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

Final Report (Volume 2B)
Specification and Explanatory Notes of Building CSU

March 2004

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0	Initial Release		1.0	4 Mar 2004	

Amendment History

Volume 2B – Specification and Explanatory Notes of Building CSU

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1   Introduction

1.1   General Overview

1.1.1   The Building Common Spatial Unit (Building CSU) is a standard common spatial unit, comprising spatial data and a set of common attributes, which is defined to facilitate business collaboration that requires exchange of geospatial data of buildings.

1.1.2   This document gives the specification of Building Common Spatial Unit (Building CSU) which shall be followed by all participating departments in the data exchange process. Participating Departments are not obliged to adopt the same specification for their internal systems.

1.1.3   The CSU specification includes 4 major components:

(a)   CSU Definition – to describe the scope covered in the CSU, the rules adopted for the delineation of CSU polygons, the CSU Identifier to uniquely identify a CSU, and the data custodianship;

(b)   CSU Workflow – to describe the processes and workflows involved in the production and exchange of CSU data during different stages of a CSU lifecycle;

(c)   CSU Data Interface Requirement – to describe the logical structure of CSU data exchanged between the interfacing systems of PDs;

(d)   Maintenance of the CSU – to describe the regular mode and frequency of data provision by Data Owners, and dissemination by the Data Agent.

1.2   Enquires

1.2.1   Any enquires to the specification shall be referred to the DAM Management Committee, c/o HPLB.

2   CSU Definition

2.1   Overview

2.1.1   Building information is core to the business of the PDs of HPLB and FSTB. Works Departments of ETWB would require similar information in the delivery of works projects. To meet the common interest of the PDs, the required building information is not only limited to that of the private buildings, but it also includes the non-private buildings like government buildings, HA buildings (public housing and Home Ownership Scheme estates) and other small building structures on government land and private land.
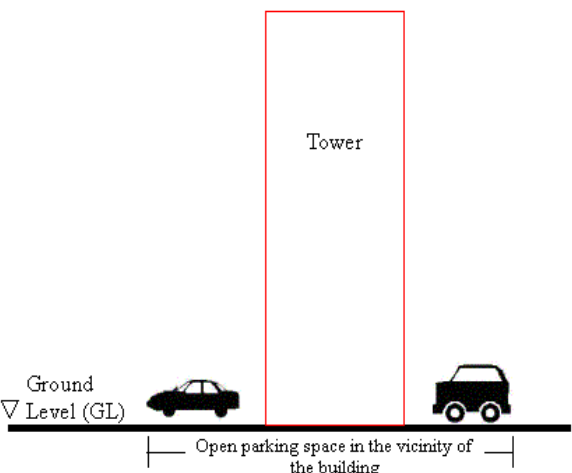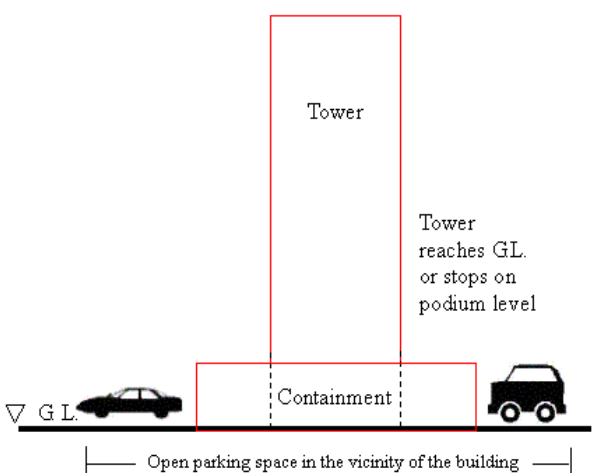
2.2   Scope

2.2.1   In the context of the Building CSU, the scope includes the following five building categories:

   (a)   Category 1: Both towers and podiums of Legal Private Buildings, and Housing Authority (HA) / Housing Society (HS) buildings under jurisdiction of the Buildings Ordinance (these include HA's Home Ownership Scheme (HOS) buildings developed under the Private Sector Participation Scheme (PSPS) and HS's buildings that require an occupation permit and are under the jurisdiction of the Buildings Ordinance);

   (b)   Category 2: New Territories Small Houses (a type of New Territories Exempted House (NTEH));

   (c)   Category 3: HA Buildings (including towers and podiums) - public housing and HOS estates (but except those under PSPS);

   (d)   Category 4: Other Government Buildings - including towers and podiums of government owned properties such as government offices, public schools, hospitals, etc.;

   (e)   Category 5: Miscellaneous Structures including temporary and open structures.

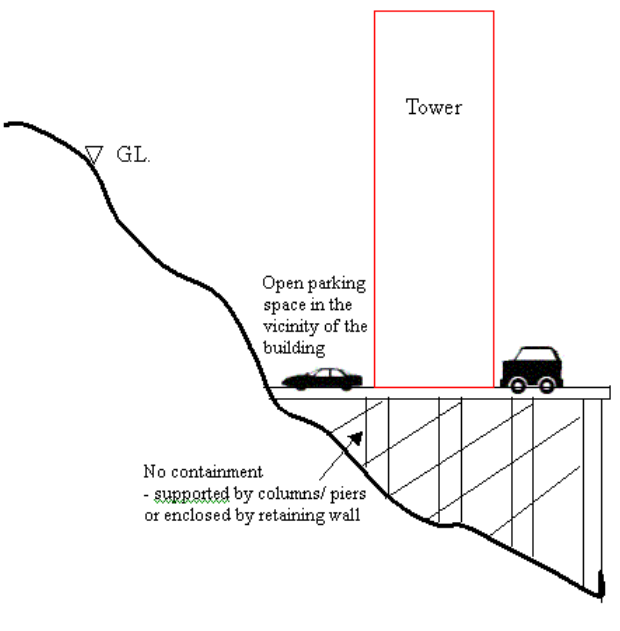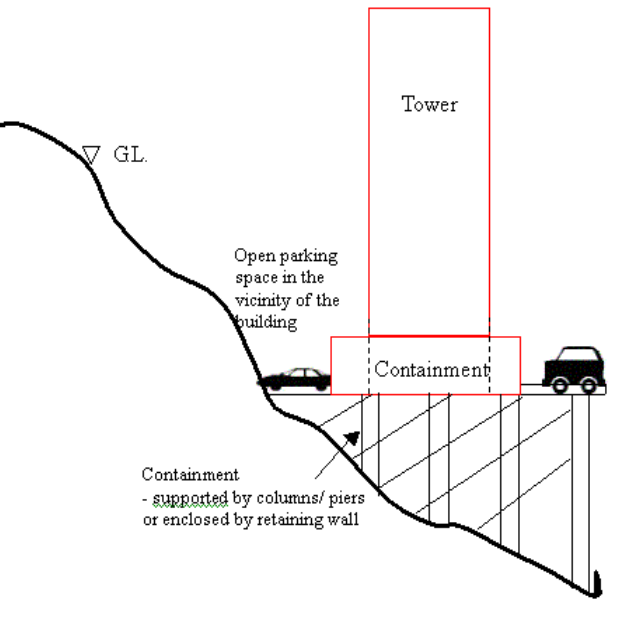2.2.2   Of each of the above categories of buildings, a building structure comprises tower(s) whereas in some cases, a building structure comprises tower(s) and podium(s). When applicable in a building structure, tower and podium are represented as separate building polygons (spatial representation of common spatial units in the Building CSU).   A building polygon could mean either a tower polygon or a podium polygon.

(a)   Tower - refers to "all permanent buildings, open side structures and temporary structures of a reasonable size as stipulated in the latest B1000 specification released by LandsD".

(b)   Podium - Figure 1 depicts the scope of Building Podium.

     (i)   Podium means a containment with facilities for a designated purpose (e.g. shops, car park etc) above ground. Usually, podium together with the tower would form the integral building structure.

     (ii)   A building structure entirely below ground is not within the scope of the Building CSU, except for its entrance / exit which may be a structure above ground. For example, the underground MTR stations and underground oil tanks are excluded from the scope.

     (iii)   The underground storeys of a tower/podium is regarded as part of the tower/podium and would not be delineated as a separate building polygon as explained in Case 6 in Figure 1.

1. Facilities on ground, without containment - **Podium polygon is not required**	2. Facilities on ground and on structure, with containment - **Podium polygon is required**
Tower Ground ▽ Level (GL) Open parking space in the vicinity of the building	Tower Tower reaches GL. or stops on podium level ▽ G.L. Containment Open parking space in the vicinity of the building

Case 1:   Only a tower polygon is required. The tower polygon does not cover the area of the ground level open parking spaces.

Case 2:   A tower polygon and a podium polygon are required. The podium polygon does not cover the area of the ground level open parking spaces.

Case 3: Only a tower polygon is required. The tower polygon does not cover the area of the supporting columns/piers.

Case 4: A tower polygon and a podium polygon are required. The podium polygon does not cover the area of the supporting columns/piers and the open parking spaces.

| 5. Facilities on structures, with containment on the hilly ground - **Podium polygon is required** | 6. Facilities underground, with containment - **Podium polygon is not required** |
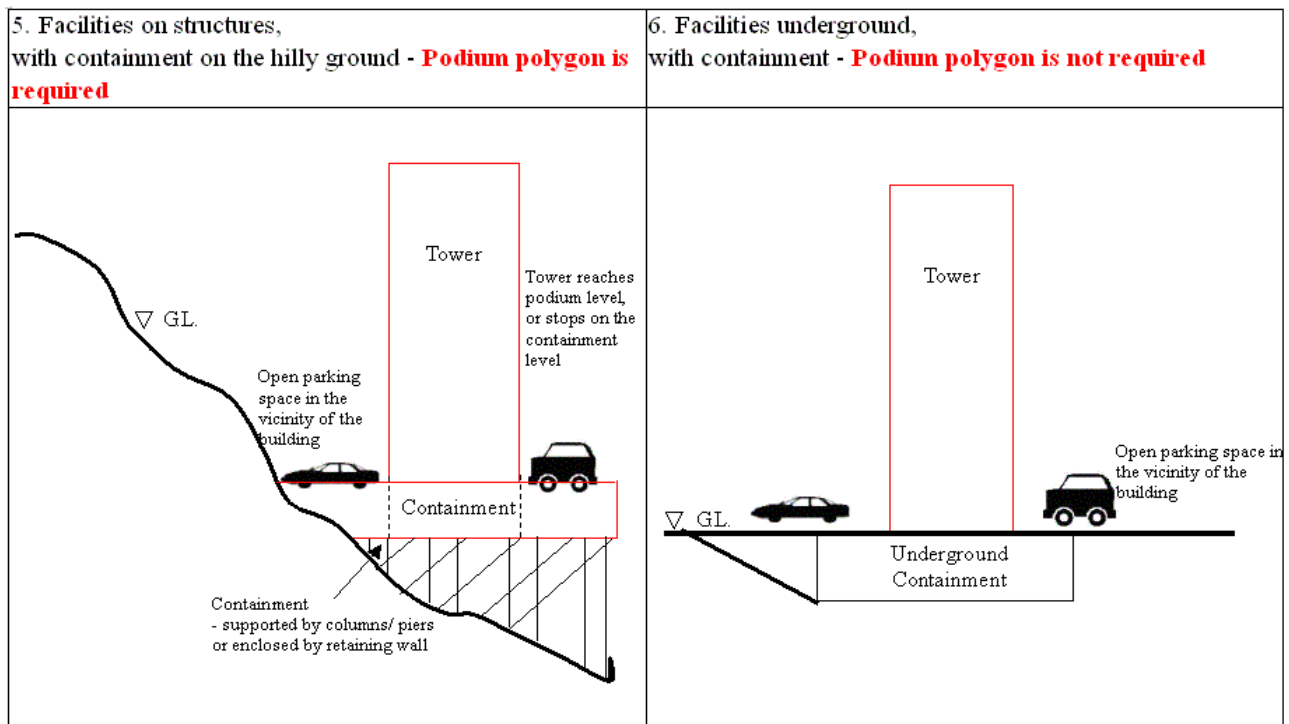
Case 5:   A tower polygon and a podium polygon are required. The podium polygon covers only the containment but not the supporting columns/piers.

Case 6:   Only a tower polygon is required showing the footprint of the tower. Relevant information that describes the attached underground containment will be included in the associated textual attributes (e.g. "No. of Storeys Below Ground")

Figure 1 Scope of Podium

2.2.3   Individual building units within a tower or podium (e.g. tenancy units Flat 2B, XXX Mansion or Shop 123A, XXX Plaza or Car Park #134 XXX Mansion) are excluded from the scope of Building CSU.

2.3   Common Rules for Delineation and Shapes of Polygons

2.3.1   All building polygons of the Building CSU shall conform to the common rules for delineation and shapes of building polygons (in preparation stage) unless otherwise justified with reasons. Conformance to the common rules will help accomplish an accurate spatial geometry that indicates the location of the building, shape and commonly aligned number of polygons representing the building structure.

2.3.2   In the early stage of a building development, there is usually neither accurate construction information available nor land survey record. It is acceptable that approximate indication would serve the purpose, i.e. deviation from the common rules for the delineation and shapes of polygons is acceptable in this circumstance. The building polygons of the Building CSU shown at the early stage of the development are for indicative purpose only.

2.3.3   The draft of the common rules for delineation and shapes of building polygons is now under preparation by LandsD.   The ultimate arrangement is that the LandsD's maintained building polygons will be the building polygons of Building CSU. LandsD will have to revise the B1000 specification for towers polygons and develop a new section to include specification for podium polygons. Finalised details of the common rules would be included in the next release of B1000 Specification of LandsD.

2.3.4   Currently, BD has a definition of their department maintained building polygon. It is the intent that one to one mapping could be built between LandsD's building polygons (building polygons of Building CSU) and BD's building polygons. The drafting of the common rules will make reference to BD's building polygon definition. Details of the BD's building polygons definition are in Appendix A.1.1 for reference.

2.3.5   For podiums, LandsD would coordinate to close the podium lines to form a polygon for <u>new</u> podiums (i.e. those constructed after implementation of Building CSU). PlanD would offer their currently maintained podium polygons to LandsD who would choose to use these available podium polygons for the Building CSU, when applicable.

2.3.6   Example of one to one mapping between BD's and LandsD's polygons is explained below:

(a)   LandsD will digitize or update the building polygons (including tower polygons and podium polygons) based on the ground survey of the permanent buildings or structures as per the latest version of the B1000

specification. The specification will include the minimum plan area in the definition of the building structures, i.e. structures smaller than the specified area will not included.

(b)   A one to one mapping between BD's and LandsD's polygons (building polygons of Building CSU) for <u>new</u> Category 1 buildings (new building shall mean the new buildings constructed after implementation date of Building CSU) shall be maintained as far as possible. That is, common rules on delineation to determine the number of buildings polygons that represents a building structure or a development site shall be aligned between BD and LandsD and will included in the latest specification of B1000. The common rules on the shape of the building polygons shall follow the latest specification of B1000, but BD has the autonomy to retain their department rule on the shape of tower polygons for their internal use.

2.4   Common Attributes

2.4.1   The table below lists the common data attributes, comprising spatial data and textual attributes, of the Building CSU.

1. Address
a. Recorded Development Name
b. Surveyed Development Name
c. Recorded Building Name
d. Surveyed Building Name
e. Street Name
f. Building No.
g. Miscellaneous Address Reference
2. No. of Storey(s)
3. OP
a. OP No.
b. Lot No. as of OP
c. Building Type as of OP
d. OP Date
4. Completion Year/Monthy/Day
5. GFA
6. Approximate Building Top Level
7. Housing Scheme
8. Certificate of Exemption Date
9. Category
10. Demolition Completion Date

Table 1 Building CSU Common Attributes

2.4.2   Please refer to section 2.6 for Data Owner(s) for each common attribute and list of Data Users of the Building CSU.

2.4.3   One common attribute may have multiple components. Please refer to section 4 for detailed description and data format of each component of each attribute for data exchange purpose.

2.4.4   Components of the same common attribute will be contained in various data entities upon exchange among PDs. The relationship between common attributes and the data entities is summarised in section 2.6.

