車主爲公司名義，本表格須由該公司所指定及授權的人士填寫及簽署，並須將全名寫在其簽署下面。)
(**The applicant should be the registered owner of the vehicle.** In the case of the registered owner being a Company, this form should be completed and signed by a person nominated and authorised by the Company. He should also put down his name in full under his signature.)

供_____年使用
FOR YEAR _____

1. 車輛的登記車主現時的個人資料PRESENT PARTICULARS OF REGISTERED OWNER OF THE VEHICLE

(i) 中文姓名:
Name in Chinese: _____

(ii) 英文姓名:
Name in English: _____

(iii) 地址 (中文):
Address in Chinese: _____

(iv) 地址 (英文):
Address in English: _____

(v) 車輛登記(車牌)號碼:
Vehicle Registration No.: _____

(vi) 日間聯絡電話號碼:
Daytime Telephone No.: _____

2. 申 請APPLICATION

(i) *☐ 本人現爲上述車輛申請一張上述年度的傾卸泥土執照。
I hereby apply for a Dumping Licence for the above listed vehicle for the above-mentioned year.

*☐ 本人現爲上述車輛申請一張額外的上述執照複本，申請的理由是：
I hereby apply for a Duplicate Dumping Licence for the above listed vehicle and the reason is.

*☐ 本人的傾卸泥土執照已遺失。(請提交有關證明文件，例如向警方報失的紀錄。)
My Dumping Licence was lost. (Please submit the relevant proof document, such as record of loss report to the police.)

*☐ 本人的傾卸泥土執照已損毀，現在交還。
My Dumping Licence was damaged and returned herewith.

*☐ 其他，請說明：
Other, please specify: _____

3. 聲 明DECLARATION

(i) 本人現聲明，據本人所知，以上所填報的資料均屬真確及並無遺漏。
I declare that to the best of my knowledge and belief the information given above is true, correct and complete.

(ii) 本人證明附上的車輛登記文件副本，爲原來文件的真本，該文件在本申請表格遞交當日仍然有效。
I certify that the enclosed copy of the Vehicle Registration Document is a true copy of the original document which is still valid on the date of this application.

(iii) 本人願意遵守傾卸泥土執照所規定的各項條件(見背頁)。
I will abide by all the conditions as stipulated in the Dumping Licence (see the back page).

申請人簽署(及公司蓋印如適用者):
Signature of Applicant (and Company Chop if applicable): _____
簽署人全名:
Name of Signee in full: _____
日期:
Date: _____

* *請在適當的格內加上「✓」號*
* *Please tick the appropriate box*

註: 填妥的申請表格，連同有申請人簽署的有效車輛登記文件副本，交回九龍公主道 號 號土木工程署大樓五樓，土木工程署路政工程部。

Note: The completed application together with a copy of the valid Vehicle Registration Document of the vehicle (duly signed by the applicant) should be returned to Port Works Division, Civil Engineering Department at 5/F, Civil Engineering Building, 101 Princess Margaret Road, Kowloon.

此欄新供部門人員填寫 *For Official Use only*

收件日期
Date received _____

執照號碼
Licence No. _____

寄出日期
Date Dispatched _____

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傾卸泥土執照所規定的各項條件

The conditions as stipulated in the Dumping Licence

1. 本執照不得轉讓別人持用。
   This licence is not transferable.

2. 執照須由執照持有人/泥頭車司機隨車攜帶，並須應填土督導員要求出示執照。
   The licence must be carried by the licensee/lorry driver and produced on demand to the Filling Supervisor.

3. 執照會連同標貼一起發出，該標貼必須貼在車輛擋風玻璃的當眼處。
   The licence is issued together with a windscreen label which must be prominently displayed on the vehicle.

4. 香港特別行政區政府對執照持有人或其僱員或車輛在公眾填土設施遇到任何意外，不須負責。在公眾填土設施內進行傾倒泥土時，執照持有人應確保採取所有安全預防措施。
   The licence is issued on the express understanding that the Government of the Hong Kong Special Administrative Region accepts no responsibility for any accidents which may befall the licensee or the staff or vehicles employed by the licensee at public filling facilities. The licensee shall ensure that every safety precaution is taken when operating at public filling facilities.

5. 執照持有人須對在本執照規定下，因進行傾倒泥土而引致的損壞負責，並須支付有關的任何修理費用。
   The licensee will be responsible for the cost of any repairs necessary as a result of damage caused by public filling under this licence.

6. 執照持有人可在報章刊登及在公眾填土設施張貼的開放日期及時間，進入公眾填土設施傾倒泥土。
   Public filling may be carried out on the days and between the hours as advertised in the press and posted at individual public filling facility.

7. 本執照准許傾倒下列物料於公眾填土設施內：
   The following materials may be disposed of at public filling facilities under this licence:

   (a) 泥土；
   earth;

   (b) 建築碎料；及
   building debris; and

   (c) 碎石和混凝土。
   broken rock and concrete.

