Electronic Test Report Submission and Revision of the Requirements on the Use of 100 mm and 150 mm Concrete Cubes

電子測試報告和修改使用100厘米及150厘米混凝土立方塊的規定

Ir Dr Fiona CHAN Wan-yin

Senior Accreditation Officer

Hong Kong Accreditation Service

Innovation and Technology Commission

The Government of HKSAR

28 Feb 2023 (pm)

Part (1)
Electronic Test Report Submission
電子測試報告

歐盟報告指出，歐洲可能正經歷五百年來最嚴重乾旱，歐洲大陸三分二地方正處於乾旱警報狀態，將為航運及農業帶來衝擊。

歐洲面臨500年一遇乾旱危機

航運及農業將受巨大衝擊

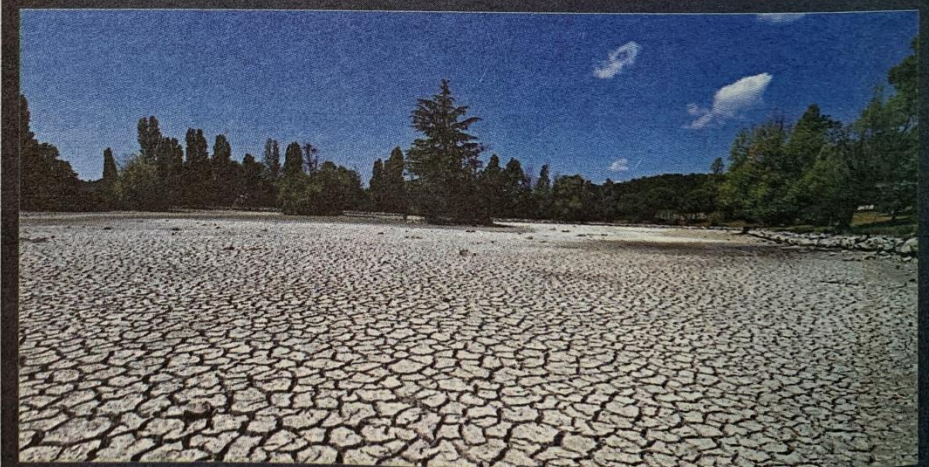
歐盟委員會旗下的研究機構歐洲乾旱觀測站周二發表八月份觀測報告，指出今年的乾旱情況可能是五百年來最嚴重，將影響航運、電力供應和農作物產量，並引發山火，情況可能在歐洲南部一些地區持續數月。

報告指，歐洲大陸三分二地方都處於乾旱警戒或警報，顯示土壤水份明顯不足。與過去五年比較，預計農作物收成方面，五穀玉米將減少百分之十六，大豆減少百分之十五，而向日葵則會減少百分之十二。持續的熱浪及缺乏雨水，對整個歐洲的水位造成前所未有壓力。

料意法等國旱情進一步惡化

此外，水位偏低亦阻礙了歐洲內陸航運，由於要確保可以在水位低的河道航行，船隻不得不減少載貨，這將加劇供應鏈問題。報告亦指，河流水位下降衝擊本身已陷入危機的能源領域，水力發電已顯著減少兩成供應。

研究專員加布里埃爾(Mariya Gabriel)表示，注意到現時山火季節明顯處於平均水平以上，並嚴重影響農作物生產，氣候變化問題毫無疑問每年都更加顯而易見。報告警告，意大利、西班牙、葡萄牙、法國、德國、荷蘭、比利時、盧森堡、羅馬尼亞、匈牙利、塞爾維亞北部、烏克蘭、摩爾多瓦、愛爾蘭和英國的旱情將進一步惡化。



■歐盟報告指出，歐洲可能正經歷五百年來最嚴重乾旱，歐洲大陸三分二地方正處於乾旱警報狀態。


寰宇大視界
台視新聞HD
主播 周璟瑜
加 幣
▲ 0.018
23.257
北歐也遭熱浪侵襲 丹麥高溫打破81年紀錄
台視
訂閱

韓國「80年來最大豪雨」 逾百人有家歸不得

2022/08/11　中央社

韓國中部地區自8日起暴雨不斷，首都圈等地區災情頻傳，至少已造成7人死亡、6人失蹤，逾百人被迫前往居民中心等地避難。

根據韓國中央災難安全對策本部統計，截至9日上午6時，京畿道及首爾等首都圈地區共有7人在豪雨災情中喪生、6人失蹤、9人受傷。

其中一名首爾銅雀區居民在8日傍晚因住宅淹水喪生，稍晚同樣在銅雀區，一名整理行道樹的公務人員被發現倒臥在路旁，推測因觸電身亡；首爾冠岳區則在晚間9時左右收到3人因淹水受困半地下住宅的通報，其中包括一名13歲孩童，最後都未能脫困，不幸喪生。

京畿道廣州市則是因豪雨引發的公車站倒塌及道路坍方意外，各造成一人喪生。

韓聯社報導，8日起在韓國中部地區降下的豪雨達到80年來新高規模，許多地區累積雨量超過300毫米，根據氣象廳觀測，首爾銅雀區新大方洞降雨量達到422毫米，幾乎是首爾整個7月的平均降雨量。

瞬間暴雨造成首爾地區漢江以南道路大淹水，許多地鐵站因積水嚴重不得不停駛，各處平面道路交通也因淹水嚴重停擺，部分路段在8日晚間9時起就宣布管制，行政安全部也在今天凌晨零時將暴風雨警報從「警戒」提升到「嚴重」等級。