2.5   CSU ID

2.5.1   The Geo-reference No. could be a suitable reference identifier to uniquely identify a building polygon of the Building CSU. However, since Geo-reference No. represents the geographical location in granularity of not smaller than 1 metre, there is risk that it could be duplicated or is not persistent in certain cases where the polygons in close proximity to each other could be represented by the same label points. For example:

(a)   Tower polygon and podium polygon of the same building structure;

(b)   On a small piece of land, the demolished building and the newly built one (e.g. for New Territories Small Houses) were built at about the location.

2.5.2   To enforce uniqueness and persistence, a composite key, comprising Geo-reference No, Record Creation Date and Polygon Type, will be used to identify a building polygon of the Building CSU:

(a)   Geo-reference No. - it is a ten-digit ID formed by combining the Easting (x) and Northing (y) coordinates of the label point that is within the building polygon. Before combining the coordinates, all decimal figures are truncated. Also, because all coordinates within HKSAR begin with "8", this digit would be truncated as well. For instance, x,y-coordinates 832123.12.E, 845123.49.N form Geo. Ref. No. 3212345123. Geo-reference No. is available for all building polygons currently on the BLDGPOLY layer of LandsD's B1000 Library as below:
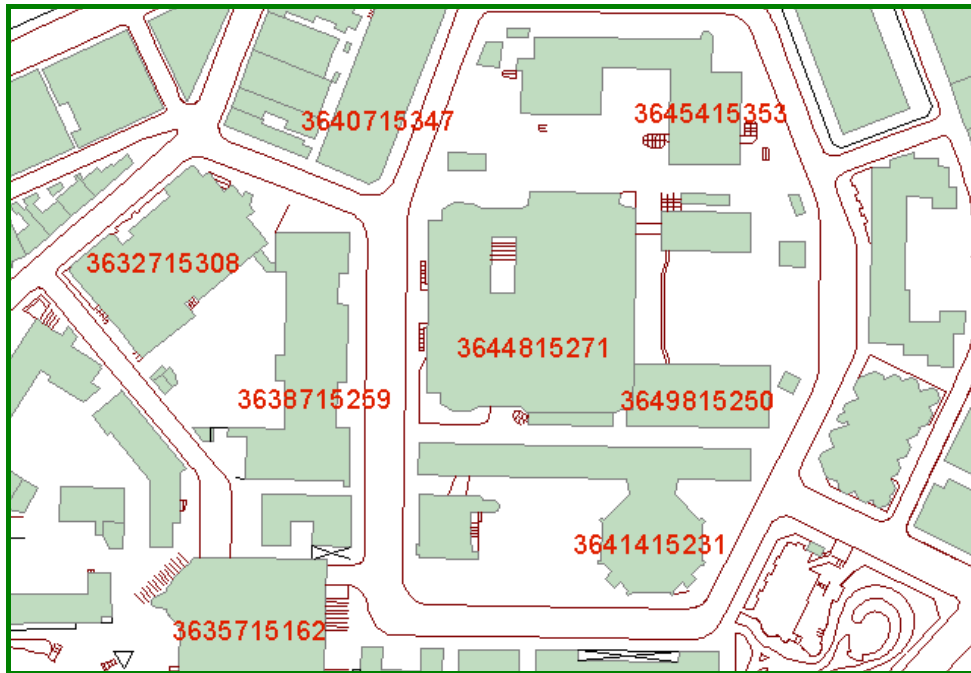
Figure 2 Building CSU ID - Geo-Reference No.

(b)   Record Creation Date - a new attribute will be introduced by LandsD to indicate the date when a building polygon is first created in CLIS (the date information will not be changed on change of the status from Proposed to Active - please see section 4.3). For example, the Record Creation Date information of a demolished building will be the same as that of the same polygon when it was in the active status.

(c)   Polygon Type - a new attribute will be introduced by LandsD to indicate whether the Building CSU is a tower polygon or a podium polygon.

2.5.3   For example, a Building CSU can be uniquely identified by (3644815271, 15/4/2003, T).

2.5.4   In the process of converting the existing buildings into the Building CSU dataset, CSU ID will be assigned in the following way:

(a)   Geo-reference No. - For tower polygons, the Geo-reference No. currently available in B1000 Library of LandsD will be adopted; for podium polygons, PlanD will contribute the first-cut podium polygons to the CSU and it is recommended that the Geo-reference No. of these podiums be assigned by LandsD for consistency and maintenance purposes.

(b)   Record Creation Date - Particular cut-off date(s) before implementation of the new CSU workflow will be chosen to be the Record Creation Date for all converted records.

(c)   Polygon Type - 'T' for all tower polygons, while 'P' for all podium polygons.

2.5.5   To facilitate processing by GIS software, a one-field format of the key is suggested, which concatenates the 3 components of the composite key. This composite key will be of 19 characters long in the format of GGGGGGGGGGTYYYYMMDD, where GGGGGGGGGG is the Geo-reference No, T is the Polygon Type and YYYYMMDD is the Record Creation Date. Hence, the CSU ID (3644815271, 15/4/2003, T) can also be represented as '3644815271T20030415'.

2.5.6   For convenience in record manipulation, a 9-digit identifier is suggested as an alternate key for linking up records in various entities. This identifier is to be generated by the system upon record creation (e.g. assigned by the import routines of the central database system hosted in the Data Agent). This physical identifier is used by computer programs only, and Data Owners and Data Users can use the 3-component composite key to represent the building polygons in the data exchange process.

2.6   Data Custodianship

2.6.1   Please refer to Volume 2I – Data Custodianship and License Agreement, for details about the defined roles and responsibilities for the Data Agent, Data Owner and Data User.

Data Agent

2.6.2   LandsD will be the Data Agent of the Building CSU.

Data Owners

2.6.3   Data ownership of the Building CSU is assigned by attribute and by building categories.

2.6.4   The Building Category information is maintained in each Building CSU for identification of Data Owners.

2.6.5   List of common attributes, corresponding Data Owners for each building category, as well as the entities storing the common attributes are summarized below:

Common Attribute	Entity	Data Owner				
		Category 1	Category 2	Category 3	Category 4	Category 5
1. Address						
a. Recorded Development Name	Development Name, Building Development Name	RVD	RVD	RVD	RVD	RVD
b. Surveyed Development Name	Development Name, Building Development Name	LandsD	LandsD	LandsD	LandsD	LandsD
c. Recorded Building Name	Building Name, Building Address	RVD	RVD	RVD	RVD	RVD
d. Surveyed Building Name	Building Name	LandsD	LandsD	LandsD	LandsD	LandsD
e. Street Name	Building Address, Street Location, Street Name, Location Name	RVD	RVD	RVD	RVD	RVD
f. Building No.	Building Address	RVD	RVD	RVD	RVD	RVD
g. Miscellaneous Address Reference	Building Address	RVD	RVD	RVD	RVD	RVD
2. No. of Storey(s)	Building Structural Info	BD	LandsD	PlanD	ArchSD	N/A
3. OP						
a. OP No.	Building OP Info	BD	N/A	N/A	N/A	N/A
b. Lot No. as of OP	Building Lot No In OP	BD	N/A	N/A	N/A	N/A
c. Building Type as of OP	Building Structural Info	BD	N/A	N/A	N/A	N/A
d. OP Date	OP Info, Building OP Info	BD	N/A	N/A	N/A	N/A
4. Completion Year/Month/Day	Building Structural Info	BD	LandsD	PlanD	ArchSD	N/A
5. GFA	Building Structural Info,	BD	N/A	N/A	N/A	N/A

Common Attribute	Entity	Data Owner				
		Category 1	Category 2	Category 3	Category 4	Category 5
	OP Info, Building OP Info					
6. Approximate Building Top Level	Building Structural Info	BD	LandsD	LandsD	ArchSD	LandsD
7. Housing Scheme	Building Geographical Info	PlanD[1]	N/A	PlanD	N/A	N/A
8. Certificate of Exemption Date	Building Geographical Info	N/A	LandsD	N/A	N/A	N/A
9. Category	Building Geographical Info, Building Structural Info	BD	LandsD	PlanD	ArchSD	LandsD
10. Demolition Completion Date	Building Geographical Info	BD	N/A	N/A	ArchSD	N/A

Table 2 Ownership of Common Attributes

2.6.6   Entities owned by each PD are summarised below, while the details are defined in the Data Ownership part under each entity in section 4.4:

PD	Entity	Ownership[2]
ArchSD	Building Geographical Info	F
	Building Structural Info	F
	Geo-Struct Mapping	R
	Data Provision Date	R
BD	Building Geographical Info	F
	Building Structural Info	F
	Geo-Struct Mapping	R
	Building OP Info	T
	OP Info	T
	Building Lot No In OP	T
	Data Provision Date	R

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[1] Applicable for those HOS buildings under PSPS scheme only.

[2] Mode of Ownership: T - the PD owns the entire entity; R - the PD owns all data items of particular records in the entity; F - the PD owns only particular data item(s) of particular record(s) in the entity.

PD	Entity	Ownership[2]
LandsD[3]	Building Geographical Info	F
	Proposed Tower Polygon	T
	Proposed Podium Polygon	T
	Active Tower Polygon	T
	Active Podium Polygon	T
	Demolished Tower Polygon	T
	Demolished Podium Polygon	T
	Building Structural Info	F
	Geo-Struct Mapping	R
	Development Name	R
	Building Development Name	R
	Building Name	R
	Data Provision Date	R
	Participating Department	T
	Renamed CSU	T
PlanD	Building Geographical Info	F
	Building Structural Info	F
	Geo-Struct Mapping	R
	Data Provision Date	R
RVD	Development Name	R
	Building Development Name	R
	Building Name	R
	Building Address	R
	Street Location	T
	Street Name	T
	Location Name	T
	Data Provision Date	R

Table 3 Ownership of Entities

2.6.7   Please refer to section 4.4 for the data items corresponding to the common attributes and the detailed ownership assignment for each data item in each entity.

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[3] LandsD would provide surveyed addresses for converted data for buildings constructed before implementation of DAM only. Hence, the Building Address entity is not included in the ongoing exchanged entity list above.

Data Users

2.6.8   The following PDs will be Data Users of the Building CSU:

(a)   BD, LandsD, PlanD of HPLB

(b)   C&SD and RVD of FSTB.

3   CSU Workflow

3.1   Overview

3.1.1   The flow charts below are used to describe the data exchange processes among the PDs in the context of Building CSU. Hence, only those processes that are directly relevant to the update or retrieval of CSU data are indicated. Internal processes within a PD, and data exchange processes between a PD and other organization (e.g. developers, government departments other than the PDs) are not included.

3.1.2   The proposed workflow process will cover the data exchange in the following three stages:

(a)   Design and Construction Stage;

(b)   Post-Construction Stage; and

(c)   Demolition Stage.

3.2   Data Exchange Processes

3.2.1   The proposed workflow is illustrated by the chart below:

<Building Data Exchange Process - Future Environment >

Design and Construction Stage

CSU Dataset

Start

CSU created
with Proposed
status
(ID: CSU01)

CSU appended
with provisional
address
(ID: CSU02)

LandsD

Obtain proposed
building
information from
various sources
(ID: LDB01)

Create proposed
building polygon
(ID: LDB02)

Assign
CSU ID
(ID: LDB03)

BD

(Cat 1)
Review, approve,
and process
building plans
(ID: BDB01)

(Cat 1)
Notified by
developers regarding
commencement of
work
(ID: BDB02)

RVD

Assign provisional
house number and
provisional address
reference
(ID: RDB01)

PlanD

ArchSD

(Cat 4)
Prepare building
plans
(ID: ADB01)

Figure 3 Workflow of Building CSU – Design and Construction Stage

<Building Data Exchange Process - Future Environment >

Post-Construction Stage (1)

CSU Datasets	(Cat 1) CSU appended with structural info (ID: CSU03)	CSU status changed to Active and added with surveyed address (ID: CSU04)
LandsD	Works completed as seen on site (ID: LDB04) — Create building polygon according to site survey results and information provided by ArchSD & BD (ID: LDB05) — Assign CSU ID to active building (re-use CSU ID under Propsosed status as far as possible) (ID: LDB06)	
BD	(Cat 1) Receive application for OP from developers (ID: BDB03) → (Cat 1) Create BD polygons as per approved buidling plans (ID: BDB04) → (Cat 1) Attach structural info to BD polygon (ID: BDB05) → (Cat 1) Pass BD polygon in electronic format to LandsD (ID: BDB06) → BDB07	
RVD		
PlanD		
ArchSD	(Cat 4) Works completed on site (ID:ADB02) — (Cat 4) Pass as-built drawings in electronic format to LandsD (ID:ADB03)	

