

COBie v3

**CONSTRUCTION TO OPERATIONS
BUILDING INFORMATION
EXCHANGE STANDARD**

Draft, June 2023

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64 Executive Summary

65

66 OVERVIEW AND PURPOSE

67 The National BIM Standard-United States® (NBIMS-
68 US™) Construction to Operations Building information
69 exchange (COBie) is a data format and process standard.
70 Its purpose is to assist project teams with capturing and
71 delivering data related to the maintainable assets of a
72 facility in a digital format, with the goal of reducing or
73 even eliminating the delay between handover (after
74 design and construction) and when the facilities
75 management system can begin the operations and
76 maintenance of those maintainable assets.

The maintainable assets of a facility for COBie are those items that the owner of a facility will manage in an Operations & Maintenance system. They can include mechanical equipment, electrical equipment, plumbing fixtures, and other items that require maintenance, upkeep, and replacement.

77

78 HISTORY



COBie was first published by the U.S. Army Corps of Engineers in 2007 with support from the National Aeronautics and Space Administration and the White House Office of Science and Technology Policy.



The National Institute of Building Sciences (NIBS) has curated and maintained COBie since 2013 under a Creative Commons License.



COBie version 2.4 was adopted as part of the U.S. National BIM Standard-United States® (NBIMS-US™) v3 in 2015.



COBie version 3 is the latest version and will become a part of NBIMS-US™ v4 in 2023.

79

COBie version 3 icon courtesy of Plannerly

80 PROCESS

81 COBie is successful when all project stakeholders are involved. These include the architects, engineers,
82 contractors, suppliers, tradespeople, commissioning agents, and the facility owner. Each has a role in
83 providing – in the COBie standardized digital format – information related to the maintainable assets
84 of that facility during the project. This data is delivered at specified milestones in the project,
85 culminating in a full delivery at project handover.

86 COBie has typically been used for building design and construction projects but can also be used for
87 infrastructure projects or to transfer facility ownership from one party to another. Throughout this
88 document, facility is used to include both building and infrastructure assets.

89 **STRUCTURE AND FORMAT**

90 The COBie format is a subset of the contents of a Building Information Model (BIM). It is non-graphic
 91 data defined as a Model View Definition (MVD) of the Industry Foundation Class (IFC) schema. It can
 92 also be represented in a spreadsheet format.

93 The structure of the tables that make up COBie includes hierarchies based on the data types:

Overall Tables	Spatial Tables	Asset Tables	Process Tables	Support Tables
FACILITY COMPANY	LEVEL ZONE SPACETYPE SPACE COORDINATE	TYPE COMPONENT SYSTEM ATTRIBUTE	PACKAGE JOB EVENT INSTRUCTION RISK	DOCUMENT RESOURCE PICKLIST

94
 95 Each data table includes a standardized set of data fields, and each field is designated as either always
 96 required, required if stated in the contract, or a reference to another field in the database. The COBie
 97 standard allows asset owners to define the specific fields they want in their data delivery. In fact, it
 98 provides the best results for asset owners when they specify what they require to be delivered.

99
 100 **VERSION 3 UPDATES**

101 V3 of the COBie standard incorporates 58 different updates grouped into four categories.

Ease of Use

- More concise documentation
- Removal of tables rarely used
- Renaming of fields and headers to better understand their purpose
- Resorting of headers to better group them
- New "Title Block" section

Modernization

- Removal of personally identifiable information fields
- Replacing "Floor" table with "Level" table to better accommodate infrastructure projects
- Support for JSON format for machine-to-machine exchanges

Capabilities

- Adding new "PartOf" field on asset tables to better understand relationships
- Adding fields that accommodate classifying and geolocating projects
- Adding a new "SpaceType" table to better organize Spaces

Workflow

- Adding tables to better document the activities of a facility (especially useful for handover between owners)
- New "Package", "Event", and "Risk" tables to go along with the existing "Job" table

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Industry Foundation Classes (IFC) and the FM Handover Model View Definition (MVD) are both open standards protected under a "creative commons" license as buildingSMART International (bSI) intellectual property. For more information, please see the bSI website at <https://www.buildingsmart.org/>.

Introduction

OVERVIEW

The Construction to Operations Building information exchange (COBie) specification provides a standard organization of data used to manage and maintain facility assets. It is a combined set of all space, product, and equipment schedules found on associated design drawings as well as a compilation of as-built, operations & maintenance (O&M), and commissioning information captured during construction.

PURPOSE

The COBie specification provides a standardized method for project teams to deliver the data necessary to maintain a facility in a digital format. This allows the facility owner the ability to populate their facility maintenance system quickly and accurately with the data needed. COBie can be used whenever a handover occurs, including:

- At the end of new construction
- At the end of a renovation
- When an existing facility changes ownership or management

COBie is not limited to buildings. It can be used to quickly deliver data related to maintainable assets on infrastructure projects that may not include buildings.

BACKGROUND

The COBie specification was initially published for NBIMS-US™ V2 (National BIM Standard-United States®) and was defined as a Model View Definition (MVD) of IFC (Industry Foundation Classes). The release of NBIMS-US V3 in 2015 included the most current version of the COBie specification, v2.4. Since that time, the COBie Work Group at NIBS has been working on updating COBie to better align with the evolution of BIM in the US. This work has culminated in a new V3 to be released in 2023 and as part of NBIMS-US V4.

CONTENT

This document details the latest version of COBie, Version 3. It includes information related to:

- The process of using COBie, overall and for different project types
- The structure of the COBie specification
- The definitions of the schemas related to COBie (Appendix)
- A log of the changes from the previous version 2.4 (Appendix)

DOCUMENT INFORMATION

Publish Date

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TERMINOLOGY

The following terms are used throughout this document. Footnotes refer to links with additional information in the Appendix A: Resources section.

TERM	DEFINITION	DETAILS
COBie	Construction to Operations Building Information Exchange	The digital standard defined in this document.
NIBS	National Institute of Building Sciences	A not-for-profit, non-government organization committed to supporting advances in building science and technology. ¹ NIBS is the author of this document.
NBIMS-US™	National BIM Standard-United States®	The National BIM Standard-United States® is a document developed and maintained by NIBS. ² The COBie standard is part of NBIMS-US™.
IFC	Industry Foundation Classes	An ISO standard (ISO 16739-1:2018) digital description of the built asset industry.
ifcXML	XML Schema Definition for IFC	An XML schema for IFC Step files based on STEP XML transformation rules
IDS	Information Delivery Specification	A document that defines the exchange requirements of digital models, which includes how the objects in the model, their properties, their classifications, their values, and their units should be exchanged.
MVD	Model View Definition	A subset of the overall IFC schema used to describe a data exchange for a specific use or workflow. ³ The COBie standard is considered an MVD of IFC.
FM	Facilities Management	The maintenance and management of an organization’s buildings and equipment.

TERM	DEFINITION	DETAILS
O&M	Operations & Maintenance	The tasks, responsibilities, and effort associated with ongoing facilities management.
JSON	JavaScript Object Notation	Open standard data file and exchange format based on attribute-value pairs and arrays in human-readable text.
GUID	Global Unique Identifier	A 128-bit text string in hexadecimal format used to represent identification of a digital element.
Asset	Maintainable assets of a facility for COBie are those items that the owner of a facility will manage in an Operations & Maintenance system.	Maintainable assets can include mechanical equipment, electrical equipment, plumbing fixtures, and other items that require maintenance, upkeep, and replacement.
Component	A single instance of a maintainable asset in COBie.	Components can be part of other components, building an assembly.
Entity	Class of information defined by common attributes and constraints as defined in ISO-10303-11.	Like the term “class” in common programming languages, but describing data structures only (not behavior, such as methods).
Element	A major component, assembly, or construction entity part which, in itself or in combination with others fulfills a predominating function of a construction entity.	See IFC and MVD use of the term.
Attribute	Unit of information with an entity, defined by a particular type or reference to a particular entity.	There are three kinds of attributes: direct, inverse, and derived.
Instance	Occurrence of an entity.	Like the term “instance of a class” in object-oriented programming.

TERM	DEFINITION	DETAILS
Object Types	Common characteristics shared by multiple object occurrences.	Like “class”, “template”, and “type” in other publications.
External Reference	Link to information outside the data set, with direct relevance to the specific information.	The link originates from outside of the data set.
Data Table or Table	Table of digital information	Tables include rows of data (records) and columns of data headers. COBie is comprised of 19 data tables.
Data Field or Field	A single field of digital information	COBie is comprised of 144 data fields.
Data Record or Record	A line of related data in a table	Each data table includes rows of data, known as records, representing the assets defined in COBie.
Data Value or Value	The data in a data field	COBie requires all data fields to have some value and not be left blank, even if that value is “n/a” (not applicable).

VERSION HISTORY

2006	The Construction Engineering Research Laboratory (CERL), within the U.S. Army Corps of Engineers, and under the lead of Bill East, began a project to create an open standard for the delivery of construction handover information. It was sponsored by the National Aeronautics and Space Administration (NASA), under the lead of William Brodt, and the White House Office of Science and Technology Policy.
2007	The Construction to Operations Building Information Exchange (COBie) v1.0 specification was published.
2008-2014	13 COBie Challenge and Case Study events were held, which showcased how different software vendors were able to comply with COBie.
2012	COBie v2.26 was published as part of the National BIM Standard-United States® (NBIMS-US™) V2 developed by the National Institute of Building Sciences (NIBS). This version of COBie included a Model View Definition (MVD) based on IFC 2x3.
2015	COBie v2.4 was published as part of NBIMS-US™ V3 and was updated to comply with IFC 4.
2015-2022	COBie v3.0 was under development at NIBS by the COBie Workgroup, a group of volunteers with extensive industry experience with COBie.
2023	COBie v3.0 was published as part of NIBS NBIMS-US™ V4 and contained many user-requested improvements.

Process

This section outlines the recommended process for generating and submitting a COBie standard deliverable during a project.

OVERALL

The general process for generating a COBie deliverable is to specify what data is wanted, when it is wanted, and who will deliver and review it. A COBie deliverable may be generated for any phase of a construction project, but the specific tables and fields must be selected or specified to populate or update (see Structure section). Each table has required fields that may be prerequisites to using other tables. Most projects find success using COBie when it is addressed at the beginning of the project.

One COBie file shall be provided for each facility. If there are multiple facilities, then an additional COBie file identifying the assets for the site shall also be provided.

INTERIM DELIVERABLES

In design and construction projects, the ultimate purpose of COBie is to deliver information about assets in a facility to the next owner/manager at the end of a phase in the project lifecycle. Typically, this is the owner at the end of construction, but it can also be applied to intermediate handovers between consultants during the design and construction process. These handovers may not include all the information ultimately required, but they can still provide valuable pieces of that information to assist other consultants (for example, from the design architect to the construction contractor at the end of design). Interim deliverables are sometimes called “data drops” and are also valuable to allow the project team to build up the process and information ultimately needed by the end of the phase to help ensure that the final handover is successful and includes the content required. Even though interim requirements are not required for all projects utilizing COBie, they are strongly recommended, especially for larger projects. Common milestones where it would be beneficial to include a data drop are end of conceptual design, end of design development, end of construction documentation, and at fixed intervals during the “in-use” phase of a facility.

SPECIFYING DELIVERABLES

The minimum requirement for a COBie deliverable is to populate the required fields in the **COBie.Instruction** table. Any additional tables and fields must be specified that are required by the person or company who will provide the COBie deliverable. Also specify who will manage and transfer COBie deliverables at each phase to ensure proper coordination between phases. What tables and fields to select depends on the desired use of the COBie deliverable for each phase, but it is recommended to start with the end in mind.

CONTENT CONSIDERATIONS

COBie has required field statuses for most tables and some fields are prerequisite to using subsequent tables. The reference and if-specified field statuses are prescriptive once the required fields are completed for each table. A list of required, reference, and if-specified field statuses are in the Structure section. When selecting tables and fields to use for a project, specify how much information is necessary for each type of equipment, because it may not be useful to collect COBie data for all equipment in the built environment. For example, it may not be useful to spend the effort collecting the serial number for every light fixture if the policy is to replace it with a similar type when it is unrepairable. However, it may be necessary to collect the serial number for equipment with long warranty durations to assist with filing a possible future claim.

PHASE CONSIDERATIONS

The scope of a construction project can be small, such as changing a filter in a building, or enormous, such as constructing a twelve-mile-long subway. Construction projects are temporary endeavors that take place over time and are composed of phases. The Construction Specification Institute (CSI) recommends nine (9) phases and defines them in OmniClass Table 31 (dated 30th October 2012 and found at <http://www.omniclass.org/>). CSI lists the phases in order of a traditional construction project lifecycle; however, work activities may occur in more than one phase simultaneously. For example, the Design Phase may be revisited to modify construction drawings due to unforeseen conditions while the remaining work continues in the Implementation Phase. In this example, an update may be required from the people responsible for the Design Phase and the people responsible for the Implementation Phase.

The table below indicates which COBie tables will likely be updated at each phase of construction and the following is a guide to help select which fields to update at each phase.

TABLE GROUPS		CONSTRUCTION PROJECT PHASES								
		Inception Phase	Conceptualization Phase	Criteria Definition Phase	Design Phase	Coordination Phase	Implementation Phase	Handover Phase	Operations Phase	Closure Phase
GENERAL	Company	●	●	●	●	●	●	●	●	●
SPACE	Facility		●	●	●					●
	Level		●	●	●					●
	SpaceType		●	●	●					●
	Space			●	●			●		●
	Zone			●	●					●
PRODUCT	Type			●	●	●	●	●	●	●
	Component				●	●	●	●	●	●
	System				●	●				●
OPERATIONAL	Resource							●	●	●
	Job							●	●	●
	Event							●	●	●
	Package							●	●	●
SUPPLEMENTARY	Risk					●			●	●
	Document	●	●	●	●	●	●	●		●
	Attribute				●	●		●		●
	Coordinate				●	●	●	●		●

Inception Phase

- Definitions:
Phase for establishing the project vision and means to satisfy the client's business or public service requirement, including site selection, planning considerations, establishment of timeline, method of delivery, budget, and which identifies necessary resources (design, legal, financing, insurance, etc.).
- Aliases:
1) Inception of a project, 2) Preparation and brief, 3) Strategy, and 4) Requirement Constraints.

During the inception phase, the Company and Document tables may need updating. The Company table requires information in the Name, Company, and Phone fields, and the Document Table requires information in the name and path fields. Prescribe which of the remaining fields to update for

the deliverable within the inception phase. For example, prescribe that the engineering firm develop a project charter and additionally complete the **COBie.Document.Table** field and **COBie.Document.TableName** field to capture them as the creators of the document. In this scenario, **COBie.Document.Name** field is the project charter's title, **COBie.Document.Path** field is the relative path to document from the COBie file location, **COBie.Document.Table** field is the Company table, and **COBie.Document.TableName** field is the engineering firm's name. Also indicate who will review the COBie deliverable for the Inception Phase, such as the owner or internal staff, and who will assume responsibility of the COBie data after approval.

Conceptualization Phase

- Definition:
Phase to identify the major design ideas in the context of programmatic objectives, facility performance, and activity parameters, to define spaces, and to initiate basic project element considerations.
- Aliases:
1) Concept and 2) Outline solution.

The Company, Facility, Level, SpaceType, and Document tables may need updating during this phase. It is recommended to consult with staff when determining what fields to prescribe, because it may be necessary to provide more guidance to the person who will perform the updates. For example, the space manager may require the **COBie.Space.RoomTag** field to follow a naming convention, or the **COBie.Space.NetArea** field to conform to a specific measurement standard, such as from the Building Owners and Manager Association (BOMA) International. These unique requirements are not part of the COBie Standard, they will need to be specified. Indicate who will review the COBie Deliverable and who will assume responsibility for the COBie data after approval.

Criteria Definition Phase

- Definition:
Phase to create and refine schematic diagrams of the basic project elements (substructure, shell, interiors, equipment, services, furnishings, special construction and demolition, and building sitework) that fully establish project spatial and element criteria as the Basis of Design.
- Aliases:
1) Development, and 2) Definition.

The Company, Facility, Level, SpaceType, Space, Zone, Type, and Document tables may need updating during the Criteria Definition Phase. It is recommended to consult with staff when determining what fields to prescribe and check for any additional requirements when capturing COBie data. For example, the facility manager may only need COBie data for a few assets, such as HVAC units, power transformers, water pumps, etc., and may want the **COBie.Type.WarrantyDescription** field for all of them.

Design Phase

- Definition:
Phase in which the project team establishes means of satisfying project Basis of Design requirements with technical solutions, evaluates alternatives through value analysis or similar processes, and completes.
- Aliases:
1) Technical Design, and 2) Construction Information.

In addition to the tables indicated in the Criteria Definition Phase, the Component, System, Attribute, and Coordinate Tables may need updating during the Design Phase. Consider what values to update in the Attribute table for each asset.

Coordination Phase

- Definition:
Phase that bridges the design effort with implementation by integrating constructability and feasibility evaluations of the design to further develop spaces, elements, products, and materials necessary for the procurement and execution of the work, irrespective of the method of delivery.
- Aliases:
1) Construction, and 2) Build.

Many pre-construction efforts occur during the Coordination Phase, such as the submission of safety plans, shop drawings, product data, etc. The designer or owner typically evaluates, coordinates, and approves the submissions which could provide more detailed information about the built environment before implementation. For example, identifying additional equipment implicit to the design. Specify a COBie deliverable that captures this information during the Coordination Phase, and the tables that may need updating are Type, Component, System, Document, Attribute, Coordinate, and Risk.

Implementation Phase

- Definition:
Phase to implement the coordinated design through construction planning, prefabrication, and field execution characterized by constructor 'means and methods', and Basis of Construction strategies, controlled by quality assurance and control protocols.
- Aliases:
1) Construction, and 2) Build.

More detailed information will become available during the Implementation phase when the constructor installs equipment, such as the equipment serial number, installation date, and precise

location. There may also be product submissions received for review and approval during this phase. As such, the tables Type, Component, Document, and Coordinate may need updating.

Handover Phase

- Definition:
Phase to evaluate the completed work through testing, inspection, and commissioning activities, including for any owner-furnished equipment, to ensure that design/performance criteria are met while conforming to applicable codes and standards, and transfer project knowledge from the design/construction team to the owner/facility management team via demonstrations, training, and documentation.
- Aliases:
1) Closeout.

There may be a need to update some fields in the Type, Component, Document, Attribute, and Coordinate tables during the Handover Phase for various reasons, such as replacing equipment with a different manufacturer due to failing an inspection. Information could also be captured that facility managers need to service equipment such as skill type, maintenance activities, and service schedules in the Resource, Job, Event, and Package tables.

Operations Phase

- Definition:
Phase in which owner or a designated agent occupies, uses, manages, and maintains a facility, which may also include partial or whole facility renovation, repair, reconditioning or remodeling activities as part of the project use lifecycle.
- Aliases:
1) In Use, 2) Operations and Maintenance, and 3) Renovation.

The Operations Phase typically consists of small projects, such as replacing or repairing equipment, that result in updating the Type and Component tables. Consequently, maintenance activities and new risks associated with the equipment replaced or repaired may need to be updated in the Resource, Job, Event, Package, and Risk tables.

Closure Phase

- Definition:
Phase which includes facility closure, preparation for unknown future use, demolition in whole or part, foreclosure, sale, or similar dispensation initiated by the decision that the facility no longer meets the needs of the owner and cannot be feasibly reconfigured for continued use by that owner.

- Aliases:
 - 1) Decommissioning, 2) End of Life, and 3) Renovation.

Demolishing a building in whole or in part may result in updating essentially all tables, depending on the project's scope. It is recommended that partial demolitions are diligently captured to ensure the COBie deliverable reflects the built environment for the next project.

MANAGEMENT CONSIDERATIONS

Specify which phases a COBie deliverable is wanted, and who will be responsible for updating each field within the deliverable. Sub-phases/milestones may also be specified such as "Construction Documents - 2" or a number of days prior to substantial completion. For example, specify that the designer is responsible for updating the name, type, and location of equipment during the Design Phase at CD-2, while the constructor is responsible for updating the manufacturer, model number, and serial number information during the Implementation Phase at 120 days prior to substantial completion. In this scenario, the constructor will use the COBie data created by the designer to develop the deliverable for the Implementation Phase. Therefore, also specify the transfer of responsibility of the COBie data from one person to another for each phase of the construction life cycle (primarily, what fields the person must keep up to date during the duration of their responsibility). Transfers of responsibility could be designer-to-owner, designer-to-constructor, owner-to-constructor, constructor-to-operator, operator-to-operator, owner-to-owner, owner-to-designer, etc. The transfers will vary depending on the category of projects such as new construction, renovations, operations and maintenance, or demolition. For example, a new construction project may generate COBie data for the first time, so the first transfer may be designer-to-constructor. For renovation projects, the owner may provide existing COBie data to the designer, which is owner-to-designer.

REVIEW CONSIDERATIONS

Designate who will review content in each COBie deliverable. For example, the facility manager could review fields related to equipment and ensure that they have sufficient data for operations and maintenance. The space manager could review space data and ensure it has the correct names, categories, zoning, etc. It is recommended to place more emphasis on reviewing the initial deliverables to clarify and express your expectations for the next deliverables.

Consider using tools to automate submittal reviews. These tools can be very useful in validating the proper formatting in a COBie deliverable and provide feedback to the authors. Several tools are freely available to check the structure of the COBie file or even to validate COBie data in Revit models before generating a COBie deliverable (either for structure or against project requirements).

Structure

This section details the structure for the COBie standard.

OVERALL

The COBie data schema is structured as a relational database made up of 19 data tables.