2022年8月22日

美國之音

中國高溫乾旱持續多日 四川再延長限電令

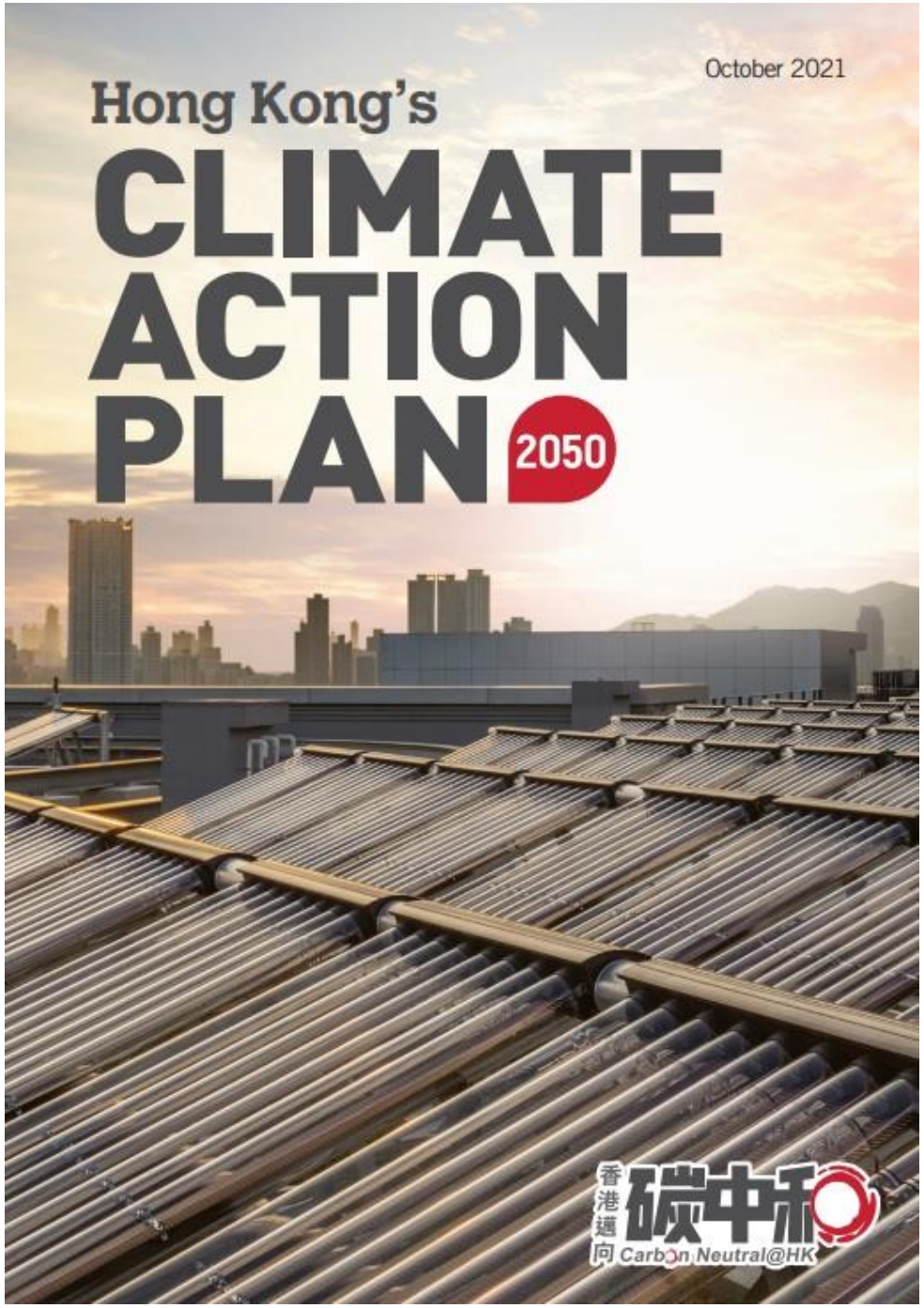
分享

打印

中國重慶段長江因乾旱裸露的河床。（2022年8月18日）

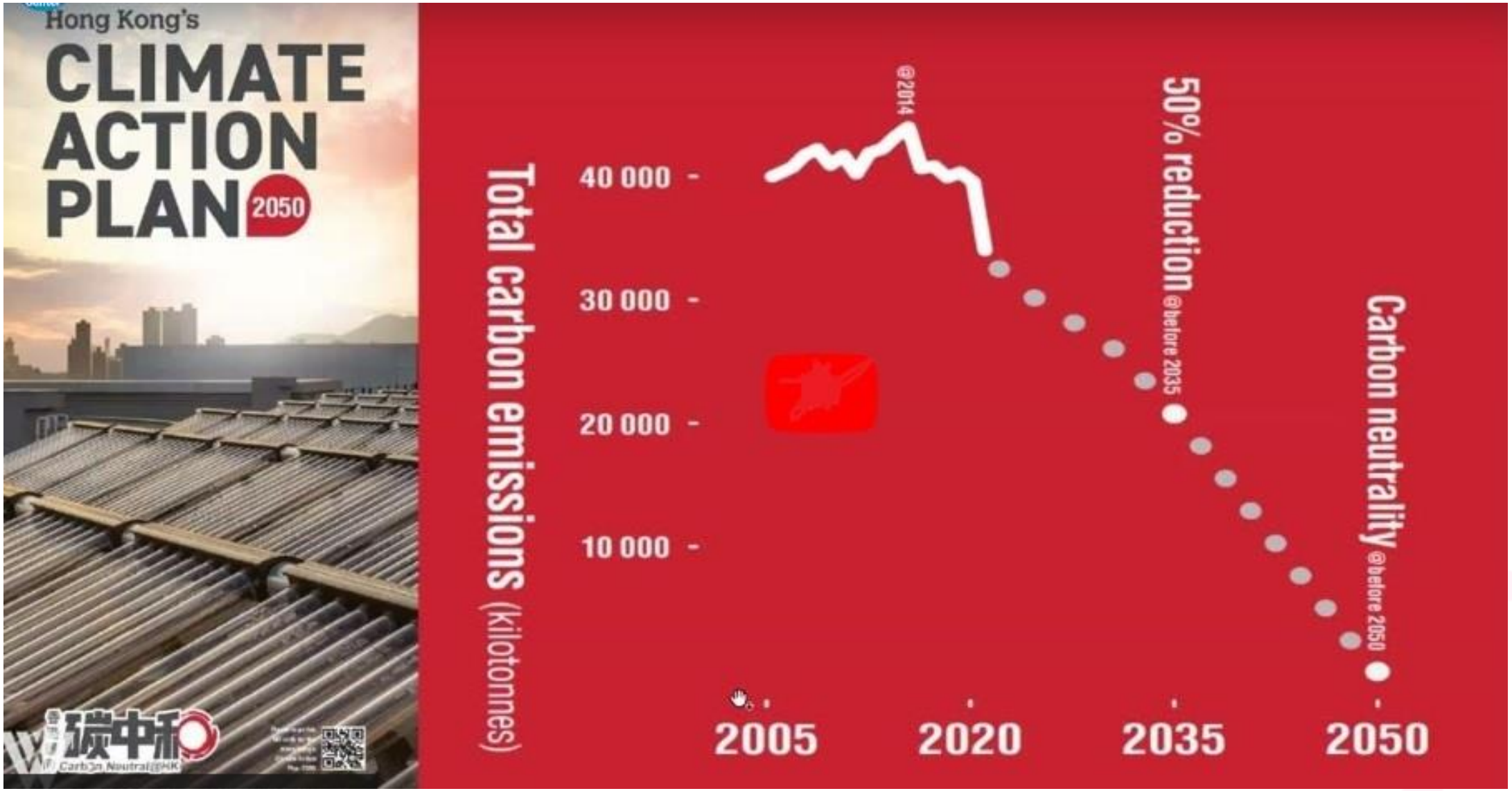
中國各地自七月以來經歷了罕見的高溫乾旱天氣，重慶市上週記錄的最高氣溫達45攝氏度，高溫乾旱天氣還引發了森林火災。西南地區的四川省由於水電供應不足，自本月15日起當局

