

Appendix XIV - Guidelines for Submission of Design and As-built BIM Models to LandsD

TABLE OF CONTENTS

1.	Introduction	XIV-1
2.	The Essentials for Successful BIM Data Submission to GBDR.....	XIV-2
2.1	Folder Structure for BIM Data Submission.....	XIV-2
2.2	Completeness Check for BIM Data Submission	XIV-6
3.	BIM Data Submission to GBDR	XIV-7
3.1	Submission via the GBDR Web User Interface	XIV-7
3.2	Submission using GBDR BIM APIs	XIV-9
4.	Checklist for the Complete BIM Data Submission.....	XIV-12

List of Tables

Table App XIV-1 Subfolders at Level 1.....	XIV-3
Table App XIV-2 Subfolders at Level 2.....	XIV-3
Table App XIV-3 Subfolders at Level 3.....	XIV-3
Table App XIV-4 Subfolders at Level 4.....	XIV-3
Table App XIV-5 Subfolders at Level 5.....	XIV-3
Table App XIV-6 Subfolders at Level 6.....	XIV-4
Table App XIV-7 Subfolders at Level 7.....	XIV-5
Table App XIV-8 BIM Submission Requirements.....	XIV-6
Table App XIV-9 Examples of GBDR BIM APIs	XIV-9

List of Figures

Figure App XIV-1 The 7-Level Folder Structure in GBDR	XIV-2
Figure App XIV-2 Input Project Details.....	XIV-7
Figure App XIV-3 Assign Files to the Corresponding Subfolders	XIV-8
Figure App XIV-4 BIM API Document on the GBDR Website	XIV-10
Figure App XIV-5 GBDR BIM API Sandbox.....	XIV-10
Figure App XIV-6 Response Simulated by GBDR BIM API Sandbox	XIV-11

1 Introduction

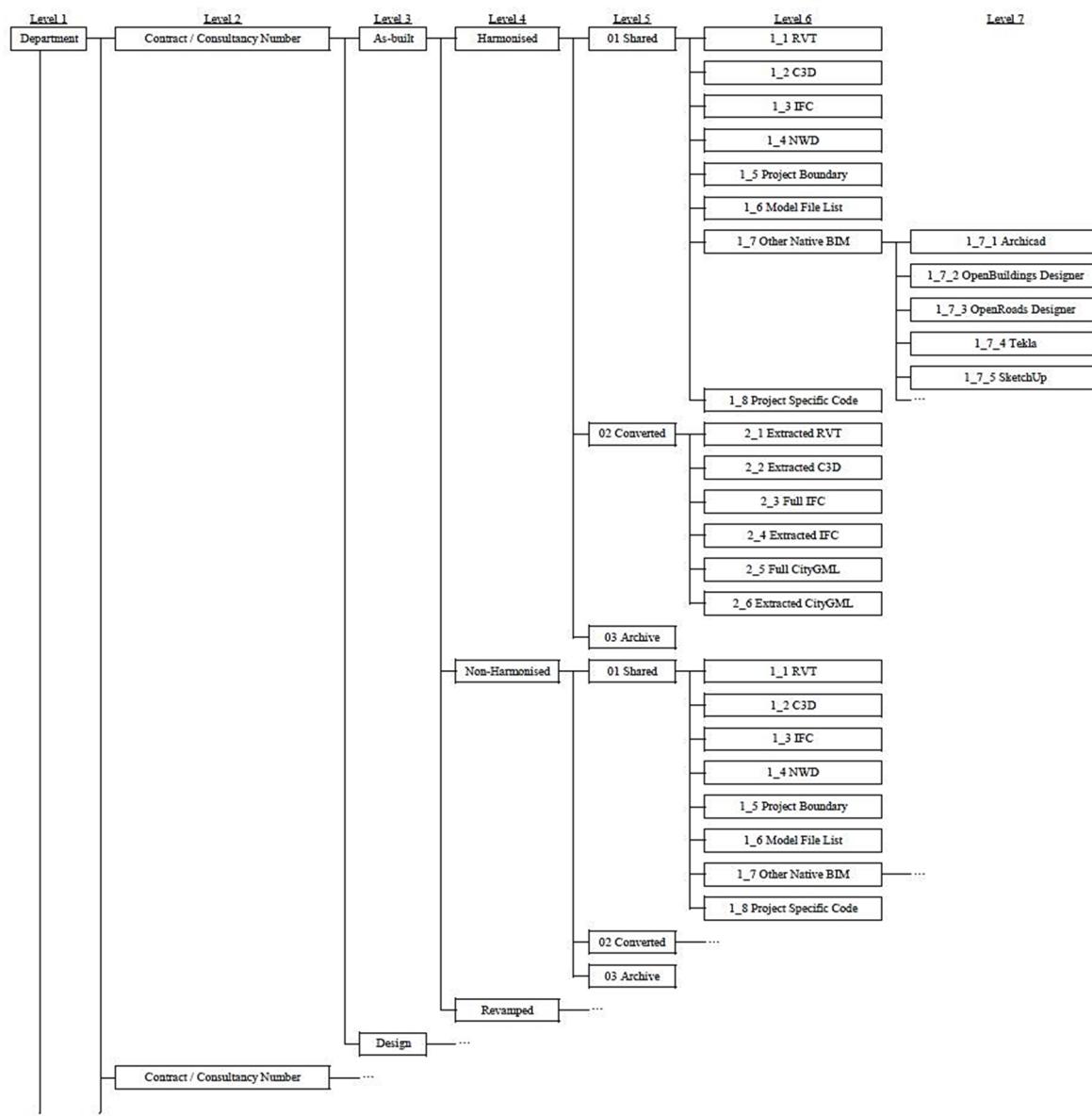
- 1.1.1 The Government BIM Data Repository (GBDR) serves as the common platform for territory-wide BIM data sharing across the Government in support of BIM Harmonisation and continuously uplifting of BIM data quality, enabling seamless BIM/GIS data integration to support smart city applications.
- 1.1.2 Currently, the GBDR provides two submission modes:
 - **Web User Interface** of the GBDR, and
 - **GBDR BIM Application Programming Interfaces (APIs)**.
- 1.1.3 This appendix outlines the requirements for submitting BIM data to the GBDR to facilitate effective BIM data sharing. It also provides comprehensive guidance to the data providers in arranging BIM submission to LandsD using the two aforementioned submission modes of the GBDR.