Instruction	SpaceType	Component	Event	Coordinate
Company	Space	System	Package	Risk
Facility	Zone	Resource	Document	PickList
Level	Type	Job	Attribute	

Key Values

As with all databases, each data table must have a unique key for each row of data in the table (record). For most of the data tables, that unique key is the first data column, "Name". For some tables, it is not expected that the value for the "Name" data field be unique, so the value in that data field alone cannot be used for the unique key. For those tables, the key is a combination of the values of several data fields in the record (compound key). The compound key is a concatenation of the values separated by an underscore and could be a concatenation of two or three fields. This means the format of the unique key will always be one of the following:

Name

Name_Field1

Name_Field1_Field2

For example, The COBie.Attribute table requires a compound key of three fields:

Format: Name_Table_Table.Name

Example: Fan Max Speed_Type_Boiler Type 1

The following shows the key values for each data table:

DATA TABLE	KEY VALUE FORMAT	KEY VALUE EXAMPLE
Company	Name	ABC_Corp
Facility	Name	Building204
Level	Name	Level_1
SpaceType	Name	Office-Medium
Space	Name	1A01
Zone	Name	Administration
Type	Name	BoilerType1
Component	Name	BLR1-6
System	Name	HVAC-01
Resource	Name	CleaningMaterials
Job	Name_Table_Table.Name	BoilerType1LockOut_Type_BoilerType1
Event	Name_Job.Name	Lift_Inspection_2023_ Inspection_10-06-2023
Package	Name	WindowReplacement2023
Risk	Name	MissingData
Document	Name_Table_Table.Name	ManufacturersEquipmentInformation-Boiler1_Type_BoilerType1
Attribute	Name_Table_Table.Name	Volts_Type_BoilerType1
Coordinate	Name_Table_Table.Name	Light_LC-1_box-upperright_Space_1A01

Often, the “Name” key value in a COBie deliverable is equivalent to the designation of that asset in the equipment schedules in the contract document set used for the facility, structure, or group of structures. But, when aggregating the data from these equipment schedules into a COBie deliverable, duplicate values could arise. For example, the pump schedule may have a P-1 designation for a pump, but the plumbing fixture schedule may have a P-1 designation for a water closet. These values will have to be modified or augmented to be COBie compliant (by concatenating other data onto the name/key values, such as the type of asset).

Data Fields

Each data table contains several data fields, and these data fields are pre-defined as part of the COBie standard. The “Data Fields” section provides the details on each of the data fields.

Reference Fields

Data fields can be related to other data fields in the database that exist in the same data table or other data tables.

For example, the value for the “Manufacturer” data field that is on the “Type” data table is a reference to the “Name” data field that is on the “Company” data table. This way, a change to that “Name” on the “Company” data table will propagate across to all other data tables referencing it.

Status

Each data table and each data field includes a status related to its requirement and there are eight available. When COBie is delivered in SpreadsheetML format (Microsoft Excel), each requirement has the option of also being color-coded for easy recognition.

1. Required

Data tables and data fields that are always required with every COBie deliverable.

SpreadsheetML Color: #FFFF99

2. Required (Reference to Another Data Field)

Data fields that are required and whose value references a different data field, either in the same data table or a different data table (including the PickList data table). This status is not used for data tables, only data fields.

SpreadsheetML Color: #FFCC99

3. Only If Specified in the Contract

Data tables and data fields that are optional and only required if specified in the contract related to COBie deliverables.

SpreadsheetML Color: #CCFFCC

4. **Only If Specified in the Contract (Reference to Another Data Field)**

Data fields that are only required if specified in the contract and whose value references a different data field, either in the same data table or a different data table (including the PickList data table). This status is not used for data tables, only data fields.

SpreadsheetML Color: #CCFFFF

5. **External Reference**

Data fields whose values contain information that allows the data to be referenced back to the computer software that initially generated that information (Originating System). This status is not used for data tables, only data fields.

SpreadsheetML Color: #CC99FF

6. **Secondary Information When Preparing Product Data**

Data tables and data fields that are optional and only required if specified in the contract related to COBie deliverables, and that include secondary information not normally contained in a COBie deliverable.

SpreadsheetML Color: #COCOCO

7. **Regional, Owner, or Product-specific Data**

Data tables and data fields that are required due to superseding regional, owner, or product-specific requirements.

SpreadsheetML Color: #99CCFF

8. **Not Used**

Data tables or data fields not used in the COBie deliverable.

SpreadsheetML Color: #000000

DATA TABLES

The data tables in COBie each serve a purpose and are organized in a hierarchy related to a facility, structure, or group of structures.

GENERAL INFORMATION	SPACE INFORMATION	PRODUCT INFORMATION	OPERATIONAL INFORMATION	SUPPLEMENTARY INFORMATION
Company	Level	Type	Instruction	Resource
Facility	SpaceType	Component	Job	Document
	Space	System	Event	PickList
	Zone	Attribute	Package	
	Coordinate		Risk	

In the following descriptions, the primary Key Value (data field) for each data table is shown in **bold**, where applicable. This Key is always the “Name” data field and does not exist for the Instruction and PickList data tables.

Table 1: Instruction

DESCRIPTION	Provides written instructions related to the COBie database, but also contains the general submittal information for a particular COBie deliverable.	
STATUS	Required	
DATA FIELDS	Title	LinearUnit
	Version	VolumeUnit
	Release	WeightUnit
	Status	AreaMeasurementStandard
	Region	CoordinateSystemDescription
	ExportDateTime	CoordinateSystemOrigin
	Milestone	ClassificationSystem.Company
	OriginatingCompany	ClassificationSystem.Facility
	AreaUnit	ClassificationSystem.SpaceType
	CurrencyUnit	ClassificationSystem.Type
	DurationUnit	ClassificationSystem.System
CONSIDERATIONS	Additional information on this data table related to the instruction is typically reserved for a SpreadsheetML format deliverable (Microsoft Excel workbook).	

Table 2: Company

DESCRIPTION	Represents the information related to a company that is referenced elsewhere in a COBie deliverable.	
STATUS	Required	
DATA FIELDS	Name	PostalCode
	Phone	Country
	Category	ExtSystem
	Website	ExtObject
	Street	ExtIdentifier
	PostalBox	Certifications
	Town	Department
	StateRegion	OrganizationCode
CONSIDERATIONS	This data table was called “Contact” in previous versions of COBie.	

Table 3: Facility

DESCRIPTION	Provides information related to the facility, structure, or group of structures (in the case of infrastructure projects) for which the COBie deliverable represents.	
STATUS	Required	
DATA FIELDS	Name	Longitude
	Description	Elevation
	Type	ExtSystem
	Category	ExtObject
	Address	ExtIdentifier
	Latitude	
CONSIDERATIONS		

Table 4: Level

DESCRIPTION	Contains information related to the vertical levels of a facility or, in the case of infrastructure projects, the geographic areas such as the site surrounding a facility/structure, a rail or highway corridor, etc.	
STATUS	Required	
DATA FIELDS	Name	ExtObject
	Description	ExtIdentifier
	Category	Elevation
	PartOf	Height
	ExtSystem	
CONSIDERATIONS	This data table was called “Floor” in previous versions of COBie.	

Table 5: SpaceType

DESCRIPTION	Provides information related to the different types of spaces that make up a facility, structure, or group of structures for this COBie deliverable.	
STATUS	Required	
DATA FIELDS	Name	ExtSystem
	Description	ExtObject
	Category	ExtIdentifier
CONSIDERATIONS	This is a new data table for COBie v3.	

Table 6: Space

DESCRIPTION	Spaces represent the breakdown of Levels into rooms/areas, and which have common functional purpose to a user.	
STATUS	Required	
DATA FIELDS	Name	ExtSystem
	Description	ExtObject
	RoomTag	ExtIdentifier
	SpaceType.Name	GrossArea
	Level.Name	NetArea
	PartOf	UsableHeight
CONSIDERATIONS	<p>Spaces are expected to be occupiable (visitable).</p> <p>Vertically, Spaces run from top of level to bottom of slab above.</p> <p>Occupied Spaces run to bottom of the ceiling as expressed by the COBie.Space.UsableHeight data field.</p> <p>Large Spaces which have more than a single functional purpose or user may be separated into individual spaces.</p> <p>Spaces may also be used on Levels of type "Roof" or "Site" to identify spatial regions outside a facility enclosure.</p> <p>It is expected that the total list of Spaces in a COBie deliverable represent the entire span of the facility, structure, or group of structures.</p>	

Table 7: Zone

DESCRIPTION	Zones represent a grouping of Spaces combined for a common purpose.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	PartOf
	Description	ExtSystem
	Category	ExtObject
	Space.Name	ExtIdentifier
CONSIDERATIONS	It is expected that the Zones in a COBie deliverable will include all Spaces. Spaces may belong to more than one Zone.	

Table 8: Type

DESCRIPTION	Represents information related to the different types of products and equipment in the Facility.	
STATUS	Required	
DATA FIELDS	Name	WarrantyGuarantorLabor
	Description	WarrantyDurationLabor
	Category	WarrantyDurationUnit
	AssetType	ModelReference
	ExtSystem	NominalHeight
	ExtObject	NominalLength
	ExtIdentifier	NominalWeight
	Manufacturer	NominalWidth
	ModelNumber	PurchaseCost
	WarrantyGuarantorParts	WarrantyDescription
	WarrantyDurationParts	
CONSIDERATIONS	<p>The primary purpose of COBie is to capture data on “maintainable” or “manageable” assets (products and equipment) of a facility, structure, or group of structures.</p> <p>Do not add custom data fields to this data table (or to the right of the data field columns when represented in a SpreadsheetML / Microsoft Excel format). Use the Attribute data table for this.</p>	

Table 9: Component

DESCRIPTION	The individual instances of the products and equipment define in the Type data table.	
STATUS	Required	
DATA FIELDS	Name	Space.Name
	Description	Space.SecondaryName
	SerialNumber	ExtSystem
	TagNumber	ExtObject
	BarCode	ExtIdentifier
	AssetIdentifier	InstallationDate
	Type.Name	WarrantyStartDate
CONSIDERATIONS	All COBie.Component records shall be identified in the COBie.Space in which the asset is found, or the COBie.Space from which the asset it operated.	

Table 10: System

DESCRIPTION	Systems represent groupings of Components that provide some common function.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	ExtSystem
	Description	ExtObject
	Category	ExtIdentifier
	PartOf	Component.Name
CONSIDERATIONS	Components may belong to more than one system.	

Table 11: Resource

DESCRIPTION	Resource records identify the tools, materials, and training needed to maintain the facility, structure, or group of structures.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	ExtSystem
	Description	ExtObject
	Category	ExtIdentifier
CONSIDERATIONS		

Table 12: Job

DESCRIPTION	Identifies the variety of work that is required to operate, maintain, start up, shut down, or troubleshoot a given Component in the facility, structure, or group of structures.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	ExtObject
	Description	ExtIdentifier
	TaskNumber	Duration
	Category	DurationUnit
	Status	Interval
	Table	IntervalUnit
	Table.Name	Priors
	PartOf	ResourceNames
	ExtSystem	
CONSIDERATIONS		

Table 13: Event

DESCRIPTION	Events represent a single occurrence of a task as part of a Job.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	Table.Name
	Description	ExtSystem
	Category	ExtObject
	Company.Name	ExtIdentifier
	Job.Name	StartDate
	Table	EndDate
CONSIDERATIONS	This is a new data table for COBie v3.	

Table 14: Package

DESCRIPTION	Includes information about the legal contract that required the COBie deliverable.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	ExtSystem
	Description	ExtObject
	Category	ExtIdentifier
	Company.Name	StartDate
	Event.Name	EndDate
CONSIDERATIONS	This is a new data table for COBie v3.	

Table 15: Risk

DESCRIPTION	Identifies the exchange of business process and exception reporting information related to other parts of a COBie deliverable.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	ExtSystem
	Description	ExtObject
	Category	ExtIdentifier
	SpatialTable	Likelihood
	SpatialTable.Name	Consequence
	PhysicalTable	LevelOfRisk
	PhysicalTable.Name	Company.Name
	ProcessTable	Mitigation
	ProcessTable.Name	
CONSIDERATIONS	<p>Even though all the “Table” and “Table.Name” fields are shown as required, the only requirement is that at least one pair of these fields is populated, but there is the option to populate up to all three pairs.</p> <p>In other words, if the “SpatialTable” and “SpatialTable.Name” pair of data fields are populated, the “PhysicalTable” and “PhysicalTable.Name” pair or the “ProcessTable” and “ProcessTable.Name” pair do not need to be populated (though there is the option to do any combination of pairs).</p>	

Table 16: Document

DESCRIPTION	Document records identify external files that provide information associated with data in a COBie deliverable.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	ExtObject
	Description	ExtIdentifier
	Category	ApprovalBy
	Stage	Path
	Table	File
	Table.Name	Reference
	ExtSystem	
CONSIDERATIONS	Files referenced in this data table shall be provided with the COBie deliverable in Portable Document Format (PDF) or a common image file type, such as Portable Network Graphics (PNG) or Joint Photographic Experts Group (JPEG) format.	

Table 17: Attribute

DESCRIPTION	Used to store custom data fields for the COBie deliverable.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	ExtObject
	Description	ExtIdentifier
	Category	Value
	Table	Unit
	Table.Name	AllowedValues
	ExtSystem	
CONSIDERATIONS	This data table is to be used in lieu of adding custom data fields to other data tables in a COBie deliverable.	

Table 18: Coordinates

DESCRIPTION	Represents the simple geometric orientation associated with data in a COBie deliverable.	
STATUS	Required only If specified in the contract.	
DATA FIELDS	Name	ClockwiseRotation
	Category	ElevationalRotation
	Table	YawRotation
	Table.Name	RelativeTo
	CoordinateXAxis	ExtSystem
	CoordinateYAxis	ExtObject
	CoordinateZAxis	ExtIdentifier
CONSIDERATIONS	This information is useful if a single Space contains multiple Components to help identify a particular one. For example, a light fixture in a large warehouse space.	

Table 19: PickList

DESCRIPTION	Includes lists of acceptable values for certain data fields.	
STATUS	Required	
DATA FIELDS	Attribute.Category	Risk.Consequence
	Company.Category	Risk.LevelOfRisk
	Coordinate.Category	Risk.Likelihood
	Coordinate.TableName	SpaceType.Category
	Document.ApprovalBy	System.Category
	Document.Category	Table
	Document.Stage	Type.AssetType
	Event.Category	Type.Category
	Facility.Category	Zone.Category
	Facility.Type	Units.Area
	Job.Category	Units.Currency
	Job.Status	Units.Duration
	Level.Category	Units.Linear
	Package.Category	Units.Volume
	Risk.Category	Units.Weight
	Resource.Category	
CONSIDERATIONS		

DATA FIELDS

Each data table contains several data fields, and these data fields are pre-defined as part of the COBie standard.

Naming

Data field names utilize the following naming conventions:

1. Names do not contain any spaces.
2. The first letter is always capitalized, and all subsequent letters are lower case.
3. If more than one word is used for the data field name, then the words are placed together without a space in between and the first letter of each word capitalized (for example, "PartOf" or "EndDate").
4. When a data field references a different data field, either on the same data table or a different one, then the name is a combination of the data table name and the data field on that data table, separated by a period (for example, the "Component.Name" data field on the "System" data table). This is how all the data fields on the "PickList" data table are formatted, identifying the specific data fields and the data table on which they reside.

Organization

To better organize data fields on data tables, they are grouped together based on their purpose. There are six groupings:

- Identification – data fields used to help identify an asset.
- Classification – data fields used to better classify an asset.
- Location – data fields related to an asset's location.
- External – data fields populated automatically by external software.
- Required – additional data fields that are always required for each COBie deliverable.
- Optional – additional data fields that are only required if specified in the contract.

The data fields on each data table are then sorted based on these groupings (in the order shown above). When more than one data field exists in a data table with the same grouping, then the data fields are sorted alphabetically. The only exception is the "Name" data field, as that is always the first data field on the data table.

Nomenclature

Throughout this standard there are references to specific data fields on specific data tables. To make it easier to identify these, the following nomenclature is used: `DataTable.DataField`. Often, this nomenclature will be preceded with "COBie." For example, the "Name" data field on the "Type" data table would be represented as:

`COBie.Type.Name`

Default Value

Data fields should not be left blank for a COBie deliverable. Instead, a value of "n/a" should be used (without the quotes) for text fields and "0" for real number fields.

Pre-Determined Values

Some data fields in COBie must be populated with values that are already determined. In other words, users must choose a value from a list and not type in their own value (or even an abbreviation of one of the pre-determined list of values). These lists of pre-determined values are known as PickLists and there is a data table in COBie to store them.

Some of these PickLists are constant for all COBie deliverables (such as `COBie.Level.Category` and `COBie.Type.AssetType`), while others will vary based on regional or owner preferences (such as using OmniClass Table 34 values for the `COBie.Company.Category` data field in the U.S. versus Uniclass Table Ro values for the same data field in the U.K.).

Custom Data Fields

It is not permitted to create custom data fields on data tables. Instead, utilize the `COBie.Attributes` data table to add additional data fields to your COBie deliverables.

The reason is because, as a standard schema, asset management systems can have pre-built data field mappings to allow for the import of data from a standard COBie deliverable without customization. If data fields are added to data tables, then asset management systems will not be able to recognize and import those data fields without first customizing the import tool.

Data Types

Each data field can be of a certain type of data. Included in the following pages is an indicator on the type of data for that data field, using the following legend:

- T Text as a string of characters that can include letters, numbers, and punctuation. Unless otherwise noted:
 - The total field length should be limited to 255 characters or less.
 - Use only ASCII characters (0-9, A-Z, a-z, space " ", dash "-", and underscore "_").
 - Should not include non-printing characters.
 - Name fields should not include spaces due to inconsistency of parsing software.
- R Real Number
- D Date (following the ISO 8601 standard)
- U URL (Uniform Resource Locator or web address)

Details

The following pages details each of the data fields that are part of the COBie standard. This information includes the name, description, examples, and details regarding the organization and status.

COBie v3 Standard

INSTRUCTION

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Title	The title of this deliverable standard, which is always COBie.	T	n/a	Required	COBie
Version	The version of the COBie standard you are submitting.	T	n/a	Required	3
Release	The release of the COBie version.	T	n/a	Required	1
Status	The version IFC with which this COBie deliverable aligns.	T	n/a	Required	IFC4
Region	The language in which this COBie deliverable is written. Format is ISO 639-1 two letter language code.	T	n/a	Required	en-US en-GB
ExportDateTime	The date or date and time this COBie deliverable was generated. Format is ISO 8601 (YYYY-MM-DD), with the exact time optional.	D	n/a	Required	2022-12-31 2022-12-31T13:00:00
Milestone	A description of the project milestone for which this COBie deliverable represents.	T	n/a	If Specified	50% DD 90% CD Handover n/a
OriginatingCompany	The name of the company that generated this COBie deliverable, referencing a COBie.Company.Name value.	T	n/a	Required (Reference)	ABC_Corp
AreaUnit	The units for area measurements in this COBie deliverable, referencing a COBie.PickList.Units.Area value.	T	n/a	Required (Reference)	Square Feet Square Meters
CurrencyUnit	The units for currency in this COBie deliverable, referencing a COBie.PickList.Units.Currency value.	T	n/a	Required (Reference)	Dollars Euros

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
DurationUnit	The units for duration in this COBie deliverable, referencing a COBie.PickList.Units.Duration value.	T	n/a	Required (Reference)	Month Year
LinearUnit	The units for linear measurements in this COBie deliverable, referencing a COBie.PickList.Units.Linear value.	T	n/a	Required (Reference)	Feet Meters
VolumeUnit	The units for volume measurements in this COBie deliverable, referencing a COBie.PickList.Units.Volume value.	T	n/a	Required (Reference)	Cubic Feet Cubic Meters
WeightUnit	The units for area measurements in this COBie deliverable, referencing a COBie.PickList.Units.Weight value.	T	n/a	Required (Reference)	Pounds Kilograms
AreaMeasurementStandard	The associated measurement method used to calculate spatial area measurements applied to all COBie information other than that found in the Attribute data table.	T	n/a	Required	BOMA 2017 for Office Buildings: Standard Methods of Measurement (ANSI/BOMA Z65.1—2017)
CoordinateSystemDescription	A narrative of how the digital models used to generate a COBie deliverable are situated in real-world space to aid in multi-model alignment. This may include reference to a specific state plane coordinate system, or to a survey pin located on the project site.	T	n/a	Required	WGS 84 GRS80
CoordinateSystemOrigin	Typically defined by the project team and is often set at a specific location within the building or project site. The origin is usually chosen to align with a key reference point, such as a building corner, survey control point, or other significant feature. Sometimes, this can be defined with Northing, Easting, and elevation values.	T	n/a	Required	The furthest Southeast intersection of the column grid of Building 206 38°54'12.438"N, 77°2'1.0314"W

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
ClassificationSystem.Company	The classification system used for the COBie.Company.Category data field. This data field aligns with the values held in the COBie.PickList.Company.Category data field.	T	n/a	Required	OmniClass Table 34 Uniclass Table Ro
ClassificationSystem.Facility	The classification system used for the COBie.Facility.Category data field. This data field aligns with the values held in the COBie.PickList.Facility.Category data field.	T	n/a	Required	OmniClass Table 11 Uniclass Table En
ClassificationSystem.SpaceType	The classification system used for the COBie.SpaceType.Category data field. This data field aligns with the values held in the COBie.PickList.SpaceType.Category data field.	T	n/a	Required	OmniClass Table 13 Uniclass Table SL
ClassificationSystem.Type	The classification system used for the COBie.Type.Category data field. This data field aligns with the values held in the COBie.PickList.Type.Category data field	T	n/a	Required	OmniClass Table 23 Uniclass Table Pr
ClassificationSystem.System	The classification system used for the COBie.System.Category data field. This data field aligns with the values held in the COBie.PickList.System.Category data field	T	n/a	Required	OmniClass Table 21 Uniclass Table EF

