

# COBie v3

## **CONSTRUCTION TO OPERATIONS BUILDING INFORMATION EXCHANGE STANDARD**

Draft, May 2023

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# Executive Summary

## OVERVIEW AND PURPOSE

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

## 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.

COBie version 3 icon courtesy of Plannerly

## PROCESS

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

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

26 **STRUCTURE AND FORMAT**

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

30 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
SCOPE COMPANY	FLOOR ZONE SPACETYPE SPACE COORDINATE	TYPE COMPONENT SYSTEM ATTRIBUTE	PACKAGE JOB EVENT INSTRUCTION RISK	DOCUMENT RESOURCE PICKLIST

31  
 32 Each data table includes a standardized set of data fields, and each field is designated as either always  
 33 required, required if stated in the contract, or a reference to another field in the database. The COBie  
 34 standard allows asset owners to define the specific fields they want in their data delivery. In fact, it  
 35 provides the best results for asset owners when they specify what they require to be delivered.

36  
 37 **VERSION 3 UPDATES**

38 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 "Facility" table with "Scope" table to 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/>.

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64

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## 65 Introduction

66

### 67 OVERVIEW

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

73

### 74 PURPOSE

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

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

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

84

### 85 BACKGROUND

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

92

### 93 CONTENT

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

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

99

100 **DOCUMENT INFORMATION**

101

102 **Publish Date**

103 **Month 00**, 2023

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 116 property. For more information, please see the bSI website:

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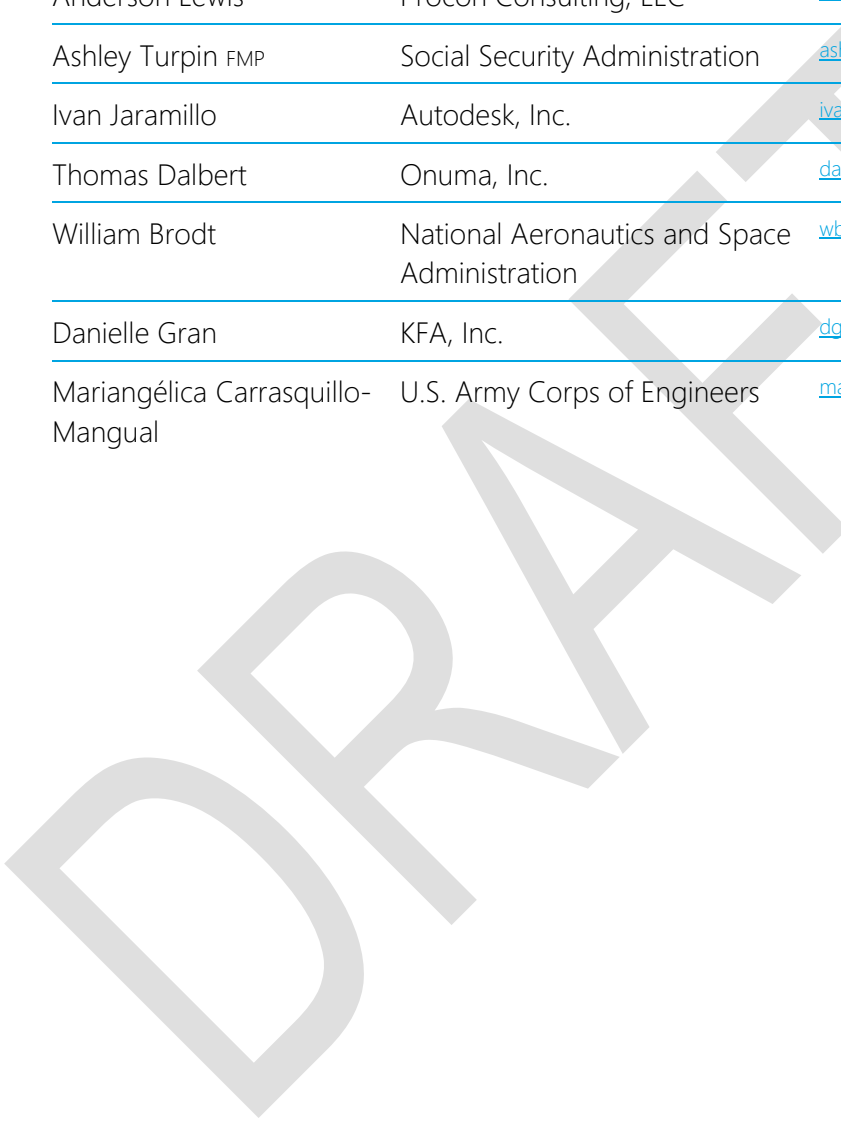
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125 **TERMINOLOGY**

126 The following terms are used throughout this document. Footnotes refer to links with additional  
 127 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. <sup>1</sup>  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. <sup>2</sup>  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. <sup>3</sup>  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	The 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 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 Row or Row	A line of related data in a table	Each data table includes rows of data 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).

128

129

130 **VERSION HISTORY**

131

**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, 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.

132

133

## 134 **Process**

135 This section outlines the recommended process for generating and submitting a COBie standard  
136 deliverable during your projects.

### 137 **OVERALL**

138 The general process for generating a COBie deliverable is to specify what data you want, when you  
139 want it, and who will deliver and review it. You may generate a COBie deliverable for any phase of a  
140 construction project, but you must select or specify which tables and fields you want to populate or  
141 update (see Structure section). Each table has required fields that may be prerequisites to using other  
142 tables. Most projects find success using COBie when it is addressed at the beginning of the project.

### 143 **INTERIM DELIVERABLES**

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

### 155 **SPECIFYING DELIVERABLES**

156 The minimum requirement for a COBie deliverable is to populate the required fields in the  
157 **COBie.Instruction** table. You must specify any additional tables and fields required by the person or  
158 company who will provide the COBie deliverable. You should also specify who will manage and  
159 transfer COBie deliverables at each phase to ensure proper coordination between phases. What  
160 tables and fields to select depends on your desired use of the COBie deliverable for each phase, but it  
161 is recommended to start with the end in mind.