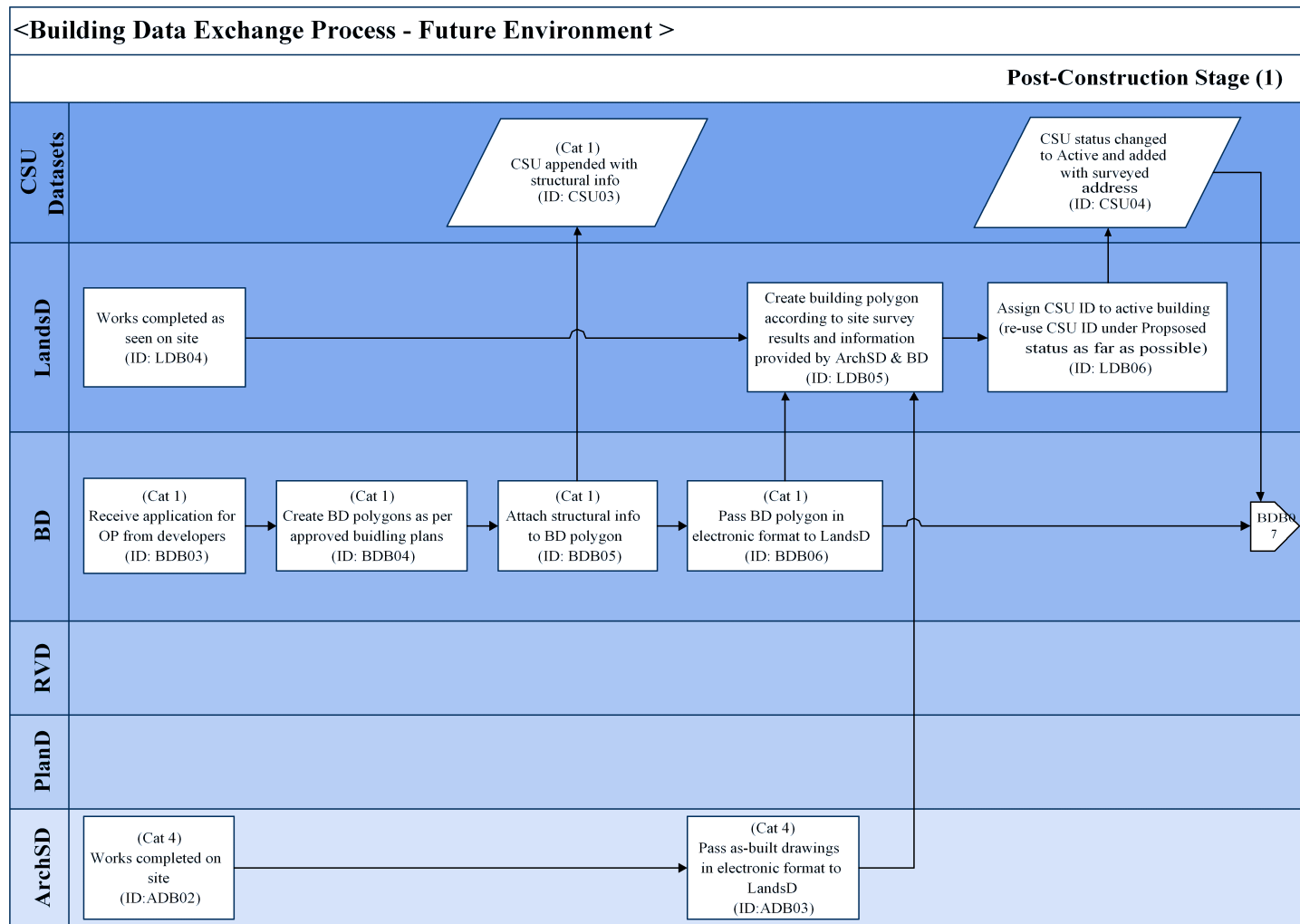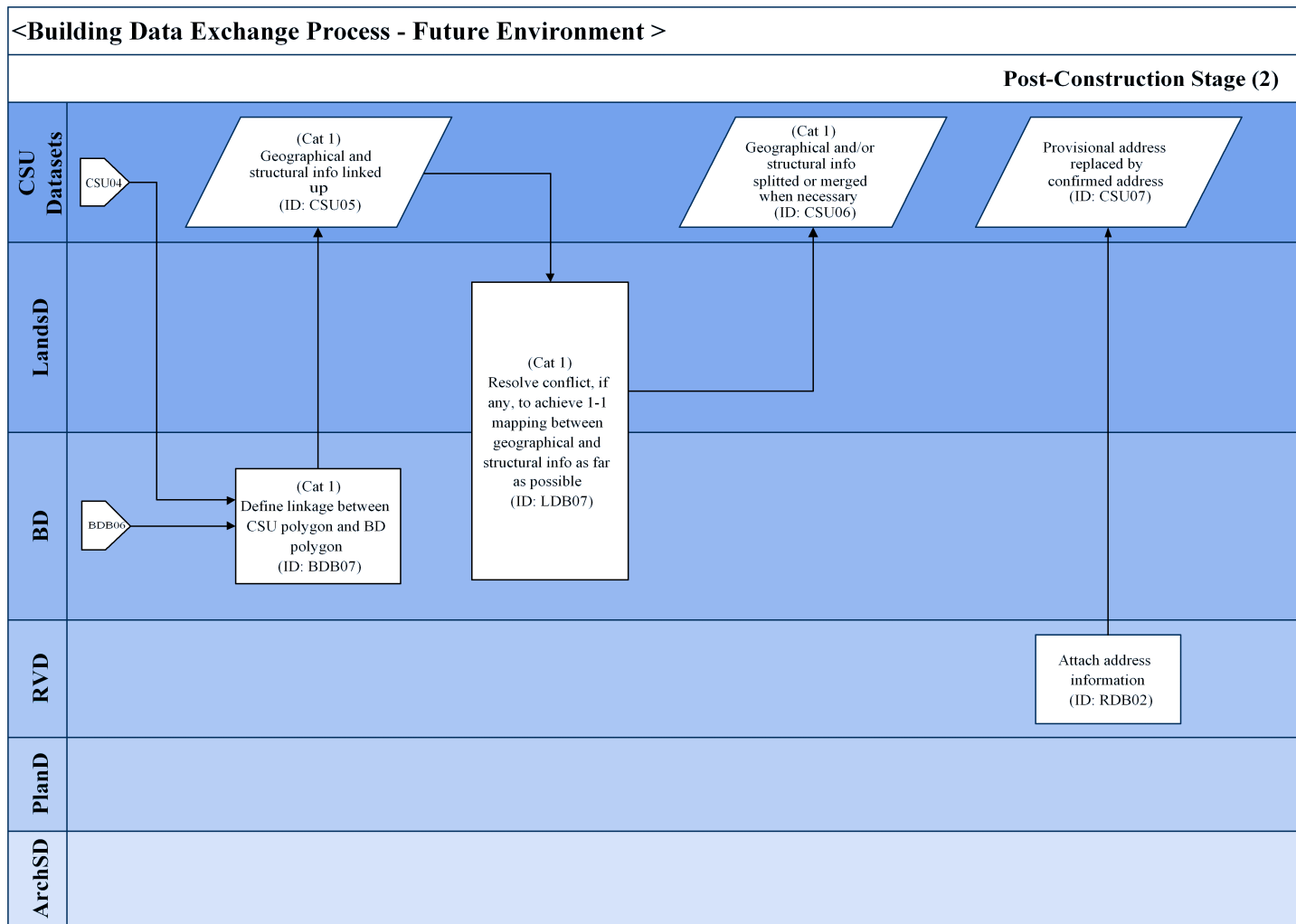*Figure 4 Workflow of Building CSU - Post Construction Stage (1)*

Figure 5 Workflow of Building CSU – Post-Construction Stage (2)

\<Building Data Exchange Process - Future Environment \>

Post-Construction Stage (3)

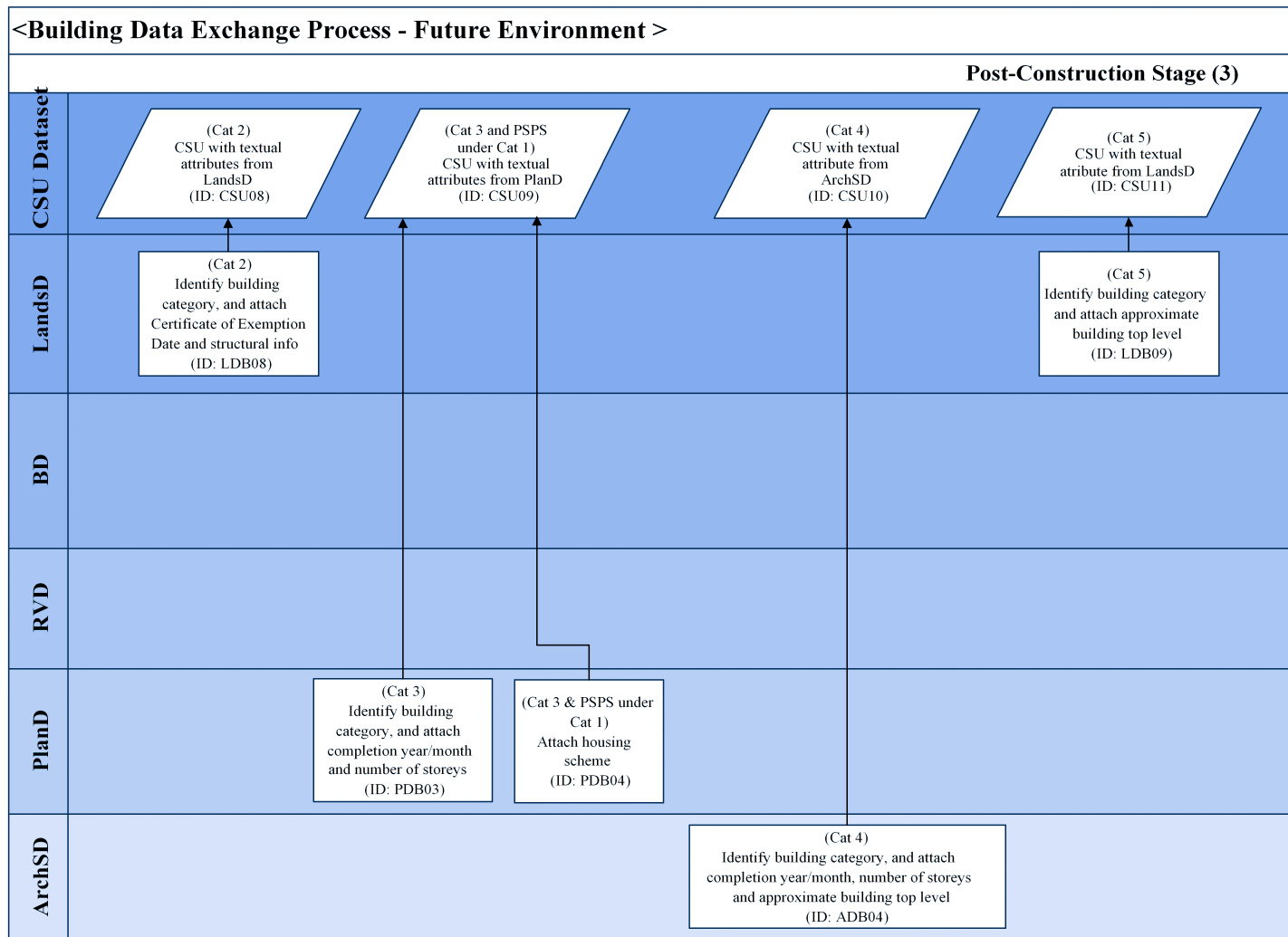|	
CSU Dataset	(Cat 2) CSU with textual attributes from LandsD (ID: CSU08) (Cat 3 and PSPS under Cat 1) CSU with textual attributes from PlanD (ID: CSU09) (Cat 4) CSU with textual attribute from ArchSD (ID: CSU10) (Cat 5) CSU with textual atribute from LandsD (ID: CSU11)
LandsD	(Cat 2) Identify building category, and attach Certificate of Exemption Date and structural info (ID: LDB08) (Cat 5) Identify building category and attach approximate building top level (ID: LDB09)
BD	
RVD	
PlanD	(Cat 3) Identify building category, and attach completion year/month and number of storeys (ID: PDB03) (Cat 3 & PSPS under Cat 1) Attach housing scheme (ID: PDB04)
ArchSD	(Cat 4) Identify building category, and attach completion year/month, number of storeys and approximate building top level (ID: ADB04)

Figure 6 Workflow of Building CSU – Post-Construction Stage (3)

Figure 7 Workflow of Building CSU – Post-Construction Stage (4)
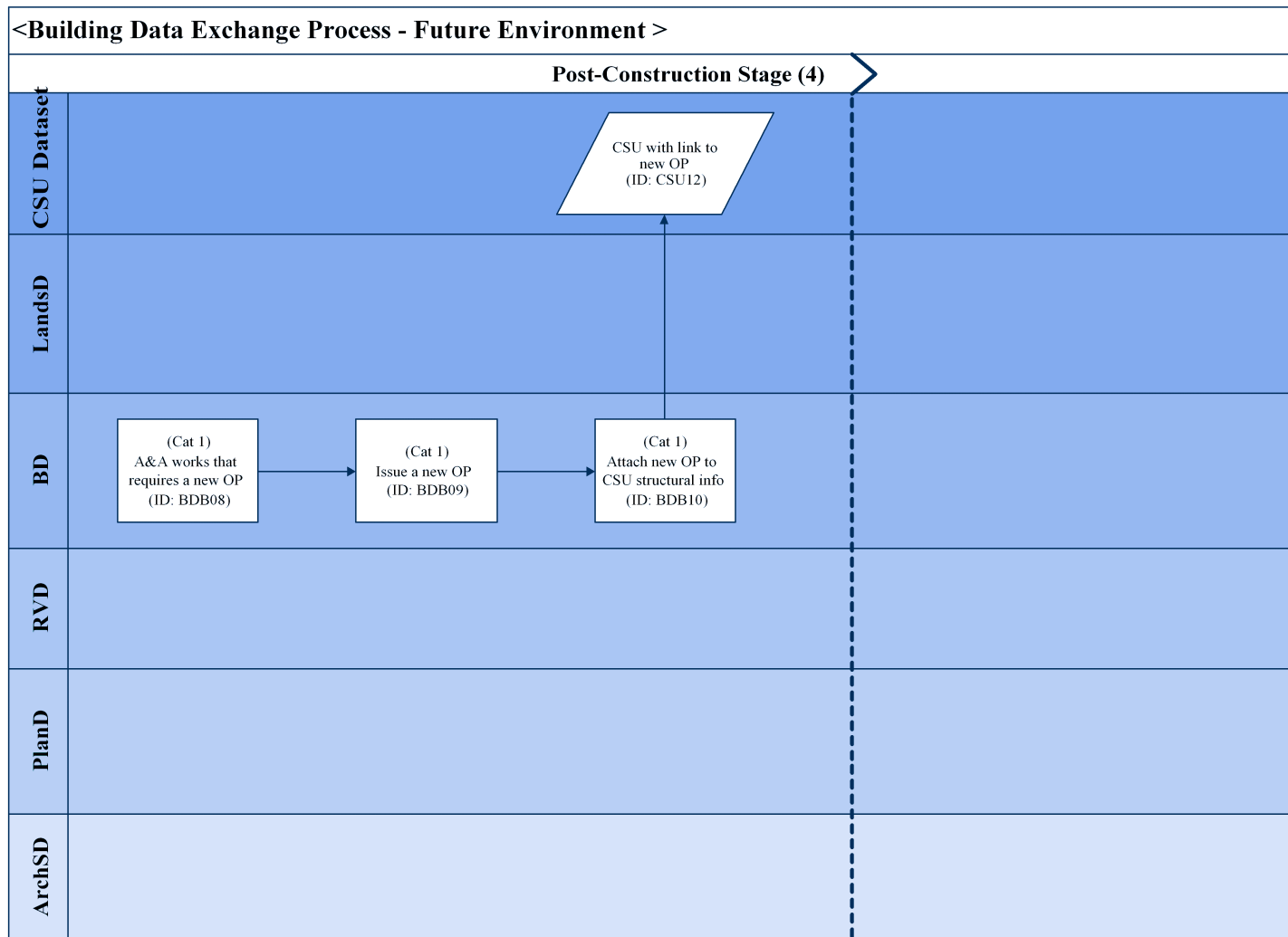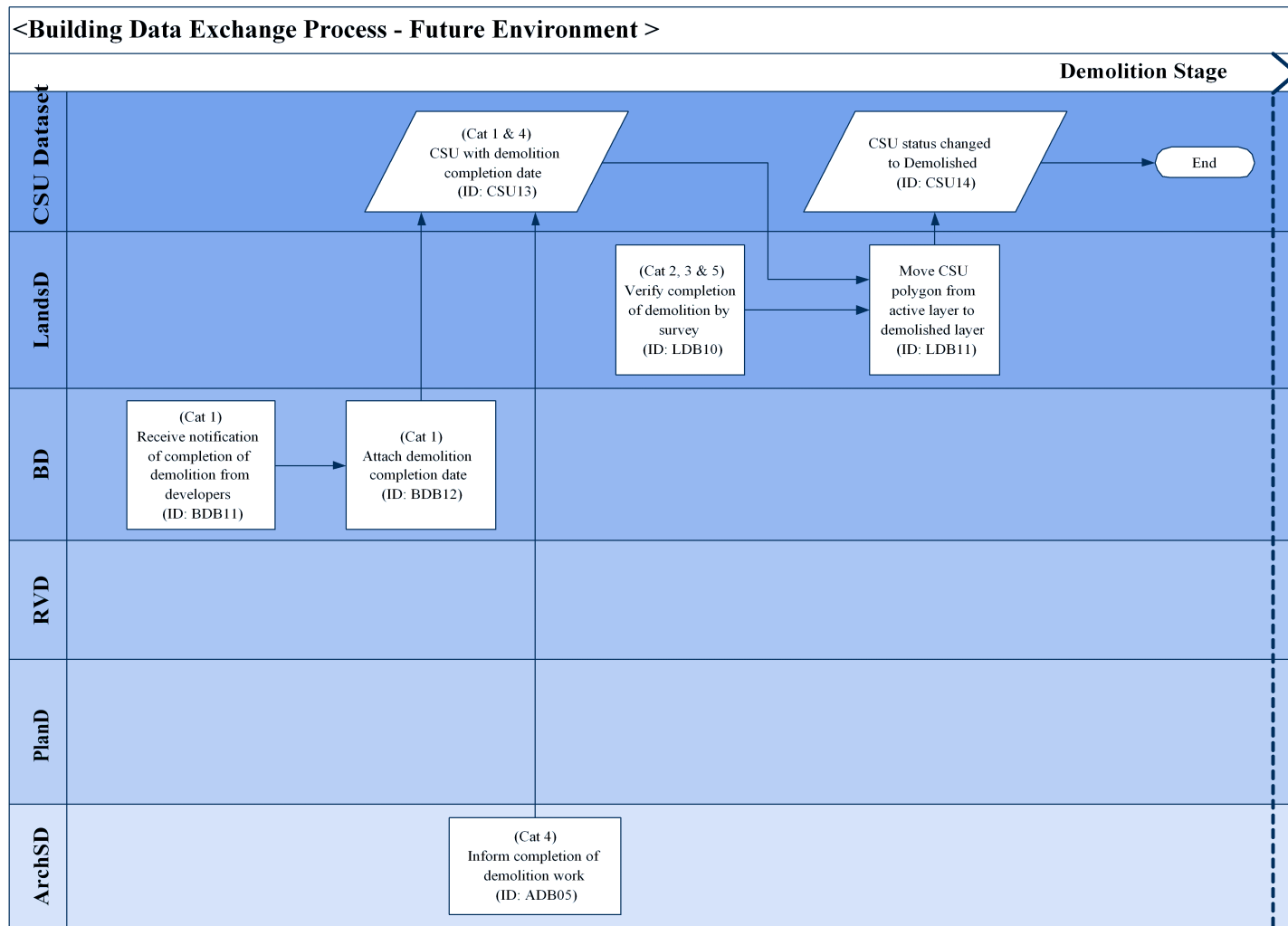
<Building Data Exchange Process - Future Environment >

Demolition Stage

CSU Dataset

(Cat 1 & 4)
CSU with demolition
completion date
(ID: CSU13)

CSU status changed
to Demolished
(ID: CSU14)

End

LandsD

(Cat 2, 3 & 5)
Verify completion
of demolition by
survey
(ID: LDB10)

Move CSU
polygon from
active layer to
demolished layer
(ID: LDB11)

BD

(Cat 1)
Receive notification
of completion of
demolition from
developers
(ID: BDB11)

(Cat 1)
Attach demolition
completion date
(ID: BDB12)

RVD

PlanD

ArchSD

(Cat 4)
Inform completion of
demolition work
(ID: ADB05)

Figure 8 Workflow of Building CSU – Demolition Stage

3.2.2   Design and Construction Stage

    (a)   In the early stage of the development, developers/PDs would exchange data of various types e.g. master layout plan etc for different purpose, e.g. lease compliance, statutory compliance or request to informal requests from departments. Since only preliminary information is usually available at this stage, LandsD would base on the limited information and provide a tentative layout of the building polygons in the proposed layer (please see section 4.3). The polygons would be put on the appropriate proposed layers and updated in the early stage of the development. The shown geometry of the polygons is usually for indicative purposes only (please see section 2.3.2) since there is no precise survey of the building layout. Data Users should note that not every building under design/construction will be registered in the CSU dataset due to limited information accessible by LandsD.

