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Housing, Planning and Lands Bureau
Murray Building
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Hong Kong

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**HOUSING, PLANNING AND LANDS BUREAU
TECHNICAL CIRCULAR (PLANNING AND LANDS)
NO. 1/2007**

**Data Alignment Measures
for the Exchange of Planning, Lands and Public Works Data**

Scope

This Circular announces the implementation of the Data Alignment Measures for the exchange of planning, lands and public works data. It shall be read in conjunction with Environment, Transport and Works Bureau Technical Circular (Works) No. 38/2002 and No. 38/2002A “Computer-Aided-Drafting Standard for Works Projects”, and Housing, Planning and Lands Bureau Technical Circular (Planning and Lands) No. 2/2007.

2. The Secretary for the Environment, Transport and Works, Commissioner for Census and Statistics, and Commissioner of Rating and Valuation have been consulted and agreed with the provisions of this Technical Circular.

Effective Date

3. This Circular shall take immediate effect.

Effect on Existing Circulars

4. This Circular supersedes Planning, Environment and Lands Branch Technical Circular No. 3/96 “Documentation for Digital Geographic Data”.

Definition

5. In this Circular, unless the context otherwise requires,
- (a) “Final Report” means the Final Report on Implementation of Data Alignment Measures for the Alignment of Planning, Lands and Public Works Data published in Housing, Planning and Lands Bureau (HPLB)’s website, address as follows –
<http://www.hplb.gov.hk/eng/publication/dam.htm>
 - (b) “Data Alignment Measures” (DAM) means the 6 initiatives as stated in paragraph 10 below, which are the short term measures to improve the planning, lands and public works data exchange processes among Participating Departments;
 - (c) “Planning, Lands and Public Works (PLW) data” means geographic data, Computer Aided Drawing (CAD) data and textual data which could be in digital or in hard copy format;
 - (d) “Participating Departments (PDs)” means Architectural Services Department (ArchSD), Buildings Department (BD), Census and Statistics Department (C&SD), Civil Engineering and Development Department (CEDD), Drainage Services Department (DSD), Electrical and Mechanical Services Department (E&MSD), Environmental Protection Department (EPD), Highways Department (HyD), Housing Department (HD), Lands Department (LandsD), Land Registry (LR), Planning Department (PlanD), Rating and Valuation Department (RVD), Transport Department (TD) and Water Supplies Department (WSD);

- (e) “Common Spatial Units” (CSUs) means the standard units for exchange of Geospatial Data, comprising the spatial data and a set of common attributes as defined in the Final Report;
- (f) “Data Owners” means those PDs which are data source owners of CSU attributes. They are responsible for making reasonable effort to ensure the quality, completeness and currency of the provided data, converting them to the agreed CSU specification, and submitting them to the respective Data Agent for dissemination to Data Users;
- (g) “Data Agents” means those designated PDs which are responsible for the preparation of CSU data, including the integration, manipulation and conversion of received CSU attributes from Data Owners; the assignment and maintenance of the unique CSU ID; and regular dissemination to the Data Users;
- (h) “Data Users” means those PDs who receive CSUs from the Data Agents. They are responsible for mapping the CSUs to their internal computer systems;
- (i) “Geographic Information Systems” (GISs) means those computer systems for the input, editing, storage, retrieval, analysis, manipulation, display or output of location-based information or geographically referenced information; and
- (j) “Geospatial Data” means the information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the Earth.

Background

6. In recent years, government departments have made significant progress in capturing, updating and analyzing geographic data for the development of GISs to meet departmental requirements. Notwithstanding the progress made, there are

problems in data exchange arising from data definition, compatibility of digital format, data quality, data conversion and turnaround time.

Data Alignment Strategy

7. In 2000, the then Planning and Lands Bureau commissioned a consultancy study for the purpose of streamlining the exchange of PLW data between government departments and business partners. The study recommended the implementation of a Data Alignment Strategy¹ (DAS) to, inter alia, improve the exchange of PLW data. It would comprise a two-stage approach, viz. the implementation of DAM to improve data exchange processes in the short-term, and a Data Alignment Framework as a longer-term strategy to be considered based on experience gained from the implementation of DAM.

8. The DAS is complementary to the Government's Digital 21 Strategy² and facilitates the adoption of the Interoperability Framework³ promulgated by the Office of Government Chief Information Officer (OGCIO).