相關內容



The Government of the HKSAR (October 8) announced **Hong Kong's Climate Action Plan 2050**, setting out the vision of **"Zero-carbon Emissions·Liveable City·Sustainable Development"**, and outlining the strategies and targets for combating climate change and achieving carbon neutrality.

香港特區政府（十月八日）公布**《香港氣候行動藍圖2050》**，以**「零碳排放·綠色宜居·持續發展」**為願景，提出香港應對氣候變化和實現碳中和的策略和目標。


Hong Kong's
CLIMATE ACTION PLAN 2050
碳中和
Carbon Neutral@HK
Total carbon emissions (kilotonnes)
40 000
30 000
20 000
10 000
@ 2014
50% reduction @ before 2035
Carbon neutrality @ before 2050
2005
2020
2035
2050

Paper consumption in Testing and Certification
檢測認證行業用紙量

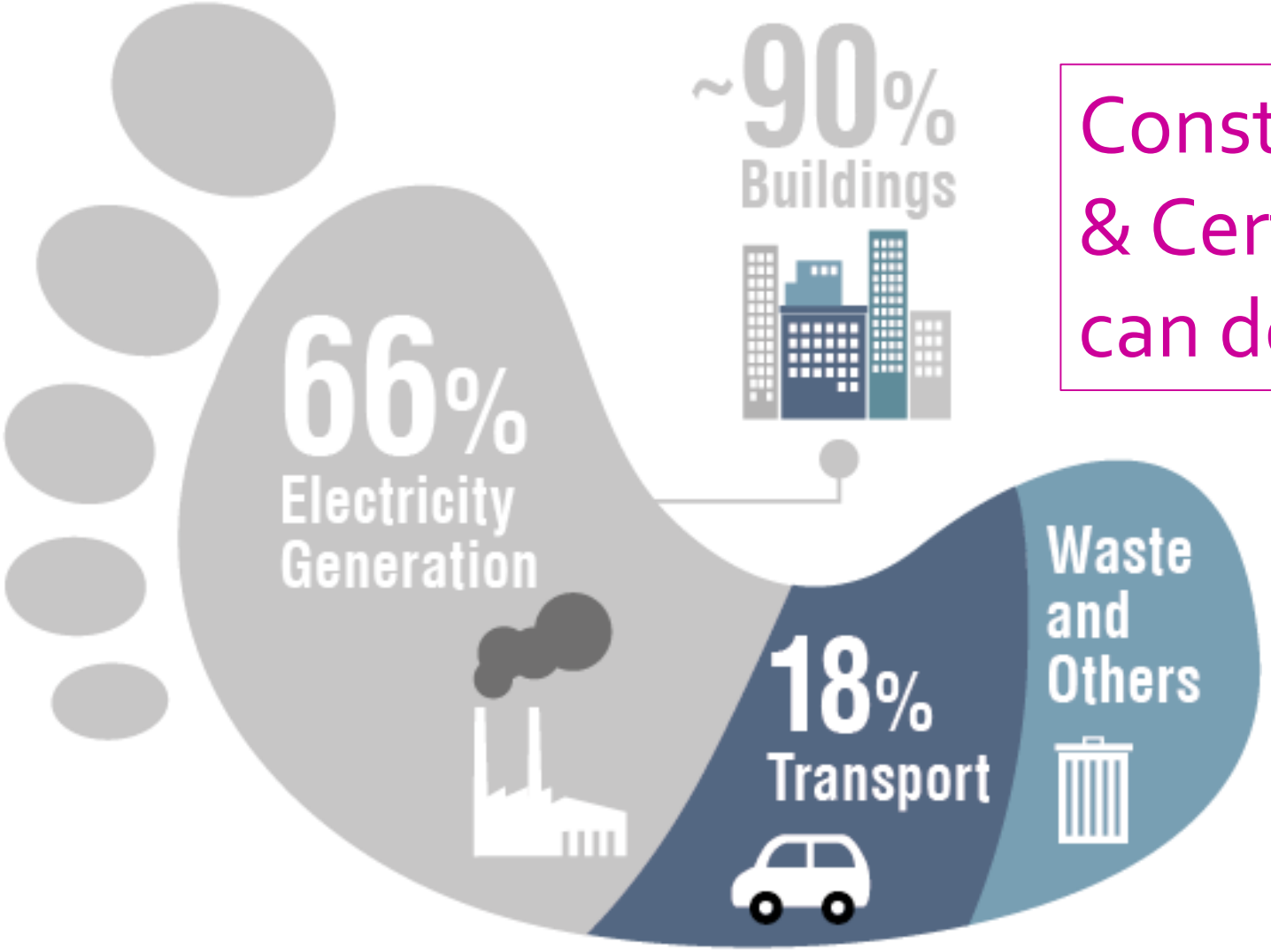
MONITORING OF SOLID WASTE IN HONG KONG Waste Statistics for 2021