    (b)   BD is the statutory authority to approve building plans submission from private developments whereas ArchSD is the architect/structural engineer of the client department for government buildings. In the design stage, design plans of private developments are submitted to BD for review and approval.

    (c)   For government buildings (Category 4), once the plans are approved for construction, ArchSD, being a Data Owner, will submit their plans in digital format to LandsD, who would then assign CSU ID(s) to the polygons and create the corresponding Building Geographical Info record(s) (please see entities description in section 2.6.5), comprising proposed status, and building polygon information to represent the building(s) contained in the plans (CSU01).

    (d)   For private buildings (Category 1), due to concern on copyrights of the building plans, BD will not copy the building plan submissions to the PDs who are included in the distribution list for statutory approval purpose. As such, BD will not copy the building plans to LandsD for mapping purpose prior to completion of the building development. After all, the Building CSU sub-working group recognizes that some PDs would have a genuine need to coordinate the sharing of the approved building plans information prior to issue of concerned OPs. Otherwise there would be duplicated effort from PDs.   It is seen that there is reengineering opportunity to improve the current data exchange process. The issue may be resolved outside the DAM project scope, and the ongoing DAM Maintenance Committee may review the progress on initial implementation of DAM.

    (e)   Upon receipt of an application for a provisional house number submitted by the developer, the Building CSU will be assigned with a provisional

house number by RVD. RVD will create Building Address record(s) under the concerned Building Geographical Info record (CSU02).

3.2.3   Post-Construction Stage

(a)   On completion/stage completion of building construction of a private development (Category 1 buildings), BD will receive Occupation Permit (OP) application from developers. On approval of the application, BD will create the building polygons (on implementation of BD's GIS) based on the approved building plans. The number of building polygons will be determined according to the delineation rules contained in the latest revised B1000 specification (please see section 2.3), but BD can choose to retain their own rules to determine the shape of the building polygons maintained by BD. BD will contribute the OP and other structural information to CSU to form the concerned Building Structural Info, Building OP Info and Building Lot No in OP records (CSU03).

(b)   When the development comes to a stage when the physical building structure is completed on ground, the geometry that indicates the location of the building would be updated by LandsD. LandsD will either create a building polygon or update the corresponding building polygon on transfer to the active layer, when applicable, conforming to the latest B1000 specification. The CSU ID assigned to the polygon during the Design and Construction Stage, when applicable, will be retained for the corresponding polygon on transfer to the active layer when carried over to the Post-Construction Stage as far as possible (say, as long as the original label point is still within the active building polygon), or LandsD will assign a new CSU ID to the Building CSU when necessary. The status of the polygon of the Building CSU will be changed to Active (CSU04).

(c)   There is no strict sequence relationship between (a) and (b) (i.e. LDB04-6 and BDB03-6). The former may occur before the latter for some buildings, but vice versa for some other buildings. In the situation when BD polygons are created before the CSU , BD will pass their building polygons for LandsD's reference in preparing the CSU polygon.

(d)   Once the CSU polygon has both the Building Geographical Info record and Building Structural Info record (please refer to section 2.6.5 for entities owned by LandsD and BD), BD will do the mapping between the CSU polygon (Building Polygon record) and their departmental building polygon. BD will carry out periodic check to find out whether there are any BD polygons which are yet to have a link with the corresponding CSU polygons (e.g. periodic check could be carried out at time after collecting new changes from the CSU dataset). The linkage results form the Geo-Struct Mapping record(s) for the concerned CSU (CSU05).

(e)   LandsD and BD will work together to maintain a 1-1 mapping between the CSU polygons and BD's polygons as far as possible. Designated personnel from the two departments will work together to resolve any odd cases, if any, in their periodic meetings. The polygons in question might then need to be merged/split and the corresponding Building Geographical Info record and/or Building Structural Info record of the polygons would need to be merged/split accordingly and the corresponding Geo-Struct Mapping record(s) will be re-defined (CSU06). If there are BD's polygons which are created with Building Structural Info records, and they are outside the Building CSU scope (e.g. an underground building structure), they will not be included in the Building CSU and hence they will not be assigned CSU ID nor corresponding Building Geographical Info record.

(f)   For the CSU polygons with Active status, RVD will attach confirmed address to the Building CSU, which will form the Building Address record(s).

(g)   For Category 2, 3 & 5 buildings, after they are marked as Active, the corresponding Data Owner (LandsD for Category 2 & 5, PlanD for Category 3) will then identify building category information and attach additional attributes to the CSU to form the corresponding Building Structural Info record (CSU08, CSU09 & CSU11).

(h)   For government buildings (Category 4), ArchSD will pass the as-built drawings to LandsD on completion of building construction. ArchSD will provide the category, completion year/month, number of storeys and approximate building top level information to the CSU together with the as-built drawings. For those buildings already registered in the CSU dataset (i.e. Building Geographical Info and Building Polygon records already created) in the Design and Construction Stage, ArchSD shall also quote the corresponding CSU ID(s). The corresponding Building Structural Info records can then be formed using the textual attributes provided by ArchSD (ADB04). LandsD would then verify or create the active building polygons conforming to the common rules for the delineation and shapes of polygons (CSU10).

(i)   Alternation and Addition (A&A) works on private buildings (Category 1) may require a new OP. When this occurs, BD will use the new OP information to form new Building OP Info record which would be attached to the corresponding Building Structural Info record. Since the linkage between BD's polygons and CSU polygons have already been built up in earlier stage (i.e. the corresponding Geo-Struct Mapping records), the the new OP will be linked to the corresponding CSU.

3.2.4   Demolition Stage (demolished layers DBLDG and DPOD)

(a)   It is a statutory requirement that the demolition of a private building (Category 1) shall be approved by BD. On completion of the demolition, BD then receives a notification from the private developer. BD updates their database to include the demolition completion date, and forwards the information to LandsD (CSU13).

(b)   For government buildings (Category 4), ArchSD will also record the completion of demolition work and forwards the information to LandsD (CSU13).

(c)   LandsD will update the Building CSU with the demolition completion date provided by BD or ArchSD. For those demolished buildings which do not have the demolition completion dates, neither supplied by ArchSD nor BD, LandsD will record the demolition date from their routine topographic survey. Upon completion of the field survey, the CSU status will be changed to Demolished (CSU14).

4   CSU Data Interface Requirement

4.1   Overview

4.1.1   A logical model for CSU data exchange is defined for PDs' exchange of the Building CSU. It describes the logical structure of CSU data exchanged between the interfacing systems of PDs. PDs, as either Data Owners or Data Users, are not required to adopt the same logical data structure in their own departmental systems. However, each PD is recommended to maintain a mapping between the Common Spatial Units and their departmental records in their respective core departmental systems(s) such that:-

(a)   Data Owner can extract data from their departmental system according to the definition of CSU; and

(b)   Data User can import CSU data into their departmental system for further processing/ analysis.

4.1.2   Mapping of the unique CSU ID with the departmental ID may be a one-to-one, one-to-many or many-to-one relation (but a many-to-many relation is not recommended) depending on the data definition of PDs' polygons represented by their departmental ID.

4.1.3   The following sections will provide details for the logical model in terms of:-

(a)   CSU status – possible statuses of a CSU;

(b)   Themes - thematic layers; and

(c)   Logical data structure, including a detailed description of the data items and assignment of ownership.

4.2   CSU Status

4.2.1   There are three possible statuses for the Building CSU:

(a)   Proposed – Status that describes the buildings which are under design/construction; or the buildings of which the construction is completed but the geometry of respective building polygons are yet updated.

(b)   Active - Status that describes the buildings which are substantially completed and the geometry of the respective building polygons is available either from land survey or from other verified source.

(c)   Demolished – Status that describes the buildings already demolished from ground.

4.3   Themes

4.3.1   The building polygons will be organized in six layers upon dissemination:

(a)   PBLDGPOLY: contain polygons of proposed towers

(b)   PPODPOLY: contain polygons of proposed podiums

(c)   BLDGPOLY: contain polygons of active towers

(d)   PODPOLY: contain polygons of active podiums

(e)   DBLDG: contain polygons of demolished towers

(f)   DPOD: contain polygons of demolished podiums

4.3.2   The information that describes the layer in which the polygon of a Building CSU is placed can be looked up through the Status (proposed, active or demolished) and Polygon Type (tower or podium) data items in the Building Geographical Info entity.

4.3.3   All tower polygons and podium polygons in each of the above layers are closed polygons features. These polygons are two-dimensional in shapes and they represent geographic features stored as a series of segments that enclose an area. No overlapping polygon is allowed in the proposed and active layers except donut polygons.

4.3.4   In addition to simple polygon type, the above layers should also support multi-polygons and donut polygons to represent different layouts of physical structures of towers and podiums on completion of construction.

4.3.5   For each individual polygon, it should not be split even if the polygon lies along the tile border of 1:1000 survey sheets.

4.3.6   The full set of polygons should be maintained in a seamless manner, that is, the split polygons locating along the tile borders have to be merged, and the border lines have to be dissolved, thereby, other PDs' post processing effort on merging the polygons can be minimized. Also, this can facilitate the spatial query and filtering operation.

4.3.7   The polygon layers should be confined with HK 1980 Grid Coordinate System, that is the minimum and maximum spatial extents are 800000, 800000 and 867500, 848000 respectively.

4.3.8   It is recommended to establish the topological relationship that defines the behaviour of integrated features (podiums and towers), when resource is available. This would define the rule for features to share geometry with other features (e.g. towers cannot overlap) in a given layer or between multiple layers (e.g. podium polygons cannot be placed alone, but should be overlapped with the corresponding tower polygons.)

4.4   Logical Data Structure

4.4.1   Please refer to Appendix B for the conventions adopted in this section. The logical relationships among entities are illustrated below.
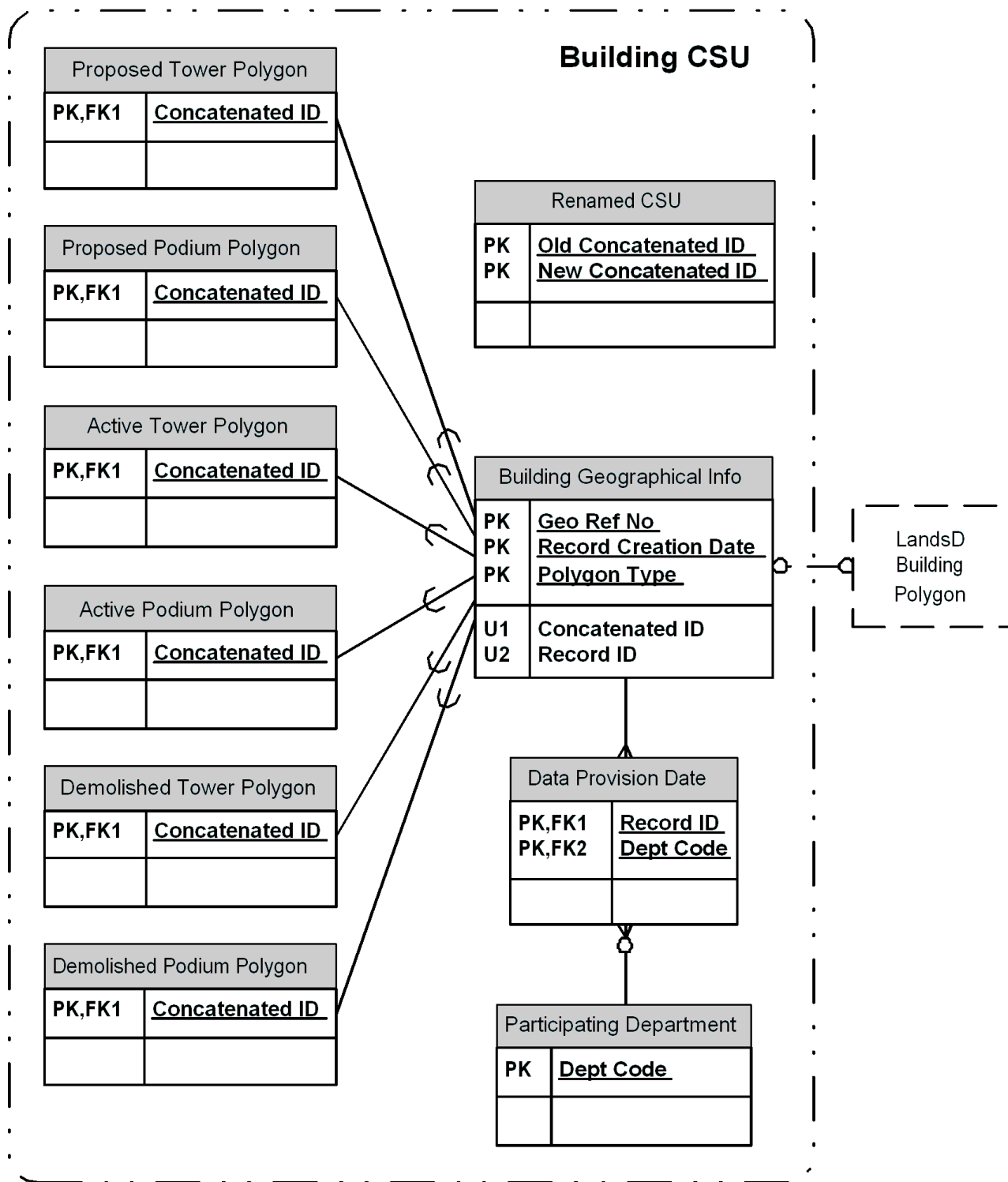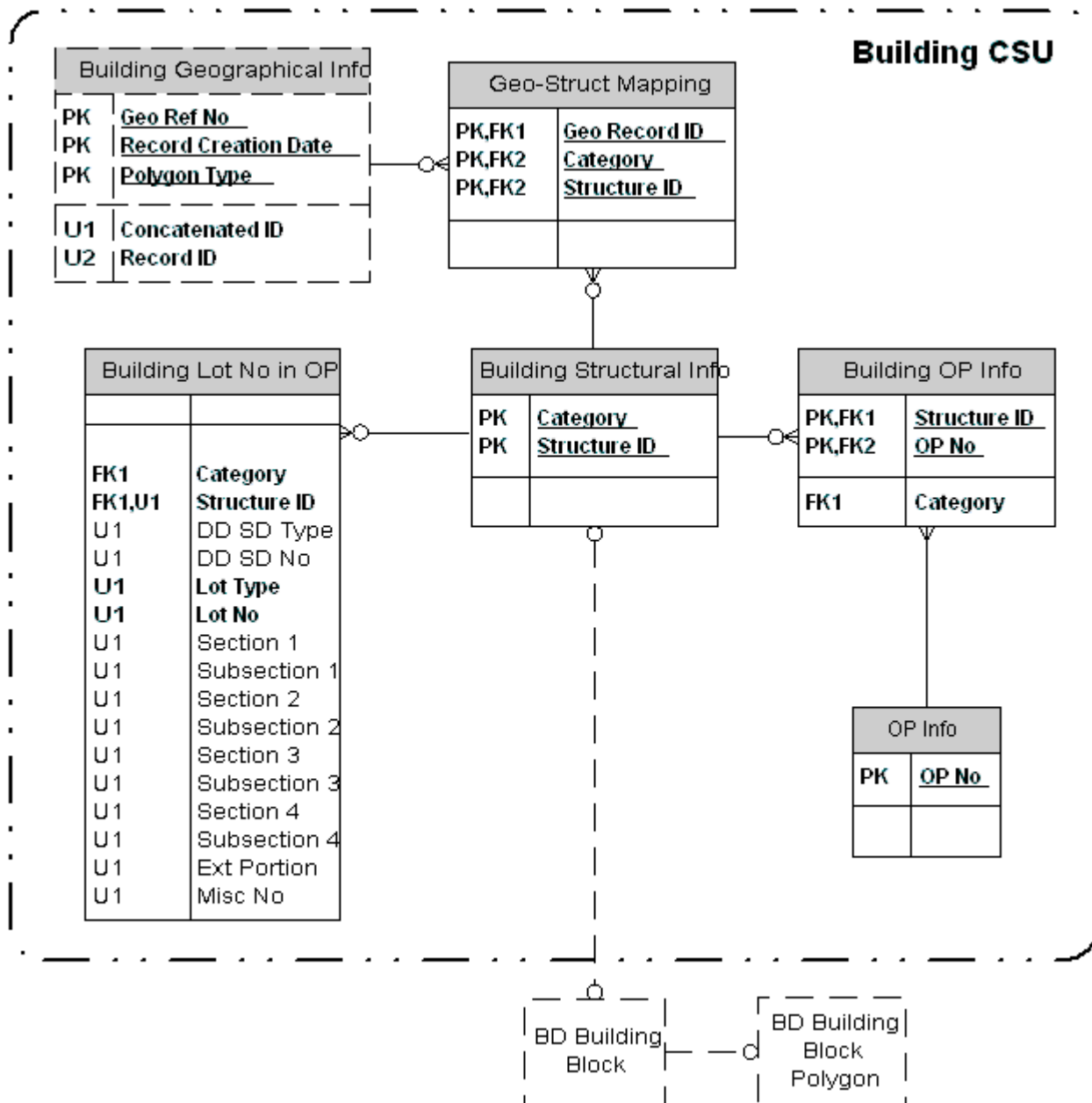
Figure 9 LDS for the Building CSU (1)