Data Alignment Measures

9. In 2003, the HPLB commissioned the consultancy study on "Implementation of Data Alignment Measures for the Alignment of Planning, Lands and Public Works Data" to take forward the implementation of DAM. 12 major producers and users of PLW data departments⁴ joined the study. The consultancy study was completed in March 2004 and departments concerned agreed to proceed with the implementation of six DAM solutions and the conduct of a Situation Analysis Review (SAR) afterwards to evaluate the effectiveness and benefits of the

¹ A summary of the DAS is at <http://www.hplb.gov.hk/eng/publication/dam.htm>

² The policy of GIS infrastructural development is at OGCIO's Digital 21 (2004) website at <http://www.ogcio.gov.hk/eng/digital/edigital.htm>

³ The Interoperability Framework is at OGCIO's website at <http://www.ogcio.gov.hk/eng/infra/eif.htm>

⁴ The 12 departments include ArchSD, BD, C&SD, CEDD, DSD, E&MSD, HyD, LandsD, LR, PlanD, RVD and WSD.

different measures in DAM. The Final Report is accessible at HPLB's website, address as follows –

<http://www.hplb.gov.hk/eng/publication/dam.htm>

10. The scope of each of the six DAM initiatives is as follows –

- (a) DAM 1: Common Spatial Units – to establish CSUs for solving the data definition problems of the most commonly exchanged Geospatial Data among PDs. Five CSUs have been identified: Slope, Building, Lot, Road Centreline and Tertiary Planning Units/Street Blocks (TPU/SB).
- (b) DAM 2: Symbology for graphic entities – to establish an inventory of GIS data containing the map style, map series, GIS platform details and the name of PD which maintains symbols specification.
- (c) DAM 3: Standards on the file formats for exchanging data – to streamline file conversion through standardizing file formats for the exchange of data.
- (d) DAM 4: Policy on exchange of data in electronic form – to formulate appropriate policy relating to the exchange of PLW Data.
- (e) DAM 5: Metadata catalogue service – to leverage the facilities now available with LandsD and to enhance the LandsD's Metadata Catalogue System (MCS) to meet the requirements for the catalogue service of the metadata documentation of the PDs.
- (f) DAM 6: Metadata production tools – to prepare an inventory report of metadata tools now being maintained by PDs.

Policy

11. All PDs shall comply with the DAM Final Report's recommendations in respect of their respective roles as Data Owners, Data Agents and Data Users. All

GIS Managers/Administrators⁵ in PDs shall produce and submit GIS metadata documentation of their GISs to the MCS of the LandsD to facilitate sharing and re-use of Geospatial Data. For CSU data, the respective Data Agents shall produce and submit the metadata documentation to LandsD. The Data Owners shall provide every assistance and necessary information to the Data Agents for compilation of the metadata documentation of the CSU data.

Implementation of DAM

12. This Circular is applicable to all PDs in DAM.

DAM 1 - Common Spatial Units

13. The DAM aligns five types of CSUs which are frequently exchanged between PDs. They are Building CSU, Lot CSU, Road Centreline CSU, Slope CSU and Tertiary Planning Unit/Street Block CSU. While there may be more than one Data Owner for the various CSU data of each CSU, a department is assigned as the sole Data Agent for each CSU. The Data Agent shall collate CSU data from all Data Owners and distribute the respective CSU data to Data Users. The Data Agents for the five CSUs are-

<u>CSU</u>	<u>Data Agent</u>
Building CSU	LandsD
Lot CSU	LandsD
Road Centreline CSU	LandsD
Slope CSU	CEDD
Tertiary Planning Unit/ Street Block CSU	PlanD

⁵ The appointment of GIS Manager/Administrator is mandated in Housing, Planning and Lands Bureau Technical Circular (Planning and Lands) No. 2/2007.

14. The PDs' role as Data Owners, Data Agents and Data Users is defined in the table⁶ below-

PDs	Slope	Building	Lot	Road Centreline	TPU/SB
ArchSD	Data Owner, Data User	Data Owner			
BD	Data User	Data Owner, Data User	Data User		Data User
C&SD		Data User			Data User
CEDD	Data Agent, Data Owner, Data User		Data User	Data User	Data User
DSD	Data Owner, Data User		Data User	Data User	Data User
E&MSD		Data User	Data User	Data User	
EPD		Data User	Data User	Data User	Data User
HyD	Data Owner, Data User			Data User	
HD	Data User	Data User	Data User	Data User	Data User
LandsD	Data Owner, Data User	Data Agent, Data Owner, Data User	Data Agent, Data Owner, Data User	Data Agent, Data Owner, Data User	Data User
LR			Data Owner (for Textual Data only)		
PlanD		Data Owner, Data User	Data User	Data User	Data Agent, Data Owner, Data User
RVD		Data Owner, Data User	Data User		Data User

⁶ The table to define PDs' role is published alongside the DAM Final Reports at <http://www.hplb.gov.hk/eng/publication/dam.htm>

PDs	Slope	Building	Lot	Road Centreline	TPU/SB
TD		Data User		Data User	
WSD	Data Owner, Data User				

HD, EPD and TD joined as PDs from August 2005 onwards. They are currently Data Users of the appropriate CSUs.