2021年香港固體廢物監測廢物統計

Environmental Protection Department

Plate 2.8 Composition of MSW disposed of at landfills in 2021 - By waste type

Composition	Average daily quantity (tpd) and percentage share by weight [3]					
	Domestic waste (a)		Commercial & industrial waste (b)		Municipal solid waste (c) = (a) + (b)	
Glass	129	(1.8%)	91	(2.1%)	220	(1.9%)
Metals	120	(1.7%)	141	(3.2%)	261	(2.3%)
Paper	1,321	(18.9%)	913	(20.9%)	2,234	(19.7%)
Plastics	1,342	(19.2%)	989	(22.7%)	2,331	(20.5%)
Putrescibles	2,510	(35.9%)	1,166	(26.7%)	3,675	(32.4%)
Textiles	252	(3.6%)	152	(3.5%)	404	(3.6%)
Wood	51	(0.7%)	211	(4.8%)	262	(2.3%)
Household hazardous wastes (HHWs) [1]	92	(1.3%)	51	(1.2%)	143	(1.3%)
Others [2]	1,177	(16.8%)	650	(14.9%)	1,827	(16.1%)
Total	**6,992**	**(100.0%)**	**4,365**	**(100.0%)**	**11,358**	**(100.0%)**

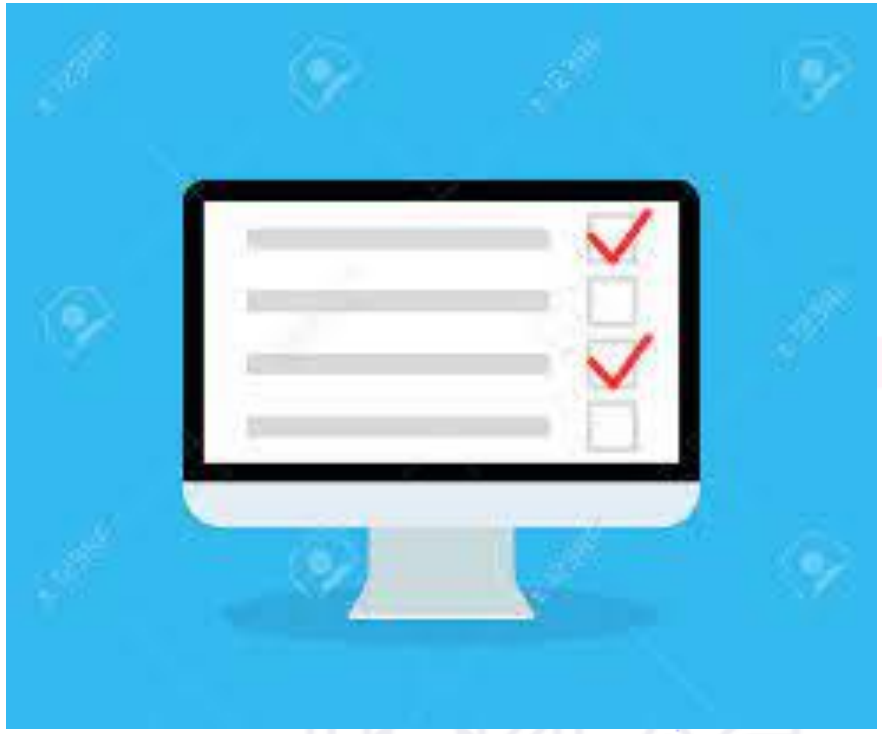


Hong Kong Carbon Emission Sources @ 2019

2019年香港碳排放源

Construction Testing & Certification Sector can do something !!!

Electronic Test Reports
電子測試報告



Scanned Electronic Test Reports
掃描電子測試報告

Handwritten signature
手寫簽署

Scanning
掃描

Electronic test report
電子測試報告

Digital signature 數碼簽署

Electronic Signature vs Digital Signature
電子簽署和數碼簽署的比較

Electronic Signature vs Digital Signature
電子簽署和數碼簽署的比較

Digital Signature 數碼簽署	Electronic Signature 電子簽署
A digital signature is authorised and regulated by certification authorities. 由證書頒發機構授權並受其監管	An electronic signature is usually not authorised and regulated by certification authorities. 通常未經證書頒發機構授權和監管
Comprised of more security features 包含較多的安全功能	Comprised of less security features 包含較少的安全功能
High level of authenticity 可信性高	Low level of authenticity 可信性低
A digital signature can be verified. 數碼簽署名可以驗證	An electronic signature cannot be verified. 電子簽名不可以驗證
Common types of digital signatures are based on Adobe and Microsoft 常見的數碼簽署名類型基於 Adobe 和 Microsoft	Key types of electronic signatures are electronic ticks and scanned signatures 電子簽名的主要類型是電子勾號和掃描簽名

香港的認可核證機關

核證機關在確保公開密碼匙基礎建設的有效運作方面擔當重要角色，並作為可信賴的第三方，負責證明電子交易所涉及有關各方的身分。

目前，香港有兩間根據《電子交易條例》（第553章）獲得認可的核證機關。根據《電子交易條例》，郵政署署長是認可核證機關，提供香港郵政核證機關服務，而電子核證服務有限公司則是根據《電子交易條例》下核證機關自願認可計劃獲得認可的商營核證機關。

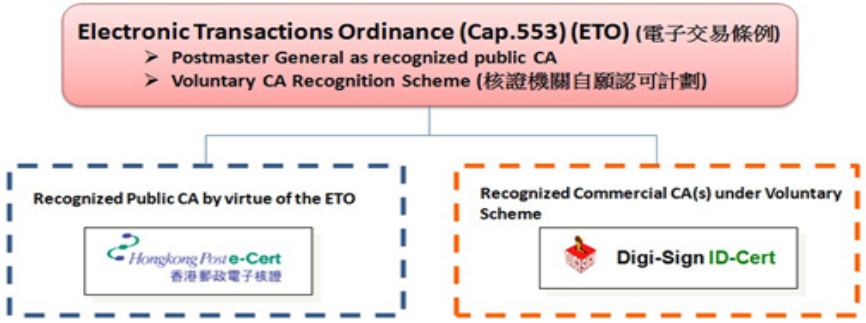
以下連結提供更多有關兩間認可核證機關的資料：

1. 郵政署署長(香港郵政核證機關)
2. 電子核證服務有限公司

Recognized Certification Authorities in Hong Kong

Certification authorities (CAs) play an important role on the effective operation of the public key infrastructure (PKI) and as a credible third party to proof of identity of the parties involved in an electronic transaction.