COMPANY

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Company. This is the primary key for this data table and each value must be unique.	T	Identification	Required	ABC_Corp xyzconstruction-com
Phone	The telephone number for the Company.	T	Identification	Required	+1 (202) 289-7800
Category	The classification for the Company. This data field value comes from one of the values in COBie.PickList.Company.Category data field.	T	Classification	If Specified (Reference)	34-10 11 Owner Ro_10_20_14 Client n/a
Website	The website address for the Company.	T	Location	If Specified	www.abccorp.com https://www.abccorp.com/project12 n/a
Street	The street address for the Company.	T	Location	If Specified	1090 Vermont Avenue NW, Suite 700 n/a
PostalBox	The postal box address for the Company.	T	Location	If Specified	P.O. Box 1234 n/a
Town	The city or town address for the Company.	T	Location	If Specified	Washington n/a
StateRegion	The state or regional address for the Company.	T	Location	If Specified	DC n/a
PostalCode	The zip, or postal code, address for the Company.	T	Location	If Specified	20005 n/a

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Country	The country where the Company is located.	T	Location	If Specified	U.S.A. U.K. Germany n/a
ExtIdentifier	The unique identifier of the identified ExternalObject that would allow COBie data to be matched back to the data from which it was developed in the named ExternalSystem. This might be a GUID or ElementID.	T	External	External	4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be
ExtObject	The name of the data object within the computer system that holds the data provided in a given record of COBie data. The default values are the associated IFC entities that are mapped (and those that are excluded) when transforming IFC data to a given record of COBie data.	T	External	External	IfcSpace
ExtSystem	The name of the computer system generating the record of COBie data.	T	External	External	Autodesk Revit 2023, Build: 20220429_1500(x64) ArchiCAD 19 Full (USA) / Build: 5005
Certifications	The assurance by an independent governing body that a building component, service, or system meets specific requirements.	T	Optional	If Specified	Licensed electrician Certified Lead Based Paint Abatement Company n/a
Department	The name of the department for the Company.	T	Optional	If Specified	Design & Construction Operations n/a

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
OrganizationCode	The organizational code for the Company.	T	Optional	If Specified	ABC XYZ n/a

FACILITY

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Facility for this COBie deliverable. This is the primary key for this data table and each value must be unique.	T	Identification	Required	Building204 American_Legion_Bridge_and_Facilities
Description	A general text description of the facility, structure, or group of structures as part of this COBie deliverable.	T	Identification	If Specified	Medical-Dental Clinic n/a
Type	The type of facility, structure, or group of structures as part of this COBie deliverable. This data field value comes from one of the values in COBie.PickList.Facility.Type data field.	T	Classification	Required (Reference)	Facility Project Site
Category	The classification for the Facility. This data field value comes from one of the values in COBie.PickList.Facility.Category data field.	T	Classification	If Specified (Reference)	11-27 25 19 Office-Retail Building En_20_15_10 Multiple occupation office n/a
Address	The city or town address of the project in Facility.	T	Location	Required	1090 Vermont Avenue NW, Suite 700, Washington, DC 20005
Latitude	The specific latitude for the facility, structure, or group of structures as part of this COBie deliverable.	T	Location	Required	38°54'12.438"N
Longitude	The specific longitude for the facility, structure, or group of structures as part of this COBie deliverable.	T	Location	Required	77°2'1.0314"W
Elevation	The specific elevation above sea level for the facility, structure, or group of structures as part of this COBie deliverable.	T	Location	Required	2,432
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					

LEVEL

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Level. This is the primary key for this data table and each value must be unique.	T	Identification	Required	Level_1 Mezzanine
Description	A general text description of the Level.	T	Identification	If Specified	First floor n/a
Category	The classification for the Level. This data field value comes from one of the values in COBie.PickList.Level.Category data field.	T	Classification	Required (Reference)	Roof Floor Site
PartOf	A reference to another COBie.Level.Name item on this data table to represent that this item is a subset of that one. For example, a facility on a sloped grade that has a single "Level 1" floor per the signage, but that is separated within by a few steps, so the model has two different levels defined to manage the elements.	T	Classification	If Specified (Reference)	Mezzanine n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					
Elevation	The elevation at the top of the level structure. If allowable values are not specified by contract, the default value is measured as a relative value compared to the facility's datum.	R	Optional	If Specified	12 150 0
Height	The distance between the top of level structure to bottom of structure above. This is typically applicable to records having the COBie.Level.Category data field value of "Floor".	R	Optional	If Specified	96 150 0

SPACETYPE

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Space Type. This is the primary key for this data table and each value must be unique.	T	Identification	Required	Office-Medium
Description	A general text description of the Space Type.	T	Identification	If Specified	Office of 60SF - 99SF n/a
Category	The classification for the Space Type. This data field value comes from one of the values in COBie.PickList.SpaceType.Category data field.	T	Classification	If Specified (Reference)	13-55 11 Office Spaces SL_20_15_27 Enclosed offices n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					

SPACE

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Space. This value does not need to be unique. This is often the room number in the construction documents.	T	Identification	Required	1A01 Room217
Description	A general text description of the Space. This is often the room name in the construction documents.	T	Identification	Required	Office Communication Room
RoomTag	The signage provided for each Space. Signage applied to doors, if different, is identified as Attribute records related to each applicable door. The information here is equivalent to that found in construction signage submittals.	T	Identification	If Specified	6-1A01 n/a
SpaceType.Name	A reference to an item from the SpaceType data table (a COBie.SpaceType.Name value).	T	Classification	Required (Reference)	Office-Medium
Level.Name	A reference to an item from the Level data table (a COBie.Level.Name value).	T	Location	Required (Reference)	Level_1
PartOf	A reference to another COBie.Space.Name item on this data table to represent that this item is a subset of that one. For example, a large open room that has cubicles within. Each cubicle space would be part of the large open space.	T	Location	If Specified (Reference)	WorkArea500 n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
GrossArea	The total space area as specified in the design contract and calculated by the identified COBie.Instruction.AreaMeasurementStandard value.	R	Optional	If Specified	415 0
NetArea	The usable space area as specified in the design contract and calculated by the identified COBie.Instruction.AreaMeasurementStandard value.	R	Optional	If Specified	325 0
UsableHeight	Distance from top of finished level to bottom of ceiling. If there is no ceiling, then this value must match COBie.Level.Height .	R	Optional	If Specified	120 0

ZONE

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Zone. This is the primary key for this data table and each value must be unique.	T	Identification	Required	Administration Circulation
Description	A general text description of the Zone.	T	Identification	If Specified	Administration Department Circulation Area n/a
Category	The classification for the Zone. This data field value comes from one of the values in COBie.PickList.Zone.Category data field.	T	Classification	If Specified (Reference)	Circulation Zone Occupancy Zone n/a
Space.Name	A reference to an item from the Space data table (a COBie.Space.Name value).	T	Location	Required (Reference)	1A01, 1A02, 1A03 2E16, 2E24
PartOf	A reference to another COBie.Zone.Name item on this data table to represent that this item is a subset of that one. For example, a large zone for the west wing of a facility could be divided up into smaller zones that are part of the west wing zone.	T	Location	If Specified (Reference)	Logistics n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					

TYPE

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the asset Type. This is the primary key for this data table and each value must be unique.	T	Identification	Required	BoilerType1 Door_Type_A
Description	A general text description of the asset Type.	T	Identification	Required	Induced Heat Draft, Natural Gas Fired, Copper Tube, Hot Water Boiler Single Panel Flush Solid Core Wood
Category	The classification for the asset Type. This data field value comes from one of the values in COBie.PickList.Type.Category data field.	T	Classification	If Specified (Reference)	23-33 11 22 Electric Boilers Pr_60_60_08_27 Electric Boilers n/a
AssetType	The type of asset. This data field value comes from one of the values in COBie.PickList.Type.AssetType data field.	T	Classification	If Specified (Reference)	Fixed Moveable n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					
Manufacturer	The name of the company that manufactures the asset. This data field value comes from one of the values in COBie.Company.Name data field.	T	Required	If Specified (Reference)	ABC_Corp n/a
ModelNumber	During the construction and handover phases, this is the manufacturer's model number of the installed product. During planning and design phases, this data field is not applicable.	T	Required	Required	CBN1435 M-Series

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
WarrantyGuarantorParts	<p>During the construction and handover phases, this is the name of the company that is responsible for replacement parts during the warranty period.</p> <p>During planning and design phases, this data field is not applicable.</p> <p>This is a reference to an item from the Company data table (a COBie.Company.Name value).</p>	T	Required	If Specified (Reference)	ABC Corp. n/a
WarrantyDurationParts	<p>During the construction and handover phases, this is the length of the warranty period for replacement parts provided by the product manufacturer.</p> <p>During planning and design phases, this data field is not applicable.</p>	T	Required	Required	3 36
WarrantyGuarantorLabor	<p>During the construction and handover phases, this is the name of the company that is responsible for labor costs during the warranty period.</p> <p>During planning and design phases, this data field is not applicable.</p> <p>This is a reference to an item from the Company data table (a COBie.Company.Name value).</p>	T	Required	If Specified (Reference)	ABC_Corp n/a
WarrantyDurationLabor	<p>During the construction and handover phases, this is the length of the warranty period for labor repairs provided by the product manufacturer.</p> <p>During planning and design phases, this data field is not applicable.</p>	T	Required	Required	1 12

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
WarrantyDurationUnit	<p>The unit of measure associated with values found in COBie.Type.WarrantyDurationParts and COBie.Type.WarrantyDurationLabor.</p> <p>If allowable values are not specified by contract, the default values are "Month" and "Year".</p> <p>This data field value comes from one of the values in COBie.PickList.Units.Duration data field.</p>	T	Required	Required (Reference)	Month Year
ModelReference	<p>During the construction and handover phases, this is the manufacturer's catalog or reference resource, such as a website, where information about the installed asset may be found.</p> <p>During planning and design phases, this data field is not applicable.</p>	T	Optional	If Specified	8200HI n/a
NominalHeight	<p>An approximate measure based on the bounding box of the asset before it is modified to fit into the space.</p> <p>Height is measured vertically from the bottom up.</p>	R	Optional	If Specified	96 0
NominalLength	<p>An approximate measure based on the bounding box of the asset before it is modified to fit into the space.</p> <p>Length is measured horizontally and is typically the longer of the two values (length and width).</p>	R	Optional	If Specified	72 0
NominalWeight	<p>An approximate measure of the overall weight of the product before it is modified to fit into the space.</p>	R	Optional	If Specified	60 0
NominalWidth	<p>An approximate measure based on the bounding box of the asset before it is modified to fit into the space.</p> <p>Width is measured horizontally and is typically the shorter of the two values (length and width).</p>	R	Optional	If Specified	30 0

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
PurchaseCost	<p>During the construction and handover phases, this is the purchase cost of the asset.</p> <p>During planning and design phases, this data field is not applicable.</p>	R	Optional	If Specified	5200 0
WarrantyDescription	A general description of the warranty for the asset.	T	Optional	If Specified	3 years parts, 1 year labor n/a

COBie v3 Standard

COMPONENT

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the asset Component. This is the primary key for this data table and each value must be unique.	T	Identification	Required	BLR1-6 DR206
Description	A general text description of the asset Component.	T	Identification	Required	Gas Boiler Single Door
AssetIdentifier	An alternative identifier for the specific component to be used as defined by associated contract.	T	Identification	If Specified	ABC123 n/a
BarCode	During the construction and handover phases, this is the barcode found on the installed product name plate. During planning and design phases, this data field is not applicable.	T	Identification	If Specified	012345678901 n/a
SerialNumber	During the construction and handover phases, this is the serial number found on the installed product name plate. During planning and design phases, this data field is not applicable.	T	Identification	If Specified	C02NQCC6FY17 n/a
TagNumber	During the construction and handover phases, this is the value of tag affixed to the installed asset. During planning and design phases, this data field is not applicable.	T	Identification	If Specified	ABC123 n/a
Type.Name	This is a reference to an item from the Type data table (a COBie.Type.Name value).	T	Classification	Required (Reference)	BoilerType1 Door_Type_A

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Space.Name	<p>This is the name of the space in which this asset is located.</p> <p>This is a reference to an item from the Space data table (a COBie.Space.Name value).</p>	T	Location	Required (Reference)	1A01 Room217
Space.SecondaryName	<p>This is the name of the secondary space in which this asset is located. This may be used if the asset spans across more than one space.</p> <p>This is a reference to an item from the Space data table (a COBie.Space.Name value).</p>	T	Location	If Specified (Reference)	1A01 Room217 n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					
InstallationDate	<p>During the construction and handover phases, this is the date on which this asset was placed in its final location.</p> <p>During planning and design phases, this data field is not applicable.</p>	D	Optional	If Specified	2022-12-31 n/a
WarrantyStartDate	<p>During the construction and handover phases, this is the date on which the asset's warranty period begins.</p> <p>During planning and design phases, this data field is not applicable.</p>	D	Optional	If Specified	2022-12-31 n/a

SYSTEM

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the System. This is the primary key for this data table and each value must be unique.	T	Identification	Required	HVAC-01 FireProtection
Description	A general text description of the System.	T	Identification	If Specified	HVAC System 01 Fire Protection System n/a
Category	The classification for the System. This data field value comes from one of the values in COBie.PickList.System.Category data field.	T	Classification	If Specified (Reference)	21-04 20 10 Domestic Water Distribution EF_55_70 Water supply n/a
PartOf	A reference to another COBie.System.Name item on this data table to represent that this item is a subset of that one. For example, a sanitary vent system may be part of an overall sanitary waste system.	T	Location	If Specified (Reference)	SANVENT-02 n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					
Component.Name	A reference to an item from the Component data table (a COBie.Component.Name value).	T	Required	Reference	BLR1-6, BLR1-7 DR204, DR205, DR206, DR207

RESOURCE

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Resource that is required to be used on the Job. This Resource may be shared across multiple Jobs. This is the primary key for this data table and each value must be unique.	T	Identification	Required	CleaningMaterials Boiler_Chemicals
Description	A general text description of the Resource.	T	Identification	If Specified	Chemicals and tools needed to clean areas and equipment Chemicals needed to maintain boilers n/a
Category	The classification for the Resource. This data field value comes from one of the values in COBie.PickList.Resource.Category data field.	T	Classification	Required (Reference)	Labor Material
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					

JOB

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	<p>The name of the Job.</p> <p>This is the primary key for this data table and each value must be unique.</p>	T	Identification	Required	<p>AHUType01-AnnualMaintenance</p> <p>BoilerType1LockOut</p> <p>Inspection_10-06-2023</p>
Description	<p>A general text description of the Job.</p> <p>There are typically three ways to populate this field.</p> <ol style="list-style-type: none"> 1. A general description of the Job, with all steps outlined in an associated document. 2. The complete set of all numbered steps. To assist CMMS/CAFM vendors, these steps should be delimited with a semi-colon. 3. A description of one of several linked steps using the COBie.Job.TaskNumber and COBie.Job.Priors data fields. 	T	Identification	Required	Series of maintenance tasks related to the Air Handling Units as detailed in the preventative maintenance manual from the manufacturer.
TaskNumber	<p>If COBie.Job.Description contains a series of individual operations, this is the identification (non-zero integers) used to reference each step.</p> <p>If COBie.Job.Description contains a series of individual operations; this becomes the third part of the compound key, otherwise it is ignored.</p> <p>The first COBie.Job.Description in the series shall have a value of "0" and provide the general information about the job whose tasks follow.</p>	T	Identification	If Specified	<p>0</p> <p>1</p> <p>n/a</p>
Category	<p>The classification for the Job.</p> <p>This data field value comes from one of the values in COBie.PickList.Job.Category data field.</p>	T	Classification	Required (Reference)	<p>Inspection</p> <p>ShutDown</p>

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DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Status	The status of the Level. This data field value comes from one of the values in COBie.PickList.Job.Status data field.	T	Classification	Required (Reference)	Not Yet Started Completed
Table	Reference to another data table related to this Job.	T	Location	Required (Reference)	Package Risk Type Component
Table.Name	The primary key (value in the "Name" data field) of the data record on the data table referenced in COBie.Job.Table data field.	T	Location	Required (Reference)	WindowReplacement2023 Missing_Data BoilerType1 BLR1-6
PartOf	A reference to another COBie.Job.Name item on this data table to represent that this item is a subset of that one. For example, a "Filter Replacement" Job could be part of an overall "AHU Annual Maintenance" Job.	T	Location	If Specified (Reference)	AHUType01-AnnualMaintenance n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					
Duration	The length of time required to perform the Job.	R	Required	Required	180 1
DurationUnit	The unit of time associated with the COBie.Job.Duration data field. This data field value comes from one of the values in COBie.PickList.Unit.Duration data field.	T	Required	Required (Reference)	Minute Hour

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Interval	The planned time interval between occurrence events for this Job.	R	Required	Required	1 2
IntervalUnit	The unit of time associated with the COBie.Job.Interval data field. This data field value comes from one of the values in COBie.PickList.Unit.Duration data field.	T	Required	Required (Reference)	Year Month
Priors	The Tasks that must be completed before this Job. If COBie.Job.Description contains a series of individual operations, this is a comma delimited list of the COBie.Job.TaskNumber for all prior jobs. The first in the series shall have a value of "0".	T	Required	If Specified (Reference)	0 1 n/a
Resource.Name	A comma delimited list of the Resources needed for this Job. This data field value comes from one of the values in COBie.Resource.Name data field.	T	Required	If Specified (Reference)	Cleaning Materials, Boiler Chemicals n/a

EVENT

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Event. This value does not need to be unique.	T	Identification	Required	Lift_Inspection_2023
Description	A general text description of the Event.	T	Identification	Required	Statutory type 2 inspection
Category	The classification for the Event. This data field value comes from one of the values in COBie.PickList.Event.Category data field.	T	Classification	Required (Reference)	One Time Planned Repeating
Company.Name	The name of the company that is responsible for this Event. This is a reference to an item from the Company data table (a COBie.Company.Name value).	T	Location	Required (Reference)	ABC_Corp xyzconstruction-com
Job.Name	The name of the Job of which this Event is a part. This is a reference to an item from the Job data table (a COBie.Job.Name value).	T	Location	Required (Reference)	AHUType01-AnnualMaintenance BoilerType1LockOut
Table	Reference to another data table related to this Event.	T	Location	Required (Reference)	Job Document
Table.Name	The primary key (value in the "Name" data field) of the data record on the data table referenced in COBie.Event.Table data field.	T	Location	Required (Reference)	AHUType01-AnnualMaintenance ManufacturersEquipmentInformation-Boiler1
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					

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DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
StartDate	The date on which this Event begins.	D	Required	Required	2022-12-31 2022-12-31T13:00:00
EndDate	The date on which this Event ends	D	Optional	If Specified	2022-12-31 2022-12-31T13:00:00 n/a

PACKAGE

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Package. This is the primary key for this data table and each value must be unique.	T	Identification	Required	WindowReplacement2023
Description	A general text description of the Package.	T	Identification	Required	Planned replacement of openings
Category	The classification for the Package. This data field value comes from one of the values in COBie.PickList.Package.Category data field.	T	Classification	If Specified (Reference)	22-01 93 13 – Facility Maintenance Procedures n/a
Company.Name	The name of the company that is responsible for this Package. This is a reference to an item from the Company data table (a COBie.Company.Name value).	T	Location	Required (Reference)	ABC_Corp xyzconstruction-com
Event.Name	A comma delimited list of the Events associated with this Package. This is a reference to an item from the Event data table (a COBie.Event.Name value).	T	Location	Required (Reference)	Lift inspection 2023-02-03
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					
StartDate	The date on which this Package begins.	D	Required	Required	2022-12-31 2022-12-31T13:00:00
EndDate	The date on which this Package ends	D	Optional	If Specified	2022-12-31 2022-12-31T13:00:00 n/a

RISK

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Risk. This is the primary key for this data table and each value must be unique.	T	Identification	Required	MissingData Product_Substitution
Description	A general text description of the Risk.	T	Identification	Required	Balcony railing failure
Category	The classification for the Risk. This data field value comes from one of the values in COBie.PickList.Risk.Category data field.	T	Classification	Required (Reference)	Environmental Safety
SpatialTable	This is a reference to another data table related to the location of this Risk. This value could be from the Facility, Space, or Zone data tables.	T	Location	If Specified (Reference)	Facility Space Zone n/a
SpatialTable.Name	This is the data field of the SpatialData data table referenced. This value could be from the COBie.Facility.Name , COBie.Space.Name , or COBie.Zone.Name data fields.	T	Location	If Specified (Reference)	Building204 1A01 Administration n/a
PhysicalTable	This is a reference to another data table related to the location of this Risk. This value could be from the Facility, Type, Component, or System data tables.	T	Location	If Specified (Reference)	Facility Type n/a
PhysicalTable.Name	This is the data field of the PhysicalData data table referenced. This value could be from the COBie.Type.Name or COBie.Component.Name data fields.	T	Location	If Specified (Reference)	Building204 BoilerType1 n/a

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DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
ProcessTable	This is a reference to another data table related to the location of this Risk. This value could be from the Facility, Job, Event, or Package data tables.	T	Location	If Specified (Reference)	Facility Job n/a
ProcessTable.Name	This is the data field of the ProcessData data table referenced. This value could be from the COBie.Job.Name or COBie.Event.Name data fields.	T	Location	If Specified (Reference)	Building204 AHUType01-AnnualMaintenance n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					
Company.Name	The name of the company that is responsible for this Risk. This data field value comes from one of the values in COBie.Company.Name data field.	T	Location	Required (Reference)	ABC_Corp
Consequence	The consequence of this Risk. This data field value comes from one of the values in COBie.PickList.Risk.Consequence data field.	T	Required	Required (Reference)	Moderate Unknown
LevelOfRisk	The level of this Risk. This data field value comes from one of the values in COBie.PickList.Risk.LevelOfRisk data field.	T	Required	Required (Reference)	High Low
Likelihood	The likelihood of this Risk. This data field value comes from one of the values in COBie.PickList.Risk.Likelihood data field.	T	Required	Required (Reference)	Has Occurred Moderate
Mitigation	A general text description on how to this Risk will be mitigated.	T	Optional	If Specified	Warning signs pending repairs n/a