### 162 **CONTENT CONSIDERATIONS**

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

172 **PHASE CONSIDERATIONS**

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

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

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

185

186 **Inception Phase**187     ▪ Definitions:

188     Phase for establishing the project vision and means to satisfy the client's business or public  
 189     service requirement, including site selection, planning considerations, establishment of  
 190     timeline, method of delivery, budget and which identifies necessary resources (design, legal,  
 191     financing, insurance, etc.).

192     ▪ Aliases:

193     1) Inception of a project, 2) Preparation and brief, 3) Strategy, and 4) Requirement Constraints.

194     During the inception phase, you will likely need to update the Company and Document tables. The  
 195     Company table requires information in the Name, Company, and Phone fields, and the Document  
 196     Table requires information in the name and path fields. You may prescribe which of the remaining  
 197     fields you want to update for the deliverable within the inception phase. For example, you may  
 198     prescribe that the engineering firm develop a project charter and additionally complete the  
 199     **COBie.Document.Table** field and **COBie.Document.TableName** field to capture them as the creators  
 200     of the document. In this scenario, **COBie.Document.Name** field is the project charter's title,  
 201     **COBie.Document.Path** field is the relative path to document from the COBie file location,  
 202     **COBie.Document.Table** field is the Company table, and **COBie.Document.TableName** field is the  
 203     engineering firm's name. You should also indicate who will review the COBie deliverable for the  
 204     Inception Phase, such as the owner or internal staff, and who will assume responsibility of the COBie  
 205     data after approval.

206

207 **Conceptualization Phase**208     ▪ Definition:

209     Phase to identify the major design ideas in the context of programmatic objectives, facility  
 210     performance, and activity parameters, to define spaces, and to initiate basic project element  
 211     considerations.

212     ▪ Aliases:

213     1) Concept and 2) Outline solution.

214     You will likely need to update the Company, Scope, Floor, SpaceType, and Document tables during  
 215     this phase. It is recommended to consult your staff when determining what fields to prescribe,  
 216     because you may need to provide more guidance to the person who will perform the updates. For  
 217     example, the space manager may require the **COBie.Space.RoomTag** field to follow a naming  
 218     convention, or the **COBie.Space.NetArea** field to conform to a specific measurement standard, such  
 219     as from the Building Owners and Manager Association (BOMA) International. These unique  
 220     requirements are not part of the COBie Standard, so you will need to specify them. You should  
 221     indicate who will review the COBie Deliverable and who will assume responsibility for the COBie data  
 222     after approval.

223



224 **Criteria Definition Phase**

225     ▪ Definition:

226         Phase to create and refine schematic diagrams of the basic project elements (substructure,  
227         shell, interiors, equipment, services, furnishings, special construction and demolition, and  
228         building sitework) that fully establish project spatial and element criteria as the Basis of Design.

229     ▪ Aliases:

230         1) Development, and 2) Definition.

231     You may likely update fields within the Company, Scope, Floor, SpaceType, Space, Zone, Type, and  
232     Document tables during the Criteria Definition Phase. It is recommended to consult your staff when  
233     determining what fields to prescribe and check for additional requirements you may have when  
234     capturing COBie data. For example, the facility manager may only need COBie data for a few assets,  
235     such as HVAC units, power transformers, water pumps, etc., and may want the  
236     **COBie.Type.WarrantyDescription** field for all of them.

237

238 **Design Phase**

239     ▪ Definition:

240         Phase in which the project team establishes means of satisfying project Basis of Design  
241         requirements with technical solutions, evaluates alternatives through value analysis or similar  
242         processes, and completes.

243     ▪ Aliases:

244         1) Technical Design, and 2) Construction Information.

245     In addition to the tables we indicated in the Criteria Definition Phase, you will likely need to update  
246     Component, System, Attribute, and Coordinate Tables during the Design Phase. You should consider  
247     what values you want to update in the Attribute table for each asset.

248

249 **Coordination Phase**

250     ▪ Definition:

251         Phase that bridges the design effort with implementation by integrating constructability and  
252         feasibility evaluations of the design to further develop spaces, elements, products, and  
253         materials necessary for the procurement and execution of the work, irrespective of the  
254         method of delivery.

255     ▪ Aliases:

256         1) Construction, and 2) Build.

257     Many pre-construction efforts occur during the Coordination Phase, such as the submission of safety  
258     plans, shop drawings, product data, etc. The designer or owner typically evaluates, coordinates, and  
259     approves the submissions which could provide more detailed information about the built  
260     environment before implementation. For example, identifying additional equipment implicit to the

261 design. You could specify a COBie deliverable that captures this information during the Coordination  
262 Phase, and the tables you may likely update are Type, Component, System, Document, Attribute,  
263 Coordinate, and Risk.

264

### 265 Implementation Phase

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

272 More detailed information will become available during the Implementation phase when the  
273 constructor installs equipment, such as the equipment serial number, installation date, and precise  
274 location. You may also continue to receive product submissions for review and approval during this  
275 phase. As such, the tables you may likely want to update are Type, Component, Document, and  
276 Coordinate.

277

### 278 Handover Phase

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

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

292

293

294 **Operations Phase**

295     ▪ Definition:

296         Phase in which owner or a designated agent occupies, uses, manages, and maintains a facility,  
297         which may also include partial or whole facility renovation, repair, reconditioning or  
298         remodeling activities as part of the project use lifecycle.

299     ▪ Aliases:

300         1) In Use, 2) Operations and Maintenance, and 3) Renovation.

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

305

306 **Closure Phase**

307     ▪ Definition:

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

312     ▪ Aliases:

313         1) Decommissioning, 2) End of Life, and 3) Renovation.