Currently, there are two recognized CAs under the Electronic Transactions Ordinance (Cap. 553) (ETO) in Hong Kong. The Postmaster General is a recognized CA by virtue of the ETO and offers Hongkong Post Certification Authority services, whereas the Digi-Sign Certification Services Limited is a commercial recognized CA which has been granted recognition under the Voluntary CA Recognition Scheme of the ETO.



More on the two recognized CAs are at following links:

1. Postmaster General (Hongkong Post Certification Authority)
2. Digi-Sign Certification Services Limited

《電子交易條例》(第553章)

為訂立明確的法律架構以推動電子商務在香港特別行政區的發展，政府於2000年1月制定《電子交易條例》(第553章)(「條例」)，並於2004年6月作出修訂。大體上，條例旨在：

- 賦予電子紀錄及電子簽署(請看下文的註釋1)跟紙張文件上的紀錄和簽署同等的法律地位；以及
- 設立核證機關自願認可計劃以加強社會人士對電子交易的信心。

(註釋1：就不涉及政府單位的電子交易而言，任何形式的電子簽署，只要可靠恰當並獲簽署的接受人認同，已能符合法律有關簽署的規定。就涉及政府單位的電子交易而言，有認可數碼證書證明的數碼簽署，便符合法律上的簽署規定。)

數碼證書是在進行網上交易時能保證聲稱身分者的電子紀錄。數碼證書由核證機關發出。香港郵政核證機關是根據《電子交易條例》獲認可的核證機關，而其他商業營運的核證機關亦可向政府資訊科技總監自願提出申請，成為認可核證機關。核證機關及其發出的數碼證書必須達致政府接納的標準，方會獲得認可。

The 'Certified' symbol is consistent across all language versions of the Adobe reader range. The 'Certified by...' message will be translated into the appropriate local language and all signature properties including date/time details will also be localized.

Following a thorough verification of the 'Applicant' requesting a PDF Signing for Adobe CDS certificate, GlobalSign will issue a 'pickup' link which allows a certificate to be generated and securely stored on a SafeNet® hardware cryptographic device. Authors can digitally certify PDFs using certificates "chained" up to the trusted Adobe Root. Recipients simply need to open the document using the Adobe free reader to instantly verify the authenticity and integrity of the document. Adobe's simple to interpret "Blue Ribbon, Yellow Warning Triangle, and Red X" trust messaging allows even novice users an easy to understand method to determine if the document is legitimate.

Valid and certified!
Authenticity and Integrity are verified
Pass

Error!
Authenticity Check Fails

Error!
Integrity Check Fails

Valid and certified!

Authenticity and Integrity are verified

TRUST

Error!

The author cannot be verified

DO NOT TRUST

CHECK INTERNET CONNECTIVITY

Error!

The document has been modified since it was signed

DO NOT TRUST

See Demo Reports

Hong Kong Housing Authority's requirements on electronic test reports with digital signatory

- The following requirement item C33.3 (bb) has been included in the latest term contracts, which was commenced on 17.10.2022.

PART C - TECHNICAL (GENERAL) (Cont'd)

C33 Security Requirements on IT/Data Communication Systems (Cont'd)

C33.3 Application Security Requirements (Cont'd)

(viii) If XML is used, it shall not include sensitive data in XML document in clear-text. Extensible Stylesheet Language ("XSL") can be used to transfer the XML document to exclude/encrypt sensitive information prior to delivery.

(z) The system shall avoid on disclosing system information through the error handling process.

(aa) The system shall have the central module developed to record all audit trails, exceptions and generate error logs.

(bb) If digital signature is implemented, digital signature suites with 2048-bit RSA key and SHA-256 shall be used. The digital certificate shall be issued by the Postmaster General or other certification authorities recognized by the Government Chief Information Officer under the Electronic Transactions Ordinance (Cap. 553).

Advantages of Electronic Test Reports

- ✓ improve efficiency 提高效率
- ✓ save costs 節約成本
- ✓ reduce storage space 減少存儲空間
- ✓ reduce resources 減少資源

Huge Number of Electronic Test Reports

Smart Government Innovation LAB

Housing Bureau
The Government of the Hong Kong Special Administrative Region of the People's Republic of China

Funding from TechConnect Block Vote was secured in 2019 to develop an automatic platform for submission and checking of test reports for construction materials, as a pilot project, two main construction materials namely reinforcement bars and concrete were involved via the use of Artificial Intelligence, Optical Character Recognition and Document Management technologies. The system was called HeCheck – Housing Electronic Checking System for Test Reports Using Artificial Intelligence Technology. The idea and technologies were proven to be effective and suitable for such use.