DOCUMENT

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Document. This value does not need to be unique.	T	Identification	Required	ManufacturersEquipmentInformation-Boiler1 Medical_Gas_System- Normal_Operating_Instructions
Description	A general text description of the Document.	T	Identification	If Specified	Equipment information reference sheet User Manual n/a
Category	The classification for the Document. This data field value comes from one of the values in COBie.PickList.Document.Category data field.	T	Classification	Required (Reference)	Contract Drawings Specifications
Stage	A value of the type of information contained. This data field value comes from one of the values in COBie.PickList.Document.Stage data field.	T	Classification	Required (Reference)	Approved As Built
Table	Reference to another data table related to this Document that can include any other data table.	T	Location	Required (Reference)	System Type
Table.Name	The primary key (value in the "Name" data field) of the data record on the data table referenced in COBie.Document.Table data field.	T	Location	Required (Reference)	HVAC-01 BoilerType1
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					
ApprovalBy	A value of the type of approver for this document. This data field value comes from one of the values in COBie.PickList.Document.AprovalBy data field.	T	Required	Required (Reference)	Owner Approval Contractor Certified

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Path	<p>The path to the document. Can accommodate:</p> <ul style="list-style-type: none"> ▪ Full file path (drive and folders) ▪ Relative file path (folders) ▪ Web URL <p>This value may include the file name as well, in which case the COBie.Document.File data field will be "n/a".</p>	U	Required	Required	<p>X:\Folder\Subfolder\ https://www.abc.com/file.ext</p>
File	<p>The name of the file, with file extension, that contains the associated information.</p> <p>The file name may also be included in the COBie.Document.Path data field.</p>	T	Optional	If Specified	<p>123Main_Arch_R23.rvt ComissioningReport.pdf n/a</p>
Reference	<p>If different from the COBie.Document.Path and COBie.Document.File data fields, this is a reference to documents provided from manufacturers' catalogs or websites.</p>	T	Optional	If Specified	<p>https://www.abc.com/doclibrary/ n/a</p>

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ATTRIBUTE

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Attribute. This value does not need to be unique.	T	Identification	Required	FanMaxSpeed Volts
Description	A general text description of the Attribute.	T	Identification	If Specified	Maximum fan speed Nominal Voltage n/a
Category	The classification for the Attribute. This data field value comes from one of the values in COBie.PickList.Attribute.Category data field.	T	Classification	Required (Reference)	Approved As Built
Table	This is a reference to another data table to where this Attribute applies.	T	Location	Required (Reference)	Type Component
Table.Name	The primary key (value in the "Name" data field) of the data record on the data table referenced in COBie.Attribute.Table data field.	T	Location	Required (Reference)	BoilerType1 BLR1-6
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					
Value	The value of the Attribute.	T	Required	Required	123 1200.56
Unit	The unit defining the Value of the Attribute.	T	Required	Required	Feet Amps

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DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
AllowedValues	A comma delimited list of one or more allowed values for the "Value" data field of a particular item on the "Attribute" data table.	T	Optional	If Specified	Inlet, Outlet 5kVA, 10kVA, 15kVA Fixed, Variable n/a

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COORDINATE

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Coordinate. This value does not need to be unique.	T	Identification	Required	Light_LC-1_box-upperright DR206_box-lowerleft
Category	The classification for the Coordinate. This data field value comes from one of the values in COBie.PickList.Coordinate.Category data field.	T	Classification	Required (Reference)	Point Line-end-one
Table	Reference to another data table that can include: COBie.Facility , COBie.Level , COBie.Space , COBie.Type , or COBie.Coordinate .	T	Location	Required (Reference)	Level Space
Table.Name	The primary key (value in the "Name" data field) of the data record on the data table referenced in COBie.Coordinate.Table data field.	T	Location	Required (Reference)	Level_1 1A01
CoordinateXAxis	The relative coordinate of the referenced asset along the X-axis.	R	Location	Required	28.75 -108.50
CoordinateYAxis	The relative coordinate of the referenced asset along the Y-axis.	R	Location	Required	42.25 -80.00
CoordinateZAxis	The relative coordinate of the referenced asset along the Z-axis.	R	Location	Required	0.00 96.50
ClockwiseRotation	Rotation of the asset around the Z-axis of the identified point.	R	Location	Required	0.00 90.00
ElevationalRotation	Rotation of the asset around the X-axis of the identified point.	R	Location	Required	0.00 180.00
YawRotation	Rotation of the asset around the Y-axis of the identified point.	R	Location	Required	0.00 90.00

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
RelativeTo	<p>A reference to another COBie.Coordinate.Name item on this data table.</p> <p>If used, this coordinate is relative to that one.</p> <p>Leaving this data field as "n/a" will imply the coordinate is relative to the coordinate system called out in the COBie.Instruction.CoordinateSystemDescription data field.</p>	T	Location	If Specified (Reference)	Light_LC-1_box-upperright n/a
ExtIdentifier	See the "Company" data table section above for details about these data fields.				
ExtObject					
ExtSystem					

PICKLIST

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Attribute.Category	The pre-determined values allowed for assigning a category to the attributes in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Approved ▪ As Built ▪ Exact Requirement ▪ Maximum Requirement ▪ Minimum Requirement ▪ Requirement ▪ Submitted
Coordinate.Category	The pre-determined values allowed for categorizing the coordinates in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Point ▪ Line-end-one ▪ Line-end-two ▪ Box-lowerleft ▪ Box-upperright
Coordinate.TableName	The pre-determined values allowed for assigning a data table to which the coordinates in a COBie deliverable apply.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Component ▪ Level ▪ Space
Document.ApprovalBy	The pre-determined values allowed for assigning an approver for the documents in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Owner Approval ▪ Contractor Certified ▪ Information Only

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Document.Category	The pre-determined values allowed for categorizing the documents in a COBie deliverable.	T	n/a	If Specified	<p>Only the following values are allowed:</p> <ul style="list-style-type: none"> ▪ Certificates ▪ Client Requirements ▪ Closeout Submittals ▪ Contract Drawings ▪ Contract Modifications ▪ Contract Specifications ▪ Design Data ▪ Design Review Comment ▪ Manufacturer Field Reports ▪ Manufacturer Instructions ▪ Operation and Maintenance ▪ Preconstruction Submittals ▪ Product Data ▪ Punch List Items ▪ Request for Information ▪ Requests for Information ▪ Samples ▪ Shop Drawings ▪ Specifications ▪ Test Reports
Document.Stage	The pre-determined values allowed for assigning a stage to the documents in a COBie deliverable.	T	n/a	If Specified	<p>Only the following values are allowed:</p> <ul style="list-style-type: none"> ▪ Approved ▪ As Built ▪ Exact Requirement ▪ Maximum Requirement ▪ Minimum Requirement ▪ Requirement ▪ Submitted
Event.Category	The pre-determined values allowed for categorizing the events in a COBie deliverable.	T	n/a	If Specified	<p>Only the following values are allowed:</p> <ul style="list-style-type: none"> ▪ One Time ▪ Planned ▪ Repeating

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Facility.Category	The pre-determined values allowed for categorizing the facility in a COBie deliverable.	T	n/a	If Specified	Typically, the values shown for this in the U.S. are those from OmniClass Table 11, while Uniclass Table En is used in the U.K.
Facility.Type	The pre-determined values allowed for the facility type in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Facility ▪ Project Site
Job.Category	The pre-determined values allowed for categorizing the jobs in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Adjustment ▪ Calibration ▪ Emergency ▪ Inspection ▪ Operation ▪ Project Management ▪ Safety ▪ ShutDown ▪ StartUp ▪ Testing ▪ Trouble
Job.Status	The pre-determined values allowed for the status of your jobs in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Not Yet Started ▪ Started ▪ Completed
Level.Category	The pre-determined values allowed for categorizing the levels in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Floor ▪ Roof ▪ Site
Package.Category	The pre-determined values allowed for the category of your packages in a COBie deliverable	T	n/a	If Specified	Typically, the values shown for this in the U.S. are those from OmniClass Table 22, while Uniclass Table Ss is used in the U.K.

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Resource.Category	The pre-determined values allowed for categorizing the resources in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Labor ▪ Material ▪ Tools ▪ Training
Risk.Category	The pre-determined values allowed for categorizing the risks in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Change ▪ Claim ▪ Coordination ▪ Environmental ▪ Function ▪ IndoorAirQuality ▪ Installation ▪ RFI ▪ Safety ▪ Specification
Risk.Consequence	The pre-determined values allowed for the risk consequences in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Very High ▪ High ▪ Moderate ▪ Low ▪ Unknown
Risk.LevelOfRisk	The pre-determined values allowed for the levels of risk in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Very High ▪ High ▪ Moderate ▪ Low ▪ Unknown

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Risk.Likelihood	The pre-determined values allowed for the likelihood of risks in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> Has Occurred High Moderate Low Unknown
SpaceType.Category	The pre-determined values allowed for categorizing the space types in a COBie deliverable.	T	n/a	If Specified	Typically, the values shown for this in the U.S. are those from OmniClass Table 13, while Uniclass Table SL is used in the U.K.
System.Category	The pre-determined values allowed for categorizing the systems in a COBie deliverable.	T	n/a	If Specified	Typically, the values shown for this in the U.S. are those from OmniClass Table 21, while Uniclass Table EF is used in the U.K.
Table	A list of the COBie data tables.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> Attribute Company Component Coordinate Document Event Facility Job Level Package Resource Risk Space SpaceType System Type Zone
Type.AssetType	The pre-determined values allowed for designating the type of asset each component type is in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> Fixed Moveable

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Type.Category	The pre-determined values allowed for categorizing the component types in a COBie deliverable.	T	n/a	If Specified	Typically, the values shown for this in the U.S. are those from OmniClass Table 23, while Uniclass Table Pr is used in the U.K.
Zone.Category	The pre-determined values allowed for categorizing the zones in a COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Circulation Zone ▪ Fire Alarm Zone ▪ Historical Preservation Zone ▪ Lighting Zone ▪ Occupancy Zone ▪ Ventilation Zone
Units.Area	The pre-determined values allowed for data fields that represent area measurements. The overall value is captured in the COBie.Instruction.AreaUnit data field.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ Square Inches ▪ Square Feet ▪ Square Miles ▪ Square Millimeters ▪ Square Meters ▪ Square Kilometers
Units.Currency	The pre-determined values allowed for data fields that represent currency. The overall value is captured in the COBie.Instruction.CurrencyUnit data field.	T	n/a	If Specified	The values shown should be from the ISO 4217 Currency codes.
Units.Duration	The pre-determined values allowed for data fields that represent duration. The overall value is captured in the COBie.Instruction.DurationUnit data field.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> ▪ As required ▪ Day ▪ Minute ▪ Month ▪ Quarter ▪ Week ▪ Year

COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Units.Linear	<p>The pre-determined values allowed for data fields that represent linear measurements.</p> <p>The overall value is captured in the COBie.Instruction.linearUnit data field.</p>	T	n/a	If Specified	<p>Only the following values are allowed:</p> <ul style="list-style-type: none"> ▪ Inches ▪ Feet ▪ Miles ▪ Millimeters ▪ Meters ▪ Kilometers
Units.Volume	<p>The pre-determined values allowed for data fields that represent volume measurement.</p> <p>The overall value is captured in the COBie.Instruction.VolumeUnit data field.</p>	T	n/a	If Specified	<p>Only the following values are allowed:</p> <ul style="list-style-type: none"> ▪ Cubic Feet ▪ Cubic Meters
Units.Weight	<p>The pre-determined values allowed for data fields that represent weight measurements.</p> <p>The overall value is captured in the COBie.Instruction.WeightUnit data field.</p>	T	n/a	If Specified	<p>Only the following values are allowed:</p> <ul style="list-style-type: none"> ▪ Ounces ▪ Pounds ▪ Tons ▪ Grams ▪ Kilograms ▪ Metric Tons

FORMAT

There are several approved formats in which the COBie database can be delivered. These include:

- STEP physical file format ISO/IEC 10303-21:2016
- ifcXML format ISO/IEC 10303-28:2007
- SpreadsheetML format ISO/IEC 29500-1:2016
- JSON format ISO/IEC 21778:2017

For details on these formats and their corresponding schema, see the “Appendix” in this document.



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Appendix A: Resources

The following resources are referenced in this document.

ID	DESCRIPTION	URL
1	National Institute of Building Sciences (NIBS)	https://www.nibs.org/
2	The National BIM Standard-United States® (NBIMS-US™)	https://www.nationalbimstandard.org/
2	buildingSMART USA – Model View Definitions (MVD)	https://www.buildingsmartusa.org/standards/bsi-standards/model-view-definitions-mvd/

Appendix B: Schema Definitions

STEP PHYSICAL FILE FORMAT

ISO/IEC 10303-21:2016

There are three related parts to the ISO standard related to the STEP Physical File (SPF) format:

- **ISO 10303-11, Industrial automation systems and integration** — Product data representation and exchange — Part 11: description methods: The EXPRESS Language Reference Manual. This is the format of figures found in the referenced MVD.
- **ISO 10303-21, Industrial automation systems and integration** — Product data representation and exchange — Part 21: Implementation methods: Clear text encoding of the exchange structure. This is typically referred to as the STEP Physical File Format.
- **ISO 10303-28, Industrial automation systems and integration** — Product data representation and exchange — Part 28: Implementation methods: XML representations of EXPRESS schemas and data, using XML schemas. This is typically referred to as ifcXML.

IFC FORMAT

IFC Tables A, B, and C are intended to direct the reader to the most relevant pages of the IFC4.3 documentation:

<http://ifc43-docs.standards.buildingsmart.org/>

The COBie3 MVD and IDS contain the formal definitions.

IFC Table A – Mapping Between COBie v3 Tables and IFC entities

* Indicates an abstract entity where only its subtypes are used

#	TABLE	IFC4.3	Notes
1	Instruction	IfcProject, IfcUnitAssignment	See IFC Table B
2	Company	IfcOrganization	
3	Facility	IfcProject IfcSite IfcFacility, IfcBuilding, IfcBridge IfcRail, IfcRoad, IfcTunnel (IFC4.4)	(ifc2x3: IfcBuilding)
4	Level	IfcFacilityPart, IfcBuildingStorey	(ifc2x3: IfcBuildingStorey)
5	SpaceType	IfcSpaceType	
6	Space	IfcSpace, IfcExternalSpatialElement	(ifc2x3: IfcSpace)
7	Zone	IfcZone	
8	Type	IfcElementType*	See IFC Table C
9	Component	IfcElement*	See IFC Table C
10	System	IfcSystem, IfcCircuit, IfcBuildingSystem, IfcStructuralSystem, IfcDistributionSystem	
11	Resource	IfcConstructionEquipmentResourceType IfcConstructionMaterialResourceType IfcConstructionProductResourceType	
12	Job	IfcTaskType	(Ifc2x3: IfcTask)
13	Event	IfcTask	
14	Package	IfcWorkPlan	
15	Risk	Pset_Risk	
16	Document	IfcDocumentInformation	
17	Attribute	IfcPropertyValue*	
18	Coordinate	IfcLocalPlacement	
19	PickList	IfcClassification	classification hierarchy

IFC Table B – Mapping Between COBie v3 Fields and IFC Properties, Attributes, and Relationships
 Relationships are listed right-justified.

FIELD	IFC	NOTES (See IFC Table A)
Address	Pset_Address.AddressLines*	Facility
AllowedValues	EnumerationValues	Attribute
ApprovalBy	IfcResourceApprovalRelationship	Document
AreaMeasurementStandard	MethodOfMeasurement	Instruction
AreaUnit	Units	Instruction
AssetIdentifier	AssetIdentifier	Component
AssetType	AssetAccountingType	Type
BarCode	BarCode	Component
Category	IfcClassificationReference RiskType	Company, Facility, Level, SpaceType, Zone, Type, System, Resource, Job, Event, Package, Document, Attribute, Coordinate. Risk
Certifications	Roles*	Company
ClassificationSystem.Company	IfcClassification.Name	Instruction
ClassificationSystem.Facility	IfcClassification.Name	Instruction
ClassificationSystem.SpaceType	IfcClassification.Name	Instruction
ClassificationSystem.System	IfcClassification.Name	Instruction
ClassificationSystem.Type	IfcClassification.Name	Instruction
ClockwiseRotation	RelativePlacement	Coordinate
Company.Category	(see IFC Table A)	PickList
Company.Name	IfcRelAssignsToActor	Event, Package, Risk
Component.Name	IfcRelAssignsToGroup	System
Consequence	MitigatedRiskConsequence	Risk
Coordinate.Category	(see IFC Table A)	PickList
Coordinate.TableName	(see IFC Table A)	PickList
CoordinateSystemDescription		Instruction
CoordinateSystemOrigin		Instruction
CoordinateXAxis	RelativePlacement	Coordinate
CoordinateYAxis	RelativePlacement	Coordinate
CoordinateZAxis	RelativePlacement	Coordinate
Country	Pset_Address.Country	Company
CurrencyUnit	Units	Instruction
Department	IfcOrganizationRelationship	Company

FIELD	IFC	NOTES (See IFC Table A)
Description	Description Pset_Risk.NatureOfRisk	Space, Type, Component, Job, Event, Package, Facility, Level, SpaceType, Zone, System, Resource, Document, Attribute. Risk
Document.ApprovalBy	(see IFC Table A)	PickList
Document.Category	(see IFC Table A)	PickList
Document.Stage	(see IFC Table A)	PickList
Duration	TaskTime	Job
DurationUnit	IfcUnitAssignment	Instruction, Job
Elevation	IfcBuilding.Elevation IfcBuildingStorey.Elevation	Facility Level
ElevationRotation	RelativePlacement	Coordinate
EndDate	IfcTaskTime	Event, Package
Event.Category	(see IFC Table A)	PickList
Event.Name	IfcRelAssignsToControl	Package
ExportDateTime	IfcOwnerHistory.ModifiedDate	Instruction
ExtIdentifier	GlobalId	<i>All but Instruction and PickList</i>
ExtObject	(derived using IFC table A)	<i>All but Instruction and PickList</i>
ExtSystem	IfcApplication.Identifier	<i>All but Instruction and PickList</i>
File	Location	Document
Facility.Category	(see IFC Table A)	PickList
Facility.Type	(see IFC Table A)	PickList
GrossArea	GrossFloorArea	Space
Height	GrossHeight	Level
InstallationDate	InstallationDate	Component
Interval	TaskTime	Job
IntervalUnit	IfcUnitAssignment	Job
Job.Category	(see IFC Table A)	PickList
Job.Name	IfcRelDefinesByType	Event
Job.Status	(see IFC Table A)	PickList
Latitude	Latitude	Facility
Level.Category	(see IFC Table A)	PickList
Level.Name	IfcRelDecomposes	Space
LevelOfRisk	MitigatedRiskSignificance	Risk
Likelihood	MitigatedRiskLikelihood	Risk
LinearUnit	Units	Instruction
Longitude	Longitude	Facility

FIELD	IFC	NOTES (See IFC Table A)
Manufacturer	Manufacturer	Type
Milestone	Phase	Instruction
Mitigation	MitigationPlanned	Risk
ModelNumber	ModelLabel	Type
ModelReference	ModelReference	Type
Name	Name RiskName	<i>All but</i> Instruction, PickList <i>and</i> Risk Risk
NetArea	NetFloorArea	Space
NominalHeight	NominalHeight	Type
NominalLength	NominalLength	Type
NominalWeight	Weight	Type
NominalWidth	NominalWidth	Type
OrganizationCode	Identification	Company
OriginatingCompany	IfcOwnerHistory.OwningUser	Instruction
PartOf	IfcRelDecomposes	Level, Space, Zone, System, Job
Path	Location	Document
Phone	Pset_Address.TelephoneNumbers*	Company
PhysicalTable	(derived using IFC table A)	Risk
PhysicalTable.Name	AssociatedProduct	Risk
PostalBox	Pset_Address.PostalBox	Company
PostalCode	Pset_Address.PostalCode	Company
Priors	IfcRelSequence	Job
ProcessTable	(derived using IFC table A)	Risk
ProcessTable.Name	AssociatedActivity	Risk
PurchaseCost	Pset_Asset.OriginalCost	Type
Reference	Name	Document
Region	Pset_Address.Region	Instruction
RelativeTo	PlacementRelTo	Coordinate
Release	(not mapped)	Instruction
Resource.Category	(see IFC Table A)	PickList
Resource.Names	IfcRelAssignsToResource	Job
Risk.Category	(see IFC Table A)	PickList
Risk.Consequence	(see IFC Table A)	PickList
Risk.LevelOfRisk	(see IFC Table A)	PickList
Risk.Likelihood	(see IFC Table A)	PickList
RoomTag	LongName	Space
SerialNumber	Pset_ManufacturerOccurrence.SerialNumber	Component

FIELD	IFC	NOTES (See IFC Table A)
Space.Name	IfcRelAssignsToGroup	Component, Zone
Space.SecondaryName	LongName	Component
SpaceType.Category	(see IFC Table A)	PickList
SpaceType.Name	IfcRelDefinedByType	Space
SpatialTable	(derived using IFC table A)	Risk
SpatialTable.Name	AssociatedLocation	Risk
Stage	Purpose	Document
StartDate	IfcTaskTime	Event, Package
StateRegion	Pset_Address.Region	Company
Status	(not mapped) Status	Instruction, Job
Street	Pset_Address.AddressLines*	Company
System.Category	(see IFC Table A)	PickList
Table	(derived using IFC table A)	Job, Event, Document, Attribute, Coordinate, PickList
Table.Name	(derived)	Job, Event, Document, Attribute, Coordinate
TagNumber	Pset_ConstructionOccurrence.TagNumber	Component
TaskNumber	Identification	Job
Title	(not mapped)	Instruction
Town	Pset_Address.Town	Company
Type	(derived from IFC entity)	Facility
Type.AssetType	(see IFC Table A)	PickList
Type.Category	(see IFC Table A)	PickList
Type.Name	IfcRelDefinesByType	Component
Unit	Unit	Attribute
Units.Area	(see IFC Table A)	PickList
Units.Currency	(see IFC Table A)	PickList
Units.Duration	(see IFC Table A)	PickList
Units.Linear	(see IFC Table A)	PickList
Units.Volume	(see IFC Table A)	PickList
Units.Weight	(see IFC Table A)	PickList
UsableHeight	(see IFC Table A)	Space
Value	NominalValue	Attribute
Version	(not mapped)	Instruction
VolumeUnit	Units	Instruction
WarrantyDescription	Pset_Warranty	Type
WarrantyDurationLabor	Pset_Warranty	Type

FIELD	IFC	NOTES (See IFC Table A)
WarrantyDurationParts	Pset_Warranty	Type
WarrantyDurationUnit	Pset_Warranty	Type
WarrantyGuarantorLabor	Pset_Warranty	Type
WarrantyGuarantorParts	Pset_Warranty	Type
WarrantyStartDate	Pset_Warranty	Component
Website	Pset_Address.WWWHomePageURL	Company
WeightUnit	Units	Instruction
YawRotation	RelativePlacement	Coordinate
Zone.Category	(see IFC Table A)	PickList

IFC Table C – Expected IFC Subtypes for COBie v3 Type and Component Tables

Only manageable entities are listed. Refer to table 8 Type and Table 9 Component.