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

317

318

**319 MANAGEMENT CONSIDERATIONS**

320 You should specify which phases for which you want a COBie deliverable, and who will be responsible  
321 for updating each field within the deliverable. You may also want to specify sub-phases/milestones  
322 such as “Construction Documents - 2” or a number of days prior to substantial completion. For  
323 example, you may specify that the designer is responsible for updating the name, type, and location  
324 of equipment during the Design Phase at CD-2, while the constructor is responsible for updating the  
325 manufacturer, model number, and serial number information during the Implementation Phase at 120  
326 days prior to substantial completion. In this scenario, the constructor will use the COBie data created  
327 by the designer to develop the deliverable for the Implementation Phase. Therefore, you should also  
328 specify the transfer of responsibility of the COBie data from one person to another for each phase of  
329 the construction lifecycle. Primarily, what fields the person must keep up to date during the duration  
330 of their responsibility. Transfers of responsibility could be designer-to-owner, designer-to-constructor,  
331 owner-to-constructor, constructor-to-operator, operator-to-operator, owner-to-owner, owner-to-  
332 designer, etc. The transfers will vary depending on the category of projects such as new construction,  
333 renovations, operations and maintenance, or demolition. For example, a new construction project  
334 may generate COBie data for the first time, so the first transfer may be designer-to-constructor. For  
335 renovation projects, the owner may provide existing COBie data to the designer, which is owner-to-  
336 designer.

337

**338 REVIEW CONSIDERATIONS**

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

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

349

350

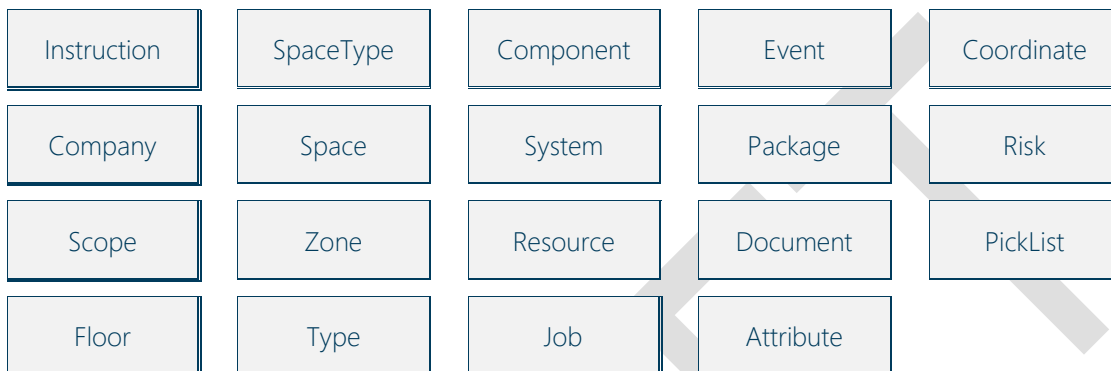
## 351 Structure

352 This section details the structure for the COBie standard.

353

### 354 OVERALL

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



356

### 357 Key Values

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

366 Name

367 Name\_Field1

368 Name\_Field1\_Field2

369

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

371 Format: Name\_Table\_Table.Name

372 Example: Fan Max Speed\_Type\_Boiler Type 1

373

374

375 The following shows the key values for each data table:

DATA TABLE	KEY VALUE FORMAT	KEY VALUE EXAMPLE
Company	Name	
Scope	Name	
Floor	Name	
SpaceType	Name	
Space	Name	
Zone	Name	
Type	Name	
Component	Name	
System	Name	
Resource	Name	
Job	Name_Table_Table.Name	
Event	Name_Job.Name	
Package	Name	
Risk	Name	
Document	Name_Table_Table.Name	
Attribute	Name_Table_Table.Name	
Coordinate	Name_Table_Table.Name	

376

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

384

### 385 Data Fields

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

388 **Reference Fields**

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

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

395

396 **Status**

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

400

401 **1. Required**

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

403 SpreadsheetML Color: #FFFF99

404

405 **2. Required (Reference to Another Data Field)**

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

409 SpreadsheetML Color: #FFCC99

410

411 **3. Only If Specified in the Contract**

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

414 SpreadsheetML Color: #CCFFCC

415

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

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

420 SpreadsheetML Color: #CCFFFF

421

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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: #C0C0C0
  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



445 **DATA TABLES**

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

GENERAL INFORMATION	SPACE INFORMATION	PRODUCT INFORMATION	OPERATIONAL INFORMATION	SUPPLEMENTARY INFORMATION
<b>Company</b>	Floor	Type	Instruction	Resource
<b>Scope</b>	SpaceType	Component	Job	Document
	Space	System	Event	PickList
	Zone	<b>Attribute</b>	Package	
	Coordinate		<b>Risk</b>	

448

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

452

453

454 **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.Scope
	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).	

455

456

457 **Table 2: Company**

DESCRIPTION	Represents the information related to a company that is referenced elsewhere in a COBie deliverable.	
STATUS	Required	
DATA FIELDS	<b>Name</b>	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.	

458

459

460 **Table 3: Scope**

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	<b>Name</b>	Longitude
	Description	Elevation
	Type	ExtSystem
	Category	ExtObject
	Address	ExtIdentifier
	Latitude	
CONSIDERATIONS	This data table was called "Facility" in previous versions of COBie	

461

462

463 **Table 4: Floor**

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	<b>Name</b>	ExtObject
	Description	ExtIdentifier
	Category	Elevation
	PartOf	Height
	ExtSystem	
CONSIDERATIONS		

464

465

466 **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	<b>Name</b>	ExtSystem
	Description	ExtObject
	Category	ExtIdentifier
CONSIDERATIONS	This is a new data table for COBie v3.	

467

468

469 **Table 6: Space**

DESCRIPTION	Spaces represent the breakdown of Floors into rooms/areas, and which have common functional purpose to a user.	
STATUS	Required	
DATA FIELDS	<b>Name</b>	ExtSystem
	Description	ExtObject
	RoomTag	ExtIdentifier
	SpaceType.Name	GrossArea
	Floor.Name	NetArea
	PartOf	UsableHeight
CONSIDERATIONS	<p>Spaces are expected to be occupiable (visitable).</p> <p>Vertically, Spaces run from top of floor to bottom of slab above.</p> <p>Occupied Spaces run to bottom of the ceiling as expressed by the <b>COBie.Space.UsableHeight</b> 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 Floors 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>	

470

471

472 **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	<b>Name</b>	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.	