   上述物料不得含有海泥、家居垃圾、膠料、金屬、工業及化學廢料、動植物以及填土督導員認為不適宜棄置於公眾填土設施的其他物料。但可准許混雜少量木料於可接受的物料內。
   The materials shall be free from marine mud, household refuse, plastic, metal, industrial and chemical waste, animal and vegetable matter, and other material considered unsuitable by the Filling Supervisor. Small quantities of timber mixed with otherwise suitable material will be permitted.

8. 物料的傾卸，須按填土督導員所指示的地點及方法進行。
   The materials shall be unloaded at the location and in the manner instructed by the Filling Supervisor.

9. 執照持有人/泥頭車司機須應填土督導員的要求，報告有關物料的來源。
   The licensee/lorry driver shall report the source of material when requested by the Filling Supervisor.

10. 執照持有人/泥頭車司機須確保他的泥頭車在離開公眾填土設施前，在該設施內所提供的車輪清洗設施清洗乾淨。
    The licensee/lorry driver shall ensure that his/her lorry is cleaned at the wheel washing facilities provided at the public filling facility before leaving the public filling facility.

11. 執照持有人/泥頭車司機須防止泥頭車上的物料跌落公路路面上。
    Care shall be taken to prevent any material being dropped from lorries onto public roads.

12. 如違反上述條件，當局可將執照撤銷而毋須作出通知，並可能會採取法律行動。
    Non-compliance with these conditions will entail withdrawal of the licence without notice and may result in legal action being taken.

13. 當局保留權利，可隨時將執照在有效期屆滿前予以取消及/或關閉任何公眾填土設施而毋須事先通知，亦毋須另設替代的公眾填土設施。
    The right is reserved to cancel this licence at any time before the date of expiry and/or to close any public filling facility without prior notice and without provision of an alternative public filling facility.

14. 任何執照持有人/泥頭車司機在法庭上被裁定違法傾卸物料，當局會將其執照撤銷。
    Any licensee/lorry driver who is convicted in court for illegal dumping will entail withdrawal of the licence.

15. 執照持有人/泥頭車司機須確保其泥頭車上運載的物料，以合適的防水布(帆布)妥善覆蓋。
    The licensee/lorry driver shall ensure that the material being carried by his/her lorry is well covered with suitable impervious sheeting such as tarpaulin.

16. 執照持有人/泥頭車司機不得超過車輛許可總重量裝載。
    The licensee/lorry driver shall not load his/her lorry exceeding the permitted gross vehicle weight.

Waste Minimization
Provision of Fitments and Fittings in New Buildings

It has been suggested, arising from reports of sanitary fitments and other fixtures/fittings in new buildings being discarded upon occupation, that requirements for the provision of such fitments and fittings prior to completion of new buildings should not be insisted upon to reduce waste.

2. A working group (WG) comprising government officials and representatives of the building industry has studied the issue. A survey has indicated that the problem of carting away of sanitary fitments/fittings required under the building regulations in newly completed private buildings is not significant. The WG has also identified the following concerns if the requisite fitments/fittings are not provided at the time of completion of a new building :

(a) construction waste generated from fitting out works carried out by individual contractors while a new building is under occupation;

(b) chaotic condition arising from individual owners engaging their own contractor for the fitting out works; and

(c) the practicality of testing plumbing and drainage system without fitments for compliance with regulation.

3. The WG is of the view that the basic sanitary fitments required under the building regulations should be installed prior to the issue of an occupation permit. The WG, however, has also recommended that modification of the relevant building regulation be considered to permit certain sanitary fitments be not installed at the time of issuing an occupation permit on merits of individual case. The Building Authority has accepted the recommendation and will favourably consider giving a modification of Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations in the following circumstances :

(a) premises such as restaurants and hotels for which extensive renovation and fitting out of the required sanitary fitting by a restaurant or hotel operator will only be carried out after the issue of the occupation permit and in the process any sanitary fitting installed prior to the issue of an occupation permit would be dismantled in the course of such renovation work;

(b) a developer has offered to provide fittings to individual purchaser's choices.

/4.....

4. AP wishing to take advantage of the circumstances set out in para 3 should provide details on the extent of the sanitary fitments and fittings to be installed after the issue of the occupation permit in the application for modification together with an undertaking to the effect that :-

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(a) the outstanding fitments and fittings will be installed prior to the actual occupation of the relevant part of the premises;

(b) the outstanding fitments and fittings will be installed in accordance with the provisions of the Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations and the requirements of the Water Authority;

(c) the outstanding fitments and fittings will be installed under his supervision by the registered general building contractor who will employ a licenced plumber for the carrying out of the plumbing works; and

(d) Water Authority will be notified via the submission of standard form WW046 available in the office of Water Authority for the installation of the outstanding plumbing fittings.