Extension / Elements / Domain	Ifc...(Type)
Product Extension	Impact Protection Device Transport Element
Shared Bldg. Elements	Door Window
Shared Bldg. Service Elements	Distribution Chamber Element Energy Conversion Device Flow Controller Flow Moving Device Flow Storage Device Flow Terminal
Shared Infrastructure Elements	Sign Signal
Building Controls Domain	Actuator Alarm Controller Flow Instrument Sensor Unitary Control Element
Electrical Domain	Audio Visual Appliance Communications Appliance Distribution Board Electric Appliance Electric Flow Storage Device Electric Flow Treatment Device Electric Generator Electric Motor Electric Time Control Light Fixture Mobile Telecommunications Appliance Protective Device Tripping Unit Solar Device Switching Device Transformer

Extension / Elements / Domain	Ifc...(Type)
HVAC Domain	Air Terminal Air Terminal Box Air To Air Heat Recovery Boiler Burner Chiller Coil Compressor Condenser Damper Duct Silencer Engine Evaporative Cooler Fan Filter Flow Meter Heat Exchanger Humidifier Medical device Pump Space Heater Tank Unitary Equipment Valve
Plumbing Fire Protection Domain	Fire Suppression Terminal Interceptor Sanitary Terminal Waste Terminal
Ports and Waterways Domain	Conveyor Segment Liquid Terminal Mooring Device Navigation Element
Rail Domain	Rail Track Element
Tunnel Domain	(IFC4.4)

SPREADSHEETML FORMAT

ISO/IEC 29500-1:2016

SpreadsheetML is an XML schema reflecting the organization of spreadsheet data in Microsoft Excel. The use of SpreadsheetML format for COBie data is optional in this specification. The SpreadsheetML format represents COBie data in an easy to understand and digest format (human readable).

More information on the SpreadsheetML schema can be found here:

<https://learn.microsoft.com/en-us/office/open-xml/structure-of-a-spreadsheetml-document>

An example blank spreadsheet is included as part of this standard.

JSON FORMAT

ISO/IEC 21778:2017

The ability to deliver COBie data in a JSON format is new for this version.

General

- There is a restriction that additional properties (user added columns) must be of type 'string'.
- References within a JSON document should use JSON pointers. That means that the value of all references will have different values when delivered in JSON than when delivered in other formats.
- For references to the **COBie.PickList** table, there are specified enums for lists that are enumerated in the table. There are no references to external standards.
- This schema will be much easier for JavaScript applications to consume if the field names are valid JavaScript identities. Therefore, the **COBie.X.Name** field is replaced with '_Ref' and it has been added to all table references.
- The **COBie.X.Table** and **COBie.X.Table.Name** fields have been replaced with a single 'Table_Ref' field that is either a JSON-pointer or an array of JSON pointers.

Instructions Table

- Version and Release should be numeric.
- All the unit fields are required, and the Organization column is updated to reflect that.

Facility Table

- **COBie.Facility.Latitude**, **COBie.Facility.Longitude**, and **COBie.Facility.Elevation** should be numeric as this assumes a +/- real number as used by GPS.
- Minimum and maximum constraints have been added to **COBie.Facility.Latitude** and **COBie.Facility.Longitude**.

Component Table

- **COBie.Space.SecondaryName** is rendered as 'SecondarySpace_Ref'.

Job Table

- **COBie.Job.Table** and **COBie.Job.Table.Name** are rendered as arrays.
- **COBie.Job.ResourceNames** is replaced with 'Resource_Ref', which is an array of JSON pointers.

Risk

- The following fields have been replaced and each of them is single valued:
COBie.Risk.SpatialTable and COBie.Risk.SpatialTable.Name with 'Spatial_Ref'.
COBie.Risk.PhysicalTable and COBie.Risk.PhysicalTable.Name with 'Physical_Ref'.
COBie.Risk.ProcessTable and COBie.Risk.ProcessTable.Name with 'Process_Ref'.

Sample Schema

```
{
  "title": "COBie v3 JSON Schema",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "$id": "https://www.nibs.com/Schema/COBie/v3",
  "description": "",
  "type": "object",
  "required": [
    "Instructions",
    "Company",
    "Facility",
    "Level",
    "SpaceType",
    "Space",
    "Type",
    "Component"
  ],
  "properties": {
    "Instructions": {
      "type": "object",
      "description": "Provides written instructions related to the COBie database, but also contains the general submittal information for a particular COBie deliverable.",
      "required": [
        "Title",
        "Version",
        "Release",
        "Status",
        "Region",
        "ExportDateTime",
        "AreaUnit",
        "CurrencyUnit",
        "DurationUnit",

```

```

    "LinearUnit",
    "VolumeUnit",
    "WeightUnit",
    "AreaMeasurementStandard",
    "CoordinateSystemDescription",
    "CoordinateSystemOrigin",
    "ClassificationSystem.Company",
    "ClassificationSystem.Facility",
    "ClassificationSystem.SpaceType",
    "ClassificationSystem.Type",
    "ClassificationSystem.System"
  ],
  "properties": {
    "Title": {
      "type": "string"
    },
    "Version": {
      "type": "number",
      "default": 3
    },
    "Release": {
      "type": "number",
      "default": 0
    },
    "Status": {
      "type": "string",
      "description": "The version IFC with which this COBie deliverable aligns.",
      "default": "IFC4"
    },
    "Region": {
      "type": "string",
      "description": "Format is ISO-639-1 two letter language code",
      "examples": [
        "en-US",
        "en-GB"
      ]
    },
    "ExportDateTime": {
      "type": "string",
      "format": "date-time",
      "description": "Format is ISO-8601 (YYYY-MM-DD) with exact time optional",

```

```

    "examples": [
      "2022-12-31",
      "2022-12-31T13:00:00"
    ]
  },
  "Milestone": {
    "type": "string",
    "description": "A description of the project milestone for which this COBie
      deliverable represents.",
    "examples": [
      "50% DD",
      "90% CD",
      "Handover"
    ]
  },
  "OriginatingCompany": {
    "type": "string",
    "format": "json-pointer",
    "description": "The name of the company that generated this COBie
      deliverable, referencing a COBie.Company.Name value.",
    "examples": [
      "/Company/3"
    ]
  },
  "AreaUnit": {
    "type": "string",
    "description": "From the 'Units.Area' field on the PickLists table",
    "enum": [
      "Square Inches",
      "Square Feet",
      "Square Miles",
      "Square Millimeters",
      "Square Meters",
      "Square Kilometers"
    ],
    "examples": [
      "Square Feet",
      "Square Meters"
    ]
  },
  "CurrencyUnit": {

```

```

    "type": "string",
    "description": "From the 'Units.Currency' field on the PickLists table",
    "examples": [
      "Dollars",
      "Euros"
    ]
  },
  "DurationUnit": {
    "type": "string",
    "description": "From the 'Units.Duration' field on the PickLists table",
    "enum": [
      "As required",
      "Day",
      "Minute",
      "Month",
      "Quarter",
      "Week",
      "Year"
    ],
    "examples": [
      "Month",
      "Year"
    ]
  },
  "LinearUnit": {
    "type": "string",
    "description": "From the 'Units.Linear' field on the PickLists table",
    "enum": [
      "Inches",
      "Feet",
      "Miles",
      "Millimeters",
      "Meters",
      "Kilometers"
    ],
    "examples": [
      "Feet",
      "Meters"
    ]
  },
  "VolumeUnit": {

```

```

    "type": "string",
    "description": "From the 'Units.Volume' field on the PickLists table",
    "enum": [
      "Cubic Feet",
      "Cubic Meters"
    ],
    "examples": [
      "Cubic Feet",
      "Cubic Meters"
    ]
  },
  "WeightUnit": {
    "type": "string",
    "description": "From the 'Units.Weight' field on the PickLists table",
    "enum": [
      "Ounces",
      "Pounds",
      "Tons",
      "Grams",
      "Kilograms",
      "Metric Tons"
    ],
    "examples": [
      "Pounds",
      "Kilograms"
    ]
  },
  "AreaMeasurementStandard": {
    "type": "string",
    "examples": [
      "BOMA 2017 for Office Buildings",
      "Standard Methods of Measurement (ANSI/BOMA Z65.1-2017)"
    ]
  },
  "CoordinateSystemDescription": {
    "type": "string",
    "examples": [
      "Degrees, Minutes, Seconds"
    ]
  },
  "CoordinateSystemOrigin": {

```

```

    "type": "string",
    "examples": [
      "38°54'12.438\"N, 77°2'1.0314\"W"
    ]
  },
  "ClassificationSystem_Company": {
    "type": "string",
    "description": "Provide system name and version",
    "examples": [
      "OmniClass Table 34",
      "Uniclass Table Ro"
    ]
  },
  "ClassificationSystem_Facility": {
    "type": "string",
    "description": "Provide system name and version",
    "examples": [
      "OmniClass Table 11",
      "Uniclass Table En"
    ]
  },
  "ClassificationSystem_SpaceType": {
    "type": "string",
    "description": "Provide system name and version",
    "examples": [
      "OmniClass Table 13",
      "Uniclass Table SL"
    ]
  },
  "ClassificationSystem_Type": {
    "type": "string",
    "description": "Provide system name and version",
    "examples": [
      "OmniClass Table 23",
      "Uniclass Table Pr"
    ]
  },
  "ClassificationSystem_System": {
    "type": "string",
    "description": "Provide system name and version",
    "examples": [

```

```

        "OmniClass Table 21",
        "Uniclass Table EF"
    ]
}
},
"additionalProperties": {
    "type": "string"
}
},
"Company": {
    "type": "array",
    "uniqueItems": true,
    "description": "Represents the information related to a company that is referenced
        elsewhere in a COBie deliverable.",
    "items": [
        {
            "type": "object",
            "required": [
                "Name",
                "Phone"
            ],
            "properties": {
                "Name": {
                    "type": "string",
                    "description": "The name of the Company. This is the primary key for
                        this data table and each must be unique.",
                    "examples": [
                        "ABC_Corp",
                        "xyzconstruction-com"
                    ]
                },
                "Phone": {
                    "type": "string",
                    "description": "The telephone number for the Company.",
                    "examples": [
                        "+1 (202) 289-7800"
                    ]
                }
            },
            "Category": {
                "type": "string",

```

```

    "description": "The classification for the Company. This data field
                    value comes from one of the values in
                    COBie.PickList.Company.Category data field.",
    "examples": [
        "34-10 11 Owner",
        "Ro_10_20_14 Client"
    ]
},
"Website": {
    "type": "string",
    "description": "The website address for the Company.",
    "examples": [
        "www.abccorp.com"
    ]
},
"Street": {
    "type": "string",
    "description": "The street address for the Company.",
    "examples": [
        "1090 Vermont Avenue NW, Suite 700"
    ]
},
"PostalBox": {
    "type": "string",
    "description": "The postal box address for the Company.",
    "examples": [
        "P.O. Box 1234"
    ]
},
"Town": {
    "type": "string",
    "description": "The city or town address for the Company",
    "examples": [
        "Washington"
    ]
},
"StateRegion": {
    "type": "string",
    "description": "The state or regional address for the Company.",
    "examples": [
        "DC",

```



```

        "NC"
    ]
},
"PostalCode": {
    "type": "string",
    "description": "The zip, or postal code, address for the Company.",
    "examples": [
        "20005"
    ]
},
"Country": {
    "type": "string",
    "description": "The country where the Company is located.",
    "examples": [
        "U.S.A.",
        "U.K.",
        "Germany"
    ]
},
"ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified
        ExternalObject that would allow COBie data to be
        matched back to the data from which it was developed
        in the named ExternalSystem. This might be a GUID or
        ElementID.",
    "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
},
"ExtObject": {
    "type": "string",
    "description": "The name of the data object within the computer
        system that holds the data provided in a given row of
        COBie data. The default values are the associated IFC
        entities that are mapped (and those that are
        excluded) when transforming IFC data to a given row
        of COBie data.",
    "examples": [
        "IfcSpace"
    ]
},
"ExtSystem": {
    "type": "string",

```

```

      "description": "The name of the computer system generating the row of
        COBie data.",
      "examples": [
        "Autodesk Revit 2023, Build: 20220429_1500(x64)",
        "ArchiCAD 19 Full (USA) / Build: 5005",
        "IBM Maximo"
      ]
    },
    "Certifications": {
      "type": "string"
    },
    "Department": {
      "type": "string",
      "description": "The name of the department for the Company.",
      "examples": []
    },
    "OrganizationCode": {
      "type": "string",
      "description": "The organizational code for the Company."
    }
  },
  "additionalProperties": {
    "type": "string"
  }
}
],
"Facility": {
  "type": "object",
  "description": "Provides information related to the facility, structure, or group of
    structures (in the case of infrastructure projects) for which the
    COBie deliverable represents.",
  "required": [
    "Name",
    "Address",
    "Latitude",
    "Longitude",
    "Elevation"
  ],
  "properties": {
    "Name": {
      "type": "string",

```

```

    "description": "The name of the Facility for this COBie deliverable. This is
                  the primary key for this data table and each must be unique."
  },
  "Descriptions": {
    "type": "string",
    "description": "A general text description of the facility, structure, or
                  group of structures as part of this COBie deliverable."
  },
  "Types": {
    "type": "string",
    "enum": [
      "Facility",
      "Project",
      "Site"
    ],
    "description": "The type of facility, structure, or group of structures as
                  part of this COBie deliverable. This data field value comes
                  from one of the values in COBie.PickList.Facility.Type data
                  field.",
    "examples": [
      "Facility",
      "Project",
      "Site"
    ]
  },
  "Category": {
    "type": "string",
    "description": "The classification for the Facility. This data field value
                  comes from one of the values in
                  COBie.PickList.Facility.Category data field.",
    "examples": [
      "11-27 25 19 Office-Retail Building",
      "En_20_15_10 Multiple occupation office buildings"
    ]
  },
  "Address": {
    "type": "string",
    "description": "The city or town address of the project in Facility.",
    "examples": [
      "1090 Vermont Avenue NW, Suite 700, Washington, DC 20005"
    ]
  },
  "Latitude": {

```

```

    "type": "number",
    "minimum": -90,
    "maximum": 90,
    "description": "The specific latitude for the facility, structure, or group
                    of structures as part of this COBie deliverable.",
    "examples": [
        42.3584
    ]
},
"Longitude": {
    "type": "number",
    "minimum": -180,
    "maximum": 180,
    "description": "The specific longitude for the facility, structure, or group
                    of structures as part of this COBie deliverable.",
    "examples": [
        -71.0598
    ]
},
"Elevation": {
    "type": "number",
    "description": "The specific elevation above sea level for the facility,
                    structure, or group of structures as part of this COBie
                    deliverable.",
    "examples": [
        354,
        14,
        115,
        5
    ]
},
"ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified ExternalObject that
                    would allow COBie data to be matched back to the data from
                    which it was developed in the named ExternalSystem. This
                    might be a GUID or ElementID.",
    "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
},
"ExtObject": {
    "type": "string",

```

```

      "description": "The name of the data object within the computer system that
                    holds the data provided in a given row of COBie data. The
                    default values are the associated IFC entities that are
                    mapped (and those that are excluded) when transforming IFC
                    data to a given row of COBie data.",

      "examples": [
        "IfcSpace"
      ]
    },
    "ExtSystem": {
      "type": "string",
      "description": "The name of the computer system generating the row of COBie
                    data.",
      "examples": [
        "Autodesk Revit 2023, Build: 20220429_1500(x64)",
        "ArchiCAD 19 Full (USA) / Build: 5005",
        "IBM Maximo"
      ]
    },
    "Description": {
      "type": "string"
    }
  },
  "additionalProperties": {
    "type": "string"
  }
},
"Level": {
  "type": "array",
  "uniqueItems": true,
  "minItems": 1,
  "description": "Contains information related to the vertical levels of a facility or,
                in the case of infrastructure projects, the geographic areas such as
                the site surrounding a facility/structure, a rail or highway
                corridor, etc.",
  "items": [
    {
      "type": "object",
      "required": [
        "Name"
      ],
      "properties": {
        "Name": {
          "type": "string",

```

```

    "title": "The name of the Level.",
    "description": "This is the primary key for this data table and each
                  must be unique."
  },
  "Description": {
    "type": "string",
    "description": "A general text description of the Level.",
    "examples": [
      "3rd floor area plan"
    ]
  },
  "Category": {
    "type": "string",
    "enum": [
      "Roof",
      "Floor",
      "Site"
    ],
    "description": "The classification for the Level. This data field
                  value comes from one of the values in
                  COBie.PickList.Level.Category data field.",
    "examples": [
      "Roof",
      "Floor",
      "Site"
    ]
  },
  "PartOf": {
    "type": "string",
    "format": "json-pointer",
    "description": "A json-pointer reference to another Level item on
                  this data table to represent that this item is a
                  subset of that one. For example, a facility on a
                  sloped grade that has a single "Level 1" floor per
                  the signage, but that is separated within by a few
                  steps, so the model has two different levels defined
                  to manage the elements.",
    "examples": [
      "Floor/23"
    ]
  },
  "ExtIdentifier": {
    "type": "string",

```

```

    "description": "The unique identifier of the identified
                  ExternalObject that would allow COBie data to be
                  matched back to the data from which it was developed
                  in the named ExternalSystem. This might be a GUID or
                  ElementID.",
    "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
},
"ExtObject": {
    "type": "string",
    "description": "The name of the data object within the computer
                  system that holds the data provided in a given row of
                  COBie data. The default values are the associated IFC
                  entities that are mapped (and those that are
                  excluded) when transforming IFC data to a given row
                  of COBie data.",
    "examples": [
        "IfcSpace"
    ]
},
"ExtSystem": {
    "type": "string",
    "description": "The name of the computer system generating the row of
                  COBie data.",
    "examples": [
        "Autodesk Revit 2023, Build: 20220429_1500(x64)",
        "ArchiCAD 19 Full (USA) / Build: 5005",
        "IBM Maximo"
    ]
},
"Elevation": {
    "type": "number",
    "description": "The elevation at the top of the level structure. If
                  allowable values are not specified by contract, the
                  default value is measured as a relative value
                  compared to the facility's datum.",
    "examples": [
        354,
        14,
        115,
        5
    ]
},
"Height": {

```

```

        "type": "number",
        "description": "The distance between the top of level structure to
                        bottom of structure above.",
        "examples": [
            10,
            12
        ]
    },
    "additionalProperties": {
        "type": "string"
    }
}
],
"SpaceType": {
    "type": "array",
    "description": "Provides information related to the different types of spaces that
                    make up a facility, structure, or group of structures for this COBie
                    deliverable.",
    "uniqueItems": true,
    "items": [
        {
            "type": "object",
            "required": [
                "Name"
            ],
            "properties": {
                "Name": {
                    "type": "string",
                    "description": "This is the primary key for this data table and each
                                    must be unique."
                }
            },
            "Description": {
                "type": "string",
                "description": "A general text description of the Space Type.",
                "examples": [
                    "Shared Open cubicles"
                ]
            }
        },
        {
            "Category": {
                "type": "string",

```



```

    "description": "The classification for the Space Type. This data
                  field value comes from one of the values in
                  COBie.PickList.SpaceType.Category data field.",
    "examples": [
        "13-55 11 Office Spaces",
        "SL_20_15_27 Enclosed offices"
    ]
},
"ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified
                  ExternalObject that would allow COBie data to be
                  matched back to the data from which it was developed
                  in the named ExternalSystem. This might be a GUID or
                  ElementID.",
    "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
},
"ExtObject": {
    "type": "string",
    "description": "The name of the data object within the computer
                  system that holds the data provided in a given row of
                  COBie data. The default values are the associated IFC
                  entities that are mapped (and those that are
                  excluded) when transforming IFC data to a given row
                  of COBie data.",
    "examples": [
        "IfcSpace"
    ]
},
"ExtSystem": {
    "type": "string",
    "description": "The name of the computer system generating the row of
                  COBie data.",
    "examples": [
        "Autodesk Revit 2023, Build: 20220429_1500(x64)",
        "ArchiCAD 19 Full (USA) / Build: 5005",
        "IBM Maximo"
    ]
}
},
"additionalProperties": {
    "type": "string"
}
}