473

474

DRAFT

475 **Table 8: Type**

DESCRIPTION	Represents information related to the different types of products and equipment in the Scope.	
STATUS	Required	
DATA FIELDS	<b>Name</b>	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>You may not simply 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). You must use the Attribute data table for this.</p>	

476

477

478 **Table 9 Component**

DESCRIPTION	The individual instances of the products and equipment define in the Type data table.	
STATUS	Required	
DATA FIELDS	<b>Name</b>	Space.Name
	Description	Space.SecondaryName
	SerialNumber	ExtSystem
	TagNumber	ExtObject
	BarCode	ExtIdentifier
	AssetIdentifier	InstallationDate
	Type.Name	WarrantyStartDate
CONSIDERATIONS		

479

480

481 **Table 10: System**

DESCRIPTION	Systems represent groupings of Components that provide some common function.	
STATUS	Required only If specified in the contract	
DATA FIELDS	<b>Name</b>	ExtSystem
	Description	ExtObject
	Category	ExtIdentifier
	PartOf	Component.Name
CONSIDERATIONS		

482

483



484 **Table 11: Resource**

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

485

486

487 **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 (scope).	
STATUS	Required only If specified in the contract	
DATA FIELDS	<b>Name</b>	ExtObject
	Description	ExtIdentifier
	TaskNumber	Duration
	Category	DurationUnit
	Status	Interval
	Table	IntervalUnit
	Table.Name	Priors
	PartOf	ResourceNames
	ExtSystem	
CONSIDERATIONS		

488

489

490 **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	<b>Name</b>	Table.Name
	Description	ExtSystem
	Category	ExtObject
	Company.Name	ExtIdentifier
	Job.Name	StartDate
	Table	EndDate
CONSIDERATIONS	This is a new data table for COBie v3.	

491

492

493 **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	<b>Name</b>	ExtSystem
	Description	ExtObject
	Category	ExtIdentifier
	Company.Name	StartDate
	Event.Name	EndDate
CONSIDERATIONS	This is a new data table for COBie v3.	

494

495

496 **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 Even though all the "Table" and "Table.Name" fields are shown as required, you are only required to populate at least one pair of these fields, but you have the option to populate up to all three pairs.  
 In other words, if you populate the "SpatialTable" and "SpatialTable.Name" pair of data fields, you don't need to populate the "PhysicalTable" and "PhysicalTable.Name" pair or the "ProcessTable" and "ProcessTable.Name" pair (though you have the option to do any combination of pairs).

497

498

499 **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	<b>Name</b>	ExtObject
	Description	ExtIdentifier
	Category	ApprovalBy
	Stage	Path
	Table	File
	Table.Name	Reference
	ExtSystem	
CONSIDERATIONS		

500

501 **Table 17: Attribute**

DESCRIPTION	Used to store custom data fields for the COBie deliverable.	
STATUS	Required only If specified in the contract	
DATA FIELDS	<b>Name</b>	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.	

502

503

504 **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	<b>Name</b>	ClockwiseRotation
	Category	ElevationalRotation
	Table	YawRotation
	Table.Name	RelativeTo
	CoordinateXAxis	ExtSystem
	CoordinateYAxis	ExtObject
	CoordinateZAxis	ExtIdentifier
CONSIDERATIONS	This information can be useful if a single Space contains multiple Components to help identify a particular one. For example, a light fixture in a large warehouse space.	

505

506

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507	<b>Table 19: Picklist</b>
	DESCRIPTION Includes lists of acceptable values for certain data fields.
	STATUS Required
	DATA FIELDS
	Attribute.Category Scope.Category
	Company.Category Scope.Type
	Coordinate.Category SpaceType.Category
	Coordinate.TableName System.Category
	Document.ApprovalBy Table
	Document.Category Type.AssetType
	Document.Stage Type.Category
	Event.Category Zone.Category
	Floor.Category Units.Area
	Job.Category Units.Currency
	Job.Status Units.Duration
	Package.Category Units.Linear
	Risk.Category Units.Volume
	Resource.Category Units.Weight
	Risk.Consequence
	Risk.LevelOfRisk
	Risk.Likelihood
	CONSIDERATIONS

508

509

510 **DATA FIELDS**

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

513

514 **Naming**

515 Data field names utilize the following naming conventions:

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

527

528 **Organization**

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

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

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

541

542

543 **Nomenclature**

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

548 **COBie.Type.Name**

549

550 **Default Value**

551 Data fields should not be left blank for a COBie deliverable. Instead, a value of "n/a" should be  
552 used (without the quotes).

553

554 **Pre-Determined Values**

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

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

563

564 **Custom Data Fields**

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

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

572

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**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 (a string of characters that can include letters, numbers, and punctuation)
- 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, the description, examples, and details regarding the organization and status.