5. The survey also shows that some doors, floor finishes and partitions are taken out and are replaced by owners of new flats. You may therefore wish to offer more choices of colour schemes, door types and floor finish patterns for potential purchasers of buildings.

(C M LEUNG)
Building Authority

Ref. : BD GP/BREG/RC/2
BD GP/BREG/SF/1 (II)

First issued July 2000
This revision December 2000 (AD/NB1) (para 4 amended)

Index under : Sanitary Fitments
Fittings and Fixtures

Submission of Schedule of Building Materials and Products

Under the Buildings Ordinance, the authorized person (AP), registered structural engineer (RSE) and registered contractor (RC) have responsibilities to supervise building works including the selection and application of building materials and to certify compliance with relevant provisions of the Buildings Ordinance upon completion of works. To expedite the processing of an application for occupation permit, the Building Authority requires the submission of a schedule under Building (Administration) Regulation 44, confirming the use of accepted building materials and products in construction.

2. The schedule should be submitted with an application for occupation permit. The AP should confirm and certify in the schedule the application and performance of building materials and products in compliance with the relevant provisions of the Buildings Ordinance and Regulations; the RC should confirm the use of those building materials and products in construction. Except for regularly used building materials, the schedule should cover all materials and products not specified on the approved plans, the application of which would involve the structural integrity and fire safety of the building. A sample schedule is provided at Appendix A.

3. When appropriate, a schedule should also be submitted on completion of alteration and addition works.

(Helen C P Lai YU)
Building Authority

Ref. : BD GP/BORD/10

First issued December 1994 (AD/D)

Index under : Schedule of Building Materials and Products
Submission of Schedule of Building Materials and Products

PNRC 25
Appendix A

Certificate of Accepted Building Materials and Products

BD Ref. : _____ Date : _____

Re : _____
(Address of development site)

To Building Authority,

I confirm that accepted building materials and products have been specified in the above building construction. Pursuant to Building (Administration) Regulation 44, I duly endorse the attached Schedule of Building Materials and Products (Annex A. 1 & A. 2).

I hereby certify that the building materials and products listed in the attached Schedule are acceptable products under relevant building regulations and that I am satisfied with the application and performance of these products.

_____
Signature of Authorized Person

I hereby confirm that the accepted building materials and products listed in the attached Schedule have been used and properly applied in the above building construction.

_____
Signature of Registered Contractor

Annex A. 1

Schedule of Building Materials and Products

Re : _____

(Address of development site)

(A) Fire Resisting Products

Building Product	Proprietary Name	Fire Resisting Performance	Compliance with relevant Building Regulations & Codes of Practice	Relevant test reports or assessment reports	Remarks/ Comments
a) Fire resisting doorset					
b) Fire resisting glazing					
c) Fire-stop in curtain wall					
d) Others (ie proprietary products, fire shutter, sealing system etc)					

_____

Signature of Authorized Person

Annex A. 2

Schedule of Building Materials and Products (cont'd)

(B) Other Building Materials and Products

Building Product	Proprietary Name	Compliance with relevant Building Regulations & Codes of Practice	Relevant test reports, assessment reports or supporting documents	Remarks/Comments
a) Glazing barrier				
b) Others				

I confirm that the above mentioned building products have been tested or assessed as stated and hereby certify that the application and performance of these products comply with the relevant Building Regulations.

_____

Signature of Authorized Person

_____

Date

Buildings Department **Lands Department** **Planning Department**

Joint Practice Note No. 1

Green and Innovative Buildings

Introduction

To protect and improve the built and natural environment, the Buildings Department (BD), the Lands Department (LandsD) and the Planning Department (PlanD) promote the construction of green and innovative buildings. The objective is to encourage the design and construction of buildings that encompass the following features:

(a) Adopting a holistic life cycle approach to planning, design, construction and maintenance;

(b) Maximizing the use of natural renewable resources and recycled/green building material;

(c) Minimizing the consumption of energy, in particular those non-renewable types; and

(d) Reducing construction and demolition waste.

2. This is the first of a series of practice notes to be issued jointly by BD, LandsD and PlanD on the subject. The joint practice note sets out the incentives we would provide to encourage the incorporation of these features in building development, and the procedures for application for them under the Buildings Ordinance, the Lease Conditions and the Town Planning Ordinance, where relevant.

Incentives

3. We wish to encourage the industry to explore ways to improve environmental performance during the construction and throughout the life cycle of new buildings by incorporating initially the features in items (a) to (d) in paragraph 1. The first package of incentives which are effective from the issuance of this joint practice note, includes a list of green features that may, subject to the conditions specified in subsequent paragraphs, be exempted from Gross Floor Area (GFA) and Site Coverage (SC) calculations. This list will be continuously reviewed and revised in pace with the ongoing development of green buildings and new incentives to encourage the provision of new green features in buildings.