```

```

    }
  ]
},
"Space": {
  "type": "array",
  "uniqueItems": true,
  "minItems": 1,
  "description": "Spaces represent the horizontal decomposition of Levels in COBie and
    which have common functional purpose and user.",
  "items": [
    {
      "type": "object",
      "required": [
        "Name",
        "Description",
        "Level_Ref"
      ],
      "properties": {
        "Name": {
          "type": "string",
          "description": "The name of the Space. This value does not need to be
            unique. This is often the room number in the
            construction documents."
        },
        "Description": {
          "type": "string",
          "description": "A general text description of the Space.",
          "examples": [
            "Bob's Office",
            "Conference room seating 12"
          ]
        },
        "SpaceType_Ref": {
          "type": "string",
          "format": "json-pointer",
          "description": "A json-pointer reference to an item from the space
            type data table."
        },
        "Level_Ref": {
          "type": "string",
          "format": "json-pointer",

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```

      "description": "A json-pointer reference to an item from the Level
        data table."
    },
    "PartOf": {
      "type": "string",
      "format": "json-pointer",
      "description": "A json-pointer reference to another Level item on
        this data table to represent that this item is a
        subset of that one. For example, a large open Room
        that has cubicles within. Each cubicle space would be
        part of the large open space.",
      "examples": [
        "Space/105"
      ]
    },
    "ExtIdentifier": {
      "type": "string",
      "description": "The unique identifier of the identified
        ExternalObject that would allow COBie data to be
        matched back to the data from which it was developed
        in the named ExternalSystem. This might be a GUID or
        ElementID.",
      "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
      ]
    },
    "ExtObject": {
      "type": "string",
      "description": "The name of the data object within the computer
        system that holds the data provided in a given row of
        COBie data. The default values are the associated IFC
        entities that are mapped (and those that are
        excluded) when transforming IFC data to a given row
        of COBie data.",
      "examples": [
        "IfcSpace"
      ]
    },
    "ExtSystem": {
      "type": "string",
      "description": "The name of the computer system generating the row of
        COBie data.",
      "examples": [
        "Autodesk Revit 2023, Build: 20220429_1500(x64)",
        "ArchiCAD 19 Full (USA) / Build: 5005",
        "IBM Maximo"
      ]
    }
  }
}

```

```

    ]
  },
  "GrossArea": {
    "type": "number",
    "description": "The total space area as specified in the design
      contract and calculated by the identified
      COBie.Instruction.AreaMeasurementStandard value.",
    "examples": [
      "1125.25",
      "3201"
    ]
  },
  "NetArea": {
    "type": "number",
    "description": "The usable space area as specified in the design
      contract and calculated by the identified
      COBie.Instruction.AreaMeasurementStandard value.",
    "examples": [
      "988.62",
      "3110.3"
    ]
  },
  "UsableHeight": {
    "type": "number",
    "description": "Distance from top of finished level to bottom of
      ceiling. If there is no ceiling, then this value must
      match COBie.Level.Height.",
    "examples": [
      "22",
      "120"
    ]
  }
},
"additionalProperties": {
  "type": "string"
}
}
]
},
"Zone": {
  "type": "array",
  "description": "Zones represent the aggregation of Spaces that provide some common
    purpose.",

```

```

"items": [
  {
    "type": "object",
    "required": [
      "Name",
      "Space_Ref"
    ],
    "properties": {
      "Name": {
        "type": "string",
        "title": "The name of the Zone.",
        "description": "This is the primary key for this data table and each
          must be unique."
      },
      "Description": {
        "type": "string",
        "description": "A general text description of the Zone.",
        "examples": [
          "Seating for the development organization"
        ]
      },
      "Category": {
        "type": "string",
        "description": "The classification for the Zone. This data field
          value comes from one of the values in
          COBie.PickList.Zone.Category data field.",
        "examples": [
          "Circulation Zone",
          "Occupancy Zone"
        ]
      },
      "Space_Ref": {
        "type": "array",
        "minItems": 1,
        "description": "An array of json-pointer references to an items from
          the space data table.",
        "items": {
          "type": "string",
          "format": "json-pointer"
        }
      },
      "PartOf": {

```

```

    "type": "string",
    "format": "json-pointer",
    "description": "A json-pointer reference to another Zone item on this
                    data table to represent that this item is a subset of
                    that one. For example, a large zone for the west wing
                    of a facility could be divided up into smaller zones
                    that are part of the west wing zone.",
    "examples": [
        "Space/105"
    ]
},
"ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified
                    ExternalObject that would allow COBie data to be
                    matched back to the data from which it was developed
                    in the named ExternalSystem. This might be a GUID or
                    ElementID.",
    "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
},
"ExtObject": {
    "type": "string",
    "description": "The name of the data object within the computer
                    system that holds the data provided in a given row of
                    COBie data. The default values are the associated IFC
                    entities that are mapped (and those that are
                    excluded) when transforming IFC data to a given row
                    of COBie data.",
    "examples": [
        "IfcSpace"
    ]
},
"ExtSystem": {
    "type": "string",
    "description": "The name of the computer system generating the row of
                    COBie data.",
    "examples": [
        "Autodesk Revit 2023, Build: 20220429_1500(x64)",
        "ArchiCAD 19 Full (USA) / Build: 5005",
        "IBM Maximo"
    ]
}
},
"additionalProperties": {

```

```

        "type": "string"
      }
    }
  ]
},
"Type": {
  "type": "array",
  "description": "Represents information related to the different types of products and
    equipment in the Facility.",
  "items": [
    {
      "type": "object",
      "required": [
        "Name",
        "Description",
        "Manufacturer_Ref",
        "ModelNumber",
        "WarrantyGuarantorParts_Ref",
        "WarrantyDurationParts",
        "WarrantyGuarantorLabor_Ref",
        "WarrantyDurationLabor",
        "WarrantyDurationUnit"
      ],
      "properties": {
        "Name": {
          "type": "string",
          "title": "The name of the asset Type.",
          "description": "This is the primary key for this data table and each
            must be unique."
        },
        "Description": {
          "type": "string",
          "description": "A general text description of the asset Type.",
          "examples": [
            "32x80 Hollow core door"
          ]
        }
      },
      "Category": {
        "type": "string",
        "description": "The classification for the asset type. This data
          field value comes from one of the values in
          COBie.PickList.Type.Category data field."
      }
    }
  ]
}

```

```

    "examples": [
      "23-33 11 22 Electric Boilers",
      "Pr_60_60_08_27 Electric Boilers"
    ]
  },
  "AssetType": {
    "type": "string",
    "enum": [
      "Fixed",
      "Moveable"
    ],
    "description": "The type of asset. This data field value comes from
      one of the values in COBie.PickList.Type.AssetType
      data field.",
    "examples": [
      "Fixed",
      "Moveable"
    ]
  },
  "ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified
      ExternalObject that would allow COBie data to be
      matched back to the data from which it was developed
      in the named ExternalSystem. This might be a GUID or
      ElementID.",
    "examples": [
      "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
  },
  "ExtObject": {
    "type": "string",
    "description": "The name of the data object within the computer
      system that holds the data provided in a given row of
      COBie data. The default values are the associated IFC
      entities that are mapped (and those that are
      excluded) when transforming IFC data to a given row
      of COBie data.",
    "examples": [
      "IfcSpace"
    ]
  },
  "ExtSystem": {
    "type": "string",

```



```

    "description": "The name of the computer system generating the row of
      COBie data.",
    "examples": [
      "Autodesk Revit 2023, Build: 20220429_1500(x64)",
      "ArchiCAD 19 Full (USA) / Build: 5005",
      "IBM Maximo"
    ]
  },
  "Manufacturer_Ref": {
    "type": "string",
    "format": "json-pointer",
    "description": "The name of the company that manufactures the asset.
      This is a json-pointer reference to an entry in the
      COBie.Company table.",
    "examples": [
      "Company/26"
    ]
  },
  "ModelNumber": {
    "type": "string",
    "format": "json-pointer",
    "description": "During the construction and handover phases, this is
      the manufacturer's model number of the installed
      product. During planning and design phases, this data
      field is not applicable",
    "examples": [
      "Mark IV v2"
    ]
  },
  "WarrantyGuarantorParts_Ref": {
    "type": "string",
    "format": "json-pointer",
    "description": "During the construction and handover phases, this is
      the name of the company that is responsible for
      replacement parts during the warranty period. During
      planning and design phases, this data field is not
      applicable. This is a json-pointer reference to an
      entry in the COBie.Company table.",
    "examples": [
      "Company/27"
    ]
  },
  "WarrantyDurationParts": {
    "type": "string",
    "format": "json-pointer",

```

```

      "description": "During the construction and handover phases, this is
                    the length of the warranty period for replacement
                    parts provided by the product manufacturer. During
                    planning and design phases, this data field is not
                    applicable.",

      "examples": [
        "3",
        "36"
      ]
    },
    "WarrantyGuarantorLabor_Ref": {
      "type": "string",
      "format": "json-pointer",
      "description": "During the construction and handover phases, this is
                    the name of the company that is responsible for labor
                    costs during the warranty period. During planning and
                    design phases, this data field is not applicable.
                    This is a json-pointer reference to an entry in the
                    COBie.Company table.",

      "examples": [
        "Company/28"
      ]
    },
    "WarrantyDurationLabor": {
      "type": "string",
      "format": "duration",
      "description": "During the construction and handover phases, this is
                    the length of the warranty period for labor repairs
                    provided by the product manufacturer. During planning
                    and design phases, this data field is not
                    applicable.",

      "examples": [
        "1",
        "12"
      ]
    },
    "WarrantyDurationUnit": {
      "type": "string",
      "enum": [
        "As required",
        "Day",
        "Minute",
        "Month",
        "Quarter",
        "Week",
      ]
    }
  }

```

```

        "Year"
      ],
      "description": "The unit of measure associated with values found in
        COBie.Type.WarrantyDurationParts and
        COBie.Type.WarrantyDurationLabor. If allowable values
        are not specified by contract, the default values are
        Month and Year. This data field value comes from one
        of the values in COBie.PickList.Units.Duration data
        field."
    },
    "ModelReference": {
      "type": "string"
    },
    "NominalHeight": {
      "type": "number"
    },
    "NominalLength": {
      "type": "number"
    },
    "NominalWeight": {
      "type": "number"
    },
    "NominalWidth": {
      "type": "number"
    },
    "PurchaseCost": {
      "type": "string",
      "description": "The purchase cost of the asset."
    },
    "WarrantyDescription": {
      "type": "string",
      "description": "A description of the warranty for the asset."
    }
  },
  "additionalProperties": {
    "type": "string"
  }
}
]
},
"Component": {
  "type": "array",

```

```

"description": "The individual instances of the products and equipment define in the
                Type data table.",
"items": [
  {
    "type": "object",
    "required": [
      "Name",
      "Description",
      "Space_Ref"
    ],
    "properties": {
      "Name": {
        "type": "string",
        "title": "The name of the asset Component.",
        "description": "This is the primary key for this data table and each
                        must be unique."
      },
      "Description": {
        "type": "string",
        "description": "A general text description of the asset Component."
      },
      "AssetIdentifier": {
        "type": "string"
      },
      "BarCode": {
        "type": "string"
      },
      "SerialNumber": {
        "type": "string"
      },
      "TagNumber": {
        "type": "string"
      },
      "Type_Ref": {
        "type": "string",
        "format": "json-pointer",
        "description": "A json-pointer reference to an item from the type
                        data table."
      },
      "Space_Ref": {
        "type": "string",
        "format": "json-pointer",

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```

        "description": "A json-pointer reference to an item from the space
            data table."
    },
    "SecondarySpace_Ref": {
        "type": "string",
        "format": "json-pointer",
        "description": "A json-pointer reference to an item from the space
            data table. To accommodate doors and other openings
            that lead from one space to another."
    },
    "ExtIdentifier": {
        "type": "string",
        "description": "The unique identifier of the identified
            ExternalObject that would allow COBie data to be
            matched back to the data from which it was developed
            in the named ExternalSystem. This might be a GUID or
            ElementID.",
        "examples": [
            "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
        ]
    },
    "ExtObject": {
        "type": "string",
        "description": "The name of the data object within the computer
            system that holds the data provided in a given row of
            COBie data. The default values are the associated IFC
            entities that are mapped (and those that are
            excluded) when transforming IFC data to a given row
            of COBie data.",
        "examples": [
            "IfcSpace"
        ]
    },
    "ExtSystem": {
        "type": "string",
        "description": "The name of the computer system generating the row of
            COBie data.",
        "examples": [
            "Autodesk Revit 2023, Build: 20220429_1500(x64)",
            "ArchiCAD 19 Full (USA) / Build: 5005",
            "IBM Maximo"
        ]
    },
    "InstallationDate": {
        "type": "string",

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        "format": "date"
      },
      "WarrantyStartDate": {
        "type": "string",
        "format": "date"
      }
    },
    "additionalProperties": {
      "type": "string"
    }
  }
]
},
"System": {
  "type": "array",
  "description": "Systems represent aggregations of Components that provide some common function.",
  "items": [
    {
      "type": "object",
      "required": [
        "Name",
        "Component_Ref"
      ],
      "properties": {
        "Name": {
          "type": "string",
          "title": "The name of the System.",
          "description": "This is the primary key for this data table and each must be unique."
        },
        "Description": {
          "type": "string",
          "description": "A general text description of the System.",
          "examples": [
            "East wing HVAC"
          ]
        },
        "Category": {
          "type": "string",

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    "description": "The classification for the System. This data field
                    value comes from one of the values in
                    COBie.PickList.System.Category data field.",
    "examples": [
        "21-04 20 10 Domestic Water Distribution",
        "EF_55_70 Water supply"
    ]
},
"Component_Ref": {
    "type": "array",
    "minItems": 1,
    "description": "An array of json-pointer references to items from the
                    component table.",
    "items": {
        "type": "string",
        "format": "json-pointer"
    },
    "examples": [
        [
            "Component/105",
            "Component/237"
        ]
    ]
},
"PartOf": {
    "type": "string",
    "format": "json-pointer",
    "description": "A json-pointer reference to another System item on
                    this data table to represent that this item is a
                    subset of that one. For example, a large zone for the
                    west wing of a facility could be divided up into
                    smaller zones that are part of the west wing zone.",
    "examples": [
        "System/105"
    ]
},
"ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified
                    ExternalObject that would allow COBie data to be
                    matched back to the data from which it was developed
                    in the named ExternalSystem. This might be a GUID or
                    ElementID.",
    "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
}

```

```

    ]
  },
  "ExtObject": {
    "type": "string",
    "description": "The name of the data object within the computer
      system that holds the data provided in a given row of
      COBie data. The default values are the associated IFC
      entities that are mapped (and those that are
      excluded) when transforming IFC data to a given row
      of COBie data.",
    "examples": [
      "IfcSpace"
    ]
  },
  "ExtSystem": {
    "type": "string",
    "description": "The name of the computer system generating the row of
      COBie data.",
    "examples": [
      "Autodesk Revit 2023, Build: 20220429_1500(x64)",
      "ArchiCAD 19 Full (USA) / Build: 5005",
      "IBM Maximo"
    ]
  }
},
"additionalProperties": {
  "type": "string"
}
}
]
},
"Resource": {
  "type": "array",
  "description": "Resource records identify the tools, materials, and training needed
    to maintain the facility, structure, or group of structures.",
  "items": [
    {
      "type": "object",
      "required": [
        "Name"
      ],
      "properties": {
        "Name": {

```



```

    "type": "string",
    "title": "The name of the Resource.",
    "description": "This is the primary key for this data table and each
                    must be unique."
  },
  "Description": {
    "type": "string",
    "description": "A general text description of the Resource.",
    "examples": [
      "T8 warm white florescent tubes - 4ft"
    ]
  },
  "Category": {
    "type": "string",
    "enum": [
      "Labor",
      "Material",
      "Tools",
      "Training"
    ],
    "description": "The classification for the Resource. This data field
                    value comes from one of the values in
                    COBie.PickList.Resource.Category data field.",
    "examples": [
      "Labor",
      "Material"
    ]
  },
  "ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified
                    ExternalObject that would allow COBie data to be
                    matched back to the data from which it was developed
                    in the named ExternalSystem. This might be a GUID or
                    ElementID.",
    "examples": [
      "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
  },
  "ExtObject": {
    "type": "string",
    "description": "The name of the data object within the computer
                    system that holds the data provided in a given row of
                    COBie data. The default values are the associated IFC

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        entities that are mapped (and those that are
        excluded) when transforming IFC data to a given row
        of COBie data.",
        "examples": [
            "IfcSpace"
        ]
    },
    "ExtSystem": {
        "type": "string",
        "description": "The name of the computer system generating the row of
            COBie data.",
        "examples": [
            "Autodesk Revit 2023, Build: 20220429_1500(x64)",
            "ArchiCAD 19 Full (USA) / Build: 5005",
            "IBM Maximo"
        ]
    }
},
"additionalProperties": {
    "type": "string"
}
}
]
},
"Job": {
    "type": "array",
    "description": "Identifies the variety of work that is required to operate, maintain,
        start up, shut down, or troubleshoot a given Component in the
        facility, structure, or group of structures.",
    "items": [
        {
            "type": "object",
            "required": [
                "Name",
                "Description",
                "Duration",
                "DurationUnit",
                "Interval",
                "IntervalUnit",
                "Priors",
                "Resource_Ref"
            ],
        }
    ],
}

```

```

"properties": {
  "Name": {
    "type": "string",
    "title": "The name of the Job.",
    "description": "This is the primary key for this data table and each
                  must be unique."
  },
  "Description": {
    "type": "string",
    "description": "A general text description of the Job."
  },
  "TaskNumber": {
    "type": "string"
  },
  "Category": {
    "type": "string",
    "enum": [
      "Adjustment",
      "Calibration",
      "Emergency",
      "Inspection",
      "Operation",
      "Project Management",
      "Safety",
      "ShutDown",
      "StartUp",
      "Testing",
      "Trouble"
    ],
    "description": "The classification for the Job. This data field value
                  comes from one of the values in
                  COBie.PickList.Job.Category data field.",
    "examples": [
      "Inspection",
      "ShutDown"
    ]
  },
  "Status": {
    "type": "string",
    "enum": [
      "Not Yet Started",
      "Started",

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        "Completed"
    ],
    "description": "Status of the job.",
    "examples": [
        "Not Yet Started",
        "Completed"
    ]
},
"Table_Ref": {
    "type": "array",
    "minItems": 1,
    "description": "An array of json-pointer references to items from
        other tables that are part of the job.",
    "items": {
        "type": "string",
        "format": "json-pointer"
    },
    "examples": [
        [
            "Company/21",
            "Space/105",
            "Component/237"
        ]
    ]
},
"PartOf": {
    "type": "string",
    "format": "json-pointer",
    "description": "A json-pointer reference to another Job item on this
        table to represent that this item is a subset of that
        one. For example, adding a reusable sub-task such as
        shutdown to a larger job such as inspection.",
    "examples": [
        "Space/105"
    ]
},
"ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified
        ExternalObject that would allow COBie data to be
        matched back to the data from which it was developed
        in the named ExternalSystem. This might be a GUID or
        ElementID.",
    "examples": [

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        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
},
"ExtObject": {
    "type": "string",
    "description": "The name of the data object within the computer
        system that holds the data provided in a given row of
        COBie data. The default values are the associated IFC
        entities that are mapped (and those that are
        excluded) when transforming IFC data to a given row
        of COBie data.",
    "examples": [
        "IfcSpace"
    ]
},
"ExtSystem": {
    "type": "string",
    "description": "The name of the computer system generating the row of
        COBie data.",
    "examples": [
        "Autodesk Revit 2023, Build: 20220429_1500(x64)",
        "ArchiCAD 19 Full (USA) / Build: 5005",
        "IBM Maximo"
    ]
},
"Duration": {
    "type": "number"
},
"DurationUnit": {
    "type": "string",
    "enum": [
        "Day",
        "Minute",
        "Month",
        "Quarter",
        "Week",
        "Year"
    ],
    "description": "The unit of measure associated with values found in
        COBie.Job.Duration. If allowable values are not
        specified by contract, the default values are Month
        and Year. This data field value comes from one of the
        values in COBie.PickList.Units.Duration data field."
},

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    "Interval": {
      "type": "string"
    },
    "IntervalUnit": {
      "type": "string",
      "enum": [
        "As required",
        "Day",
        "Minute",
        "Month",
        "Quarter",
        "Week",
        "Year"
      ]
    },
    "Priors": {
      "type": "string"
    },
    "Resource_Ref": {
      "type": "array",
      "minItems": 1,
      "description": "An array of json-pointer references to items from the
        Resource table that are part of the job.",
      "items": {
        "type": "string",
        "format": "json-pointer"
      },
      "examples": [
        [
          "Resource/2108",
          "Resource/237"
        ]
      ]
    },
    "additionalProperties": {
      "type": "string"
    }
  }
}