15. The detailed specifications of the 5 CSUs are published in Volume 2A to 2E of the Final Report. In the course of CSU implementation, the detailed data specifications and technical standards may require modification to suit the latest development of DAM. Data Agents shall work out the required modifications in consultation with Data Owners and Data Users and promulgate such modifications through Practice Notes for PDs to comply with the standards in data exchange.

DAM 2 - Geospatial Symbolology

16. The original scope for the DAM 2 was to achieve 'standardization' of symbolology. However, upon completion of the consultancy study, the consultant recommended, and PDs agreed, not to proceed with standardization of symbolology. Instead, PDs should have the autonomy to adopt the symbolology standards as defined by source agents (e.g. CSU Data Owners) or choose their own symbols for specific presentation purposes. Information about the symbol specifications should be made available from the data source agents when requested by Data Users.

DAM 3 - File Formats Standards for data exchanges

17. E00 (Exported from Arc/Info Coverage Version 7.x) and DGN v7 (3D) with attributes storing in separated files are the recommended initial set of File Formats Standards for geospatial information. For E00 format, textual attributes of

the Geospatial Data can be embedded within the file. For DGN format, associated textual attributes should be stored in a DBF file which is linked to the DGN using MSLINK. Pure textual data exchange that does not link with Geospatial Data may be involved in the data provision process of CSUs such as Building & Lot. The respective Data Agents shall prepare a common and mutually agreed XML schema, in compliance with the standard defined in the Interoperability Framework, for data exchange with the Data Owners. The detailed file formats standards are published in Volume 2G of the Final Report. As a special arrangement, ArchSD may provide building information in DWG format to LandsD.

DAM 4 - Management Framework

18. For the smooth implementation of DAM, the organizational framework for the DAM consultancy study, which comprises a DAM Task Force and a DAM Working Group, is maintained to oversee ongoing tasks of the implementation of DAM until the completion of the SAR. The terms of reference and membership of the DAM Task Force and Working Group are stipulated in *Appendices A* and *B* respectively. Upon the completion of SAR, the DAM Task Force shall consider the appropriate organizational framework for further steering of the DAM initiative.

DAM 5 and 6 - Documentation Requirements for Metadata

19. Many PDs have already prepared a catalogue of their GISs, which provides an overview on the information contained in the GISs. To facilitate data sharing, proper metadata should be prepared.

20. The GIS Administrator of PDs shall be responsible for the preparation of the metadata documentation of his GIS. Data Agent of CSU data shall prepare the metadata documentation of his responsible CSU data. All the metadata documentation shall be deposited at the MCS of LandsD. The documentation shall be made available to all government departments. Private sectors and the public can

also access the metadata documentation, except where the Geospatial Data are sensitive, confidential or restricted for internal use only.

21. All documentation for metadata should be reviewed and updated by the GIS Administrator at least once every six months or upon major amendments. The GIS Administrator shall subsequently inform LandsD of the result of the review no matter whether there is any change in the metadata documentation or not. LandsD shall circulate a report to all PDs and HPLB annually on the up-to-dateness of metadata documentation provided by PDs for their confirmation and follow-up action, if required. The requirements shall consist of a catalogue as per *Appendix C* and the metadata documentation conforming to US Federal Geographic Data Committee's (FGDC) Standard, i.e. Content Standard of Digital Geospatial Metadata (the latest version). A brief introduction of FGDC standard is attached at *Appendix D*.

Situation Analysis Review

22. Subject to a review by the DAM Task Force, a follow-up SAR is planned to be carried out to evaluate the effectiveness, savings and benefits of the different measures in DAM.