/Exemption...

Exemption of the First Package of Green and Innovative Features from GFA and SC Calculations

210 **Under Buildings Ordinance**

4. The following green features may upon application and subject to conditions be excluded from GFA and/or SC calculations under the Buildings Ordinance:

(a) Balconies;

(b) Wider common corridors and lift lobbies;

(c) Communal sky gardens;

(d) Communal podium gardens;

(e) Acoustic fins;

(f) Sunshades and reflectors;

(g) Wing walls, wind catchers and funnels.

5. Criteria and conditions for exempting the above green features are listed in Appendix A. To contain the effect on the building bulk resulting from the provision of these incentives, the cumulative GFA exemption for all the green features, excluding sky and podium gardens, should not exceed 8% of the total permitted GFA for the development.

6. Subject to compliance with the requirements of the Town Planning Ordinance, the above exemptions under the Buildings Ordinance may be given prior to completion of any lease modification and payment of premium as may be required under lease conditions.

Under Lease Conditions

7. For new leases to be granted, suitable clauses will be inserted allowing LandsD to exempt the features listed at paragraph 4 above from calculation of GFA and/or SC if such leases provide for a maximum GFA and/or SC. LandsD may when allowing the exemption impose additional conditions to ensure that such features will be properly used and maintained.

/8. For ...

8. For existing leases with GFA and/or SC restrictions, the features as listed at paragraph 4 above may be exempted from calculation of GFA and/or SC. Where the lease contains a condition restricting the number of storeys or height of the building to be erected on the lot and the feature will cause such restriction to be breached, a lease modification will be required.

9. Balconies will be exempted from calculation of GFA and/or SC only after the completion of a lease modification and subject to payment of premium and an administrative fee. The exemption of wider common corridors and lift lobbies from GFA and/or SC calculation will not require a lease modification. The exemption of features other than balconies and wider common corridors and lift lobbies from GFA and/or SC calculation may have to be covered by a modification letter at nil premium and an appropriate administrative fee. The exemption of sky gardens from GFA calculation at nil premium is only applicable to sites with a recreational clause in the lease. For sites without a recreational clause in the lease, no premium will be charged if the sky gardens are designed for sitting out purpose only without other recreational facilities. LandsD may impose additional conditions to ensure that the exempted features are properly used and maintained.

10. An Authorized Person (AP) is advised to check against the lease conditions to determine whether a lease modification is required. In case of doubt, an enquiry may be directed to the relevant District Lands Office (DLO) of the LandsD and a reply will be given within 30 days. Alternatively, an AP will be informed directly by the DLO within 13 weeks from the receipt of a formal plan submission through the central processing system.

11. For any exemption to be granted under the lease, it is a pre-requisite that such features must first be exempted by the Building Authority. However, to facilitate the preparation of the basic terms and a demand note for the payment of the initial administrative fee, an application for lease modification should be submitted to the DLO in parallel with the submission to BD at the earliest instance. BD will alert DLO as soon as a no-objection-in-principle to the proposed green features is established. Once approval of the building plans exempting such green features have been granted by the Building Authority, an AP is advised to submit a copy of the approved plans together with a copy of the demand note receipt to DLO such that the basic terms may be finalized as soon as possible.

Under Town Planning Ordinance

12. PlanD will adopt the same criteria and conditions for the exemption of the green features from GFA and/or SC calculations as set out in paragraphs 4 and 5 above, subject to there being no contravention with the restrictions on building height and/or SC, if any, stipulated on the Outline Zoning Plan (OZP) / Development Permission Area Plan (DPAP). There may be situations where the GFA exemption may result in an increase in building height and/or SC above that stated on the OZP/DPAP. In such cases, an

/application ...

application to the Town Planning Board (TPB) for minor relaxation (if such a provision is available under the OZP/DPAP) will be required.

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13. For development schemes previously approved by the TPB, the incorporation of such green features may result in minor amendments to the approved schemes. In which case, the general requirements as set out in the TPB Guidelines for Minor Amendments to Approved Development Proposals (TPB PG-No.19A) will apply.

14. Enquiries on whether a TPB approval is required or whether an approved scheme needs to be amended as a result of the incorporation of the green features may be directed to the respective District Planning Office of the PlanD.

Application

15. The above incentives are applicable to new projects for which occupation permits have not been issued.

Formal Submission and Enquiries on Green Features

16. All formal submissions should be made through the normal channels to BD, LandsD or PlanD as appropriate.

17. Applications for exemption of the green features from GFA or SC calculations under the provisions of the Buildings Ordinance should be made by way of applications for modification with supporting documents and undertaking.

18. Enquiries on any proposed green features for incorporation in a development may be directed to the Building Innovation Unit of the BD.