Figure 10 LDS for the Building CSU (2)
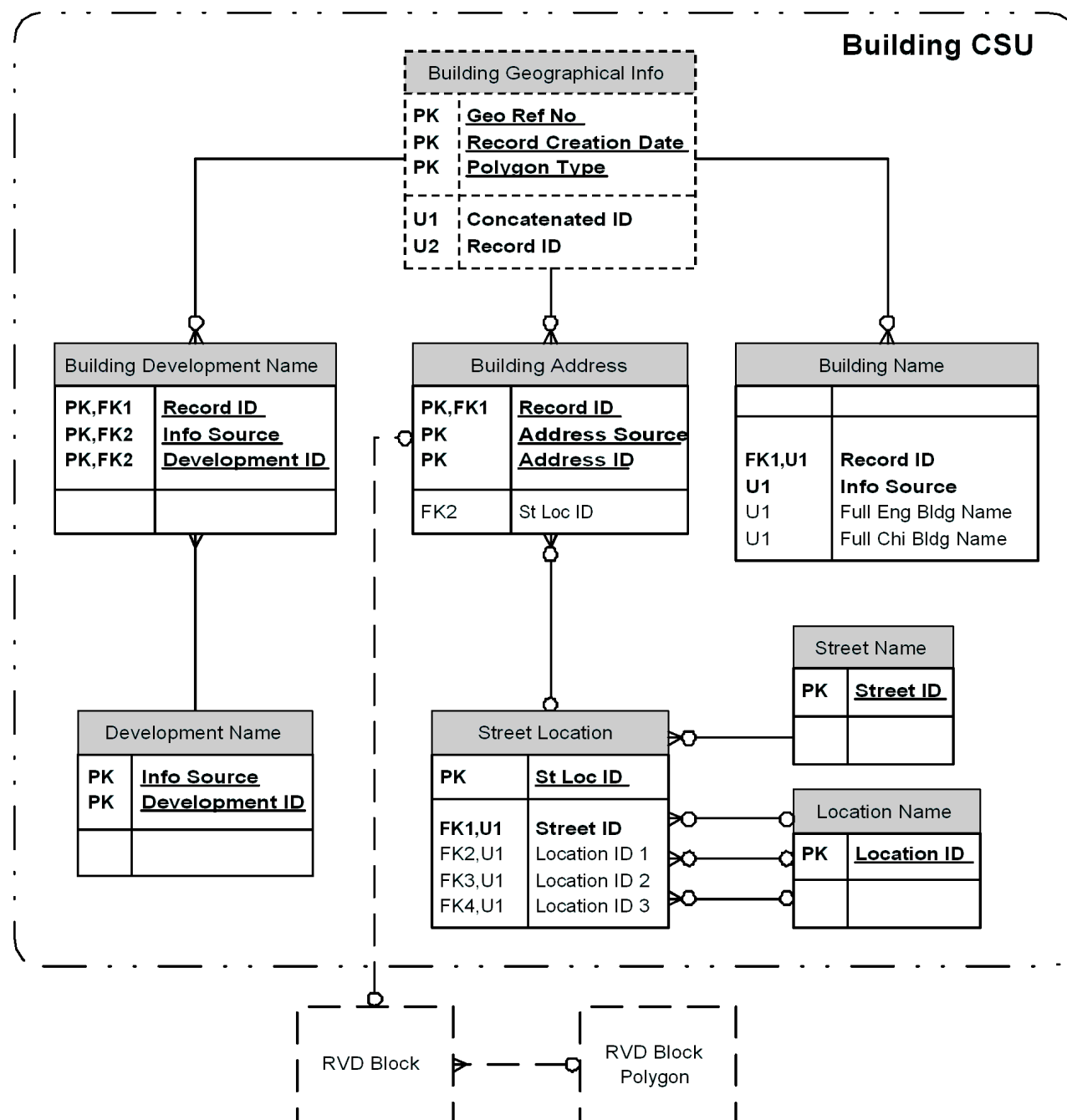
Figure 11 LDS for the Building CSU (3)

4.4.2   Based on the characteristics of each attribute and data structure in the existing systems of Data Owners, the common attributes are classified as "geographical-based" or "structural-based", and maintained under the Building Geographical Info and Building Structural Info sides respectively.

4.4.3   For buildings under Category 1:

(a)   Building Geographical Info records are to be provided by LandsD, while Building Structural Info records are to be provided by BD.

(b)   For new buildings, BD will create the Building Structural Info record(s) upon issuance of a full OP for the concerned Building CSU.

(c)   For future buildings constructed after implementation of CSU, LandsD and BD will work together to maintain a 1-1 mapping between the two records as far as possible. Records on either side may be merged/split during the resolution process. On rare cases that cannot be resolved by the two PDs, the system still allows 1-to-many or many-to-1 relation among the affected group of records. However, many-to-many relation between a group of Building Geographical Info records and Building Structural Info records is not allowed. If it is identified during the resolution process that a Building Structural Info record created by BD is representing a building structure not within the Building CSU scope (e.g. an underground building structure) and hence there is no corresponding Building Geographical Info record, such Building Structural Info record should be removed from the CSU dataset.

(d)   For existing buildings, Building Geographical Info records and Building Structural Info records will be converted based on existing data from LandsD/PlanD and BD respectively. Due to resource concern, it is agreed that no merge/split will be done to achieve 1-1 mapping between the converted records. Yet, it is recommended to resolve the cases of many-to-many linked records into 1-to-many or many-to-1 relation.

4.4.4   For buildings under Category 2 and 5:

(a)   Both Building Geographical Info records and Building Structural Info records will be defined by LandsD if applicable.

(b)   There is always a 1-1 mapping between the related Building Geographical Info record and Building Structural Info record. That is, each Building CSU will have one Building Geographical Info record and one Building Structural Info record.

(c)   For both existing and future buildings, LandsD will create the concerned Building Structural Info record when they identify a Building CSU as under these categories. Such record may not be fully populated since certain attribute information may not be available.

4.4.5   For buildings under Category 3 and 4:

(a)   Building Geographical Info records are defined by LandsD, while Building Structural Info records are defined by PlanD.

(b)   There is always a 1-1 mapping between the related Building Geographical Info record and Building Structural Info record. That is, each Building

CSU will have one Building Geographical Info record and one Building Structural Info record.

(c)   For both existing and future buildings, PlanD will create the concerned Building Structural Info record when they identify a Building CSU as under these categories.

4.4.6   Building Geographical Info record for a Category 2-5 building is created before its counterpart, which is created only when the concerned Data Owner identifies its Category. For Category 1 buildings, Building Structural Info record may be created before its corresponding Building Geographical Info record, or vice versa for the others. To indicate this possible time lag, Geo-Struct Mapping is optionally linked to Building Geographical Info and Building Structural Info respectively as shown in the diagram above.

4.4.7   LandsD Building Polygon, BD Building Block, BD Building Block Polygon, RVD Block and RVD Block Polygon entities are not maintained within the CSU dataset. They are included in the LDS above for reference. After all, it is recommended to include the identifiers of these PDs' source records in the CSU dataset to indicate the linkage between Building CSUs and the source departmental records. This can facilitate further data sharing between PDs outside the CSU context such as in handling the exchange of data that are not under the scope of CSU, the unique identifiers of BD, RVD and LandsD's records are also built-in within the Building CSU to provide linkage between Building CSU and corresponding departmental record of major stakeholders such as BD and RVD .

4.5   Entity Description

4.5.1   Some data items may be left as null due to time lag, but must be filled once the CSU is completely defined (e.g. the Category information). Such rules will be documented in Description of the affected data item. Please also refer to section 3 for information when a data item should be filled up by the Data Owner along the CSU lifecycle.

4.5.2   Some data items are applicable for particular building category(s) only. For CSUs under non-applicable category(s), such data item(s) are always left as null. For CSUs under applicable category(s), such data item(s) is left null for a particular CSU only when it is not applicable to this particular CSU (e.g. Storeys in Basement of a Category 1 Building CSU may be left null if it has no storey constructed below ground) or the information is not yet available (e.g. Housing Scheme of a Category 3 Building CSU may be left null until PlanD has received the information from Housing Department).

4.5.3   Building Geographical Info

–   Textual geographical information of a Building CSU

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Geo Ref No	Geo-reference No. of the label point of the building polygon	X(10)	Y
Record Creation Date	Date on which the building polygon is first created in CLIS of LandsD	Date	Y
Polygon Type	Type of the building polygon, where T = Tower P = Podium	X(1)	Y
Concatenated ID	Concatenation of Geo Ref No, Polygon Type and Record Creation Date (GGGGGGGGGGTYYYYMMDD), where GGGGGGGGGG part = Geo Ref No T part = Polygon Type YYYYMMDD part = Record Creation Date formatted to string representation in YYYYMMDD date format	X(19)	Y
Record ID	Computer-generated unique identifier	N(9)	Y
Status	Record status, where P = Proposed A = Active D = Demolished	X(1)	Y
Category	Building category, where 1 = Legal private buildings and HA/HS buildings that require an occupation permit and are under enforcement of the Buildings Ordinance 2 = NT small houses 3 = HA buildings except PSPS buildings 4 = Other government buildings 5 = Miscellaneous structures This information may not be available on record creation. However, once it is ever filled by the Data Owner, it must not be reverted to null value. In addition, warning should be given to original and new Data Owners in case Category is changed from a non-null value to another non-null value.	X(1)	
Housing Scheme	HA housing scheme (Applicable for PSPS buildings under Category 1 and those under Category 3 only, Null for others)	X(10)	

Data Item	Description	Format	Mandatory
Cert of Exemption Date Building Works	Date on which Certificate of Exemption - Building Works is issued (Applicable for Category 2 only, Null for others)	Date	
Cert of Exemption Date Site Formation Works	Date on which Certificate of Exemption - Site Formation Works is issued (Applicable for Category 2 only, Null for others)	Date	
Cert of Exemption Date Drainage Works	Date on which Certificate of Exemption - Drainage Works is issued (Applicable for Category 2 only, Null for others)	Date	
Demolition Completion Date	Completion date of demolition work, in particular, Category 1: As reported by responsible AP/RSE. Category 4: As recorded by ArchSD Category 2, 3 & 5: Information not available and will be left as Null.	Date	
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset)	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Geo Ref No, Record Creation Date, Polygon Type			
UK	Concatenated ID			
UK	Record ID			
CK	Polygon Type	In ('T', 'P')		
CK	Status	In ('P', 'A', 'D')		
CK	Category	In ('1', '2', '3', '4', '5')		
CK	Concatenated ID	Is concatenation of Geo Ref No, Polygon Type and Record Creation Date		

(c)   Data Ownership - vary by data item

Data Item	Condition	Data Owner
Geo Ref No	All	LandsD
Record Creation Date	All	LandsD
Polygon Type	All	LandsD
Concatenated ID	All	LandsD
Record ID	All	LandsD
Status	All	LandsD
Category	Category = '1'	BD
	Category in ('2', '5')	LandsD
	Category = '3'	PlanD
	Category = '4'	ArchSD
Housing Scheme	Category = '3'	PlanD
Cert of Exemption Date Building Works	Category = '2'	LandsD
Cert of Exemption Date Site Formation Works	Category = '2'	LandsD
Cert of Exemption Date Drainage Works	Category = '2'	LandsD
Demolition Completion Date	Category = '1'	BD
	Category = '4'	ArchSD
Timestamp	All	LandsD

4.5.4 Proposed Tower Polygon

– Spatial feature representing the boundary of a proposed tower Building CSU. When a Building CSU is under Proposed status, the delineation of the building polygon is approximate only (please see section 2.3.2) and the polygon is only for indicative purposes. The size, shape and position of the Proposed Tower may deviate considerably from the final as-constructed tower.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Concatenated ID	Concatenation of Geo Ref No, Polygon Type and Record Creation Date	X(19)	Y
Geometry	Geometry of building polygon	Polygon	Y

Data Item	Description	Format	Mandatory
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset)	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Concatenated ID			
FK	Concatenated ID		Building Geographical Info	Concatenated ID
CP	Geometry			

(c)   Data Ownership

All records		LandsD

4.5.5   Proposed Podium Polygon

–   Spatial feature representing the boundary of a proposed podium Building CSU. When a Building CSU is under Proposed status, the delineation of the podium polygon is approximate only (please see section 2.3.2) and the polygon is for indicative purposes. The size, shape and position of the Proposed Podium may deviate considerably from the final as-constructed podium.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Concatenated ID	Concatenation of Geo Ref No, Polygon Type and Record Creation Date	X(19)	Y
Geometry	Geometry of building polygon	Polygon	Y
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset)	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Concatenated ID			

Type	Data Item	Validation	Reference Entity	Reference Data Item
FK	Concatenated ID		Building Geographical Info	Concatenated ID
CP	Geometry			

(c)   Data Ownership

All records		LandsD

4.5.6   Active Tower Polygon

−   Spatial feature representing the boundary of an active tower Building CSU. When a Building CSU is under Active status, the delineation of the building polygon will reveal the land survey result. Please refer to the latest 1:1000 Basic Mapping Specification from LandsD for more information on the delineation and shape of building polygons (please refer to section 2.3).