(Signed)

(Miss Annie Tam)
for Secretary for Housing, Planning and Lands

c.c. Secretary for the Environment, Transport and Works
Secretary for Financial Services and the Treasury
Commissioner for Census and Statistics
Commissioner of Rating and Valuation
Government Chief Information Officer

DAM Task Force

Terms of Reference

The DAM Task Force assumes the role of Project Steering Committee for DAM and has the following responsibilities:

- (a) To steer the policy development of DAM and to oversee its implementation.
- (b) To oversee overall management of implementation of the short term DAM and their migration to the long term Data Alignment Framework.
- (c) To appoint members to the DAM Working Group and to endorse major deliverables recommended by the Working Group.
- (d) To promote DAM to other government departments using GIS, and to improve the usefulness and richness of the CSUs by coordinating and requesting government departments to contribute more Geospatial Data for mutual benefits.

Membership

Chairman	Deputy Secretary (Planning and Lands) ¹
Members	Principal Assistant Secretary, PAS (PL) ¹ , HPLB Chief Assistant Secretary, CAS (W) ⁷ , ETWB Representatives at directorate level from- BD C&SD CEDD DSD HyD LandsD LR OGCIO PlanD RVD

Secretary

Systems Manager, HPLB

Other government departments attending on a need basis

DAM Working Group

Terms of Reference

- (a) To report to and implement the DAM under the directives of the DAM Task Force.
- (b) To manage, monitor and review the overall implementation of DAM.
- (c) To recommend the DAM deliverables from the Project Team to the DAM Task Force for endorsement.
- (d) To endorse the CSU, metadata, file formats and symbology specifications and standards for the issue of Practice Note by Data Agents.
- (e) To endorse CSU custodianship, the mechanism on maintenance of CSU, symbol specification, file formats standards and metadata management.
- (f) To appoint sub-working groups for the development of CSUs, metadata, file formats and symbology and approve recommendations made by the sub-working groups.

Membership

Chairman	Principal Assistant Secretary (Planning and Lands) 1
Members	Representatives at Senior Professional/Professional level from- - ArchSD - BD - C&SD - CEDD - DSD - E&MSD - EPD - ETWB - HD - HyD

LandsD
LR
OGCIO
PlanD
RVD
TD
WSD

Secretary Systems Manager, HPLB

Other government departments attending on a need basis

Format for Catalogue of Metadata

Owner	Institution/Department/Company, <i>e.g. Lands Department (LandsD)</i>
Geospatial Data Name	Short GIS name, <i>e.g. Basic Mapping System (BMS)</i>
Descriptions	Function of the GIS, <i>e.g. This mapping information was converted from the original 1:1000 scale survey sheets and is being continuously up-dated. The digital map features are separately coded thereby enabling selective retrieval and display. The dataset is widely used for land administration, planning, engineering development and record purposes by the private sectors and the HKSAR Government. This versatile, up-to-date digital mapping system also serves as a common database for all other GIS applications.</i>
GIS Manager	Post: address, telephone, fax number, e-mail address, <i>e.g. CLS/LIC; 23/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong; Tel. (852) 2231 3828; Fax. (852) 2877 8520; email clslic@landsd.gov.hk</i>
GIS Administrator	Post: address, telephone, fax number, e-mail address, <i>e.g. SLS/LIC2; 23/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong; Tel: (852) 2231 3840; Fax: (852) 2877 8520; email: slic2@landsd.gov.hk</i>
Sources	source(s) of the data in the GIS system, <i>e.g. Digital Topographic Survey Data, Digital Title Survey Data, Photogrammetric Field Sheet, 1:1000 Survey Sheet and 1:1200 Survey Sheet</i>
System Platform	technology description, information of hardware, software and operation system, <i>e.g. Hardware: SUN Workstations Software: ArcInfo 7.2.1 Operation System: SUN Solaris 2.6 Chinese</i>

Item Identifier(s)	list the objects/identifiers in the dataset(s), <i>e.g. Boundary Feature, Bench Mark, Building Polygon, Contour, General Annotation, Geodetic Control Station, Miscellaneous Line, Miscellaneous Point, Sand, Railway, Relief, Hydrology, Road, Artificial Slope, Spot Height, Utility Point, Building Related Feature, Old Building, Proposed Building, Proposed Road, Proposed Infra</i>
GIS Data Coverage	extent of data, state boundaries, <i>e.g. Whole HKSAR</i>
Users	Primary User, <i>e.g. LandsD</i> Secondary Users, <i>e.g. Other government departments and private sectors</i>
Availability	Restrictions and constraints to the use of the GIS data; i.e. contains confidential data items, <i>e.g. The Government of the HKSAR is the copyright owner of the digital data, which is available for sale to the public at prescribed charges. The Government will issue a non-exclusive and non-transferable licence to the customer after he/she has purchased the data. The licensee is permitted to use the data from the date as set out in the Licence. The licensee must have obtained written consent from the Government and paid the necessary royalty charges before he/she can incorporate the digital data in any product for distribution to any third party. If the licensee ceases using the digital data, the licensee should confirm to the Government in writing that the data has been erased from his/her computer system. Sample data for testing computer system is available free of charge. Sample data for academics for teaching purpose are available on request at a nominal administrative fee. The digital data would be provided to other government departments or their consultants free of charge.</i>
Symbology	Set of Symbols used in GIS to identify items of data; <i>e.g. BMS symbology</i>
Metadata Name	Name of the metadata database, <i>e.g. B1000</i>
Data Dictionary/ Specification	Name of Data Dictionary, <i>e.g. BMS Data Dictionary Version 3.0</i>