Misuse of Incentives

19. An occupation permit will not be issued unless there is evidence indicating that the following conditions of exemption have been complied with:

(a) The green features are separately listed in the sales brochure, as detailed in paragraph 2(a) of Appendix A, if the sales of the development takes place before the issuance of an occupation permit; and

(b) The required undertaking as detailed in paragraph 2(b) of Appendix A is registered in the Land Registry.

20. The government will monitor the use of the features and will take enforcement action, including prosecution, against non-compliance with the following conditions of exemption:

/(a) The ...

(a) The green features are separately listed in the sales brochure, as detailed in paragraph 2(a) of Appendix A, if the sales of the development takes place after the issuance of an occupation permit;

(b) Balconies are not to be enclosed; or

(c) Skygardens and podium gardens are for the exclusive use of the residents / tenants and their visitors only as detailed in paragraph 2(d) of Appendix A.

21. Developers should remind purchasers of the consequence of any misuse of the above incentives.

(C. M. LEUNG)	(R. D. POPE)	(B. C. K. FUNG)
Building Authority	Director of Lands	Director of Planning

Ref.: BD GP/ENV/8
LD 2/1020/00
TPB/C/BLC/2

First issued February 2001

Index under: BIU
Green Buildings
Incentives for Green Buildings

Criteria and Conditions for Exempting the First Package of Green and Innovative Features from GFA / SC Calculation

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1. Specific criteria for exempting the first package of green and innovative features are detailed below. For the avoidance of doubt, application of incentives to residential buildings where described will not apply to the non-domestic portion of a composite building. Furthermore, domestic accommodation for commercial use such as hotels will not be qualified for the concessions.

(a) **Balconies**

The criteria for exempting balconies from GFA and SC calculations are:

(i) Only applicable to residential buildings;
(ii) Location of the balcony is restricted to the living room, dining room and bedroom;
(iii) The balcony does not replace bay window design but provide a further design option. However if both a bay window and a balcony have been proposed within the same room, the balcony will be GFA/SC accountable;
(iv) The balcony is open on at least 2 sides;
(v) It does not project beyond the lot boundary;
(vi) The summation of areas to be exempted for such balconies including portion of such balconies per residential unit is $2m^2$ or 4% of the Usable Floor Space of the unit whichever is the greater subject to a maximum of 5 m^2 ; and
(vii) Any balcony to be exempted from GFA / SC either wholly or partially is equal to or not less than $2m^2$.

(b) **Wider common corridors and lift lobbies**

Subject to the condition that the need to provide a wider corridor or lift lobby is not resulting from any statutory requirement, the criteria for exempting such floor areas from GFA and SC calculations are:

(i) Only applicable to floors other than the entrance hall(s) of residential buildings;
(ii) Where not provided with natural ventilation, width of corridor between 1200mm and 1800mm and width of lift lobby between 1650mm and 2200mm may be exempted; and
(iii) Where provided with natural ventilation, width of corridor

/between ...

between 1200mm and 2200mm and width of lift lobby between 1650mm and 2500mm may be exempted.

See Appendix B for guidance on the interpretation of corridors and lift lobbies. The above measurements are based on structural dimensions of the corridors and lift lobbies.

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(c) **Communal sky gardens**

The criteria for exempting sky gardens from GFA calculations are:

(i) Only applicable to residential buildings;
(ii) It provides natural ventilation, greenery and recreational garden space for communal use;[1]
(iii) In addition to any podium gardens, the maximum number of sky gardens provided is equal to or less than the number of residential storeys divided by 15. However, such garden may be split into say 2 sky gardens each occupying 50% of the area of the floor plate; or 3 sky gardens each occupying 1/3 of the area of the floor plate;
(iv) The sky garden occupies not less than 1/3 of the area of the floor plate;
(v) Where more than one sky garden is provided and where there is no podium garden, the first sky garden is to be located at not more than 10 storeys above the lowest ground storey for improvement of the microclimate at street level;
(vi) It is accessible from the common area only;
(vii) It has a clear height of not less than 4.5m;
(viii) It is open-sided above safe parapet height on at least two opposite sides to provide cross ventilation;
(ix) Where the garden is coupled with refuge floor, the design complies with the relevant fire codes;
(x) Exhaust from any ventilating system does not face the garden;
(xi) Not less than 25% of the garden area is to be planted with greenery;[2] and
(xii) Maintenance of the garden is financially viable.

Footnotes

1. The effective location and dimensions of a sky garden is recommended to be provided by wind tunnel tests and/or computational fluid dynamics to ensure the most favourable microclimate to the neighbourhood.

2. The use of native trees and shrubs is recommended.

/(d) Communal ...