2 The Essentials for Successful BIM Data Submission to GBDR

2.1. Folder Structure for BIM Data Submission

2.1.1. To facilitate efficient and structured BIM data management, a standardised **7-level folder structure** is being implemented for uploading and storing of BIM data in the GBDR. This hierarchical structure (refer to Figure App XIV-1) is designed to streamline submission procedures, ensure consistency, and support robust BIM data organisation and management across projects.

Figure App XIV-1 The 7-Level Folder Structure in GBDR



2.1.2. Folders and subfolders for BIM data submission across all seven levels are systematically created by the GBDR, based on project information collected by Development Bureau (DEVB) from works departments (WDs).

2.1.3. The descriptions of folder and subfolder from Level 1 to Level 7 are summarised below:-

Table App XIV-1 Subfolders at Level 1

Subfolder name	Description
ArchSD	Architectural Services Department
CEDD	Civil Engineering and Development Department
DSD	Drainage Services Department
EMSD	Electrical and Mechanical Services Department
HyD	Highways Department
WSD	Water Supplies Department

Table App XIV-2 Subfolders at Level 2

Subfolder name	Description
CONTRACT / CONSULTANCY NUMBER	Contract number or consultancy agreement number of projects with BIM adoption, collected by DEVB from WDs

Table App XIV-3 Subfolders at Level 3

Subfolder name	Description
DESIGN	Design BIM model submission
AS-BUILT	As-built BIM model submission

Table App XIV-4 Subfolders at Level 4

Subfolder name	Description
HARMONISED	BIM models that comply with DEVB BIM Harmonisation Guidelines for WDs
NON-HARMONISED	BIM models that do not comply with DEVB BIM Harmonisation Guidelines for WDs
REVAMPED	BIM models revamped by LandsD to comply with DEVB BIM Harmonisation Guidelines for WDs

Table App XIV-5 Subfolders at Level 5

Subfolder name	Description

01 SHARED	BIM data submitted by WDs
02 CONVERTED	Open BIM data in IFC format and Open GIS data in CityGML format converted by LandsD (Only for harmonised or revamped BIM models)
03 ARCHIVE	For data archive