(The content of this Appendix is extracted from Appendix C of Volume 2H of the DAM Final Report. To maintain data concurrency, the original paragraphs 1.8 & 1.9 have been combined into paragraph 1.8 to reference information directly from the FGDC website.)

Metadata and Tools

1 Federal Geographic Data Committee (FGDC) Standard

1.1 The Federal Geographic Data Committee (FGDC) initiated work on the first version of this standard in June 1992, through a forum on geospatial metadata. The committee accepted the offer of American Society for Testing and Materials Section D18.01.05 “Standard Specification for Content of Digital Geospatial Metadata” (D5714-95) to develop a draft information content standard. Extensive comments were received from the public with additional drafts produced. The refined drafts were offered for review and testing in January and March 1994. The first version was approved June 8, 1994.

1.2 Since the implementation of FGDC’s Content Standard for Digital Geospatial Metadata (CSDGM, FGDC Metadata Standard), the Standard has been adopted by Federal, state, and local agencies, companies, and groups in the US. It has also been used by other nations as they develop their own national metadata standards. As a result of this international exposure and the feedbacks received from agencies, the FGDC updated the Metadata Standard and re-published in June 1998.

1.3 The objective of the FGDC metadata standard is to provide a common set of terminology and definitions for the documentation of digital Geospatial Data that can be made compatible with current requirements and good practices now being adopted by the various user groups within the US and other countries. The standard establishes the names of data elements and compound elements (groups of data elements) to be used for these purposes, the definitions of these compound elements and data elements, and information about the values that are to be provided for the data elements.

1.4 The metadata standard will serve to provide a common set of terminology and definitions for concepts related to the metadata. It should be independent of software and hardware platforms and should cover the four roles played by the metadata as below:-

- (a) Availability – Information required to determine the sets of data that exist for a geographic location;
- (b) Fitness for use – Information required to determine if a set of data meets a specific need;

- (c) Access – Information required to acquire an identified set of data; and
- (d) Transfer – Information required to process and use a set of data.

1.5 The scope of this standard is intended to support the collection and processing of geospatial metadata. The standard is not intended to reflect an implementation design. An implementation design requires adapting the structure and form of the standard to meet application requirements. In addition, the standard does not specify the means by which this information is organized in a computer system or in a data transfer, nor the means by which this information is transmitted, communicated, or presented to the user.

1.6 The standard specifies the elements that are required to support three major uses of metadata: (1) to maintain an organization's internal investment in Geospatial Data, (2) to provide information to data clearinghouses and catalogs, and (3) to provide information needed to process and interpret data transferred from another organisation.

1.7 The FGDC Metadata Standard includes elements relating to:

- (a) Identification;
- (b) Data Quality;
- (c) Spatial Data Organization;
- (d) Spatial Reference;
- (e) Entity and Attribute;
- (f) Distribution;
- (g) Metadata Reference;
- (h) Contact;
- (i) Time Period;
- (j) Citation.

1.8 The FGDC metadata standard has a hierarchical structure and is organized into approximately 300 data elements, 199 of which are data entry elements and the remainder are grouping elements (compound elements). Of these 199 elements, several dozen are considered "mandatory" and around 100 are considered "mandatory if applicable" -- a classification which requires interpretation by the user. The rest are optional to provide structured places for information that would otherwise become lost in generalized comment fields. More information can be found at:

http://www.fgdc.gov/standards/projects/FGDC-standards-projects/metadata/base-metadata/v2_0698.pdf (CSDGM FGDC-STD-001-1998)

http://www.fgdc.gov/metadata/documents/workbook_0501_bmk.pdf (Workbook for use with CSDGM)

<http://www.fgdc.gov/dataandservices/fgdcmeta/?searchterm=compound>
(Compound Elements and Data Elements)