(d) **Communal podium gardens**

The criteria for exempting podium gardens from GFA calculations are:

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(i) It is under the footprint of a commercial or industrial tower;
(ii) The floor is for use as podium garden for sitting out purpose only;
(iii) It has a clear height of not less than 4.5m;
(iv) It is open-sided above safe parapet height on at least two opposite sides to provide cross ventilation;
(v) Where cargo/service lifts are provided, the garden is not served by such lifts;
(vi) Exhaust from any ventilating system does not face the garden;
(vii) Not less than 25% of the garden area is to be planted with greenery; [2] and
(viii) Maintenance of the garden is financially viable.

(e) **Acoustic fins**

The criteria for exempting acoustic fins from GFA and SC calculations are:

(i) It mitigates against unwanted or excessive sound and does not project more than 1.5m from the external wall. Oversized fin projecting more than 1.5m would require justification;
(ii) It is not a load bearing element, that is, it does not bear any load other than that due to its own weight and to wind pressure on its own surface; and
(iii) It does not project beyond the lot boundary.

(f) **Sunshades and reflectors**

The criteria for exempting sunshades and reflectors from GFA and SC calculations are:

(i) It improves the energy efficiency of a building and does not project more than 1.5m from the external wall. Oversized sunshade and reflector projecting more than 1.5m would require justification;
(ii) It is not a load bearing element, that is, it does not bear any load other than that due to its own weight and to wind pressure on its own surface; and
(iii) It does not project beyond the lot boundary.

/(g) Wing ...

(g) **Wing walls, wind catchers and funnels**

The criteria for exempting wing walls, wind catchers and funnels from GFA and SC calculations are:

(i) It promotes the natural ventilation of a building;

(ii) The wing wall is a fin used to channel wind into the insides of the building and does not project more than 1.5m from the external wall. Oversized wing wall projecting more than 1.5m would require justification;

(iii) The wing wall is not a load bearing element, that is, it does not bear any load other than that due to its own weight and to wind pressure on its own surface;

(iv) The wind catcher captures the cooling breeze and makes deliberate use of buoyancy. The size of the wind catcher to be exempted from GFA and SC calculation will be assessed on a case by case basis with substantiating justification;

(v) Funnel makes use of the building height to facilitate the stack/chimney effect in natural thermo-syphonic ventilation, especially during windless hours. Instances where admitting unmodified hot and humid ambient atmosphere to the interior do not provide comfort nor conserve energy, a combined mechanical and natural ventilation system using stack/chimney effect will be encouraged. The size of the funnel to be exempted from GFA and SC calculation will be assessed on a case by case basis with substantiating justification; and

(vi) It does not project beyond the lot boundary.

2. Upon granting modification to exempt the green features from GFA and/or SC calculations, the Building Authority shall, where appropriate, impose the following conditions:

(a) Where green and innovative features have been exempted from GFA calculation, such items and their use together with a schedule listing the corresponding areas so exempted must be clearly stated in the Sales Brochure. Where they are included in the saleable area of a property, such inclusion shall also be clearly stated in the Sales Brochure. On the day on which the Sales Brochure in respect of the development is made available for collection by the general public, a copy of the brochure shall be deposited with BD for record.

/(b) The ...

(b) The undertaking required to be submitted in paragraph 17 in support of an application for exemption is to be registered in the Land Registry before the application for an occupation permit is submitted. Such undertaking may include:

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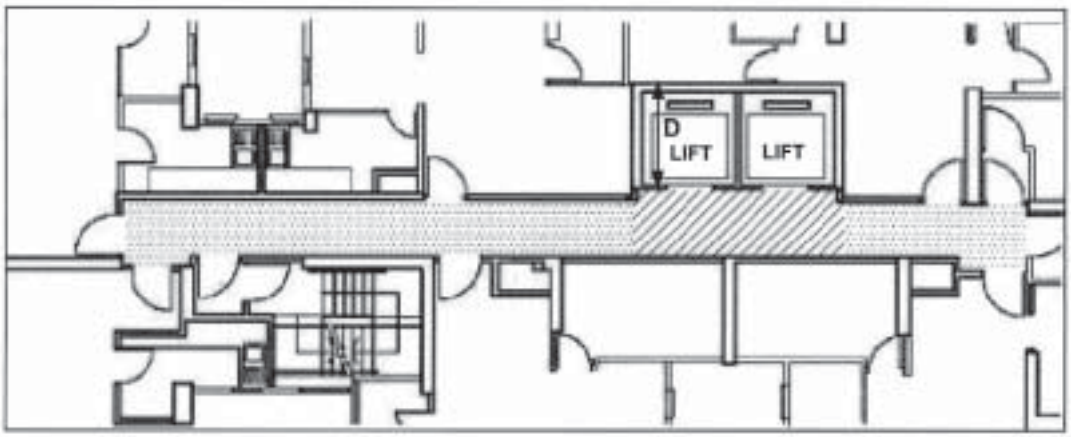
(i) A letter of undertaking from the Developer to separately list all the green features in the Sales Brochure;

(ii) A letter of undertaking from the Developer designating balconies as 'non-enclosed areas' and the sky gardens / podium gardens as 'common areas' in the Deed of Mutual Covenant (DMC) with details of the use and location clearly indicated. Such DMC should contain binding and enforceable conditions for the control, operation, financial support and maintenance for such features.