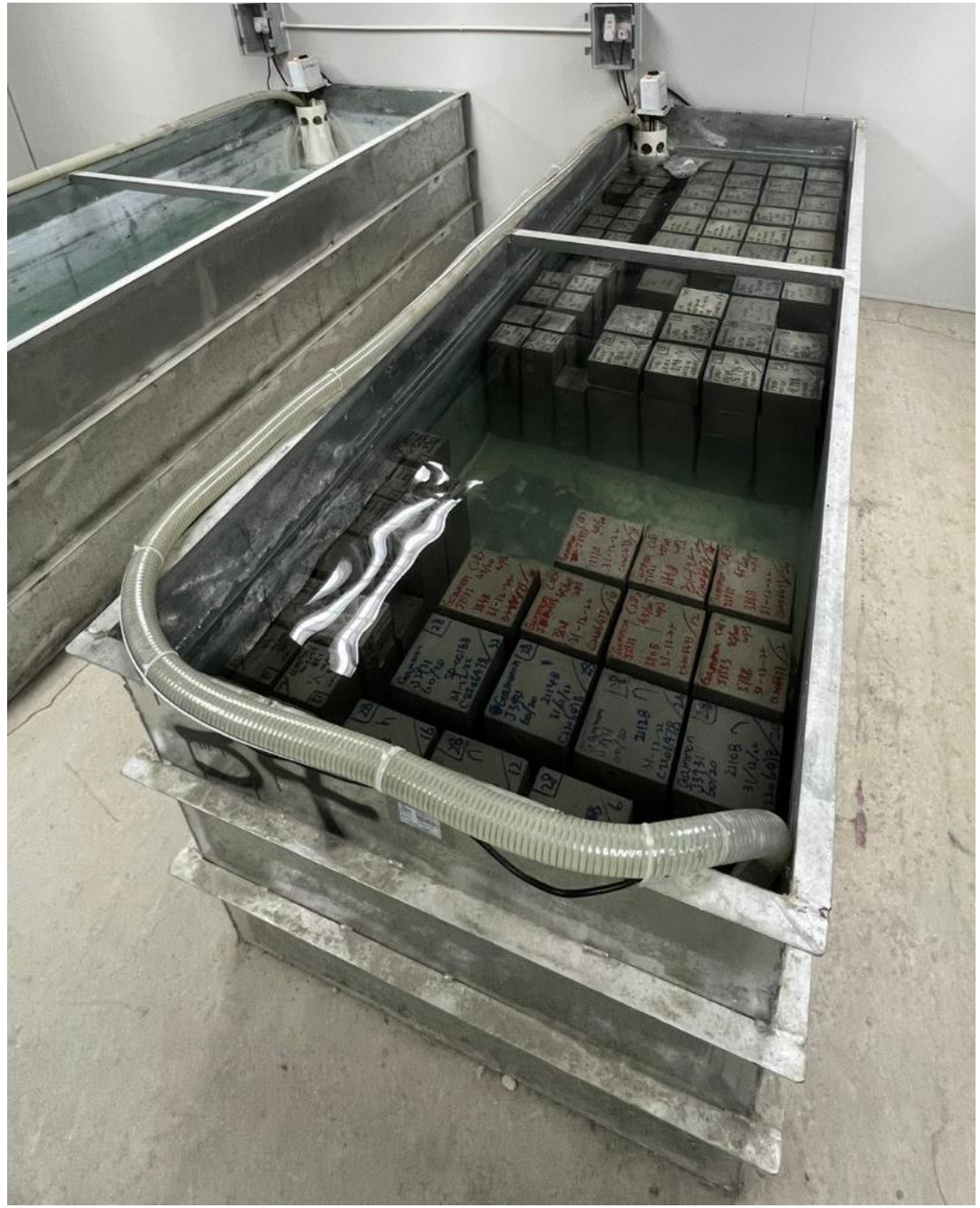
部門於 2019 年獲批TechConnect Block Vote的資金，以開發一個用於自動化提交和查核建築材料測試報告的平台。該系統被稱為 HeCheck。作為試點項目，HeCheck運用人工智能、光學字元辨識及文檔管理技術，構建了一個能自動核查鋼筋和混凝土兩種主要建築材料的測試報告的系統 ，驗證了自動化測試報告核查系統的概念和技術。

See ‘HeCheck’ video

Hong Kong Housing Authority's requirements on electronic test reports with digital signatory

- The implementation date by Hong Kong Housing Authority: 1 Jan 2023
- HKAS has been working with Hong Kong Housing Authority to work out a standard test report template for the testing laboratories in order to increase the accuracy of data capturing.

Part (2)
Revision of the Requirements on the Use of 100 mm and 150 mm Concrete Cubes
修改使用100厘米及150厘米混凝土立方塊的規定




5

SECTION 7

MAKING TEST CUBES FROM FRESH CONCRETE

7.1 SCOPE

This Section describes the method of making test cubes from fresh concrete. The method applies to concrete but does not apply to aerated concrete or very stiff concrete which cannot be compacted by vibration alone.

The basic size of test cubes should be 100 mm or 150 mm and should be at least 3½ times the nominal maximum size of the aggregate in the concrete. The size of the test cube shall be 100 mm for concrete with the maximum aggregate size not exceeding 20 mm and shall be 150 mm with the maximum aggregate size exceeding 20 mm.

with neither excessive segregation nor laitance. The concrete shall be placed in the mould in layers approximately 50 mm deep and each layer shall be compacted either by using the compacting bar or by vibrating. The excess concrete above the upper edge of the mould shall be removed using steel trowels or floats and carefully level the surface. After the top layer has been compacted, it shall be levelled to the top of the mould with a steel float, and the outside of the mould shall be wiped clean. The mould shall not be overfilled.

7.4.2 Compacting with compacting bar

During the compaction of each layer with the compacting bar, the strokes shall be distributed

《建築物(建造)規例》

(第 123 章，附屬法例 B)

58. 混凝土立方塊

(1) 混凝土的抗壓強度須以在混合後 28 天測試標準的 150 毫米立方塊的方式釐定。

Building (Construction) Regulations

(Cap. 123 sub. leg. B)

58. Concrete cubes

(1) The compressive strength of concrete shall be determined by testing standard 150 mm cubes 28 days after mixing.

Ref. : BD GR/1-125/58

First issue June 2007 (AD/NB2)

Re-issued under new categorization in August 2009 as Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers **APP-142**

Buildings Department **Practice Note for Authorized Persons and Registered Structural Engineers** **296**

Code of Practice for Structural Use of Concrete 2004

The Code of Practice for Structural Use of Concrete 2004 (the Code) was published in December 2004. Subject to the Code being used in its entirety, compliance with the requirements of the Code will be considered as complying with the provisions of the Building (Construction) Regulations (B(C)R) relating to concrete design. The concrete design for any new building development or alteration and addition works shall be based on the Code if the application for approval of the structural plans or foundation plans of which is submitted after 15 December 2006.