Table App XIV-6 Subfolders at Level 6

Subfolder name	Description
1_1 RVT	BIM models in Autodesk Revit format (.rvt)
1_2 C3D	BIM models in Autodesk Civil 3D format (.dwg)
1_3 IFC	BIM models in IFC format (.ifc)
1_4 NWD	A federated model of the project in Autodesk Navisworks Document format (.nwd)
1_5 PROJECT_BOUNDARY	Project boundary file in GIS or CAD format of .dwg, .shp or .dgn <i>[Refer to Appendix XIII for details]</i>
1_6 MODEL_FILE_LIST	An excel file (.xlsx) detailing all files to be submitted under the project, including BIM data, project boundary, etc. <i>[Refer to Appendix XIII for required input details]</i>
1_7 OTHER_NATIVE_BIM	BIM models in formats other than RVT, C3D and IFC, such as Archicad, OpenBuildings Designer, OpenRoads Designer, Tekla, SketchUp, etc. <i>[Refer to "Details of subfolders at Level 7" in Section 2.1]</i>
1_8 PROJECT_SPECIFIC_CODE	A configuration file in JSON format (.json) that defines project-specific file naming conventions. (Applicable only to harmonised or revamped BIM models) <i>[Refer to Native BIM Validation Tool package available on GBDR website]</i>
2_1 EXTRACTED_REVIT	Extracted set of “1_1 RVT” (.rvt) converted by the GBDR
2_2 EXTRACTED_C3D	Extracted set of “1_2 C3D” (.dwg) converted by the GBDR
2_3 FULL_IFC	Full set of IFC models converted by the GBDR from “1_1 RVT” and “1_2 C3D” (.ifc)
2_4 EXTRACTED_IFC	Extracted set of “2_3 FULL_IFC” (.ifc) converted by the GBDR

Subfolder name	Description
2_5 FULL_CITYGML	Full set of CityGML models converted by the GBDR from “2_3 FULL_IFC” (.gml)
2_6 EXTRACTED_CITYGML	Extracted set of “2_5 FULL_CITYGML” (.gml) converted by the GBDR

Table App XIV-7 Subfolders at Level 7

Subfolder name	Description
1_7_1 ARCHICAD	BIM models created using Archicad (.pln)
1_7_2 OPENBUILDINGS_DESIGNER	BIM models created using OpenBuildings Designer (.dgn)
1_7_3 OPENROADS_DESIGNER	BIM models created using OpenRoads Designer (.dgn)
1_7_4 TEKLA	BIM models created using Tekla Structures (.zip) <i>[A zip file of the whole model folder]</i>
1_7_5 SKETCHUP	BIM models created using SketchUp (.skp)

2.2. Completeness Check for BIM Data Submission

2.2.1 WDs can submit BIM data either through the **GBDR Web User Interface** or using the **GBDR BIM APIs**. Both submission modes are supported by streamlined procedures for uploading BIM data, which are detailed in Sections 3.1 to 3.2.

2.2.2 Once non-harmonised, harmonised, or revamped models are uploaded to the appropriate subfolders under the “**01 SHARED**” folder, the GBDR will automatically initiate a completeness check mechanism. This backend mechanism check whether all the necessary files have been included in the submission to the GBDR.

2.2.3 A summary of the submission requirements is provided in **Table App XIV-8 BIM Submission Requirements**. If the system detects any missing data or incomplete submission, an email notification will be sent to the respective WD for follow up.

Table App XIV-8 BIM Submission Requirements

File Format	Allowable File Extension	Subfolder Name	Mandatory / Optional
<i>BIM File</i>			
Revit	.rvt	1_1 RVT	Mandatory <i>Note:</i> submit at least one format
Civil 3D	.dwg	1_2 C3D	
IFC	.ifc	1_3 IFC	
Archicad	.pln	1_7_1 ARCHICAD	
OpenBuildings Designer	.dgn	1_7_2 OPENBUILDINGS_DESIGNER	
OpenRoads Designer	.dgn	1_7_3 OPENROADS_DESIGNER	
Tekla	.zip	1_7_4 TEKLA	
SketchUp	.skp	1_7_5 SKETCHUP	
<i>Reference File</i>			
Navisworks	.nwd	1_4 NWD	Optional
<i>Project Boundary</i>			
GIS / CAD	.dwg/.dgn/.shp	1_5 PROJECT_BOUNDARY	Mandatory
<i>Model File List</i>			
Excel	.xlsx	1_6 MODEL_FILE_LIST	Mandatory
<i>Project Specific Code</i>			
JSON	.json	1_8 PROJECT_SPECIFIC_CODE	Mandatory <i>Note:</i> not required for non- harmonised BIM data submission