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 <b>COBie.Company.Name</b> value.	T	n/a	Required (Reference)	ABC Corp.
AreaUnit	The units for area measurements in this COBie deliverable, referencing a <b>COBie.PickList.Units.Area</b> value.	T	n/a	Required (Reference)	Square Feet Square Meters
CurrencyUnit	The units for currency in this COBie deliverable, referencing a <b>COBie.PickList.Units.Currency</b> 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 <b>COBie.PickList.Units.Duration</b> value.	T	n/a	Required (Reference)	Month Year
LinearUnit	The units for linear measurements in this COBie deliverable, referencing a <b>COBie.PickList.Units.Linear</b> value.	T	n/a	Required (Reference)	Feet Meters
VolumeUnit	The units for volume measurements in this COBie deliverable, referencing a <b>COBie.PickList.Units.Volume</b> value.	T	n/a	Required (Reference)	Cubic Feet Cubic Meters
WeightUnit	The units for area measurements in this COBie deliverable, referencing a <b>COBie.PickList.Units.Weight</b> 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 <b>COBie.Company.Category</b> data field. This data field aligns with the values held in the <b>COBie.Picklist.Company.Category</b> data field.	T	n/a	Required	OmniClass Table 34 Uniclass Table Ro
ClassificationSystem.Scope	The classification system used for the <b>COBie.Scope.Category</b> data field. This data field aligns with the values held in the <b>COBie.Picklist.Scope.Category</b> data field.	T	n/a	Required	OmniClass Table 11 Uniclass Table En
ClassificationSystem.SpaceType	The classification system used for the <b>COBie.SpaceType.Category</b> data field. This data field aligns with the values held in the <b>COBie.Picklist.SpaceType.Category</b> data field.	T	n/a	Required	OmniClass Table 13 Uniclass Table SL
ClassificationSystem.Type	The classification system used for the <b>COBie.Type.Category</b> data field. This data field aligns with the values held in the <b>COBie.Picklist.Type.Category</b> data field	T	n/a	Required	OmniClass Table 23 Uniclass Table Pr
ClassificationSystem.System	The classification system used for the <b>COBie.System.Category</b> data field. This data field aligns with the values held in the <b>COBie.Picklist.System.Category</b> 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 <b>COBie.Picklist.Company.Category</b> data field.	T	Classification	If Specified (Reference)	34-10 11 Owner Ro_10_20_14 Client
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 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.	T	External	External	IfcSpace
ExtSystem	The name of the computer system generating the row 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

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SCOPE

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Scope for this COBie deliverable. This is the primary key for this data table and each value must be unique.	T	Identification	Required	Building 204 American Legion Bridge and its Associated 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 <b>COBie.Picklist.Scope.Type</b> data field.	T	Classification	Required (Reference)	Facility Project Site
Category	The classification for the Scope. This data field value comes from one of the values in <b>COBie.Picklist.Scope.Category</b> data field.	T	Classification	If Specified (Reference)	11-27 25 19 Office-Retail Building En_20_15_10 Multiple occupation office buildings
Address	The city or town address of the project in Scope.	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					



FLOOR

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Name	The name of the Floor.  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 Floor.	T	Identification	If Specified	First floor  n/a
Category	The classification for the Floor.  This data field value comes from one of the values in <b>COBie.Picklist.Floor.Category</b> data field.	T	Classification	Required (Reference)	Roof  Floor  Site
PartOf	A reference to another <b>COBie.Floor.Name</b> 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 floor structure. If allowable values are not specified by contract, the default value is measured as a relative value compared to the scope's datum.	R	Optional	If Specified	0  150  n/a
Height	The distance between the top of floor structure to bottom of structure above.  This is typically applicable to rows having the <b>COBie.Floor.Category</b> data field value of "Floor".	R	Optional	If Specified	96  150  n/a

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 <b>COBie.Picklist.SpaceType.Category</b> data field.	T	Classification	If Specified (Reference)	13-55 11 Office Spaces SL_20_15_27 Enclosed offices
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 Room 217
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 <b>COBie.SpaceType.Name</b> value).	T	Classification	Required (Reference)	Office, Medium
Floor.Name	A reference to an item from the Floor data table (a <b>COBie.Floor.Name</b> value).	T	Location	Required (Reference)	Level 1
PartOf	A reference to another <b>COBie.Space.Name</b> 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)	Work Area 500 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 <b>COBie.Instruction.AreaMeasurementStandard</b> value.	R	Optional	If Specified	415 n/a
NetArea	The usable space area as specified in the design contract and calculated by the identified <b>COBie.Instruction.AreaMeasurementStandard</b> value.	R	Optional	If Specified	325 n/a
UsableHeight	Distance from top of finished floor to bottom of ceiling. If there is no ceiling, then this value must match <b>COBie.Floor.Height</b> .	R	Optional	If Specified	120 n/a

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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 <b>COBie.Picklist.Zone.Category</b> data field.	T	Classification	If Specified (Reference)	Circulation Zone  Occupancy Zone
Space.Name	A reference to an item from the Space data table (a <b>COBie.Space.Name</b> value).	T	Location	Required (Reference)	1A01, 1A02, 1A03  2E16, 2E24
PartOf	A reference to another <b>COBie.Zone.Name</b> 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	Boiler Type 1 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 <b>COBie.Picklist.Type.Category</b> data field.	T	Classification	If Specified (Reference)	23-33 11 22 Electric Boilers Pr_60_60_08_27 Electric Boilers
AssetType	The type of asset. This data field value comes from one of the values in <b>COBie.Picklist.Type.AssetType</b> data field.	T	Classification	If Specified (Reference)	Fixed Moveable
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 <b>COBie.Company.Name</b> data field.	T	Required	If Specified (Reference)	ABC Corp.
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 <b>COBie.Company.Name</b> 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 n/a
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 <b>COBie.Company.Name</b> 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 n/a

## COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
WarrantyDurationUnit	<p>The unit of measure associated with values found in <b>COBie.Type.WarrantyDurationParts</b> and <b>COBie.Type.WarrantyDurationLabor</b>.</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 <b>COBie.Picklist.Units.Duration</b> 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 n/a
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 n/a
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 n/a
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 n/a



## 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	<p>5200</p> <p>n/a</p>
WarrantyDescription	A general description of the warranty for the asset.	T	Optional	If Specified	<p>3 years parts, 1 year labor</p> <p>n/a</p>