Ref. : BD GR/1-125/58

First issue June 2007 (AD/NB2)

Building (Construction) Regulations

(Cap. 123 sub. leg. B)

Appendix A
(PNAP 296)
(APP-142)

List of Building (Construction) Regulations that may require modifications

Item	B(C)R	Subject	Relevant Clause/Table in the Code	Remarks
3	58	Concrete cubes to be 150 mm.	Clause 10.3.4.2	Where 100 mm concrete cubes are used, modification of the B(C)R will be required.

**Commencement date of CAP 123Q,
i.e. 1 February 2021,
according to L.N. 8 of 2020**

~~《建[illegible]（建[illegible]規例》~~

~~（第 123 [illegible]法例 B）~~

~~Building (C[illegible]n) Regulations~~

~~([illegible]123 [illegible]g. B)~~

《建築物（建造）規例》

（第 123 章，附屬法例 Q）

Building (Construction) Regulation

(Cap. 123 sub. leg. Q)

L.N. 8 of 2020

Building (Construction) Regulations (Repeal) Regulation

(Made by the Secretary for Development under section 38 of the Buildings Ordinance (Cap. 123))

1. Commencement

This Regulation comes into operation on 1 February 2021.

2. Repeal

The Building (Construction) Regulations (Cap. 123 sub. leg. B) are repealed.

Michael WONG Wai-lun
Secretary for Development

6 January 2020

2020 年第 8 號法律公告

《〈建築物（建造）規例〉（廢除）規例》

（由發展局局長根據《建築物條例》（第 123 章）第 38 條訂立）

1. 生效日期

本規例自 2021 年 2 月 1 日起實施。

2. 廢除

《建築物（建造）規例》（第 123 章，附屬法例 B）現予廢除。

發展局局長
黃偉綸

2020 年 1 月 6 日

Legal matters

The Buildings Ordinance and related legislation are amended as and when appropriate to reflect technological advancement and changing circumstances.

The Department enforces the law and prosecutes offenders with rigour and organises public education programmes to promote building safety and preventive maintenance.

Buildings Ordinance and related Legislation

You may refer to the electronic version of the legislation of Hong Kong, which is intended for **information purposes only**, in the Bilingual Laws Information System (BLIS) of the Department of Justice through the following links.

For official versions of the legislation of Hong Kong, you should refer to **the loose-leaf edition** of the Laws of Hong Kong and the Government Gazette.

Buildings Ordinance and the Subsidiary Regulations

- CAP 123 Buildings Ordinance
- CAP 123A Building (Administration) Regulations
- CAP 123C Building (Demolition Works) Regulations
- CAP 123D Building (Escalators) Regulations (Repealed)
- CAP 123E Building (Lifts) Regulations (Repealed)
- CAP 123F Building (Planning) Regulations
- CAP 123G Building (Private Streets and Access Roads) Regulations
- CAP 123H Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulations
- CAP 123I Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations
- CAP 123J Building (Ventilating Systems) Regulations
- CAP 123K Building (Oil Storage Installations) Regulations
- CAP 123L Building (Appeal) Regulation
- CAP 123M Building (Energy Efficiency) Regulation
- CAP 123N Building (Minor Works) Regulation
- CAP 123O Building (Minor Works) (Fees) Regulation
- CAP 123P Building (Inspection and Repair) Regulation
- CAP 123Q Building (Construction) Regulation

NO CAP 123B Building (Construction) Regulations on the website of Buildings Department

《建築物（建造）規例》

（第 123 章，附屬法例 Q）

58. **混凝土立方塊**

(1) 混凝土的抗壓強度須[illegible]後 28 天測試標準的 150 毫米立方塊的方式釐定。

Building (Construction) Regulation

(Cap. 123 sub. leg. Q)

58. **Concrete cubes**

(1) The compressive st[illegible]f concrete shall be determined by testing standard [illegible] 28 days after mixing.

Appendix

Amendments to the Code of Practice for Structural Use of Concrete 2013 (2020 Edition)

(February 2022)

Legends:

Amended

Deleted

Appendix

Item	Current version	Amendments
5. Clause 10.3.4.2(a)	10.3.4.2 Concrete Cube Tests During Construction (a) Concrete Cubes The compressive strength of concrete shall be determined by testing 100 mm or 150 mm cubes 28 days after mixing. A representative sample shall be taken from fresh concrete to make test cubes and each sample shall be taken from a single batch. The rate of sampling shall be at least that specified in Table 10.1 and at least one sample shall be taken from each grade of concrete produced on any one day.	10.3.4.2 Concrete Cube Tests During Construction (a) Concrete Cubes The compressive strength of concrete shall be determined by testing 100 mm cubes, or 150 mm cubes if the maximum aggregate size of concrete exceeds 20 mm, 28 days after mixing. A representative sample shall be taken from fresh concrete to make test cubes and each sample shall be taken from a single batch. The rate of sampling shall be at least that specified in Table 10.1 and at least one sample shall be taken from each grade of concrete produced on any one day.

SECTION 7

MAKING TEST CUBES FROM FRESH CONCRETE

7.1 SCOPE

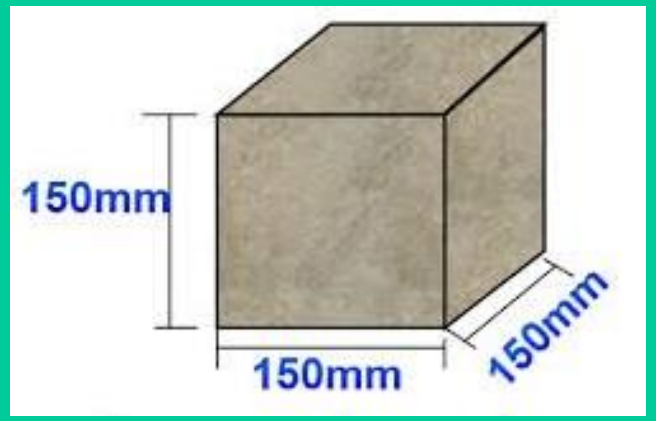
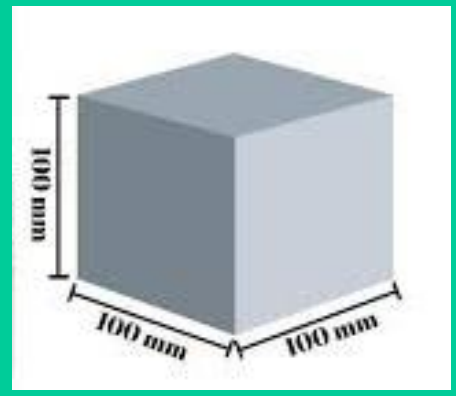
This Section describes the method of making test cubes from fresh concrete. The method applies to concrete but does not apply to aerated concrete or very stiff concrete which cannot be compacted by vibration alone.