(c) Balconies shall not be enclosed.

(d) Skygardens and podium gardens shall be for the exclusive use of the residents / tenants and their visitors only as indicated on the approved plans and such areas shall not be used for any purpose or by any other persons without the prior consent of the Building Authority.

Appendix B
(JPN1)



straight-lined corridor / lift lobby arrangement

figure 1

In a straight-lined corridor / lift lobby arrangement, the "lift lobby" is the space contained within the core, immediately outside the lift shafts. Where it extends beyond the core walls by a distance which is equivalent to or more than the depth of the lift shaft, such space beyond the core walls will be considered as a "corridor".

Legend:

	Lift Lobby
	Corridor
"D"	Depth of the lift shaft

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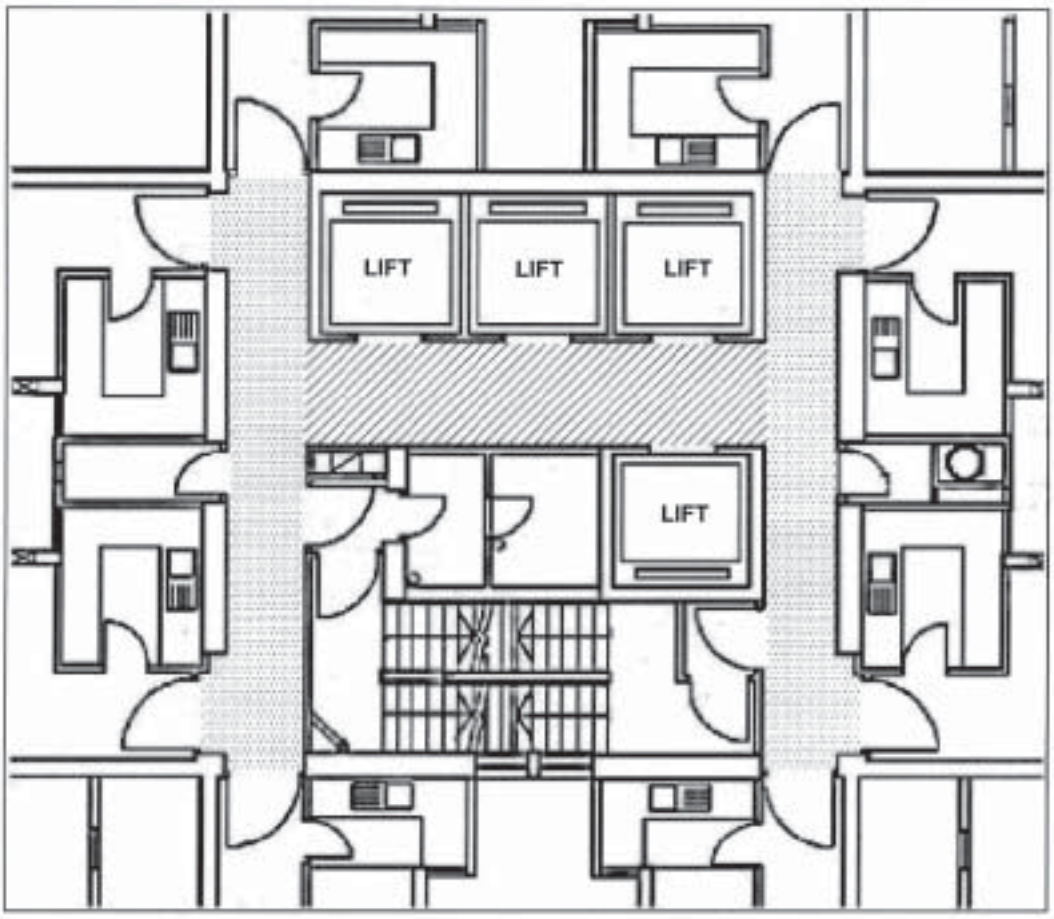
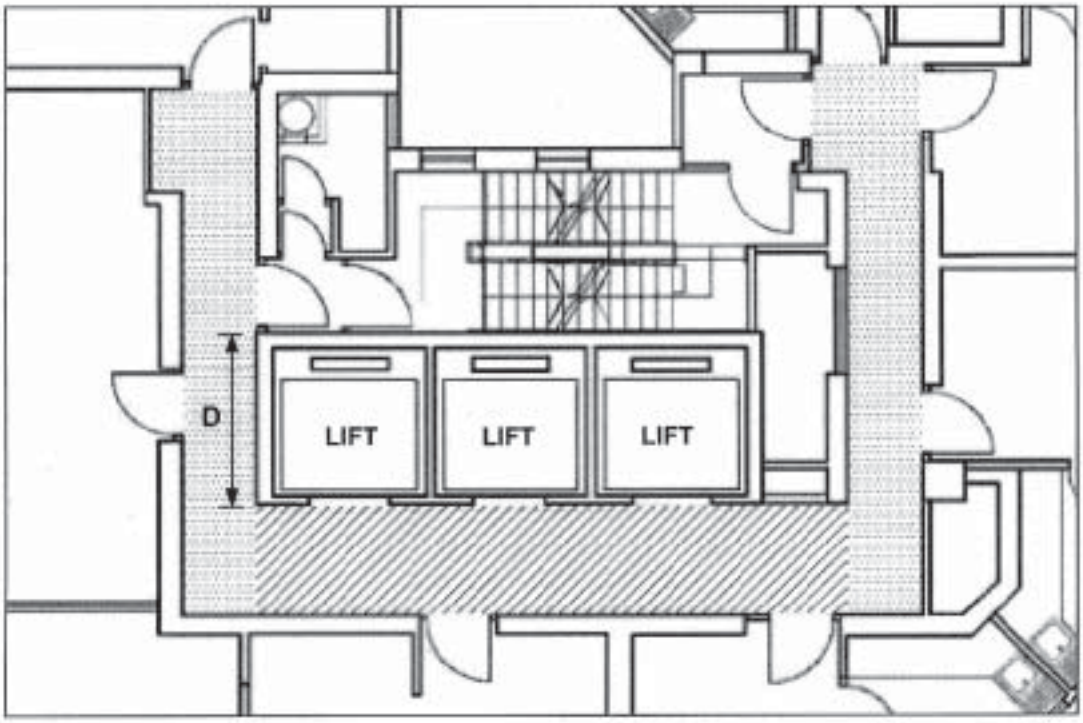