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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 <b>COBie.Type.Name</b> value).	T	Classification	Required (Reference)	Boiler Type 1 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 <b>COBie.Space.Name</b> value).</p>	T	Location	Required (Reference)	1A01 Room 217
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 <b>COBie.Space.Name</b> value).</p>	T	Location	If Specified (Reference)	1A01 Room 217
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 Fire Protection
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 <b>COBie.Picklist.System.Category</b> data field.	T	Classification	If Specified (Reference)	21-04 20 10 Domestic Water Distribution EF_55_70 Water supply
PartOf	A reference to another <b>COBie.System.Name</b> 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
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 <b>COBie.Component.Name</b> 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	Cleaning Materials  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 <b>COBie.Picklist.Resource.Category</b> 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>AHU Type 01 Annual Maintenance</p> <p>Boiler Type 1 Lock Out</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"> <li>1. A general description of the Job, with all steps outlined in an associated document.</li> <li>2. The complete set of all numbered steps. To assist CMMS/CAFM vendors, these steps should be delimited with a semi-colon.</li> <li>3. A description of one of several linked steps using the <b>COBie.Job.TaskNumber</b> and <b>COBie.Job.Priors</b> data fields.</li> </ol>	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 <b>COBie.Job.Description</b> contains a series of individual operations, this is the identification (non-zero integers) used to reference each step.</p> <p>If <b>COBie.Job.Description</b> contains a series of individual operations; this becomes the third part of the compound key, otherwise it is ignored.</p> <p>The first <b>COBie.Job.Description</b> 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 <b>COBie.Picklist.Job.Category</b> data field.</p>	T	Classification	Required (Reference)	<p>Inspection</p> <p>ShutDown</p>
Status	<p>The status of the Floor.</p> <p>This data field value comes from one of the values in <b>COBie.Picklist.Job.Status</b> data field.</p>	T	Classification	Required (Reference)	<p>Not Yet Started</p> <p>Completed</p>

## COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
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 row on the data table referenced in <b>COBie.Job.Table</b> data field.	T	Location	Required (Reference)	Window Replacement 2023 Missing Data Boiler Type 1 BLR1-6
PartOf	A reference to another <b>COBie.Job.Name</b> 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)	AHU Annual Maintenance
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 <b>COBie.Job.Duration</b> data field.  This data field value comes from one of the values in <b>COBie.Picklist.Unit.Duration</b> data field.	T	Required	Required (Reference)	Minute Hour
Interval	The planned time interval between occurrence events for this Job.	R	Required	Required	1 2

## COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
IntervalUnit	The unit of time associated with the <b>COBie.Job.Interval</b> data field.  This data field value comes from one of the values in <b>COBie.Picklist.Unit.Duration</b> data field.	T	Required	Required (Reference)	Year Month
Priors	The Tasks that must be completed before this Job.  If <b>COBie.Job.Description</b> contains a series of individual operations, this is a comma delimited list of the <b>COBie.Job.TaskNumber</b> 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 <b>COBie.Resource.Name</b> 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 2023-02-03
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 <b>COBie.Picklist.Event.Category</b> 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 <b>COBie.Company.Name</b> value).	T	Location	Required (Reference)	ABC Corp. XYZ Construction Company
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 <b>COBie.Job.Name</b> value).	T	Location	Required (Reference)	AHU Annual Maintenance Boiler Lock Out
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 row on the data table referenced in <b>COBie.Event.Table</b> data field.	T	Location	Required (Reference)	AHU Annual Maintenance Manufacturers Equipment Information-Boiler1
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
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

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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	Window Replacement 2023
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 <b>COBie.Picklist.Package.Category</b> data field.	T	Classification	If Specified (Reference)	22-01 93 13 – Facility Maintenance Procedures
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 <b>COBie.Company.Name</b> value).	T	Location	Required (Reference)	ABC Corp. XYZ Construction Company
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 <b>COBie.Event.Name</b> value).	T	Location	Required (Reference)	Lift inspection 2023-02-03 n/a
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	Missing Data 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 <b>COBie.Picklist.Risk.Category</b> 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 Scope, Space, or Zone data tables.	T	Location	If Specified (Reference)	Scope Space Zone
SpatialTable.Name	This is the data field of the SpatialData data table referenced. This value could be from the <b>COBie.Scope.Name</b> , <b>COBie.Space.Name</b> , or <b>COBie.Zone.Name</b> data fields.	T	Location	If Specified (Reference)	Building 204 1A01 Administration
PhysicalTable	This is a reference to another data table related to the location of this Risk. This value could be from the Scope, Type, Component, or System data tables.	T	Location	If Specified (Reference)	Scope Type
PhysicalTable.Name	This is the data field of the PhysicalData data table referenced. This value could be from the <b>COBie.Type.Name</b> or <b>COBie.Component.Name</b> data fields.	T	Location	If Specified (Reference)	Building 204 Boiler Type 1
ProcessTable	This is a reference to another data table related to the location of this Risk. This value could be from the Scope, Job, Event, or Package data tables.	T	Location	If Specified (Reference)	Scope Job

## COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
ProcessTable.Name	This is the data field of the ProcessData data table referenced. This value could be from the <b>COBie.Job.Name</b> or <b>COBie.Event.Name</b> data fields.	T	Location	If Specified (Reference)	Building 204 AHU Annual Maintenance
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 <b>COBie.Company.Name</b> 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 <b>COBie.Picklist.Risk.Consequence</b> 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 <b>COBie.Picklist.Risk.LevelOfRisk</b> 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 <b>COBie.Picklist.Risk.Likelihood</b> 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	Manufacturers Equipment Information-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 <b>COBie.Picklist.Document.Category</b> 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 <b>COBie.Picklist.Document.Stage</b> 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 row on the data table referenced in <b>COBie.Document.Table</b> data field.	T	Location	Required (Reference)	HVAC-01 Boiler Type 1
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 <b>COBie.Picklist.Document.ApprovalBy</b> 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"> <li>▪ Full file path (drive and folders)</li> <li>▪ Relative file path (folders)</li> <li>▪ Web URL</li> </ul> <p>This value may include the file name as well, in which case the <b>COBie.Document.File</b> data field will be "n/a".</p>	U	Required	Required	<p>X:\Folder\Subfolder\  <a href="https://www.abc.com/file.ext">https://www.abc.com/file.ext</a></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 <b>COBie.Document.Path</b> data field.</p>	T	Optional	If Specified	<p>123Main_Arch_R23.rvt            ComissioningReport.pdf            n/a</p>
Reference	<p>If different from the <b>COBie.Document.Path</b> and <b>COBie.Document.File</b> data fields, this is a reference to documents provided from manufacturers' catalogs or websites.</p>	T	Optional	If Specified	<p><a href="https://www.abc.com/doclibrary/">https://www.abc.com/doclibrary/</a>            n/a</p>