3 BIM Data Submission to GBDR

3.1 Submission via the GBDR Web User Interface

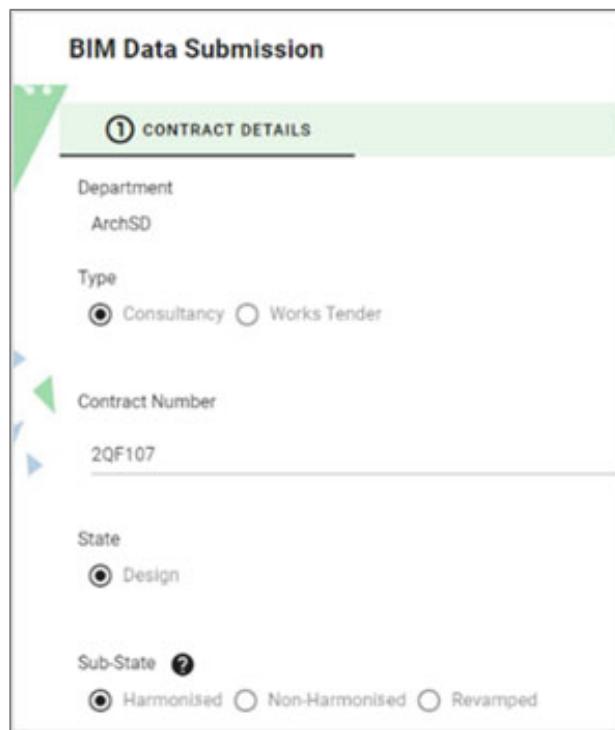
To submit BIM data via the GBDR Web User Interface, follow the steps outlined below.

3.1.1 Login to the GBDR.

3.1.2 Click “**BIM Data Submission**”.

3.1.3 Input the required project details (refer to Figure App XIV-2). Then, click “**Select Data**”.

Figure App XIV-2 Input Project Details
(Note: This figure is for illustration purpose only.)



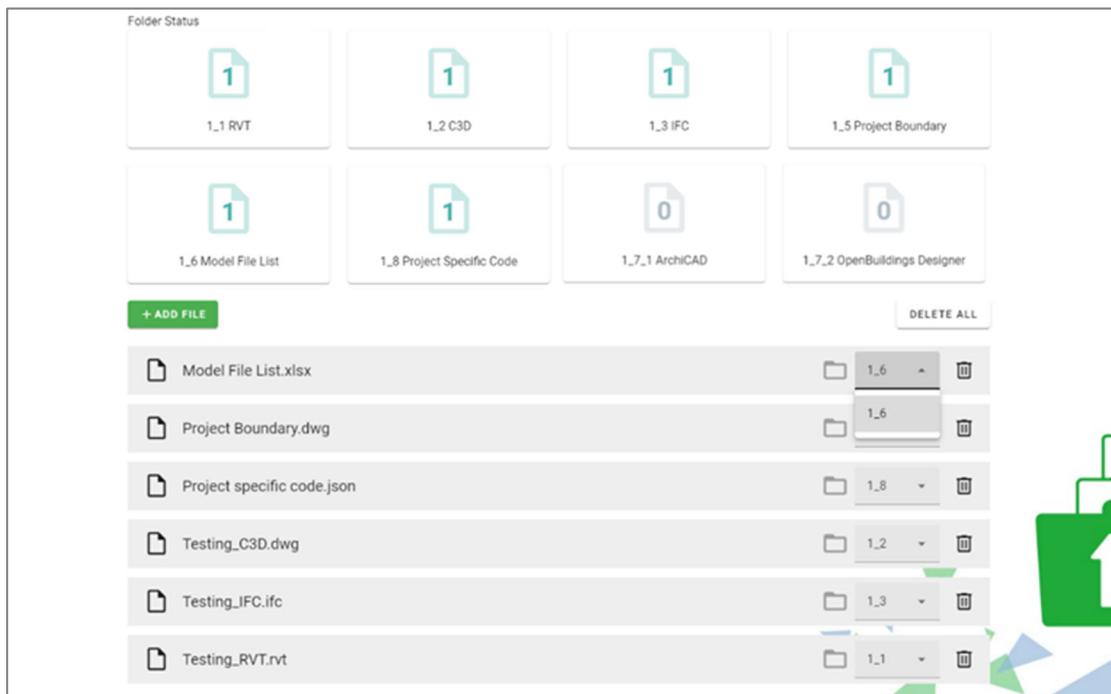
The screenshot shows a web-based form titled 'BIM Data Submission'. The first section, 'CONTRACT DETAILS', is highlighted with a green header. It contains the following fields:

- Department: ArchSD
- Type: Consultancy Works Tender
- Contract Number: 2QF107
- State: Design
- Sub-State: Harmonised Non-Harmonised Revamped

3.1.4 Click “**ADD FILE**” to add files in accordance with the requirements set out in Table App XIV-8 BIM Submission Requirements. Ensure that all files meet the prescribed format to facilitate successful submission to the GBDR.

3.1.5 Click to assign the added files to the corresponding subfolders. Then, Click “**Next**”. (Refer to Figure App XIV-3)

Figure App XIV-3 Assign Files to the Corresponding Subfolders
(Note: This figure is for illustration purpose only.)



3.1.6 Add reference file(s), if applicable. Click “Next”.

3.1.7 Click “**Confirm Data Upload**” to proceed with uploading the selected files to the GBDR. Once the process is complete, check the upload status of each file to ensure successful submission.

3.1.8 To delete any previously submitted files from the GBDR, navigate to the relevant subfolder, and select the file to be removed. Then, click  to initiate the deletion process.

3.1.9 A message box will appear once the deletion process is completed. Click “**Close**”.

3.2 Submission using GBDR BIM APIs

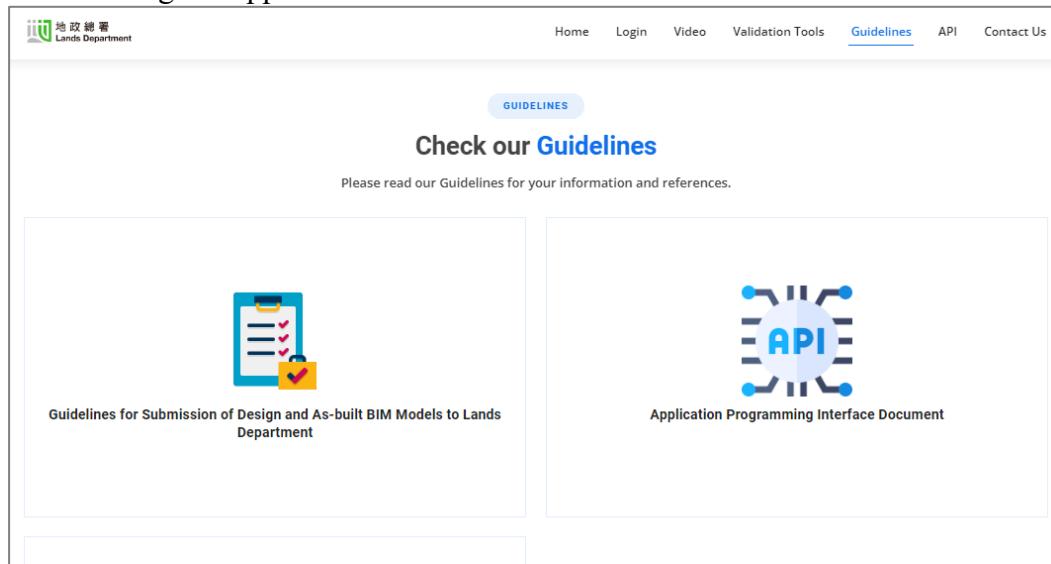
3.2.1 To support the development of system interfacing between the GBDR and the BIM Common Data Collaboration Platform (CDCP) or BIM/GIS applications of WDs, a suite of BIM APIs has been developed (refer to Table App XIV-9). These BIM APIs enable direct submission of BIM models and data from WDs' CDCP and systems to the GBDR, and the retrieval of BIM data from the GBDR for further use and analysis in the WDs' CDCP and systems.