H-shaped corridor / lift lobby arrangement

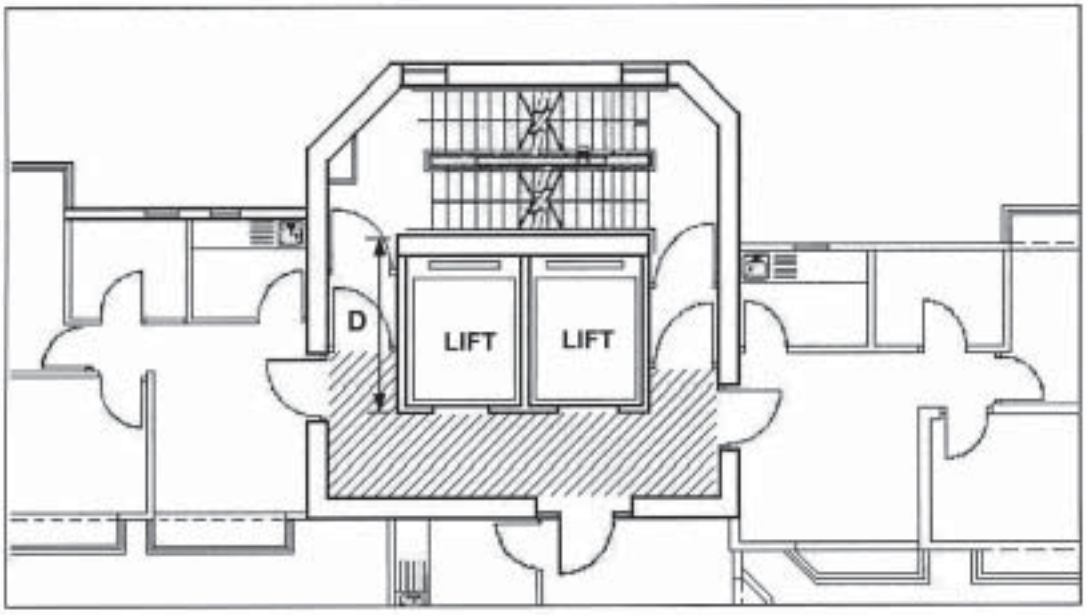
figure 2

In an H-shaped corridor / lift lobby arrangement, the "lift lobby" is the space immediately outside the lift shafts and it stops where it meets the "corridor" at either ends.



U-shaped corridor / lift lobby arrangement

figure 3



U-shaped corridor / lift lobby arrangement

figure 4

In a U-shaped corridor / lift lobby arrangement, the "lift lobby" is the space immediately outside the lift shafts. It may turn directions and extend beyond up to a maximum length which is equivalent to the depth of the lift shaft. If the space extends beyond this depth, it will be considered as a "corridor".