The basic size of test cubes should be 100 mm or 150 mm and should be at least 3½ times the nominal maximum size of the aggregate in the concrete. The size of the test cube shall be 100 mm for concrete with the maximum aggregate size not exceeding 20 mm and shall be 150 mm with the maximum aggregate size exceeding 20 mm.

with neither excessive segregation nor laitance. The concrete shall be placed in the mould in layers approximately 50 mm deep and each layer shall be compacted either by using the compacting bar or by vibrating. The excess concrete above the upper edge of the mould shall be removed using steel trowels or floats and carefully level the surface. After the top layer has been compacted, it shall be levelled to the top of the mould with a steel float, and the outside of the mould shall be wiped clean. The mould shall not be overfilled.

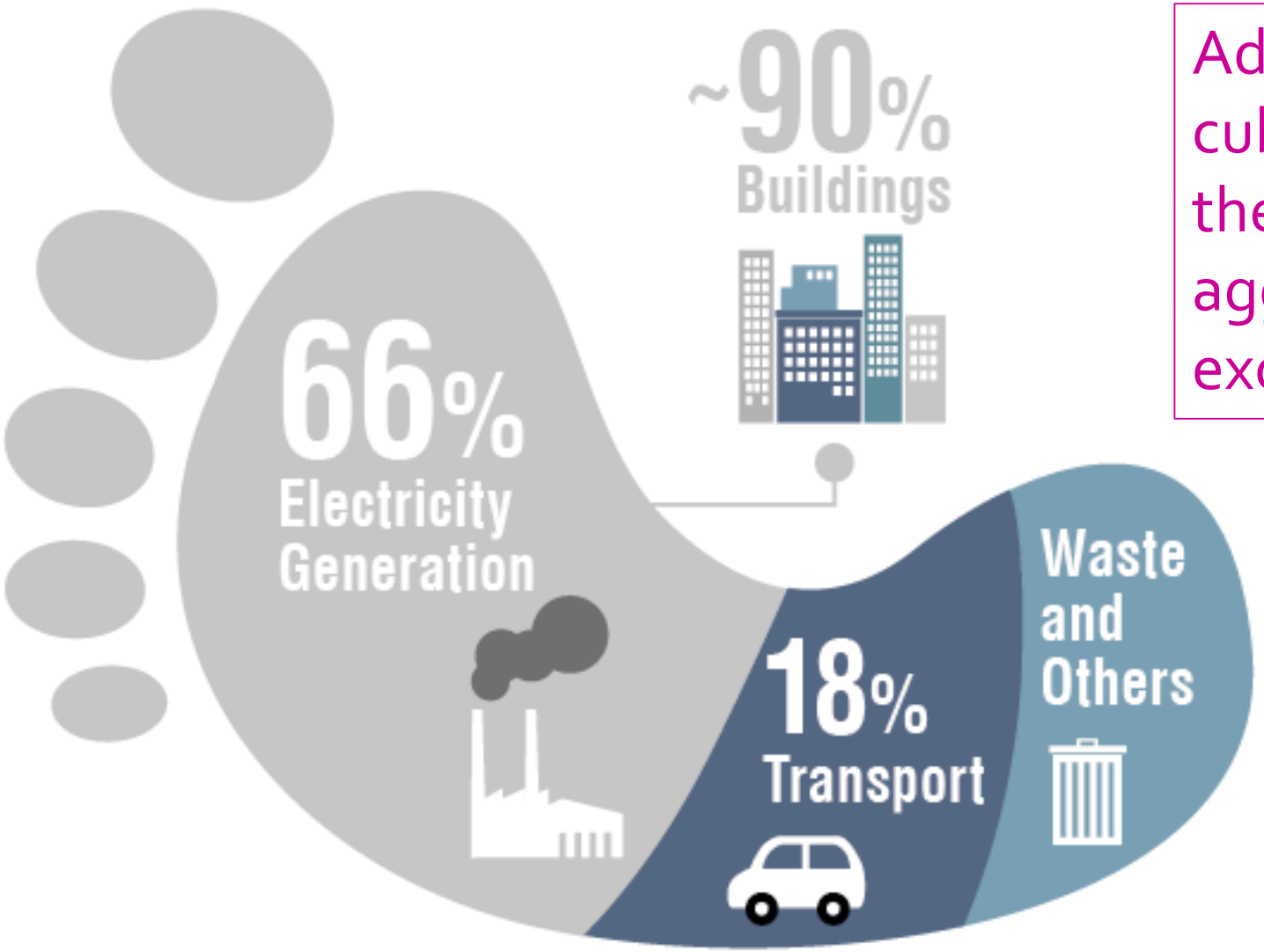
7.4.2 Compacting with compacting bar

During the compaction of each layer with the compacting bar, the strokes shall be distributed

		
Mass	~ 8 kg **(heavier – operators get hurt easier)** **(increase landfill burden)**	~ 2.5 kg
Volume	150mm x 150mm x 150mm **(occupies more space in a curing tank)** **(more consumption of electricity)**	100mm x 100mm x 100mm

	100mm Cube	150mm Cube
Maximum number of cube per tank	800	370

Adoption of 100 mm cubes for concrete with the maximum aggregate size not exceeding 20 mm.



Hong Kong Carbon Emission Sources @ 2019

The End & Thank you!

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