3.2.2 For detailed specifications and implementation guidelines, please refer to the BIM API Document available on the GBDR website (refer to Figure App XIV-4).

Table App XIV-9 Examples of GBDR BIM APIs

API Name	Description
Login to Government BIM Data Repository	This API is provided for logging into the Government BIM Data Repository with UserID and SessionKey.
Retrieve BIM Model List	This API is provided for retrieving the full list of BIM models available for download. Before downloading the BIM Model, users may apply filters to narrow of selection based on the parameters provided. If no filters are specified, a complete list is returned.
Select and Download BIM Files	This API is provided for selecting specific BIM model files from the list for download.
Get Download URL for BIM Model	This API is provided for obtaining the URL needed to download the selected BIM models.
Get Contract and Department Information	This API is provided for retrieving Contract and Department information from the list of project information provided by DEVB collected from WDs.
Upload BIM File	This API is provided for uploading BIM files and other data to the GBDR.
Checking if File Exists	This API is provided for checking whether a specific BIM file already exists in the GBDR.
Delete BIM File	This API is provided for deleting previously submitted BIM files from the GBDR.
Check BIM File Upload Status	This API is provided for checking the upload status of BIM files submitted to the GBDR.

Figure App XIV-4 BIM API Document on the GBDR Website



3.2.3 In addition to the API documentation, LandsD has developed the **GBDR BIM API Sandbox** (refer to Figure App XIV-5) to assist IT developers and contractors of WDs in simulating API responses. This sandbox environment supports system interfacing development, testing and integration workflows (refer to Figure App XIV-6), which is accessible on GBDR website.

Figure App XIV-5 GBDR BIM API Sandbox

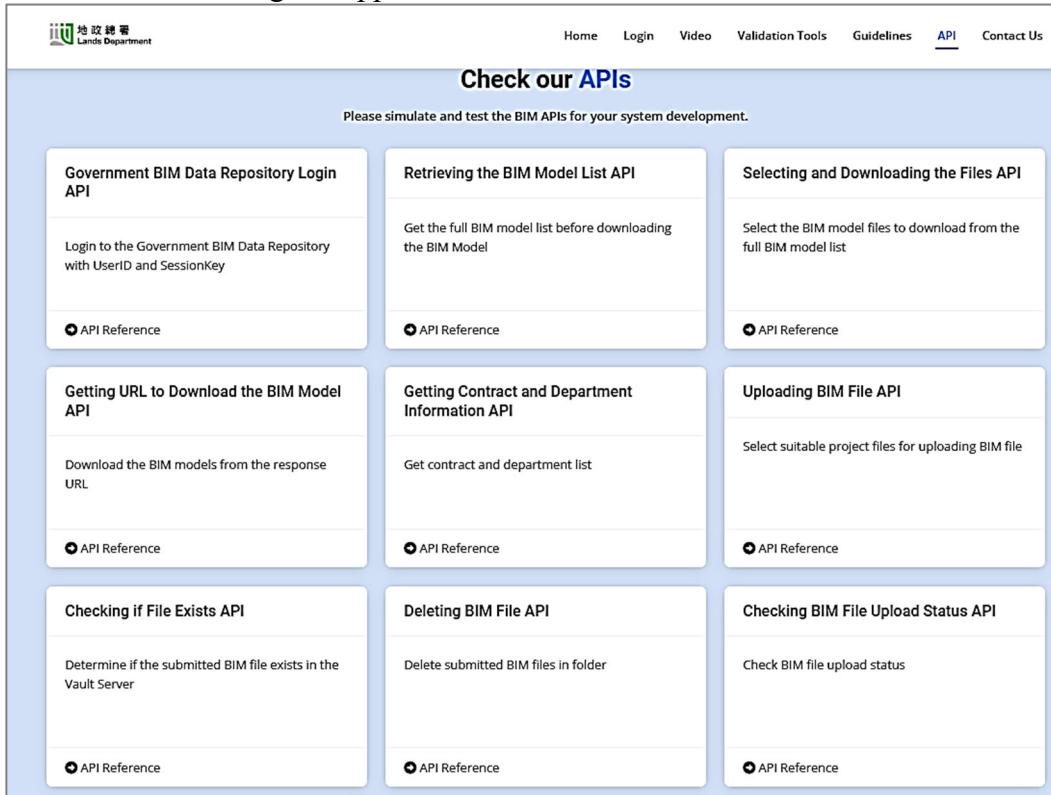


Figure App XIV-6 Response Simulated by GBDR BIM API Sandbox

Getting Contract and Department Information API

This API is provided for getting the Contract and Department information from the Design and As-built Data Register. Information of the Design and As-built Data Register is updated by the Development Bureau on quarterly basis.