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	Fan Max Speed 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 <b>COBie.Picklist.Attribute.Category</b> 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 row on the data table referenced in <b>COBie.Attribute.Table</b> data field.	T	Location	Required (Reference)	Boiler Type 1 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



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 <b>COBie.Picklist.Coordinate.Category</b> data field.	T	Classification	Required (Reference)	Point Line-end-one
Table	Reference to another data table that can include: <b>COBie.Facility</b> , <b>COBie.Floor</b> , <b>COBie.Space</b> , <b>COBie.Type</b> , or <b>COBie.Coordinate</b> .	T	Location	Required (Reference)	Floor Space
Table.Name	The primary key (value in the "Name" data field) of the data row on the data table referenced in <b>COBie.Coordinate.Table</b> 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 <b>COBie.Coordinate.Name</b> 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 <b>COBie.Instruction.CoordinateSystemDescription</b> 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 your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Approved</li> <li>▪ As Built</li> <li>▪ Exact Requirement</li> <li>▪ Maximum Requirement</li> <li>▪ Minimum Requirement</li> <li>▪ Requirement</li> <li>▪ Submitted</li> </ul>
Coordinate.Category	The pre-determined values allowed for categorizing the coordinates in your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Point</li> <li>▪ Line-end-one</li> <li>▪ Line-end-two</li> <li>▪ Box-lowerleft</li> <li>▪ Box-upperright</li> </ul>
Coordinate.TableName	The pre-determined values allowed for assigning a data table to which the coordinates in your COBie deliverable apply.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Component</li> <li>▪ Floor</li> <li>▪ Space</li> </ul>
Document.ApprovalBy	The pre-determined values allowed for assigning an approver for the documents in your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Owner Approval</li> <li>▪ Contractor Certified</li> <li>▪ Information Only</li> </ul>

## COBie v3 Standard

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

## COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Floor.Category	The pre-determined values allowed for categorizing the floors in your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Floor</li> <li>▪ Roof</li> <li>▪ Site</li> </ul>
Job.Category	The pre-determined values allowed for categorizing the jobs in your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Adjustment</li> <li>▪ Calibration</li> <li>▪ Emergency</li> <li>▪ Inspection</li> <li>▪ Operation</li> <li>▪ Project Management</li> <li>▪ Safety</li> <li>▪ ShutDown</li> <li>▪ StartUp</li> <li>▪ Testing</li> <li>▪ Trouble</li> </ul>
Job.Status	The pre-determined values allowed for the status of your jobs in your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Not Yet Started</li> <li>▪ Started</li> <li>▪ Completed</li> </ul>
Package.Category	The pre-determined values allowed for the category of your packages in your 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.
Resource.Category	The pre-determined values allowed for categorizing the resources in your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Labor</li> <li>▪ Material</li> <li>▪ Tools</li> <li>▪ Training</li> </ul>

## COBie v3 Standard

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

## COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Scope.Type	The pre-determined values allowed for the scope type in your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Facility</li> <li>▪ Project</li> <li>▪ Site</li> </ul>
SpaceType.Category	The pre-determined values allowed for categorizing the space types in your 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 your 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"> <li>▪ Attribute</li> <li>▪ Company</li> <li>▪ Component</li> <li>▪ Coordinate</li> <li>▪ Document</li> <li>▪ Event</li> <li>▪ Facility</li> <li>▪ Floor</li> <li>▪ Job</li> <li>▪ Package</li> <li>▪ Resource</li> <li>▪ Risk</li> <li>▪ Space</li> <li>▪ SpaceType</li> <li>▪ System</li> <li>▪ Type</li> <li>▪ Zone</li> </ul>
Type.AssetType	The pre-determined values allowed for designating the type of asset each component type is in your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Fixed</li> <li>▪ Moveable</li> </ul>



## COBie v3 Standard

DATA FIELD	DESCRIPTION	TYPE	ORGANIZATION	STATUS	EXAMPLES
Type.Category	The pre-determined values allowed for categorizing the component types in your 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 your COBie deliverable.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Circulation Zone</li> <li>▪ Fire Alarm Zone</li> <li>▪ Historical Preservation Zone</li> <li>▪ Lighting Zone</li> <li>▪ Occupancy Zone</li> <li>▪ Ventilation Zone</li> </ul>
Units.Area	The pre-determined values allowed for data fields that represent area measurements.  The overall value is captured in the <b>COBie.Instruction.AreaUnit</b> data field.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ Square Inches</li> <li>▪ Square Feet</li> <li>▪ Square Miles</li> <li>▪ Square Millimeters</li> <li>▪ Square Meters</li> <li>▪ Square Kilometers</li> </ul>
Units.Currency	The pre-determined values allowed for data fields that represent currency.  The overall value is captured in the <b>COBie.Instruction.CurrencyUnit</b> 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 <b>COBie.Instruction.DurationUnit</b> data field.	T	n/a	If Specified	Only the following values are allowed: <ul style="list-style-type: none"> <li>▪ As required</li> <li>▪ Day</li> <li>▪ Minute</li> <li>▪ Month</li> <li>▪ Quarter</li> <li>▪ Week</li> <li>▪ Year</li> </ul>

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

## 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)	<a href="https://www.nibs.org/">https://www.nibs.org/</a>
2	The National BIM Standard-United States® (NBIMS-US™)	<a href="https://www.nationalbimstandard.org/">https://www.nationalbimstandard.org/</a>
2	buildingSMART USA – Model View Definitions (MVD)	<a href="https://www.buildingsmartusa.org/standards/bsi-standards/model-view-definitions-mvd/">https://www.buildingsmartusa.org/standards/bsi-standards/model-view-definitions-mvd/</a>

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## 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.