```

```

"Event": {
  "type": "array",
  "description": "Events represent a single occurrence of a task as part of a Job.",
  "items": [
    {
      "type": "object",
      "required": [
        "Name",
        "Description",
        "StartDate"
      ],
      "properties": {
        "Name": {
          "type": "string",
          "title": "The name of the Event.",
          "description": "The name of the Event. This value does not need to be
            unique."
        },
        "Description": {
          "type": "string",
          "description": "A general text description of the Event."
        },
        "Category": {
          "type": "string",
          "enum": [
            "One Time",
            "Planned",
            "Repeating"
          ],
          "description": "The classification for the Event. This data field
            value comes from one of the values in
            COBie.PickList.Event.Category data field.",
          "examples": [
            "One Time",
            "Planned",
            "Repeating"
          ]
        },
        "Company_Ref": {
          "type": "string",
          "format": "json-pointer",
          "examples": [

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```

        "/Company/3"
    ]
},
"Jpb_Ref": {
    "type": "string",
    "format": "json-pointer",
    "examples": [
        "/Job/11"
    ]
},
"Table_Ref": {
    "type": "array",
    "minItems": 1,
    "description": "An array of json-pointer references to items from
        other tables that are part of the event.",
    "items": {
        "type": "string",
        "format": "json-pointer"
    },
    "examples": [
        [
            "Company/21",
            "Space/105",
            "Component/237"
        ]
    ]
},
"ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified
        ExternalObject that would allow COBie data to be
        matched back to the data from which it was developed
        in the named ExternalSystem. This might be a GUID or
        ElementID.",
    "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
},
"ExtObject": {
    "type": "string",
    "description": "The name of the data object within the computer
        system that holds the data provided in a given row of
        COBie data. The default values are the associated IFC
        entities that are mapped (and those that are

```



```

],
"properties": {
  "Name": {
    "type": "string",
    "title": "The name of the Package.",
    "description": "This is the primary key for this data table and each
                  must be unique."
  },
  "Description": {
    "type": "string",
    "description": "A general text description of the Package."
  },
  "Category": {
    "type": "string",
    "description": "The classification for the Package. This data field
                  value comes from one of the values in
                  COBie.PickList.Package.Category data field."
  },
  "Company_Ref": {
    "type": "string",
    "format": "json-pointer",
    "examples": [
      "/Company/3"
    ]
  },
  "Event_Ref": {
    "type": "string",
    "format": "json-pointer",
    "examples": [
      "/Event/909"
    ]
  },
  "ExtIdentifier": {
    "type": "string",
    "description": "The unique identifier of the identified
                  ExternalObject that would allow COBie data to be
                  matched back to the data from which it was developed
                  in the named ExternalSystem. This might be a GUID or
                  ElementID.",
    "examples": [
      "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
    ]
  }
},

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```

    "ExtObject": {
      "type": "string",
      "description": "The name of the data object within the computer
        system that holds the data provided in a given row of
        COBie data. The default values are the associated IFC
        entities that are mapped (and those that are
        excluded) when transforming IFC data to a given row
        of COBie data.",
      "examples": [
        "IfcSpace"
      ]
    },
    "ExtSystem": {
      "type": "string",
      "description": "The name of the computer system generating the row of
        COBie data.",
      "examples": [
        "Autodesk Revit 2023, Build: 20220429_1500(x64)",
        "ArchiCAD 19 Full (USA) / Build: 5005",
        "IBM Maximo"
      ]
    },
    "StartDate": {
      "type": "string",
      "format": "date-time"
    },
    "EndDate": {
      "type": "string",
      "format": "date-time"
    }
  },
  "additionalProperties": {
    "type": "string"
  }
}

],
"Risk": {
  "type": "array",
  "description": "Identifies the exchange of business process and exception reporting
    information related to other parts of a COBie deliverable.",
  "items": [
    {

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"type": "object",
"required": [
  "Name",
  "Description",
  "Consequence",
  "LevelOfRisk",
  "Likelihood"
],
"properties": {
  "Name": {
    "type": "string",
    "title": "The name of the Risk.",
    "description": "This is the primary key for this data table and each
      must be unique."
  },
  "Description": {
    "type": "string",
    "description": "A general text description of the Risk."
  },
  "Category": {
    "type": "string",
    "enum": [
      "Change",
      "Claim",
      "Coordination",
      "Environmental",
      "Function",
      "IndoorAirQuality",
      "Installation",
      "RFI",
      "Safety",
      "Specification"
    ],
    "description": "The classification for the Risk. This data field
      value comes from one of the values in
      COBie.PickList.Risk.Category data field.",
    "examples": [
      [
        "Environmental",
        "Safety"
      ]
    ]
  }
}

```

```

    },
    "Spatial_Ref": {
      "type": "string",
      "format": "json-pointer",
      "examples": [
        "/Space/909"
      ]
    },
    },
    "Physical_Ref": {
      "type": "string",
      "format": "json-pointer",
      "examples": [
        "/Component/909"
      ]
    },
    },
    "Process_Ref": {
      "type": "string",
      "format": "json-pointer",
      "examples": [
        "/Event/909"
      ]
    },
    },
    "ExtIdentifier": {
      "type": "string",
      "description": "The unique identifier of the identified
        ExternalObject that would allow COBie data to be
        matched back to the data from which it was developed
        in the named ExternalSystem. This might be a GUID or
        ElementID.",
      "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
      ]
    },
    },
    "ExtObject": {
      "type": "string",
      "description": "The name of the data object within the computer
        system that holds the data provided in a given row of
        COBie data. The default values are the associated IFC
        entities that are mapped (and those that are
        excluded) when transforming IFC data to a given row
        of COBie data.",
      "examples": [
        "IfcSpace"
      ]
    }
  ]
}

```

```

    },
    "ExtSystem": {
      "type": "string",
      "description": "The name of the computer system generating the row of
        COBie data.",
      "examples": [
        "Autodesk Revit 2023, Build: 20220429_1500(x64)",
        "ArchiCAD 19 Full (USA) / Build: 5005",
        "IBM Maximo"
      ]
    },
    },
    "Company_Ref": {
      "type": "string",
      "format": "json-pointer",
      "examples": [
        "/Company/3"
      ]
    },
    },
    "Consequence": {
      "type": "string",
      "enum": [
        "Very High",
        "High",
        "Moderate",
        "Low",
        "Unknown"
      ]
    },
    },
    "LevelOfRisk": {
      "type": "string",
      "enum": [
        "Very High",
        "High",
        "Moderate",
        "Low",
        "Unknown"
      ]
    },
    },
    "Likelihood": {
      "type": "string",
      "enum": [

```



```

    },
    "Category": {
      "type": "string",
      "enum": [
        "Certificates",
        "Client Requirements",
        "Closeout Submittals",
        "Contract Drawings",
        "Contract Modifications",
        "Contract Specifications",
        "Design Data",
        "Design Review Comment",
        "Manufacturer Field Reports",
        "Manufacturer Instructions",
        "Operation and Maintenance",
        "Preconstruction Submittals",
        "Product Data",
        "Punch List Items",
        "Request for Information",
        "Requests for Information",
        "Samples",
        "Shop Drawings",
        "Specifications",
        "Test Reports"
      ],
      "description": "The classification for the Document. This data field
        value comes from one of the values in
        COBie.PickList.Document.Category data field.",
      "examples": [
        "Contract Drawings",
        "Specifications"
      ]
    },
    "Table_Ref": {
      "type": "string",
      "format": "json-pointer",
      "description": "The element to which the document applies.",
      "examples": [
        "/Event/909"
      ]
    }
  },

```



```

"ExtIdentifier": {
  "type": "string",
  "description": "The unique identifier of the identified
                  ExternalObject that would allow COBie data to be
                  matched back to the data from which it was developed
                  in the named ExternalSystem. This might be a GUID or
                  ElementID.",
  "examples": [
    "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
  ]
},
"ExtObject": {
  "type": "string",
  "description": "The name of the data object within the computer
                  system that holds the data provided in a given row of
                  COBie data. The default values are the associated IFC
                  entities that are mapped (and those that are
                  excluded) when transforming IFC data to a given row
                  of COBie data.",
  "examples": [
    "IfcSpace"
  ]
},
"ExtSystem": {
  "type": "string",
  "description": "The name of the computer system generating the row of
                  COBie data.",
  "examples": [
    "Autodesk Revit 2023, Build: 20220429_1500(x64)",
    "ArchiCAD 19 Full (USA) / Build: 5005",
    "IBM Maximo"
  ]
},
"ApprovalBy": {
  "type": "string"
},
"Path": {
  "type": "string",
  "format": "uri"
},
"File": {
  "type": "string",
  "examples": [
    "123Main_Arch_R23.rvt",

```

```

        "ComissioningReport.pdf",
        "n/a"
    ]
},
"Reference": {
    "type": "string"
}
},
"additionalProperties": {
    "type": "string"
}
}
]
},
"Attribute": {
    "type": "array",
    "description": "Used to store custom data fields for the COBie deliverable.",
    "items": [
        {
            "type": "object",
            "required": [
                "Name",
                "Table_Ref",
                "type",
                "Unit"
            ],
            "properties": {
                "Name": {
                    "type": "string",
                    "title": "The name of the Attribute.",
                    "description": "The name of the Attribute. This value does not need
                        to be unique."
                },
                "Description": {
                    "type": "string",
                    "description": "A general text description of the Attribute."
                },
                "Category": {
                    "type": "string",
                    "description": "The classification for the Attribute."
                }
            }
        }
    ]
}
}

```

```

"Table_Ref": {
  "type": "string",
  "format": "json-pointer",
  "description": "The element to which the attribute applies.",
  "examples": [
    "/Space/42"
  ]
},
"ExtIdentifier": {
  "type": "string",
  "description": "The unique identifier of the identified
  ExternalObject that would allow COBie data to be
  matched back to the data from which it was developed
  in the named ExternalSystem. This might be a GUID or
  ElementID.",
  "examples": [
    "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
  ]
},
"ExtObject": {
  "type": "string",
  "description": "The name of the data object within the computer
  system that holds the data provided in a given row of
  COBie data. The default values are the associated IFC
  entities that are mapped (and those that are
  excluded) when transforming IFC data to a given row
  of COBie data.",
  "examples": [
    "IfcSpace"
  ]
},
"ExtSystem": {
  "type": "string",
  "description": "The name of the computer system generating the row of
  COBie data.",
  "examples": [
    "Autodesk Revit 2023, Build: 20220429_1500(x64)",
    "ArchiCAD 19 Full (USA) / Build: 5005",
    "IBM Maximo"
  ]
},
"Value": {
  "type": "string",
  "examples": [

```



```

    "ClockwiseRotation",
    "ElevationalRotation",
    "YawRotation"
  ],
  "properties": {
    "Name": {
      "type": "string",
      "title": "The name of the Coordinate.",
      "description": "The name of the Coordinate. This value does not need
        to be unique."
    },
    "Category": {
      "type": "string",
      "enum": [
        "Point",
        "Line-end-one",
        "Line-end-two",
        "Box-lowerleft",
        "Box-upperright"
      ],
      "description": "The classification for the Coordinate. This data
        field value comes from one of the values in
        COBie.PickList.Coordinate.Category data field."
    },
    "Table_Ref": {
      "type": "string",
      "format": "json-pointer",
      "description": "The element to which the coordinate applies.",
      "examples": [
        "/Space/42"
      ]
    },
    "ExtIdentifier": {
      "type": "string",
      "description": "The unique identifier of the identified
        ExternalObject that would allow COBie data to be
        matched back to the data from which it was developed
        in the named ExternalSystem. This might be a GUID or
        ElementID.",
      "examples": [
        "4ec17585-c36e-4cc3-8301-61df48a06d7e-000c89be"
      ]
    }
  },

```

```

"CoordinateXAxis": {
  "type": "number"
},
"CoordinateYAxis": {
  "type": "number"
},
"CoordinateZAxis": {
  "type": "number"
},
"ClockwiseRotation": {
  "type": "number"
},
"ElevationalRotation": {
  "type": "number"
},
"YawRotation": {
  "type": "number"
},
"RelativeTo": {
  "type": "string"
},
"ExtObject": {
  "type": "string",
  "description": "The name of the data object within the computer
system that holds the data provided in a given row of
COBie data. The default values are the associated IFC
entities that are mapped (and those that are
excluded) when transforming IFC data to a given row
of COBie data.",
  "examples": [
    "IfcSpace"
  ]
},
"ExtSystem": {
  "type": "string",
  "description": "The name of the computer system generating the row of
COBie data.",
  "examples": [
    "Autodesk Revit 2023, Build: 20220429_1500(x64)",
    "ArchiCAD 19 Full (USA) / Build: 5005",
    "IBM Maximo"
  ]
}

```

```
    },  
    "additionalProperties": {  
      "type": "string"  
    }  
  }  
]  
}  
}  
}
```

Appendix C: Change Log

This section details the changes to the COBie v3 Standard from the previous v2.4 standard.

OVERVIEW

Version 3 of the COBie standard incorporates 61 different changes and updates grouped into the following four categories.

Ease of Use

- More concise documentation
- Removal of data tables rarely used
- Renaming of data fields and headers to better understand their purpose
- Resorting of headers to better group them
- New "Title Block" section to have all pertinent deliverable information in one place

Modernization

- Removal of personally identifiable information data fields
- Replacing "Floor" data table with "Level" data table to accommodate infrastructure projects
- Support for JSON format for machine-to-machine exchanges

Capabilities

- Adding new "PartOf" data field on asset data tables to better understand relationships
- Adding data fields that accommodate classifying and geo-locating projects better
- Adding a new "SpaceType" data table to better organize spaces

Workflow

- Adding data tables to better document the activities of a facility (especially useful for handover between owners)
- New "Package", "Event", and "Risk" data tables to go along with the existing "Job" data table

GENERAL

ID	CHANGE	REASONING
00.01	<p>New Terminology</p> <p>Replaced any reference to “Spreadsheet” with “Data Table”, or simply “Table”.</p> <p>Replaced any reference to “Column” with “Data Field”, or simply “Field”.</p> <p>Replaced any reference to “Cell” with “Data Value”, or simply “Value”.</p>	<p>Moves away from spreadsheet terminology to utilize industry standard database terminology.</p>
00.08	<p>PartOf</p> <p>Added new “PartOf” data field to data tables that would benefit. This includes:</p> <ul style="list-style-type: none"> ▪ Level ▪ Space ▪ Zone ▪ System ▪ Job <p>Because the value in this data field is a reference to other records in the data table, it will be color coded as orange.</p>	<p>Allows for relationships between records in a data table, so that some records may be a part of another.</p> <p>The addition of this data field also allows for the removal of other data tables, such as the Assembly data table.</p>
00.09	<p>CreatedBy and CreatedOn</p> <p>Removed the “CreatedBy” and “CreatedOn” fields from all data tables.</p>	<p>These data fields can violate privacy laws such as the General Data Protection Regulation (GDPR) and are not necessary for every record in a COBie submittal.</p> <p>COBie submittals only need a single “Issue Date” field, so that data field was added to the Instruction data table.</p>
00.12	<p>JSON</p> <p>Added the JSON format as an approved COBie submission format.</p>	<p>Adds a widely used database format to assist with machine-to-machine transfer of data.</p>

ID	CHANGE	REASONING
00.13	<p>Classification System</p> <p>Added a data field on the Instruction data table to identify the standard classification systems used.</p>	No data field in previous version to hold this information.
00.14	<p>Table and Table.Name</p> <p>Renamed data fields that reference other data tables, and a period is used to separate the two different items. This includes renaming data fields:</p> <ul style="list-style-type: none"> ▪ "SheetName" now becomes "Table" ▪ "RowName" now becomes "Table.Name" 	Provides consistency by standardizing the naming of data fields that reference other data tables.
00.15	<p>Reorganized Fields</p> <p>The order of the data fields in each data table has been reorganized based on the "category" of the data field. These categories include:</p> <ul style="list-style-type: none"> ▪ <u>Identification</u> – data fields that identify the asset defined in the record (such as "Name" and "Description"). ▪ <u>Classification</u> – data fields that classify the asset defined in the record (such as "Type" and "Category"). ▪ <u>Location</u> – data fields that define the location of the asset defined in the record (such as the name of the Level or the Space and the "PartOf" field). ▪ <u>External</u> – data fields that represent external data, as color coded by purple. ▪ <u>Required</u> – data fields that are required to contain a value for all COBie submittals, as color coded in yellow. ▪ <u>Optional</u> – data fields that are only required to contain a value if specified in the contract, as color coded in green. 	Provides a consistent organization of the data fields across all data tables.

ID	CHANGE	REASONING
00.16	<p>Additional Statuses</p> <p>The previous status of “Reference to other sheet or pick list” has been split into two separate statuses:</p> <ul style="list-style-type: none"><li>▪ Required (reference to other data field), which maintains the current orange color coding<li>▪ If specified as required (reference to other data field), which adds a new blue color coding	<p>Previous version was confusing regarding whether or not reference data fields were always required or only required if specified in the contract.</p>

TABLE STRUCTURE

Previously referred to as “Worksheets”, data tables in version 3 of the COBie standard have been modified. This includes:

- Two data tables renamed
- Three data tables added
- Four data tables removed

FIGURE AD.1 shows a summary of those changes, and the following sections provide details. Overall, the total number of data tables has been reduced by one, from 20 to 19.

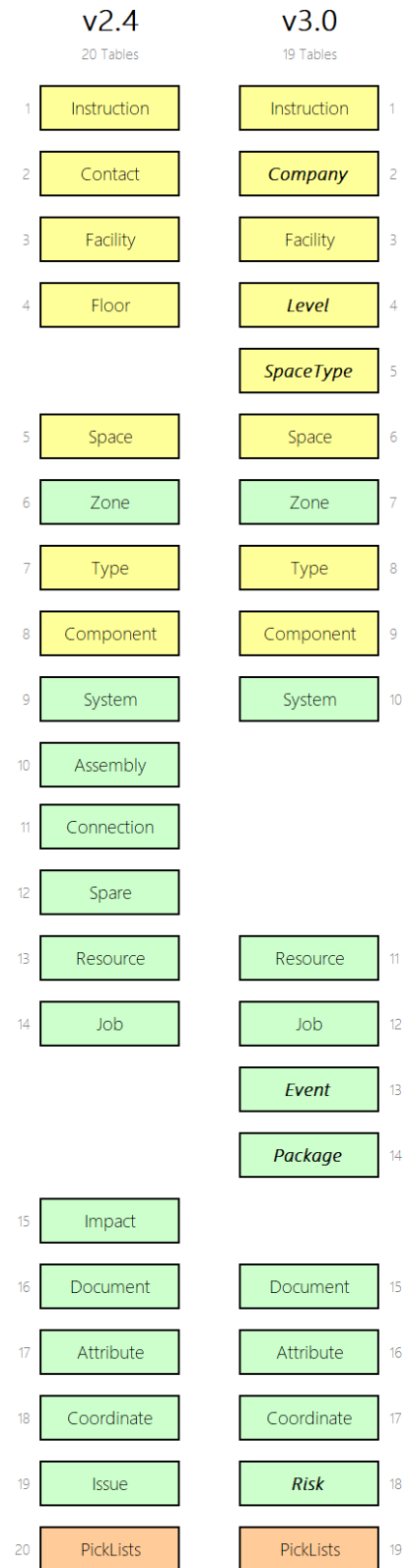


FIGURE AD.1

TABLE 1: INSTRUCTION

This data table was overhauled to include much more information pertinent to the COBie submittal. Dubbed the “Title Block”, the data fields now in this data table are a combination of new and moved from other data tables.

ID	CHANGE	REASONING
01.02	Title Block	Aggregates all data fields related to the submittal into one place.
00.13	Expanded the data fields in the Instruction data table to	
07.04	include data fields related to submission of a COBie	
07.09	deliverable. This included:	
18.01	<ul style="list-style-type: none"> ▪ Time and date (“ExportDateTime”) to replace the removed “CreatedOn” data field ▪ A new data field to describe the “Milestone” ▪ A new data field for the company delivering the submission, which replaces the “CreatedBy” data field and is a reference to the Company data table (formerly the Contact data table) ▪ The unit data fields that used to reside on the Type and Facility data tables were relocated here and a new “WeightUnit” data field was added ▪ The area measurement data field was relocated here and renamed to “AreaMeasurementStandard” ▪ Two new data fields to define the coordinate system description and origin ▪ Five new data fields to define the classification systems used in the submission, one for each corresponding data table (Company, Facility, SpaceType, Type, and System) 	

COBie v3 Standard

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table.

Version	COBie2.4
Region	en-US
Purpose	

Title	COBie
Version	3
Release	1
Status	IFC4
Region	
ExportDateTime	
Milestone	
OriginatingCompany	
AreaUnit	
CurrencyUnit	
DurationUnit	
LinearUnit	
VolumeUnit	
WeightUnit	
AreaMeasurementStandard	
CoordinateSystemDescription	
CoordinateSystemOrigin	
ClassificationSystem.Company	
ClassificationSystem.Facility	
ClassificationSystem.SpaceType	
ClassificationSystem.Type	
ClassificationSystem.System	

Format is ISO-639-1 two letter language code
Format is ISO-8601 (YYYY-MM-DD) with exact time optional
From the "Units.Area" field on the PickLists table
From the "Units.Currency" field on the PickLists table
From the "Units.Duration" field on the PickLists table
From the "Units.Linear" field on the PickLists table
From the "Units.Volume" field on the PickLists table
From the "Units.Weight" field on the PickLists table
Provide system name and version
Provide system name and version
Provide system name and version
Provide system name and version
Provide system name and version

FIGURE AD.2

TABLE 2: CONTACT

This data table is no longer about individuals, but about companies/organizations.