API URL
<https://gbdr.landsd.ccg.hk/api/bim-dr-api/api/BIMUpload/getContractNameAndDept>

API URL for testing
<https://test-gbdr.landsd.ccg.hk/api/bim-dr-api/api/BIMUpload/getContractNameAndDept>

Method
 GET

Parameter

Variable Name	Type	Length	Description	Mandatory
userId	Number	11	User id. User id is returned by the login API.	Yes
sessionKey	String	255	User session key. Session key is returned by the login API.	Yes
type	String	255	Consultancy/WorksTender	Yes
bimType	String	1	Adoption of BIM – Y/N	No
contractNo	String	255	It specifies the consultancy agreement no. or contract no. of each project.	No

Response
 The data will be returned in JSON format. For example:

```
{
  STATUS: "success",
  STATUSCODE: "0000",
  DESCRIPTION: "API Response Success",
  DATA: [
    {
      contractNo: "CE 6/2012 (OS)",
      deptname: "DSD",
      tentativeCompletionDate: null,
      actualCompletionDate: null,
      id: 1,
      title: "Construction of Additional Sewage Rising Mains and Rehabilitation of the Existing Sewage Rising Main between Tung Chung and Siu Ho Wan - Investigation",
      publishStatus: "Y"
    },
    {
      contractNo: "SQH140",
      deptname: "ArchDSD",
      tentativeCompletionDate: "2025-12",
      actualCompletionDate: null,
      id: 2,
      title: "Quantity Surveying Services for Design and Construction of Government Chinese Medicines Testing Institute in Tseung Kwan O",
      publishStatus: "N"
    }
  ],
  LASTUPDATEDTIMESTAMP: 1707216392058,
  VERSION: "1.1.3"
}
```

Try the API

User ID
Session Key

4 Checklist for the Complete BIM Data Submission

4.1.1 This checklist can be used to check that all essential items are prepared for a successful BIM data submission to the GBDR.

Checklist for Complete BIM Data Submission			
A	Project Details		
A1	Project Type	<input type="checkbox"/> Consultancy Agreement	<input type="checkbox"/> Works Tender
A2	Stage	<input type="checkbox"/> Design (D)	<input type="checkbox"/> As-built (AB)
A3	Comply with the DEVB BIM Harmonisation Guidelines for WDs?	<input type="checkbox"/> Yes [<i>Harmonised</i>]	<input type="checkbox"/> No [<i>Non-Harmonised</i>]

B	Data Upload	
B1	Submit at least one format:	
<input type="checkbox"/> 1_1 RVT (.rvt)	<input type="checkbox"/> 1_2 C3D (.dwg)	
<input type="checkbox"/> 1_3 IFC (.ifc)	<input type="checkbox"/> 1_7_1 ARCHICAD (.pln)	
<input type="checkbox"/> 1_7_2 OPENBUILDINGS_DESIGNER(.dgn)	<input type="checkbox"/> 1_7_3 OPENROADS_DESIGNER (.dgn)	
<input type="checkbox"/> 1_7_4 TEKLA (.zip) *only one ZIP file for the whole model	<input type="checkbox"/> 1_7_5 SKETCHUP (.skp)	
B2	Submit all of the below information:	
<input type="checkbox"/> 1_5 PROJECT_BOUNDARY (.dwg, .shp or .dgn)	<input type="checkbox"/> 1_6 MODEL_FILE_LIST (.xlsx)	
*Submit ONLY ONE file File Name: <i>Project boundary.dwg/.shp/.dgn</i>		
<input type="checkbox"/> 1_8 PROJECT_SPECIFIC_CODE (.json) *Submit ONLY ONE file File Name: <i>Project specific code.json</i>		
B3	If select “Yes” in item A3 of this checklist, submit below information:	

Note: This checklist is intended to help users review the completeness of the data files before uploading them to the GBDR. It is provided for guidance only and is NOT required as part of the submission.