Alberta Infrastructure

Digital Project Delivery
COBie Requirements

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COBie Requirements Objective

A building's value to an owner is only realized by those buildings that are easily maintained, operated, and managed following the building turn-over when design and construction teams depart from the jobsite.

The Construction Operations Building information exchange (COBie) is a specification for the delivery of building information during design and construction to organize and ultimately replace current document-based construction handover deliverables.

The objective of COBie deliverables is to capture data that is already found on drawing schedules, construction administration forms and handover deliverables. The result is a single, consistent, open-standard, for construction handover information.

All project stakeholders shall have downloaded, read, and understood the COBie standard and these instructions. Since engineering consultants and construction subcontractors have a critical role in helping designers and prime contractors meet COBie deliverable requirements, participating engineering consultants and subcontractors shall have downloaded, read, and understood the COBie standard and these Instructions.

COBie Standard

NBIMS-US V3 may be downloaded from http://www.nationalbimstandard.org. Free registration is required prior to download. Following download, the COBie Standard is found in chapter 4.2 (and related Annexes). Architects, engineers, and contractors will find most value from NBIMS-U V3, chapter 4.2, pages 1-46 and 218-230. Pages in the center of the COBie standard are of primary interest to business process analysts and software engineers.

There are four formats in which COBie data may be delivered. These formats are found in Table 81, page 214. The format required by the Province is identified in this document. The requirements for COBie deliverables during design and construction are found in Table 89, page 229, and Table 90, page 230 of COBie Standard, chapter 4.2. The additional requirements applied by the Province are identified in this document and in Alberta Infrastructure COBie Requirements-Appendix 001.

1. COBie Deliverable

1.1 Compressed File

.1 All COBie deliverables shall be provided, as defined in the AIM Execution Plan (AEP), in a single compressed file.

.2 The name of the file shall be in accordance with the Project Codification Standard provided by the Province.

.3 The COBie deliverable file shall contain the following:

    .1 One (1) COBie file, in XLSX format.

    .2 One (1) COBie Quality Control Report, in HTML format.

    .3 The complete set of files referenced in the COBie.Document Tab.

1.2 The COBie File

.1 The COBie file shall be delivered as a single XLSX file containing the complete set of project information for all disciplines associated with the project phase.

.2 The list of required COBie tabs and instructions are identified in Alberta Infrastructure COBie Requirements Appendix 001.

.3 The Excel tabs that are not required for a specific deliverable shall be included with only a single header row.

.4 Information that is not available or not applicable for a given field shall be set as "n/a".

1.3 COBie Deliverable Submissions

.1 The COBie deliverables shall be produced and delivered to the Province in accordance with the Province's COBie Requirements and the delivery schedule defined in the AEP.

.2 Design COBie Deliverable

    .1 The Consultant shall deliver a COBie 2.40 (NIBS) compatible file with the following tabs populated:

        .1 Contact
        .2 Facility
        .3 Floor
        .4 Space
        .5 Type
        .6 Component
        .7 System

.3 Construction COBie Deliverable

.1 The Contractor shall deliver a COBie 2.40 (NIBS) compatible file with the following tabs populated:

.1 Contact
.2 Facility
.3 Floor
.4 Space
.5 Type
.6 Component
.7 System
.8 Document

1.4 COBie.Document Tab

.1 The COBie document tab shall be populated by the Contractor and shall contain the COBie data and links to documents for all handover documentation specified in 01 78 23 Operation and Maintenance data and Manuals, including but not limited to:

.1 Shop Drawings
.2 Product Data
.3 Manufacturers' Reports
.4 Commissioning Reports
.5 Testing Reports
.6 Product Certificates
.7 Warranties
.8 Site Photos
.9 As-Built Drawings

2. Quality Control (QC)

2.1 QC Requirements

.1 The Consultant and Contractor shall:

.1 Establish a plan to collect, merge, and check COBie deliverables. Document this plan in the AEP.

.2 Perform automated testing and verification of the COBie file data using the available COBie QC Reporter Command Line Tool.

.3 Include the automated testing report as a separate file in each COBie deliverable showing zero (0) errors.

.4 Perform manual validation checks on respective COBie deliverables to ensure the COBie data matches the information in the contract documents.

3. Space and Rooms

3.1 Space and Room Requirements

.1 All rooms in the Consultant's room finish schedule, shall appear as rows in the COBie.Space tab. All other disciplines models and subcontractor shop drawings must include space names that exactly match the floor and space names found in the designer's room finish schedule.