ID	CHANGE	REASONING
02.01	Data Table Name Change Name was changed from "Contact" to "Company".	This avoids violating personal privacy laws such as GDPR.
02.02	Data Fields Renamed Renamed "Email" to "Name".	This avoids violating personal privacy laws such as GDPR.
02.01 02.03	Data Fields Removed Removed the "Company", "GivenName", and "FamilyName" data fields.	Company is redundant. This avoids violating personal privacy laws such as GDPR.
02.04	Data Fields Added Added a new "Certifications" and "Website" data fields.	To better identify and qualify companies.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Email	CreatedBy	CreatedOn	Category	Company	Phone	ExternalSystem	ExternalObject	ExternalIdentifier	Department	OrganizationCode	GivenName	FamilyName	Street	PostalBox	Town	StateRegion	PostalCode	Country	

v3

NAME	PHONE	CLASS	WEBSITE	STREET	POSTALBOX	TOWN	STATEREION	POSTALCODE	COUNTRY	EXTSYSTEM	EXTOBJECT	EXTIDENTIFIER	CERTIFICATIONS	DEPARTMENT	ORGANIZATIONCODE				

FIGURE AD.3

TABLE 3: FACILITY

This data table was revamped to not limit it to buildings.

ID	CHANGE	REASONING
03.05 03.06	New Location Data Fields Added data fields for "Address", "Latitude", "Longitude", and "Elevation".	To allow more accurate location of the project.
26.01	New Type Data Field Added a "Type" data field that references a PickList of values from which to choose.	To allow for the ability to define the type of project, moving away from only buildings. This will lay the foundation for future expansion to accommodate multiple facilities/structures in one submission.
03.02	Unit Data Fields Relocated The previous data fields related to unit types have been relocated to the updated Instruction data table.	Consolidates units and standard classifications into the new "Title Block" area.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	ProjectName	SiteName	LinearUnits	AreaUnits	VolumeUnits	CurrencyUnit	AreaMeasurement	ExternalSystem	ExternalProjectObject	ExternalProjectIdentifier	ExternalSiteObject	ExternalSiteIdentifier	ExternalFacilityObject	ExternalFacilityIdentifier	Description	ProjectDescription	SiteDescription	Phase	

v3

IDEN.		CLASS.		LOCATION				EXTERNAL		
Name	Description	Type	Category	Address	Latitude	Longitude	Elevation	ExtSystem	ExtObject	ExtIdentifier

FIGURE AD.4

TABLE 4: FLOOR

ID	CHANGE	REASONING
28.01	Data Table Name Change Name was changed from "Floor" to "Level".	To allow for more flexibility with project types, such as infrastructure projects.
00.08	PartOf Added new "PartOf" data field as a reference to other records in the data table, it will be color coded as orange.	Allows for relationships between records in a data table, so that some records may be a part of another.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	ExtSystem	ExtObject	ExtIdentifier	Description	Elevation	Height

v3

IDEN		CLASS		EXTERNAL			OPTIONAL	
Name	Description	Category	PartOf	ExtSystem	ExtObject	ExtIdentifier	Elevation	Height

FIGURE AD.5

TABLE 5: SPACE

ID	CHANGE	REASONING
05.03 23.01 00.14	New Space Type Data Field Added new data field to provide a Space Type that references the new data table of the same name.	Just as Components have a Type, now Spaces have a Space Type.
05.01 05.02 00.14	Data Fields Renamed Renamed the "FloorName" data field to "Level.Name". The documentation is updated to allow for this data field to be blank to accommodate vertical shafts, voids, exterior spaces, etc.	To align with the new naming convention.
00.08	PartOf Added new "PartOf" data field as a reference to other records in the data table, it will be color coded as orange.	Allows for relationships between records in a data table, so that some records may be a part of another.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	FloorName	Description	ExSystem	ExObject	ExIdentifier	RoomTag	UsableHeight	GrossArea	NetArea
------	-----------	-----------	----------	-----------	-------------	----------	----------	--------------	---------	--------------	-----------	---------

v3

IDENTIFICATION		CLASS		LOCATION		EXTERNAL			OPTIONAL			
Name	Description	RoomTag	Space Type Name	Level Name	PartOf	ExSystem	ExObject	ExIdentifier	GrossArea	NetArea	UsableHeight	

FIGURE AD.6

TABLE 6: ZONE

ID	CHANGE	REASONING
06.01 00.14	Data Fields Renamed Renamed the "SpaceNames" data field to "Space.Name".	To align with the new naming convention.
00.08	PartOf Added new "PartOf" data field as a reference to other records in the data table, it will be color coded as orange.	Allows for relationships between records in a data table, so that some records may be a part of another.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	SpaceNames	ExtSystem	ExtObject	ExtIdentifier	Description

v3

IDEN.		CLASS		LOCATION		EXTERNAL		
Name	Description	Category	Space.Name	PartOf	ExtSystem	ExtObject	ExtIdentifier	

FIGURE AD.7

TABLE 7: TYPE

ID	CHANGE	REASONING
07.01	<p>Documentation Updated</p> <p>Documentation will provide a better explanation of how to populate the "NominalLength", "NominalWidth", and "NominalHeight" data fields.</p>	<p>It is often confusing to know what value to put in these data fields.</p>
07.04 07.09	<p>Unit Data Fields Relocated</p> <p>Data fields related to units ("DurationUnit" and the new "NominalWeightUnit") have been relocated to the new "Title Block" on the Instruction data table.</p>	<p>Consolidates units and standard classifications into the new "Title Block" area.</p>
07.08	<p>New Weight Data Field</p> <p>Added a new "NominalWeight" field.</p>	<p>This information can be important for assets.</p>
07.10 thru 07.20	<p>Data Fields Removed</p> <p>Removed data fields that are not often used:</p> <ul style="list-style-type: none"> ▪ "Shape" ▪ "Size" ▪ "Color" ▪ "Finish" ▪ "Grade" ▪ "Material" ▪ "Constituents" ▪ "Features" ▪ "AccessibilityPerformance" ▪ "CodePerformance" ▪ "SustainabilityPerformance" 	<p>To simplify the standard and remove data fields that are rarely used.</p>

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name
CreatedBy
CreatedOn
Category
Description
AssetType
Manufacturer
ModelNumber
WarrantyGuarantorParts
WarrantyDurationParts
WarrantyGuarantorLabor
WarrantyDurationLabor
WarrantyDurationUnit
ExtSystem
ExtObject
ExtIdentifier
ReplacementCost
ExpectedLife
DurationUnit
WarrantyDescription
NominalLength
NominalWidth
NominalHeight
ModelReference
Shape
Size
Color
Finish
Grade
Material
Constituents
Features
AccessibilityPerformance
CodePerformance
SustainabilityPerformance

v3

IDEN	CLASS	EXTERNAL	REQUIRED	OPTIONAL
Name				
Description				
Category				
AssetType				
ExtSystem				
ExtObject				
ExtIdentifier				
Manufacturer				
ModelNumber				
WarrantyGuarantorParts				
WarrantyDurationParts				
WarrantyGuarantorLabor				
WarrantyDurationLabor				
WarrantyDurationUnit				
ModelReference				
NominalHeight				
NominalLength				
NominalWeight				
NominalWidth				
PurchaseCost				
WarrantyDescription				

FIGURE AD.8

TABLE 8: COMPONENT

ID	CHANGE	REASONING
08.01 00.14	Data Fields Renamed Renamed the "TypeName" data field to "Type.Name" and the "Space" data field to "Space.Name".	To align with the new naming convention.
08.03	Data Fields Added Added a new "Space.SecondaryName" data field.	To accommodate doors and other openings that lead from one space to another.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	TypeName	Space	Description	ExtSystem	ExtObject	ExtIdentifier	SerialNumber	InstallationDate	WarrantyStartDate	TagNumber	BarCode	AssetIdentifier

v3

	IDENTIFICATION					CLASS	LOCATION		EXTERNAL			OPTIONAL	
Name	Description	AssetIdentifier	BarCode	SerialNumber	TagNumber	Type.Name	Space.Name	Space.SecondaryName	ExtSystem	ExtObject	ExtIdentifier	InstallationDate	WarrantyStartDate

FIGURE AD.9

TABLE 9: SYSTEM

ID	CHANGE	REASONING
09.01 00.14	Data Fields Renamed Renamed the "ComponentNames" data field to "Component.Name".	To align with the new naming convention.
00.08	PartOf Added new "PartOf" data field as a reference to other records in the data table, it will be color coded as orange.	Allows for relationships between records in a data table, so that some records may be a part of another.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	ComponentNames	ExtSystem	ExtObject	ExtIdentifier	Description

v3

IDEN.	CLASS.	LOC.	EXTERNAL			REQ.	
Name	Description	Category	PartOf	ExtSystem	ExtObject	ExtIdentifier	Component.Name

FIGURE AD.10

TABLE 10: ASSEMBLY

ID	CHANGE	REASONING
10.01	<p>Data Table Removed</p> <p>This data table was removed.</p>	<p>To simplify the deliverable, as this data table was not often used. This functionality is now handled with the new "PartOf" data field.</p>

TABLE 11: CONNECTION

ID	CHANGE	REASONING
11.01	<p>Data Table Removed</p> <p>This data table was removed.</p>	<p>To simplify the deliverable, as this data table was not often used. The System data table can imply connections.</p>

TABLE 12: SPARE

ID	CHANGE	REASONING
12.01	<p>Data Table Removed</p> <p>This data table was removed.</p>	<p>To simplify the deliverable, as this data table was not often used. The Resource data table or the new "PartOf" data field can be used instead.</p>

TABLE 13: RESOURCE

No changes to this data table except the changes that affect every data table, including removing the “CreatedBy” and “CreatedOn” data fields and reorganizing the data fields.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	ExtSystem	ExtObject	ExtIdentifier	Description

v3

IDEN		CLASS	EXTERNAL		
Name	Description	Category	ExtSystem	ExtObject	ExtIdentifier

FIGURE AD.11

TABLE 14: JOB

ID	CHANGE	REASONING
14.05	Data Fields Renamed Renamed "Frequency" to "Interval" and "FrequencyUnit" to "IntervalUnit".	To better describe when the job takes place.
14.01 14.04	Data Fields Removed Removed the "TypeName", "Start", and "TaskStartUnit" data fields.	The type name data field has no purpose. The other two data fields are now part of the new Event data table.
14.02 14.03	Data Fields Added Added a new "Table" and "Table.Name" data fields.	To reference other records on data tables that are part of the job.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	Status	TypeName	Description	Duration	DurationUnit	Start	TaskStartUnit	Frequency	FrequencyUnit	ExtSystem	ExtObject	ExtIdentifier	TaskNumber	Priors	ResourceNames

v3

IDENTIFICATION			CLASS		LOCATION			EXTERNAL			REQUIRED					
Name	Description	TaskNumber	Category	Status	Table	Table.Name	PartOf	ExtSystem	ExtObject	ExtIdentifier	Duration	DurationUnit	Interval	IntervalUnit	Priors	ResourceNames

FIGURE AD.12

TABLE 15: IMPACT

ID	CHANGE	REASONING
15.01	<p>Data Table Removed</p> <p>This data table was removed.</p>	<p>To simplify the deliverable, as impacts can be transmitted as Attributes. For example, repeating impacts can be associated to Jobs or Events.</p>

TABLE 16: DOCUMENT

ID	CHANGE	REASONING
16.01	<p>Data Fields Renamed</p>	<p>To align with the new naming convention.</p>
16.02	<p>Renamed "SheetName" to "Table" and "RowName" to</p>	<p>Update to better reflect modern terminology.</p>
16.03	<p>"Table.Name".</p> <p>Renamed "Directory" to "Path" and updated the documentation to describe how this data field can just be populated with the path to the information (such as a URL) or both the path and file name.</p>	

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	ApprovalBy	Stage	SheetName	RowName	Directory	File	ExtSystem	ExtObject	ExtIdentifier	Description	Reference

v3

IDEN.		CLASS		LOCATION		EXTERNAL			REQUIRED	OPTIONAL		
Name	Description	Category	Stage	Table	Table.Name	ExtSystem	ExtObject	ExtIdentifier	ApprovalBy	Path	File	Reference

FIGURE AD.13

TABLE 17: ATTRIBUTE

ID	CHANGE	REASONING
17.01	Data Fields Renamed	To align with the new naming convention.
17.02	Renamed "SheetName" to "Table" and "RowName" to "Table.Name".	

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	SheetName	RowName	Value	Unit	ExtSystem	ExtObject	ExtIdentifier	Description	AllowedValues

v3

IDEN	CLASS	LOCATION	EXTERNAL	REQUIRED	OPT					
Name	Description	Category	Table	Table.Name	ExtSystem	ExtObject	ExtIdentifier	Value	Unit	AllowedValues

FIGURE AD.14

TABLE 18: COORDINATE

ID	CHANGE	REASONING
18.02	Data Fields Renamed Renamed "SheetName" to "Table" and "RowName" to "Table.Name".	To align with the new naming convention.
18.03	Data Fields Added Added a new "RelativeTo" data field. Documented that leaving this data field blank will imply the coordinate is relative to the coordinate system called out in the new Title Block.	Allows defining a coordinate relative to another coordinate.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Category	SheetName	RowName	CoordinateXAxis	CoordinateYAxis	CoordinateZAxis	ExtSystem	ExtObject	ExtIdentifier	ClockwiseRotation	ElevationRotation	YawRotation

v3

IDEN	CLASS	LOCATION							EXTERNAL				
Name	Category	Table	Table.Name	CoordinateXAxis	CoordinateYAxis	CoordinateZAxis	ClockwiseRotation	ElevationRotation	YawRotation	RelativeTo	ExtSystem	ExtObject	ExtIdentifier

FIGURE AD.15

TABLE 19: ISSUE

This data table has been repurposed to focus on the risks that can be associated with Jobs (existing data table) and Events (new data table), such as those related to health and safety.

ID	CHANGE	REASONING
19.01 27.01	Data Table Name Change Name was changed from "Issue" to "Risk".	Better describes the purpose of this data table.
27.01	Data Fields Removed Removed the following data fields: <ul style="list-style-type: none"> ▪ "Type" ▪ "Risk" ▪ "Chance" ▪ "Impact" ▪ "SheetName1" ▪ "RowName1" ▪ "SheetName2" ▪ "RowName2" ▪ "Description" ▪ "Owner" 	To better align with the purpose of this data table which is to track the risks of a job or event.
27.01	Data Fields Added Added the following data fields: <ul style="list-style-type: none"> ▪ "Category" ▪ "SpatialTable" ▪ "SpatialTable.Name" ▪ "PhysicalTable" ▪ "PhysicalTable.Name" ▪ "ProcessTable" ▪ "ProcessTable.Name" ▪ "Description" ▪ "Mitigation" ▪ "Likelihood" ▪ "Consequence" ▪ "LevelOfRisk" ▪ "Company.Name" 	To better align with the purpose of this data table which is to track the risks of a job or event.

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Name	CreatedBy	CreatedOn	Type	Risk	Chance	Impact	SheetName1	RowName1	SheetName2	RowName2	Description	Owner	Mitigation	ExtSystem	ExtObject	ExtIdentifier

v3

	IDEN.	CLASS	LOCATION						EXTERNAL			REQUIRED			OPT.	
Name	Description	Category	SpatialTable	SpatialTable.Name	PhysicalTable	PhysicalTable.Name	ProcessTable	ProcessTable.Name	ExtSystem	ExtObject	ExtIdentifier	Company.Name	Consequence	LevelOfRisk	Likelihood	Mitigation

FIGURE AD.16

TABLE 20: PICKLIST

Many changes took place to align this data table with the changes to the other data tables, including adding, removing, and renaming of different data tables.

ID	CHANGE	REASONING
20.03 00.14	<p>New Data Field Names</p> <p>To align with the new naming convention, every data field has been renamed following the "Table.Field" format. For example:</p> <p style="padding-left: 40px;">"Category-Floor" is now "Level.Category"</p> <p style="padding-left: 40px;">"Category-Element" is now "Type.Category"</p> <p style="padding-left: 40px;">"Category-Space" is now "SpaceType.Category"</p> <p style="padding-left: 40px;">"Issue-Risk" is now "Risk.LevelOfRisk"</p> <p style="padding-left: 40px;">"SheetName" is now "Table"</p> <p style="padding-left: 40px;">"Units-Linear" is now "Units.Linear"</p> <p>In addition, the data fields are now ordered alphabetically.</p>	<p>This makes it much easier to identify the PickList values for a particular data field on a particular data table.</p>
20.01	<p>OBJ Data Fields Removed</p> <p>All 20 data fields beginning with "obj" have been removed.</p>	<p>To simplify the deliverable, as these data fields were not often used.</p>
20.01	<p>Data Fields Removed</p> <p>Data fields associated with data tables that no longer exist in v3 have been removed. This includes:</p> <ul style="list-style-type: none"> ▪ "Assembly-AssemblyType" ▪ "Category-Connection" ▪ "Category-Impact" ▪ "Category-Issue" ▪ "Category-Spare" ▪ "Impact-ImpactStage" ▪ "SheetName-Assembly" ▪ "Units-Impact" 	<p>These data fields are no longer necessary.</p>
20.01	<p>Data Fields Optional</p> <p>The requirement for PickList data fields has changed from required (as color coded in yellow) to required if specified (as color coded in green).</p>	<p>To make it clearer that not all PickLists are required.</p>

ID	CHANGE	REASONING
24.01	Data Fields Added	To support newly added data tables.
25.01	Added data fields to accommodate newly added data	
26.01	tables, including:	
07.01	<ul style="list-style-type: none">▪ "Attribute.Category"▪ "Event.Category"▪ "Package.Category"▪ "Units.Weight"	

The figure below shows the comparison between the data fields in v2.4 and those in v3 for this data table. The gray text along the top of v3 does not display in the data tables and is shown to better understand the new organization of the data fields.

v2.4

Assembly-AssemblyType	objContact
Category-Connection	objCoordinate
Category-Coordinate	objDocument
Category-Document	objFacility
Category-Element	objFloor
Category-Facility	objImpact
Category-Floor	objIssue
Category-Impact	objJob
Category-Issue	objProject
Category-Job	objResource
Category-Product	objSite
Category-Resource	objSpace
Category-Role	objSpare
Category-Space	objSystem
Category-Spare	objType
Category-Zone	SheetName
Document-ApprovalBy	SheetName-Assembly
Impact-ImpactStage	SheetName-Coordinate
Issue-Chance	Stage
Issue-Impact	Type-AssetType
Issue-Risk	Units-Area
Job-Status	Units-Currency
objAssembly	Units-Duration
objAttribute	Units-Impact
objAttributeType	Units-Linear
objComponent	Units-Volume
objConnection	

v3

Attribute.Category	Resource.Category
Company.Category	Risk.Category
Coordinate.Category	Risk.Consequence
Coordinate.TableName	Risk.LevelOrRisk
Document.ApprovalBy	Risk.Likelihood
Document.Category	SpaceType.Category
Document.Stage	System.Category
Event.Category	Table
Facility.Category	Type.AssetType
Facility.Type	Type.Category
Job.Category	Zone.Category
Job.Status	Units.Area
Level.Category	Units.Currency
Package.Category	Units.Duration
	Units.Linear
	Units.Volume
	Units.Weight

FIGURE AD.17

TABLE 21: SPACETYPE

This is a new data table that allows Spaces to belong to a type, not just a classification. For example, "office", "conference", "mechanical", etc.

ID	CHANGE	REASONING
23.01	<p>New Data Table</p> <p>This data table will contain six new data fields:</p> <ul style="list-style-type: none"> ▪ "Name" ▪ "Description" ▪ "Category" ▪ "ExtSystem" ▪ "ExtObject" ▪ "ExtIdentifier" <p>The "Category" data field will reference the same PickList of values as the data field of its same name, relocated from the Space data table.</p>	<p>Just as Components have a Type, now Spaces have a Space Type.</p>

The figure below shows the data fields for this new data table. The gray text along the top does not display in the data tables and is shown to better understand the new organization of the data fields.

v3

IDEN.	CLASS.	EXTERNAL			
Name	Description	Category	ExtSystem	ExtObject	ExtIdentifier

FIGURE AD.18

TABLE 22: EVENT

This is a new data table that allows the documentation of events that affect a facility. An event is a component or an instance of a Job (existing data table).

ID	CHANGE	REASONING
24.01	<p>New Data Table</p> <p>This data table will contain 12 new data fields:</p> <ul style="list-style-type: none"> ▪ "Name" ▪ "Company.Name" ▪ "Category" ▪ "Description" ▪ "Job.Name" ▪ "StartDate" ▪ "EndDate" ▪ "Table" ▪ "Table.Name" ▪ "ExtSystem" ▪ "ExtObject" ▪ "ExtIdentifier" <p>The "Category" data field will reference a new PickList.</p>	Documents components/instances of Jobs.

The figure below shows the data fields for this new data table. The gray text along the top does not display in the data tables and is shown to better understand the new organization of the data fields.

v3

IDEN.	CLASS	LOCATION	EXTERNAL	REQ.	OPT.
Name	Description	Category	Company.Name	Job.Name	Table
			Table.Name	ExtSystem	ExtObject
				ExtIdentifier	StartDate
					EndDate

FIGURE AD.19

TABLE 23: PACKAGE

This is a new data table that captures a record of who is responsible and is often referred to as a “work package.” Multiple Jobs (existing data table) and Events (new data table) can be associated with these responsible parties.

ID	CHANGE	REASONING
25.01	<p>New Data Table</p> <p>This data table will contain ten new data fields:</p> <ul style="list-style-type: none"> ▪ "Name" ▪ "Company.Name" ▪ "Category" ▪ "Description" ▪ "Event.Name" ▪ "StartDate" ▪ "EndDate" ▪ "ExtSystem" ▪ "ExtObject" ▪ "ExtIdentifier" <p>The “Category” data field will reference a new PickList.</p>	Documents the responsible parties.

The figure below shows the data fields for this new data table. The gray text along the top does not display in the data tables and is shown to better understand the new organization of the data fields.

v3

IDEN.	CLASS	LOCATION	EXTERNAL	REQ.	OPT.
Name	Description	Category	Company.Name	Event.Name	ExtSystem
ExtObject	ExtIdentifier	StartDate	EndDate		

FIGURE AD.20