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Concatenated ID	Concatenation of Geo Ref No, Polygon Type and Record Creation Date	X(19)	Y
Geometry	Geometry of building polygon	Polygon	Y
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset)	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Concatenated ID			
FK	Concatenated ID		Building Geographical Info	Concatenated ID
CP	Geometry			

(c)   Data Ownership

All records		LandsD

4.5.7   Active Podium Polygon

    – Spatial feature representing the boundary of an active podium Building CSU. When a Building CSU is under Active status, the delineation of the podium polygon will reveal the land survey result. Please refer to the latest 1:1000 Basic Mapping Specification from LandsD for more information on the delineation and shape of building polygons (please refer to section 2.3).

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Concatenated ID	Concatenation of Geo Ref No, Polygon Type and Record Creation Date	X(19)	Y
Geometry	Geometry of building polygon	Polygon	Y
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset)	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Concatenated ID			
FK	Concatenated ID		Building Geographical Info	Concatenated ID
CP	Geometry			

(c)   Data Ownership

All records		LandsD

4.5.8   Demolished Tower Polygon

    – Spatial feature representing the boundary of a demolished tower Building CSU. When a Building CSU is under Demolished status, the building polygon has the same last layout before demolition. That is, when the building polygon is moved from the active layer to the demolished layer, only status will change, but there will be no change to the geometry.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Concatenated ID	Concatenation of Geo Ref No, Polygon Type and Record Creation Date	X(19)	Y
Geometry	Geometry of building polygon	Polygon	Y

Data Item	Description	Format	Mandatory
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset)	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Concatenated ID			
FK	Concatenated ID		Building Geographical Info	Concatenated ID
CP	Geometry			

(c)   Data Ownership

All records		LandsD

4.5.9   Demolished Podium Polygon

– Spatial feature representing the boundary of a demolished podium Building CSU. When a Building CSU is under Demolished status, the podium polygon has the same last layout before demolition. That is, when the building polygon is moved from the active layer to the demolished layer, only status will change, but there is no change in geometry.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Concatenated ID	Concatenation of Geo Ref No, Polygon Type and Record Creation Date	X(19)	Y
Geometry	Geometry of building polygon	Polygon	Y
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset)	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Concatenated ID			

Type	Data Item	Validation	Reference Entity	Reference Data Item
FK	Concatenated ID		Building Geographical Info	Concatenated ID
CP	Geometry			

(c)   Data Ownership

All records				LandsD

4.5.10   Building Structural Info

−   Textual structural information of a Building CSU

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Category	Building category	X(1)	Y
Structure ID	Record identifier: When Category = '1', it references to the concerned Building Block ID as in BD's BCIS; For other categories, it references to Record ID of the concerned Building Geographical Info record.	N(9)	Y
Storeys Above Podium	Number of storeys above podium/basement for tower blocks. It is applicable only when BD Block Type = 'TOW' or 'OTH' for Category 1 buildings, or Polygon Type of corresponding Building Geographical Info = 'T' for other categories. This figure counts only the over-podium part if the tower is sitting on a podium. For towers not sitting on podium, this counts the part over basement. (Applicable for Category 1-4 only, Null for Category 5)	N(3)	

Data Item	Description	Format	Mandatory
Storeys In Podium	Number of storeys in podium and above basement. This means the number of above-basement storeys in the podium itself for podium blocks, and means number of above-basement storeys in the podium below for tower blocks. This information may not be available for Category 1 & 4 buildings. This data item is not applicable for Category 2 & 5 and will be left as Null.	N(2)	
Storeys In Basement	Number of storeys in basement/lower ground. This counts only the storeys covered by the concerned Building CSU. For example, the basement storeys are counted into the podium block only but not to the towers sitting above. (Applicable for Category 1, 3 & 4 only, Null for Category 2 & 5)	N(2)	
Storeys Remarks	Textual description to clarify number of storeys of the building (Applicable for Category 1 only, Null for others)	X(200)	
Completion Year	Year in which the building is completed, in particular, Category 1: The year in which the OP is issued for the building. For buildings covered by multiple OPs, the first full OP will be referenced. Category 2: The year in which the Certificate of Compliance is issued for the building. Category 3: Year of completion information as provided by HA. Category 4: Year of completion as identified by ArchSD. Category 5: Information not available and will be left as Null.	N(4)	

Data Item	Description	Format	Mandatory
Completion Month	Month in which the building is completed, in particular, Category 1: The month in which the OP is issued for the building. For buildings covered by multiple OPs, the first full OP will be referenced. Category 2: The month in which the Certificate of Compliance is issued for the building. Category 3: Month of completion information as provided by HA. Category 4: Month of completion as identified by ArchSD. Category 5: Information not available and will be left as Null. For Category 1-4 buildings, both year and month of completion should be provided for all new buildings constructed after implementation of DAM. However, for some existing buildings, maybe only the year information is available.	N(2)	
Completion Day	Day of the month (1-31) on which the building is completed, in particular, Category 1: The day on which the OP is issued for the building. For buildings covered by multiple OPs, the first full OP will be referenced. Category 2: The day on which the Certificate of Compliance is issued for the building. Category 3: Day of completion information as provided by HA. Category 4: Day of completion as identified by ArchSD. Category 5: Information not available and will be left as Null. For Category 1-4 buildings, the full completion date (with year, month and day) should be provided for all new buildings constructed after implementation of DAM as far as possible. However, for some buildings, maybe only the year information, or year/month, is available.	N(2)	

Data Item	Description	Format	Mandatory
Approximate Building Top Level	Elevation of building above principal datum in metres, in particular, Category 1 & 4: Top level of a building is measured to the mean height of the roof over the highest usable floor space in the building. Category 2: Approximate level of the top of a building in metre above HKPD. Category 3 & 5: Approximate level of the top of a building in metre above HKPD. Due to resource constraint and site constraint, LandsD does not have building height of every building in Hong Kong. Only partially available for buildings constructed before implementation of DAM and LandsD currently has no resource to collect this information regularly.	N(8,2)	
GFA	Gross floor area in M² (Applicable for Category 1 only, Null for others)	N(10,2)	
BD Block Type	Building block type as recorded by BD, where TOW = Tower POD = Podium OTH = Others (Applicable for Category 1 only, Null for others)	X(3)	
Building Type In OP	Types of building as of OP e.g. industrial, commercial (Applicable for Category 1 only, Null for others)	X(200)	
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset)	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Category, Structure ID			

Type	Data Item	Validation	Reference Entity	Reference Data Item
CK	Category	In ('1', '2', '3', '4', '5')		
FK	Structure ID		Building Geographical Info	Record ID (constraint applicable only when Category <> '1')
CK	Storeys Above Podium	> 0		
CK	Storeys In Podium	> 0		
CK	Storeys In Basement	> 0		
CK	Completion Year	> 1800		
CK	Completion Month	Between 1 and 12		
CK	Completion Day	Between 1 and 31		
CK	Approximate Building Top Level	> 0		
CK	GFA	> 0		
CK	Block Type	In ('TOW', 'POD', 'OTH')		

(c)   Data Ownership - vary by data item

Data Item	Condition	Data Owner
Category	Category = '1'	BD
	Category in ('2', '5')	LandsD
	Category = '3'	PlanD
	Category = '4'	ArchSD
Structure ID	Category = '1'	BD
	Category in ('2', '5')	LandsD
	Category = '3'	PlanD
	Category = '4'	ArchSD
Storeys Above Podium	Category = '1'	BD
	Category = '2'	LandsD
	Category = '3'	PlanD
	Category = '4'	ArchSD
Storeys In Podium	Category = '1'	BD
	Category = '3'	PlanD
	Category = '4'	ArchSD

Data Item	Condition	Data Owner
Storeys In Basement	Category = '1'	BD
	Category = '3'	PlanD
	Category = '4'	ArchSD
Storeys Remarks	Category = '1'	BD
Completion Year	Category = '1'	BD
	Category = '2'	LandsD
	Category = '3'	PlanD
	Category = '4'	ArchSD
Completion Month	Category = '1'	BD
	Category = '2'	LandsD
	Category = '3'	PlanD
	Category = '4'	ArchSD
Completion Day	Category = '1'	BD
	Category = '2'	LandsD
	Category = '3'	PlanD
	Category = '4'	ArchSD
Approximate Building Top Level	Category = '1'	BD
	Category in ('2', '3', '5')	LandsD
	Category = '4'	ArchSD
GFA	Category = '1'	BD
Block Type	Category = '1'	BD
Building Type In OP	Category = '1'	BD
Timestamp	All	LandsD

4.5.11   Geo-Struct Mapping

–   Mapping between Building Geographical Info and Building Structural Info records of a Building CSU. It is to be enforced in application level that, on successful matching, the Building Geographical Info and Building Structural Info records for a building must have 1-1, 1-to-many or many-to-1 relation, but not in many-to-many relation. Warning should be given to the respective Data Owner(s) upon deletion of Geo-Struct Mapping record, since it could mean that the Category information is modified or matching between Geographical Info and Building Structural Info records is changed.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Geo Record ID	Identifier of the concerned Building Geographical Info record	N(9)	Y
Category	Building category	X(1)	Y
Structure ID	Identifier of the concerned Building Structural Info record. Hence, when Category <> '1', it has the same value as Geo Record ID.	N(9)	Y
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset). Hence, it also means when Category is identified for the Building CSU.	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Geo Record ID, Category, Structure ID			
FK	Geo Record ID		Building Geographical Info	Record ID
FK	Category, Structure ID		Building Structural Info	Category, Structure ID
CK	Structure ID	= Geo Record ID when Category <> '1'		
CK	Category	Same as concerned Building Geographical Info record (identified by Geo Record ID)	Building Geographical Info	Category

(c)   Data Ownership - vary by record

Condition	Data Owner
Category = '1'	BD
Category in ('2', '5')	LandsD
Category = '3'	PlanD

Condition	Data Owner
Category = '4'	ArchSD

4.5.12   Building OP Info

– OP(s) related to a building. An OP may cover more than one building, and one building may involve multiple OPs. This entity is applicable for buildings under Category 1 only. Details of the OP are maintained in the OP Info entity.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Category	Building category. Hence, always '1'.	X(1)	Y
Structure ID	Identifier of the concerned Building Structural Info record. Hence, it references to the concerned Building Block ID as in BD's BCIS	N(9)	Y
OP No	Occupation permit number e.g. 'D141/55'	X(15)	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Structure ID, OP No			
FK	Category, Structure ID		Building Structural Info	Category, Structure ID
FK	OP No		OP Info	OP No
CK	Category	= '1'		

(c)   Data Ownership

All records	BD

4.5.13   OP Info

– Information of Occupation Permits (OP). This entity is applicable for buildings under Category 1 only.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
OP No	Occupation permit number e.g. 'D141/55'	X(15)	Y

Data Item	Description	Format	Mandatory
OP Date	Issue date of OP. This can be null only for converted records for existing buildings, and is mandatory for all OPs issued after implementation of DAM.	Date	
Domestic GFA	Domestic gross floor area covered by the OP, and hence it covers all the buildings under this OP. This can be null only for converted records for existing buildings, and is mandatory for all OPs issued after implementation of DAM.	N(10,2)	
Non Domestic GFA	Non-domestic gross floor area covered by the OP, and hence it covers all the buildings under this OP. This can be null only for converted records for existing buildings, and is mandatory for all OPs issued after implementation of DAM.	N(10,2)	

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	OP No			
CK	Domestic GFA	>= 0		
CK	Non Domestic GFA	>= 0		

(c)   Data Ownership

All records		BD

4.5.14   Building Lot No In OP

–   Lot Number as marked in OP. This entity is applicable for buildings under Category 1 only. Lot designations are denoted in structural format. E.g. "RP OF SS2 OF SG OF RP OF IL 94 AND THE EXTENSION THERETO" will be stored as: DD SD Type = Null, DD SD No = Null, Lot Type = 'IL', Lot No. = '94', Section1 = '(RP)', Subsection1 = NULL, Section2 = 'G', Subsection2 = '2', Section3 = '(RP)', Ext Portion = '9', Misc No = Null.

− For whole lots (i.e. not subdivided), the entered lot designation will use the DD SD Type, DD SD No, Lot Type and Lot No data items only, where DD SD Type and DD SD No are applicable only for DD/SD lots only.

− For subdivided lots, the part of lot designation that was inherited from the parent whole lots (i.e. the part before Section/Subsection designation) will be entered in the same way as for the parent whole lots. The Section/Subsections part will then be entered into the Section 1-4 and Subsection 1-3 data items. The first section encountered in the lot designation will be entered as Section1, the first subsection encountered in the lot designation will be entered as Subsection1, the second section encountered in the lot designation will be entered as Section2, so and so forth. The wordings "Section" and "Subsection" in the lot designation will be omitted when entering into the said data items, e.g. 'Section A' will be recorded as 'A', 'Subsection 1' will be recorded as '1'.

− The Ext Portion data item is used when the concerned lot includes an extension also (see description of the data item below).

− The Misc No is used only for those lots defined as peculiar lots, like the peculiar lots in LR's LRS (and future IRIS). When this data item is not null, lot type, lot number and section/subsection parts of the lot designation will be entered into the data items described above wherever applicable, but not every details of the full sections, subsections and extension parts can be recorded into the structural data items. For the full textual lot designation, Data Users may make reference to the Peculiar Lots Full List accessible from the land search feature of LR's LRS/IRIS.

(a)　　　Data Item Description

Data Item	Description	Format	Mandatory
Category	Building category. Hence, always '1'.	X(1)	Y
Structure ID	Identifier of the concerned Building Structural Info record. Hence, it references to the concerned Building Block ID as in BD's BCIS	N(9)	Y
DD SD Type	DD/SD Type in English e.g. 'DD', 'SD'	X(5)	
DD SD No	DD/SD Number e.g. '1', '2'	X(4)	
Lot Type	Lot Type in English abbreviation e.g. 'LOT', 'CLL', 'IL', 'KIL'	X(15)	Y
Lot No	Lot Number (including both numeric and alphabetical part) e.g. '123', '328', '20A'	X(13)	Y

Data Item	Description	Format	Mandatory
Section 1	The first section letter (e.g. 'A', 'B', 'AA', 'C-F') appeared in a lot designation. Special values for non-section letters are enclosed in brackets, where: (PE) = PRAYA EXTENSION TO (PR) = PRAYA EXCLAMATION TO (RP) = THE REMAINING PORTION OF (RC) = THE RECLAMATION TO	X(4)	
Subsection 1	The first subsection number (e.g. '1', '2') appeared in a lot designation.	X(4)	
Section 2	The second section letter (e.g. 'A', 'B') appeared in a lot designation. Special values for non-section letters are enclosed in brackets, where: (PE) = PRAYA EXTENSION TO (PR) = PRAYA EXCLAMATION TO (RP) = THE REMAINING PORTION OF (RC) = THE RECLAMATION TO	X(4)	
Subsection 2	The second subsection number (e.g. '1', '2') appeared in a lot designation.	X(2)	
Section 3	The third section letter (e.g. 'A', 'B') appeared in a lot designation. Special values for non-section letters are enclosed in brackets, where: (PE) = PRAYA EXTENSION TO (PR) = PRAYA EXCLAMATION TO (RP) = THE REMAINING PORTION OF (RC) = THE RECLAMATION TO	X(4)	
Subsection 3	The third subsection number (e.g. '1', '2') appeared in a lot designation.	X(2)	
Section 4	The forth section letter (e.g. 'A', 'B') appeared in a lot designation. Special values for non-section letters are enclosed in brackets, where: (PE) = PRAYA EXTENSION TO (PR) = PRAYA EXCLAMATION TO (RP) = THE REMAINING PORTION OF (RC) = THE RECLAMATION TO	X(4)	

Data Item	Description	Format	Mandatory
Ext Portion	Extended portion, where 1 = and the first extension thereto 2 = and the second extension thereto 3 = and the third extension thereto 4 = and the fourth extension thereto 5 = and the fifth extension thereto 6 = and the sixth extension thereto 7 = and the seventh extension thereto 8 = and the eighth extension thereto 9 = and the extension thereto	N(1)	
Misc No	Miscellaneous number (as in LR's LRS/IRIS)	N(4)	