.2 Should there be mechanical or structural access spaces, such as plenums or under floor spaces, that require intensive management, and if agreed to by the Province to do so, these additional access spaces shall be included as rows in the COBie.Space tab.

.3 To ensure the proper identification of assets placed under, outside, or above the building a minimum of one COBie.Floor shall be provided for "Foundation"," Site", and "Roof". One COBie.Space row shall be provided for each of these COBie.Floor rows. Any COBie assets found in those regions of the building shall be identified as being within those COBie.Space rows.

4. Assets and Properties

4.1 Asset Exclusion List

.1 The list of building assets and properties to include in a COBie file cannot be stated for all buildings due to the varying design requirements for types and uses of buildings. The Consultant and Contractor shall:

    .1 Refer to the COBie standard list of excluded building elements (NBIMS-US V3, Chapter 4.2, Pages 218-219).

    .2 Include all other building assets present in the design documents in the COBie file.

4.2 Large Equipment Spatial Containment

.1 The space identified for each component shall be the space in which the component is installed and shall be named to match exactly the room numbers and names in the contract documents.

.2 If there is a question about which Component.Space to identify, the Component.Space shall be assigned to the space from which that Component would be accessed or maintained.

5. Zones

5.1 Zoning Requirements

.1 The Province does not require that the COBie.Zone Tab is used. This tab is to remain blank in the COBie Template.

6. Building Systems

6.1 System Requirements

.1 The number and descriptions of the building systems shall be defined by the Consultant and listed in the AEP.

.2 The specific value for COBie.System.Name assigned to each relevant Component shall be determined by the system on which that component is installed.

.3 The COBie.System.Name shall be named to match system names in the contract documents.

.4 The COBie.System.Catagory shall be classified in accordance with the Province's Asset Classification Standard.

7. Classification

7.1 Classification Requirements

.1 The project shall utilize the Province's Asset Classification Standard to assign classification standards to the project facility, spaces, and assets.

8. Resources

8.1 COBie Standard

.1 The COBie Standard is found in Chapter 4.2 (and Annexes) of the National Building Information Modeling Standard - United States, Version 3. This standard may be downloaded free of charge from:

http://www.nationalbimstandard.org/ following user registration.

8.2 COBie QC Checker Command Line Tool

.1 The COBie QC Checker may be found and downloaded free of charge from:

https://github.com/OhmSweetOhm/CobieQcReporter/releases/tag/1.0

8.3 Owner- Furnished Templates and Information

.1 Alberta Infrastructure COBie Requirements Appendix 001

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Appendix 001

COBie Requirements Appendix Objective

The following document details the use and implementation of the appropriate COBie sheets. These instructions will facilitate the exchange of building, system, and product information through the project life cycle.

COBie Instructions

This sheet contains the instructions, the required sheets per project phase and the legend indicating the color fill for field information. Field information falls into the categories in the table below.

Required	*Text*
Reference to another sheet or pick list	*Text*
External reference	*Text*
If specified as required	*Text*

Required – **Yellow**: Data must always be entered in these cells

Reference to other sheet or pick list – **Salmon**: indicates records related to other worksheets or pick lists

External reference – **Purple**: indicates fields populated in order to establish the relationship between the authoring tool and COBie file. The GUID (Globally Unique Identifier) makes it possible to connect graphical elements and data elements.

If specified as required – **Green**: indicates fields that are required at the phases identified in the matrix below.

Project Phase Responsibility Matrix Legend

Project Phase

SD   Schematic Design

DD   Design Development

CO   Construction

SP   Substantial Performance

Responsibility Matrix

x   Indicates when the field is first populated by the Consultant

x   Indicates when the field is updated by the Consultant

o   Indicates when the field is first populated by the Contractor

o   Indicates when the field is updated by the Contractor

COBie Contact

This sheet shall contain all the project contacts and shall be modified as the project progresses in order to reflect the project participants. This shall include the design-build team, sub-contractors, manufacturers and vendors. The COBie.Contact tab shall be populated by both the Consultants during the design phase and the Contractor during construction.