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
FK	Category, Structure ID		Building Structural Info	Category, Structure ID
UK	Structure ID, DD SD Type, DD SD No, Lot Type, Lot No, Section 1, Subsection 1, Section 2, Subsection 2, Section 3, Subsection 3, Section 4, Ext Portion, Misc No			
CK	DD SD Type	In ('DD', 'SD')		
CK	Ext Portion	Between 1 and 9		
CK	Misc No	> 0		

(c)   Data Ownership

All records		BD

4.5.15   Development Name

– Names of developments/estates. In addition to the current name, alternative name of a building (e.g. the name before renaming) may also be maintained.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Info Source	Provider of this development name, where R = Recorded name provided by RVD S = Surveyed name provided by LandsD	X(1)	Y
Development ID	Unique identifier among the development names provided by one Data Owner	N(9)	Y
Eng Dev Name	Development name in English	X(80)	Y
Chi Dev Name	Development name in Chinese	CX(25)	Y
Status	Status of the development name, where E = default O = other name (alias) P = proposed R = renamed	X(1)	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Info Source, Development ID			
CK	Info Source	In ('R', 'S')		
CK	Status	In ('E', 'O', 'P', 'R')		

(c)   Data Ownership - vary by record

Condition	Data Owner
Info Source = 'R'	RVD
Info Source = 'S'	LandsD

4.5.16   Building Development Name

– Links between buildings and their corresponding development names

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Record ID	Identifier of the concerned Building Geographical Info record	N(9)	Y
Info Source	Provider of the concerned development name, where R = Recorded name provided by RVD S = Surveyed name provided by LandsD	X(1)	Y
Development ID	Identifier of the concerned development name	N(9)	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Record ID, Info Source, Development ID			
FK	Record ID		Building Geographical Info	Record ID
FK	Info Source, Development ID		Development Name	Info Source, Development ID

(c)   Data Ownership - vary by record

Condition	Data Owner
Info Source = 'R'	RVD
Info Source = 'S'	LandsD

4.5.17   Building Name

−   Name of buildings. In addition to the current name, alternative name of a building (e.g. the name before renaming) may also be maintained.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Record ID	Identifier of the concerned Building Geographical Info record	N(9)	Y
Info Source	Provider of the concerned development name, where R = Recorded name provided by RVD S = Surveyed name provided by LandsD	X(1)	Y

Data Item	Description	Format	Mandatory
Full Eng Bldg Name	Building name in English. When Address Source = 'R', it is constructed by building name line 1-3, block description and block number in the corresponding Building Address record. At least one between Full Eng Bldg Name and Full Chi Bldg Name must not be null.	X(100)	
Full Chi Bldg Name	Building name in Chinese. When Address Source = 'R', it is constructed by building name line 1-3, block description and block number in the corresponding Building Address record. At least one between Full Eng Bldg Name and Full Chi Bldg Name must not be null.	CX(50)	
Status	Status of the development name, where E = default O = other name (alias) P = proposed R = renamed	X(1)	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
FK	Record ID		Building Geographical Info	Record ID
UK	Record ID, Info Source, Full Eng Bldg Name, Full Chi Bldg Name			
CK	Status	In ('E', 'O', 'P', 'R')		

(c)   Data Ownership - vary by record

Condition	Data Owner
Info Source = 'R'	RVD
Info Source = 'S'	LandsD

4.5.18   Building Address

−   Addresses of a Building CSU. The full postal addresses contain all Building Name, Street Name, Building Number, Development Name and Lot Number components, whichever applicable. The first 3 components are also available in structured format to facilitate Data Users to import the data into their departmental address databases, in particular for those maintaining addresses in a structural way in addition to the free-text format.

−   Surveyed addresses from LandsD may be provided only for converted data for buildings constructed before implementation of DAM. For all future buildings, only the recorded addresses from RVD will be available.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Record ID	Identifier of the concerned Building Geographical Info record	N(9)	Y
Address Source	Provider of this address, where R = Recorded address provided by RVD S = Surveyed address provided by LandsD When Address Source = 'S', only the Bldg No Num, Bldg No Alpha, Bldg No Ext and St Loc ID data items are applicable and all the other non-mandatory data items will be left as Null.	X(1)	Y
Address ID	Identifier of address assigned by Data Owner. When Address Source = 'R', it references to the concerned Block ID as in RVD's PMS	N(9)	Y
Eng Bldg Name 1	Line 1 of building name in English e.g. 'KAM FAI BUILDING', 'BLOCK 40'	X(35)	
Eng Bldg Name 2	Line 2 of building name in English	X(35)	
Eng Bldg Name 3	Line 3 of building name in English	X(35)	
Chi Bldg Name 1	Line 1 of building name in Chinese e.g. '金輝樓', '第 40 座'	CX(14)	
Chi Bldg Name 2	Line 2 of building name in Chinese	CX(14)	
Chi Bldg Name 3	Line 3 of building name in Chinese	CX(14)	
Eng Block Desc	Block description in English e.g. 'BLDG', 'APT', 'HSE', 'BLK'	X(35)	
Chi Block Desc	Block description in Chinese e.g. '大廈', '洋房', '座'	CX(14)	

Data Item	Description	Format	Mandatory
Block No Num	Numeric part of block number e.g. '1' in 'TOWER 1'	N(5)	
Block No Alpha	Alphabetic part of block number e.g. 'A' in 'BLK A'	X(10)	
Block No Alpha Prec Ind	Determine ordering of numeric and alphabetical parts of block number when both parts are not Null, where Y = Block No Alpha precedes Block No Num N = Block No Num precedes Block No Alpha	X(1)	
Block Desc Prec Ind	Determine ordering of block description and block number in full address when both are not Null, where Y = block description precedes block number (e.g. in the cases of 'BLK A' and 'TOWER 1') N = block number precedes block description (e.g. in the cases of 'NORTH BLK' and 'WEST TOWER')	X(1)	
Bldg No Num	Numeric part of building number e.g. '18' in '18A/20A', and '1' in '1B/1C'	N(4)	
Bldg No Alpha	Alphabetical part of building number e.g. 'A' in '18A/20A', and 'B' in '1B/1C'	X(2)	
Bldg No Ext	Extension of building number e.g. '/20A' in '18A/20A', and '/1C' in '1B/1C'	X(8)	
St Loc ID	Identifier of the concerned street-location	N(9)	
Unofficial Address Code	Indicate that the address unofficial, where 1 = Building number to be bracketed/No building number 2 = Building number and street name to be bracketed 3 = Dummy address i.e. building number within the range occupied by the building and recorded for search purpose, but there is no tenement/unit in the building using this building number in full address	X(1)	

Data Item	Description	Format	Mandatory
Bldg No Confirm Code	Indicate whether the assigned building number is confirmed, where C = Confirmed building number P = Provisional building number A = Not yet allocated but action to be taken B = Use existing old number but action to be taken X = Not applicable When this code is C or P, at least one of the three Bldg No fields must not be Null.	X(1)	
Eng Full Addr 1	Line 1 of the full postal address in English. Concerned lot number(s) is generated as part of the full address (line 1-5) for unofficial addresses, where unofficial addresses refer to those with non-blank Unofficial Address Code. The full address is mandatory for records with Address Source = 'R' and Unofficial Address Code = 1, 2 or Null.	X(35)	
Eng Full Addr 2	Line 2 of the full postal address in English	X(35)	
Eng Full Addr 3	Line 3 of the full postal address in English	X(35)	
Eng Full Addr 4	Line 4 of the full postal address in English	X(35)	
Eng Full Addr 5	Line 5 of the full postal address in English	X(35)	
Eng Loc Addr 1	Line 1 of location name part for postal addresses with location name. Location name part (line 1-3) is applicable normally for buildings in the New Territories only, and is appended to the last non-blank line of English full address (line 1-5) to form the full postal address.	X(35)	
Eng Loc Addr 2	Line 2 of location name part for postal addresses with location name	X(35)	
Eng Loc Addr 3	Line 3 of location name part for postal addresses with location name	X(35)	
Eng Addr Verify Code	Indicate whether the English full postal address is verified, where N = Not yet verified V = Verified, and the full address is generated by the structural address S = Verified, but the full address is manually input by user	X(1)	

Data Item	Description	Format	Mandatory
Chi Full Addr 1	Line 1 of the full postal address in Chinese. Concerned lot number(s) is generated as part of the full address (line 1-5) for unofficial addresses, where unofficial addresses refer to those with non-blank Unofficial Address Code. The full address is mandatory for records with Address Source = 'R' and Unofficial Address Code = 1, 2 or Null.	CX(14)	
Chi Full Addr 2	Line 2 of the full postal address in Chinese	CX(14)	
Chi Full Addr 3	Line 3 of the full postal address in Chinese	CX(14)	
Chi Full Addr 4	Line 4 of the full postal address in Chinese	CX(14)	
Chi Full Addr 5	Line 5 of the full address in Chinese	CX(14)	
Chi Addr Verify Code	Indicate whether the Chinese full postal address is verified, where N = Not yet verified V = Verified, and the full address is generated by the structural address S = Verified, but the full address is manually input by user	X(1)	

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Record ID, Address Source, Address ID			
FK	Record ID		Building Geographical Info	Record ID
CK	Address Source	In ('R', 'S')		
CK	Block No Num	> 0		
CK	Block No Alpha Prec Ind	In ('Y', 'N')		
CK	Block Desc Prec Ind	In ('Y', 'N')		
CK	Bldg No Num	> 0		
FK	St Loc ID		Street Location	St Loc ID
CK	Unofficial Address Code	In ('1', '2', '3')		

Type	Data Item	Validation	Reference Entity	Reference Data Item
CK	Bldg No Confirm Code	In ('C', 'P', 'A', 'B', 'X')		
CK	Eng Addr Verify Code	In ('N', 'V', 'S')		
CK	Chi Addr Verify Code	In ('N', 'V', 'S')		

(c)   Data Ownership - vary by record

Condition	Data Owner
Address Source = 'R'	RVD
Address Source = 'S'	LandsD

4.5.19   Street Location

–   Combination of street name and at most 3 location names that can be used in addresses. A combination may have the street name part only, or only 1 or 2 concerned location name(s).

(a)   Data Item Description

Data Item	Description	Format	Mandatory
St Loc ID	Unique identifier of a street name-location name combination	N(9)	Y
Street ID	Identifier of the concerned street name e.g. references to 'CASTLE PEAK RD' for 'CASTLE PEAK RD-TSUEN WAN' e.g. references to 'TAI MONG TSAI RD' for 'TAI MONG TSAI RD, TSAM CHUK WAN, SAI KUNG'	N(9)	Y
Location ID 1	Identifier of the first concerned location name, if any. Normally not available for streets in Hong Kong Island and Kowloon. e.g. references to 'TSUEN WAN' for 'CASTLE PEAK RD-TSUEN WAN' e.g. references to 'TSAM CHUK WAN' for 'TAI MONG TSAI RD, TSAM CHUK WAN, SAI KUNG'	N(9)	

Data Item	Description	Format	Mandatory
Location ID 2	Identifier of the second concerned location name, if any. Normally not available for streets in Hong Kong Island and Kowloon. e.g. references to 'SAI KUNG' for 'TAI MONG TSAI RD, TSAM CHUK WAN, SAI KUNG'	N(9)	
Location ID 3	Identifier of the third concerned location name, if any. Normally not available for streets in Hong Kong Island and Kowloon.	N(9)	
Location Nature	Nature of the street-location combination, where 1 = Street-location is equal to gazetted street name 2 = Street name part alone is equal to gazetted street name 3 = Village 4 = Others	X(1)	Y
Eng Full Name	Full street-location name in English generated according to the concerned street name and location name(s) e.g. 'CASTLE PEAK RD-TSUEN WAN'	X(57)	Y
Chi Full Name	Full street-location name in Chinese generated according to the concerned street name and location name(s) e.g. '青山公路－荃灣段'	CX(24)	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	St Loc ID			
UK	Street ID, Location ID 1, Location ID 2, Location ID 3			
FK	Street ID		Street Name	Street ID
FK	Location ID 1		Location Name	Location ID
FK	Location ID 2		Location Name	Location ID
FK	Location ID 3		Location Name	Location ID

Type	Data Item	Validation	Reference Entity	Reference Data Item
CK	Location Nature	In ('1', '2', '3', '4')		

(c)   Data Ownership

All records			RVD

4.5.20   Street Name

–   List of street names

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Street ID	Unique identifier of a street name	N(9)	Y
Eng Name	Street name in English e.g. 'CONNAUGHT' in 'CONNAUGHT RD C'	X(35)	Y
Eng Type	Street type in English e.g. 'RD' in 'CONNAUGHT RD C'	X(10)	
Eng Direction	Street direction in English e.g. 'C' in 'CONNAUGHT RD C'	X(10)	
Eng Type Prec Ind	Determine ordering of type and direction parts of the English street name when both parts are not Null, where Y = Eng Type precedes Eng Direction N = Eng Direction precedes Eng Type (Normally 'Y' for all records)	X(1)	
Chi Name	Street name in Chinese e.g. '干諾' in '干諾道中'	CX(14)	Y
Chi Type	Street type in Chinese e.g. '道' in '干諾道中'	CX(5)	
Chi Direction	Street direction in Chinese e.g. '中' in '干諾道中'	CX(5)	
Chi Type Prec Ind	Determine ordering of type and direction parts of the Chinese street name when both parts are not Null, where Y = Chi Type precedes Chi Direction N = Chi Direction precedes Chi Type e.g. 'Y' for '干諾道中', and 'N' for '西洋菜南街'	X(1)	

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Street ID			

(c)   Data Ownership

All records			RVD

4.5.21   Location Name

−   List of location names

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Location ID	Unique identifier of a location name	N(9)	Y
Eng Name	Location name in English	X(35)	Y
Chi Name	Location name in Chinese	CX(14)	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Location ID			

(c)   Data Ownership

All records			RVD

4.5.22   Data Provision Date

−   The date when any attribute, regardless spatial or textual, of a Building CSU is last updated by Data Owners. Attributes of a Building CSU include all data items maintained in Building Geographical Info, Building Structural Info, Geo-Struct Mapping, Building OP Info, OP Info, Building Lot No In OP, Building Development Name, Building Name, Building Address and the six Polygon entities. This can be logged by the Data Agent upon importing data from Data Owners into the CSU dataset.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Record ID	Identifier of the concerned Building Geographical Info record	N(9)	Y
Dept Code	Data Owner	X(10)	Y

Data Item	Description	Format	Mandatory
Last Prov Date	Date on which the Data Owner last update any attribute of the CSU	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Record ID, Dept Code			
FK	Record ID		Building Geographical Info	Record ID
FK	Dept Code		Participating Department	Dept Code

(c)   Data Ownership - vary by record

Condition	Data Owner
Dept Code = 'ARCHSD'	ArchSD
Dept Code = 'BD'	BD
Dept Code = 'LANDSD'	LandsD
Dept Code = 'PLAND'	PlanD
Dept Code = 'RVD'	RVD

4.5.23   Participating Department

−   List of Data Owner PDs. This is to be maintained by the Data Agent.

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Dept Code	Code of PD e.g. 'LANDSD', 'RVD'	X(10)	Y
Last Upload Date	Date and time when data from this Data Owner is imported into the CSU dataset. This data item may be left null upon defining a new Data Owner PD (i.e. when setting up values in this reference code table). Once the first source dataset from this Data Owner has been imported into the CSU dataset, this data item value will be set and cannot be reverted to null value. When new information is available, instead of inserting a new record, the existing record would be updated.	Date	

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Dept Code			

(c)   Data Ownership

All records		LandsD

4.5.24   Renamed CSU

–   In the situation when a CSU polygon is moved from Proposed status to Active status and the label point of the proposed building polygon no longer lies within the boundary of the active building polygon, a new label point will be picked and hence the CSU ID (which is a composite key containing the Geo-reference No.) will be re-assigned. As the "Proposed" Building CSU polygons are approximate only and there could be considerable difference between the "Proposed" Building CSU polygons and the "Active" Building CSU polygons, e.g. number of building polygons representing the same building structure or development. For easy reference by Data Users, both the original CSU ID under Proposed status and the corresponding Active one will be recorded.