COBie column	Required Information	Example	Project Phase			
			SD	DD	CO	SP
Contact.Email	Email addresses of the contact person of project team members	James.Smith@email.ca	x	x	o	x/o
Contact.CreatedBy	Email address of the contact who created the current contact	Dave.Ray@email.ca	x	x	o	x/o
Contact.CreatedOn	Enter date and time created	2017-07-21T14:57:53	x	x	o	x/o
Contact.Category	Category from COBie pick list	34-10 11 00: Owner	x	x	o	x/o
Contact.Company	Name of company	Alberta Infrastructure	x	x	o	x/o
Contact.Phone	Phone number of respective company	780-555-5555	x	x	o	x/o

COBie Facility

This sheet shall contain the facility information as provided by Alberta Infrastructure. Only one facility per COBie file shall be provided. The facility sheet shall consist of one row only.

COBie column	Requirement Information	Example	Project Phase			
			SD	DI	CO	SP
Facility.Name	Name of the Facility	Reynolds Museum	x			
Facility.CreatedBy	Reference to Contact.Email	James.Smith@email.ca	x			
Facility.CreatedOn	Date and Time created	2017-07-21T11:25:28	x			
Facility.Category	Category of Facility from COBie pick list	11-14 21 00: Museum	x			
Facility.ProjectName	Project Name	Reynolds Museum Addition	x			
Facility.SiteName	Site Name	Reynolds Museum	x			

COBie Floor

This sheet shall list all levels that relate to rooms in a facility. The facility floors shall be outlined and populated by the Consultant. The Contractor may add or update floors or levels that contain project assets or provide access to project assets. Examples include "Roof", "Site", and "Foundation". The Consultant shall update the external references with the GUID of added spaces if they are available.

COBie column	Requirement Information	Example	Project Phase			
			SD	DD	CO	SP
Floor.Name	All levels that exist within the facility	P1	x	x	o	
Floor.CreatedBy	Reference to Contact.Email	James.Smith@email.ca	x	x	o	
Floor.CreatedOn	Date and Time created	2017-07-21T09:25:25	x	x	o	
Floor.Category	Category of floor	Floor	x	x	o	
Floor.ExtSystem	Software used to generate the element	Autodesk Revit Architecture 2011	x	x		x
Floor.ExtObject	IFC type of the object	IfcBuildingStorey	x	x		x
Floor.ExtIdentifier	GUID provided by automated export	3eM8WbY_59RR5TDWs3wwJN	x	x		x
Floor.Description	Corresponding level description	Parking Level One	x	x	o	
Floor.Elevation	Elevation of floor in mm	-8600	x	x	o	

COBie Space

This sheet shall list all spaces which belong to a facility. Each space shall be a row in this sheet. The COBie spaces shall include the ceiling space above finished ceilings within the space boundaries.

COBie column	Requirement Information	Example	Project Phase			
			SD	DD	CO	SP
Space.Name	All spaces that exist within the facility	2B05	x	x	o	
			x	x	o	
Space.CreatedBy	Reference to Contact.Email	James.Smith@email.ca	x	x	o	
Space.CreatedOn	Date and Time created	2017-07-21T13:25:25	x	x	o	
Space.Category	Category based on COBie pick list	13-41 11 14 21: Restroom	x	x	o	
Space.FloorName	Reference to the applicable level from Floor.Name	P1	x	x	o	
Space.Description	Approved Room/Space description	STAFF TOILET	x	x	o	
Space.ExtSystem	Software used to generate the element	Autodesk Revit Architecture 2011	x	x		x
Space.ExtObject	IFC type of the object	IfcSpace	x	x		x
Space.ExtIdentifier	GUID provided by automated export	0ClPCUC7jCQRnj1dhupMRU	x	x		x

COBie System

This sheet shall list the building systems. Systems are groups of components that, when connected, provide specific required services. A COBie component shall be listed only once for each system but may be listed in multiple systems.

COBie column	Requirement Information	Example	Project Phase			
			SD	DD	CO	SP
System.Name	Facility system	HVAC-01		x		
System.CreatedBy	Reference to Contact.Email	James.Smith@email.ca		x		
System.CreatedOn	Date and Time created	2017-08-21T13:25:25		x		
System.Category	System category from COBie pick list	21-51 51 16: Air Distribution		x	o	
System.ComponentNames	Reference to sheet Component.Name	VAV-AHU1-A		x	o	
System.ExtSystem	n/a	n/a		x		x
System.ExtObject	n/a	n/a		x		x
System.ExtIdentifier	n/a	n/a		x		x
System.Description		HVAC System 01		x	o	

COBie Type

This sheet shall list all the types of components. Types are components with similar attributes. For each COBie type in the facility there shall be one row in this sheet.