–   During the Post-Construction Stage, merging or splitting of building polygons (hence, the Building Geographical Info and Building Polygon records) for Category 1 buildings would be required to achieve 1-1 mapping between the respective Building Geographical Info/Building Polygon and Building Structural Info records created by LandsD and BD respectively. For easy reference by Data Users, both the original CSU ID and the corresponding new one(s) after merging/splitting will be recorded.

–   An on going history log will be retained for tracing purpose.   No log will be removed even in the situation when its new CSU ID is subsequently replaced by another due to a later renaming/merging/split operation. Hence, the New Concatenated ID data item must make reference to a valid Building Geographical Info record when a Renamed CSU record is created. Though such reference may no longer hold at a later stage, e.g. when a renaming/merging/split of polygons occurred, all records should be retained in the Renamed CSU .

(a)   Data Item Description

Data Item	Description	Format	Mandatory
Old Concatenated ID	Concatenation of Geo Ref No, Polygon Type and Record Creation Date of the original CSU ID	X(19)	Y
New Concatenated ID	Concatenation of Geo Ref No, Polygon Type and Record Creation Date of the new CSU ID after renaming/merging/splitting	X(19)	Y
Operation	Operation applied to the concerned building polygon, where R = CSU ID reassigned for a CSU M = multiple CSUs merged into one S = one CSU split into multiple	X(1)	Y
Timestamp	Date and time when the record is last created/modified (i.e. when new data value(s) from Data Owner(s) is imported into the CSU dataset)	Date	Y

(b)   Constraint Description

Type	Data Item	Validation	Reference Entity	Reference Data Item
PK	Old Concatenated ID, New Concatenated ID			

(c)   Data Ownership

All records		LandsD

5   Maintenance of the CSU

5.1   Data Provision Frequency

5.1.1   To ensure the time currency of CSU data is maintained to an agreed acceptable level, each Data Owner shall commit to provide their data to the Data Agent at the the agreed updating frequency.

5.1.2   Data Owners shall provide the latest changes on CSU relevant data to the Data Agent on a regular basis. All changes since the last data upload must be included in the interface data file in the new data upload.

5.1.3   Table below provides information of data provision frequency for Building CSU of the Data Owners, ArchSD, BD, LandsD, PlanD, and RVD.

Data Owner	Current Outgoing Data Sharing Frequency (before CSU implementation)	CSU Data Provision Frequency
ArchSD	Not applicable	Monthly
BD	Monthly	Monthly
LandsD	Varies[4]	Bi-weekly (once every 2 weeks)
PlanD	Not applicable	Monthly
RVD	Not applicable	Bi-weekly

Table 4 Data Provision Frequency o f Building CSU

5.2   Data Dissemination Frequency

5.2.1   The Data Agent will update the CSU dataset using the latest data provided by the Data Owners. Periodically the Data Agent will pre-pack the CSU data in all the Standard File Formats and make the files available for download by Data Users.

5.2.2   Below presents the desirable and minimal tolerable data dissemination frequency for Data Users:

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[4] Currently there are several departments having direct connection link to LandsD to obtain the latest data update online. The data exchange frequency depends on how frequent the data receiving departments download the data from the data-providing department.

Direct Access incurs additional costs on communication lines and hardware maintenance. With the implementation of DAM, information from different PDs will be integrated to the Building CSU and made available to PDs. To minimize duplication of resource, it is recommended to minimize the Direct Access approach if possible.

Data User	Required Data Dissemination Frequency	
	Desirable	Lowest Frequency Tolerable
ArchSD	Not applicable[5]	Not applicable
BD	Monthly	Monthly
C&SD	Monthly	Monthly
LandsD	Biweekly	Monthly
PlanD	Weekly	Monthly
RVD	Weekly	Biweekly

Table 5 Data Dissemination Frequency o f Building CSU

5.3   Mode of Dissemination

5.3.1   Upon the implementation of CSU, the Data Users have to acquire the data from the Data Agent, rather than obtaining data from each respective Data Owners, such that the data exchange processes would be streamlined.

5.3.2   To minimize duplicated effort of data dissemination, CSU data shall be disseminated from a single source, i.e. Data Agent. Among the 13 PDs, the current mode of exchange of PLW data will still be retained except those replaced by the exchange of CSU dataset, dissemination of which will be carried out by data dissemination system provided by each respective Data Agent.

5.3.3   An automated data dissemination system is recommended for the Building CSU. A Data Dissemination System (DDS) will be developed and hosted by the Data Agent, i.e. LandsD, who is recommended to handle dissemination of Building CSU, Lot CSU and Road Centreline CSU data.

5.3.4   Subject to finalization of user requirements and selected technical option in the supplementary feasibility study for DDS,

(a)   The system would include a central database, data upload facilities, data import programs, data conversion tools and facilities to allow data download by Data Users. Web-based user interface might be considered as an option for data upload and download facilities.

(b)   Data downloading from Data Agent to Data Users might be supported in both full dataset mode and incremental changes mode by the

[5] No GIS system at present in ArchSD.

dissemination system hosted by the Data Agent. Periodically the Data Agent will pre-pack incremental changes in CSU information in all the supported file formats and make the packed files available for download from the dissemination system.

(c)   Data Users can download the incremental changes in their preferred file format at their convenience. Full dataset download will be supported on ad hoc basis. Due to time needed for file format conversion for the large data volume, a full dataset in a requested file format may not be available for download on the fly but only after a couple of days. Meanwhile, all textual reference code tables will be available in full set mode only and will be refreshed at the same interval as the incremental changes.

Appendix A.   Delineation Rules for Polygons of the Building CSU

A.1.1   With reference to BD's delineation principle, there are three main rules for determining the number of polygons of the building CSU.

(a)   Attached structures sharing the same Means Of Escape (MOE), such as portion of a terraced development, will be counted as one Building CSU. See Figure 12 and Figure 13.
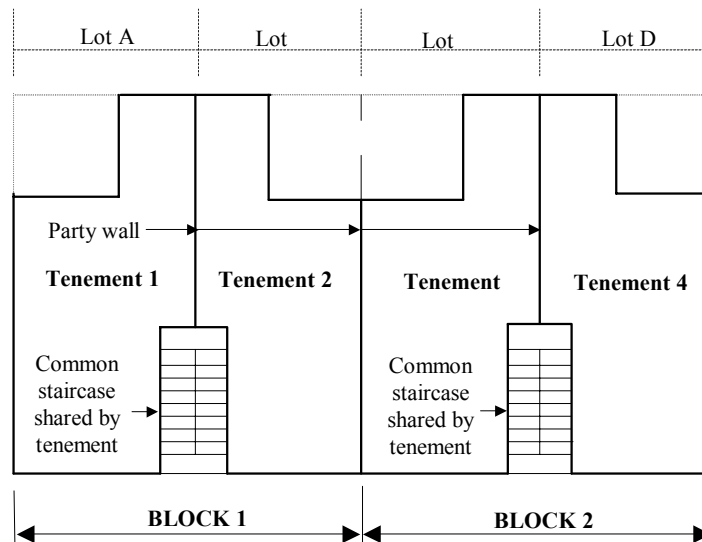
Figure 12 Delineation Rule 1 for Building CSU
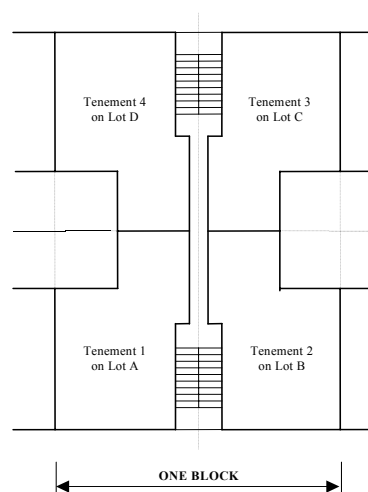
Figure 13 Delineation Rule 2 for Building CSU

(b)   If a development consists of tower blocks and a podium block, each block will be counted as a one polygon, or building block. Thus a development with two tower blocks over a podium block will be counted as three Building CSUs (see Figure 14 and Figure 15).
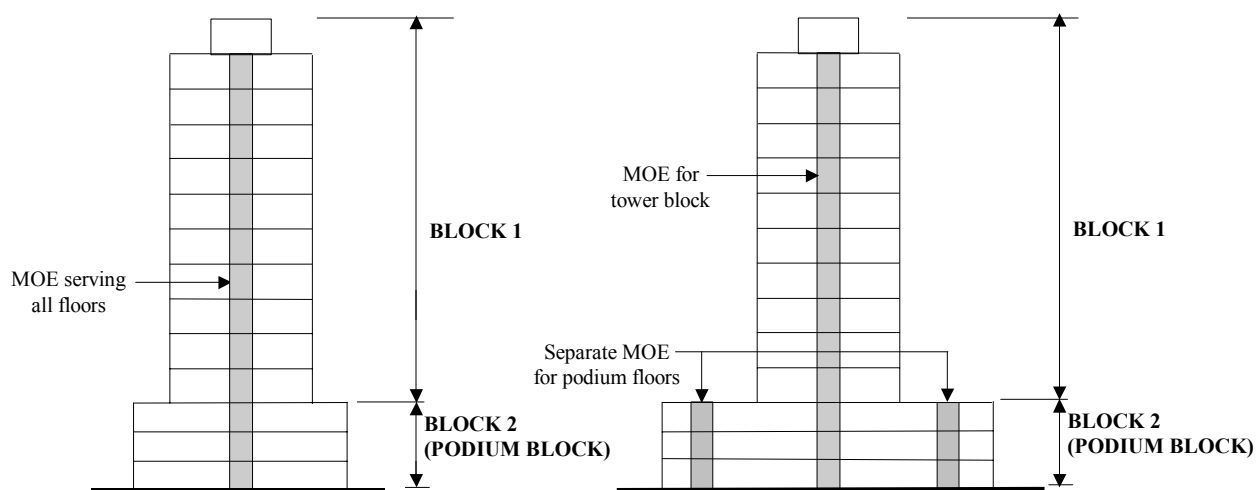
Figure 14 Delineation Rule 3 for Building CSU
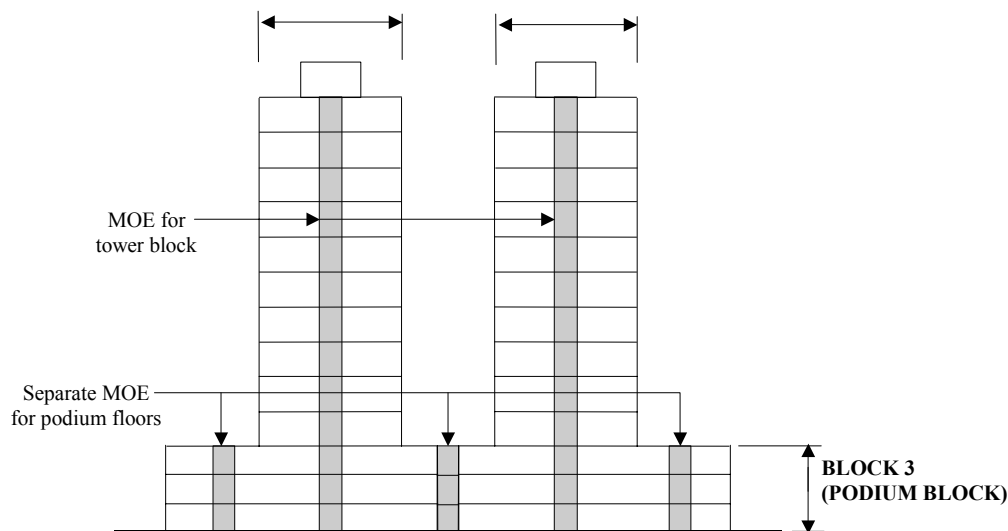
Figure 15 Delineation Rule 4 for Building CSU

(c)   For detached and semi-detached houses with individual MOE (usually with separate house numbers), each house number will be counted as a separate tower polygon, or building block (see Figure 16).
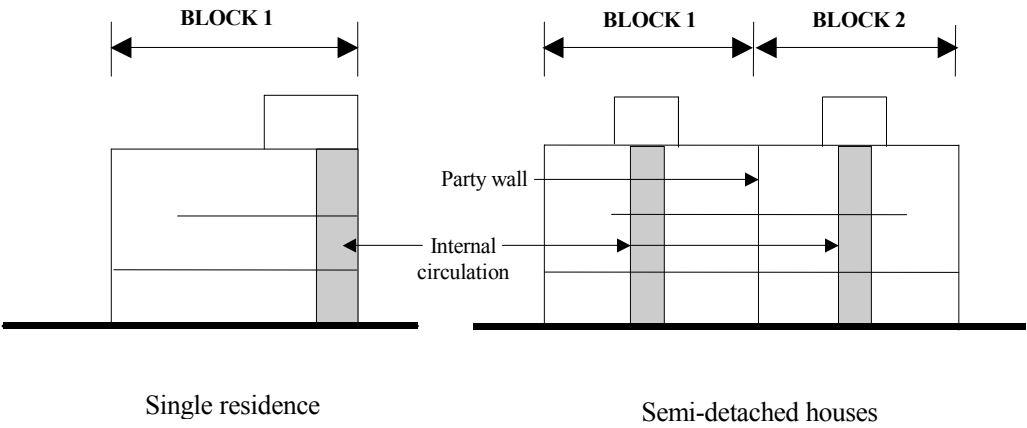
Figure 16 Delineation Rule 5 for Building CSU

Appendix B.   Conventions for Data Interface Requirement

B.1.1   Logical Data Structure Diagram

<Entity Name>	
PK	**<Data Item 1>**
FK1	<Data Item 2>
U1	<Data Item 3>
U1	<Data Item 4>

<Entity Name>	
PK	**<Data Item 1>**
FK1	<Data Item 2>
U1	<Data Item 3>
U1	<Data Item 4>

Entity
The upper part in grey shading shows the name of the entity. The lower part lists only the data items involved in the primary key, unique key(s) and foreign key(s) of the entity, while the other data items of the entity will be elaborated in Entity Description. Composite keys are represented by same key name in multiple data items (e.g. two data items marked as "U1" means a composite unique key composed of two data items) Mandatory data item(s) will be printed in bold text.
For diagrams spanned across multiple pages, the first occurrence of each entity is shown in solid-line border while all repeated occurrences in later pages are shown in dotted-line border.
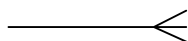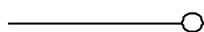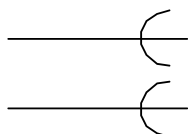
Line with crow's foot
 "many" end of a relation

Normal solid line
Mandatory end of a relation

Line with small circle at the end
Optional end of a relation. That is, a record on the left may not have any associated record on the right.

Line with a curve at the end
Exclusive relation. i.e. only 1 among the connected entities on left is linked to the entity on right at a time

B.1.2   Entity Description - Data Item Description - Format

(a)   X(n) : Variable-length character strings of max. length n

(b)   CX(n): Variable-length character strings of maximum n Chinese characters. Maximum number of bytes will depend on the character set used by the CSU dataset. E.g. CX(5) occupies at most 10 bytes if data are stored in Big5 character set.

(c)   N(m,n) : Fixed and floating point numbers, where m is precision (total number of digits before and after decimal point) and n is scale (number of digits to the right of decimal point). The n part is omitted, i.e. denoted in N(m), for integers.

(d)   Date : Point-in-time values (date and time)

(e)   Polygon : Closed polygon representing a spatial area.

B.1.3   Entity Description - Constraint Description - Type

(a)   PK : Data item is part of primary key, which is used to uniquely identify a record in the entity.

(b)   FK : Data item is part of foreign key, which means the data item values, if not null, must match the unique identifier of another entity.

(c)   UK : Data item is part of alternate key, which is used as an alternate way to uniquely identify a record in the entity.

(d)   CK : The value of data item should be checked ensuring that it falls within or meets the predefined values/ranges/rules. Hence, non-mandatory data items can be left as null, or otherwise must meet the criteria.

(e)   CP : The value of geometry type data item should be a closed polygon.

B.1.4   Entity Description - Data Ownership - Condition

(a)   RelatedEntity.DataItem : Reference to value of DataItem of the linked RelatedEntity record. For example, "CSU Feature.Status" means the Status data item of the related CSU Feature record. Unless specified, relation and linked key is determined by the concerned FK constraint as defined in Constraint Description.