COBie column	Requirement Information	Example	Project Phase			
			SD	DD	CO	SP
Type.Name	All types that exist within the facility.	Air Handling Unit		x	o	
Type.CreatedBy	Reference to Contact.Email	James.Smith@email.ca		x	o	
Type.CreatedOn	Date and Time created	2011-09-14T16:57:53		x	o	
Type.Category	Category based on COBie pick list	23-75 35 14 17: Modular Indoor Air Handling Units		x	o	
Type.Description	Item description	63300000 J		x	o	
Type.Manufacturer	Original Equipment Manufacturer(OEM)	York		x	o	
Type.ModelNumber	OEM's part number	AP-500		x	o	
Type.WarrantyDurParts	Duration of Warranty in regard to parts	1		x	o	
Type.WarrantyDurLabor	Duration of Warranty in regard to Labor	1		x	o	
Type.WarrantyDurUnit	Warranty duration unit	year		x	o	
Type.ExtSystem	Software used to generate the element	Autodesk Revit MEP 2011		x		x
Type.ExtObject	IFC type of the object	IfcFanType		x		x
Type.ExtIdentifier	GUID provided by automated export	0JGTSjcSn7v8o$ZI4qc5Mg		x		x
Type.ReplacementCost	Replacement cost per unit	n/a			o	
Type.ExpectedLife	Manufacturer or industry recommended life cycle	n/a			o	
Type.WarrantyDescription	A brief description of the assets warranty	n/a			o	
Type.NominalLength	Nominal Length of Type in mm	n/a		x	o	
Type.NominalWidth	Nominal Width of Type in mm	n/a		x	o	
Type.NominalHeight	Nominal Height of Type in mm	n/a		x	o	

COBie Components

This sheet shall list all components in the facility by unique name and identifier. This sheet is used to create an entry for each instance of a type in the facility. For each COBie component in the facility, there shall be one row in this sheet.

COBie column	Requirement Information	Example	Project Phase			
			SD	DD	CO	SP
Component.Name	Components that exist within the facility. Unique name, utilizing the Type name and a unique identifier	AHU-1		x	o	
Component.CreatedBy	Reference to Contact.Email	James.Smith@email.ca		x	o	
Component.CreatedOn	Date and Time created	2011-09-14T17:02:59		x	o	
Component.TypeName	Reference from Type.Name	Air Handling Unit		x	o	
Component.Space	Referenced from Space.Name	2D05		x	o	
Component.Description	Component Description	Air Handling Unit - Split System - Horizontal:63300000 J:63300000 J:570459		x	o	
Type.ExtSystem	Software used to generate the element	Autodesk Revit MEP 2011		x		x
Type.ExtObject	IFC type of the object	IfcFlowMovingDevice		x		x
Type.ExtIdentifier	GUID provided by automated export	0JGTSjcSn7v8o$ZI4qc5Ms		x		x
Component.SerialNumber	OEM's serial number	AH 250 PXL 3			o	
Component.InstallationDate	Installation date of the asset in YYYY-MM-DD	2011-01-14			o	
Component.WarrantyStDate	Warranty start date of the asset in YYYY-MM-DD	2011-01-14			o	

COBie Document

This sheet shall list all pertinent documents to be associated with the facility and its assets.

COBie column	Requirement Information	Example	Project Phase			
			SD	DD	CO	SP
Document.Name	Document number associated for each item or asset listed in COBie.Type	AHU Product Data			o	
Document.CreatedBy	Reference to Contact.Email	James.Smith@email.ca			o	
Document.CreatedOn	Date and Time created	2011-09-14T17:03:03			o	
Document.Category	Documents respective category	Product Data			o	
Document.SheetName	Value assigned is restricted to either Type or Component	Type			o	
Document.RowName	Reference to the respective Asset.Number from Component.Name or Type.Name	Air Handling Unit			o	
Document.Directory	n/a	doc			o	
Document.File	Associated path name	AHU-1-ProductData.PDF			o	
Type.ExtSystem	n/a	n/a				
Type.ExtObject	n/a	n/a				
Type.ExtIdentifier	n/a	n/a				
Description	Description of the Document Deliverable	Plumbing Fixture Product Submittal			o	
Reference	Specification Section	22 42 13 2.1			o	