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## 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	Scope	IfcProject IfcSite IfcFacility, IfcBuilding, IfcBridge IfcRail, IfcRoad, IfcTunnel (IFC4.4)	(ifc2x3: IfcBuilding)
4	Floor	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[*]	Scope
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, Scope, Floor, 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, Scope, Floor, 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	Scope Floor
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
Floor.Category	(see IFC Table A)	PickList
Floor.Name	IfcRelDecomposes	Space
GrossArea	GrossFloorArea	Space
Height	GrossHeight	Floor
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	Scope
LevelOfRisk	MitigatedRiskSignificance	Risk
Likelihood	MitigatedRiskLikelihood	Risk
LinearUnit	Units	Instruction
Longitude	Longitude	Scope
Manufacturer	Manufacturer	Type
Milestone	Phase	Instruction

FIELD	IFC	NOTES (See IFC Table A)
Mitigation	MitigationPlanned	Risk
ModelNumber	ModelLabel	Type
ModelReference	ModelReference	Type
Name	Name RiskName	<i>All but Instruction, PickList and Risk</i> 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	Floor, 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
Scope.Category	(see IFC Table A)	PickList
Scope.Type	(see IFC Table A)	PickList
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)	Scope
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

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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.

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## 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.

### Scope Table

- **COBie.Scope.Latitude**, **COBie.Scope.Longitude**, and **COBie.Scope.Elevation** should be numeric as this assumes a +/- real number as used by GPS.
- Minimum and maximum constraints have been added to **COBie.Scope.Latitude** and **COBie.Scope.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",
    "Scope",
    "Floor",
    "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.Scope",
    "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_Scope": {
    "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 inc.",
            "www.abc.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"
  }
}
},
"Scope": {
  "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 Scope 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.Scope.Type data field.",
  "examples": [
    "Facility",
    "Project",
    "Site"
  ]
},
"Categories": {
  "type": "string",
  "description": "The classification for the Scope. This data field value comes
from one of the values in COBie.Picklist.Scope.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 Scope.",
  "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"
  }
},
"Floor": {
  "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 Floor.",
          "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 Floor.",
      "examples": [
        "3rd floor area plan"
      ]
    }
  ],
  "Category": {

```

```

        "type": "string",
        "enum": [
            "Roof",
            "Floor",
            "Site"
        ],
        "description": "The classification for the Floor. This data field
value comes from one of the values in COBie.Picklist.Floor.Category data field.",
        "examples": [
            "Roof",
            "Floor",
            "Site"
        ]
    },
    "PartOf": {
        "type": "string",
        "format": "json-pointer",
        "description": "A json-pointer reference to another Floor 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 floor structure. If
allowable values are not specified by contract, the default value is measured as a relative value
compared to the scope's datum.",
      "examples": [
        354,
        14,
        115,
        5
      ]
    },
    "Height": {
      "type": "number",
      "description": "The distance between the top of floor 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 Floors in COBie and
which have common functional purpose and user.",
    "items": [
        {
            "type": "object",
            "required": [
                "Name",
                "Description",
                "Floor_Ref"
            ],
            "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.",
      "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."
  },
  "Floor_Ref": {
    "type": "string",
    "format": "json-pointer",
    "description": "A json-pointer reference to an item from the floor
data table."
  },
  "PartOf": {
    "type": "string",
    "format": "json-pointer",
    "description": "A json-pointer reference to another Floor 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 floor to bottom of
ceiling. If there is no ceiling, then this value must match COBie.Floor.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",

```

```

COBie data.",
    "description": "The name of the computer system generating the row of
    "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 Scope.",
    "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",

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        "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": [

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```

        "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",
    "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",
        "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",
                    "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",

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```

        "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 (scope).",
    "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 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 (scope).",
  "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",
        "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 reusbale 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": [
      "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",

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        "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."
},
"Interval": {
    "type": "string"
},
"IntervalUnit": {
    "type": "string",
    "enum": [
        "As required",
        "Day",
        "Minute",
        "Month",
        "Quarter",
        "Week",
        "Year"
    ]
},
},
"Priors": {
    "type": "string"
},
"Resource_Ref": {
    "type": "array",
    "minItems": 1,

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        "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": "This is the primary key for this data table and each
must 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": [
        "/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": [
        [

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        "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 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"
}
}

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    },
    "additionalProperties": {
      "type": "string"
    }
  }
]
},
"Package": {
  "type": "array",
  "description": "Includes information about the legal contract that required the COBie
deliverable.",
  "items": [
    {
      "type": "object",
      "required": [
        "Name",
        "Description",
        "StartDate"
      ],
      "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"
          ]
        }
      }
    }
  ],
}

```



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"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"
  ]
},
"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"
}

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    }
  },
  "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": [
    {
      "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",

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        "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": [

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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"
    ]
},
"Company_Ref": {
    "type": "string",
    "format": "json-pointer",
    "examples": [
        "/Company/3"
    ]
},
"Consequence": {
    "type": "string",
    "enum": [
        "Very High",
        "High",
        "Moderate",
        "Low",
        "Unknown"
    ]
},
"LevelOfRisk": {
    "type": "string",

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        "enum": [
            "Very High",
            "High",
            "Moderate",
            "Low",
            "Unknown"
        ]
    },
    "Likelihood": {
        "type": "string",
        "enum": [
            "Has Occurred",
            "High",
            "Moderate",
            "Low",
            "Unknown"
        ]
    },
    "Mitigation": {
        "type": "string"
    }
},
"additionalProperties": {
    "type": "string"
}
}
]
},
"Document": {
    "type": "array",
    "description": "Document records identify external files that provide information associated with data in a COBie deliverable.",
    "items": [
        {
            "type": "object",
            "required": [
                "Name",
                "Description",
                "Table_Ref",
                "ApprovalBy",
                "Path"
            ]
        }
    ]
}

```

```

    ],
    "properties": {
      "Name": {
        "type": "string",
        "title": "The name of the Document.",
        "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 Document."
      },
      "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": {

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        "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": "This is the primary key for this data table and each
must be unique."
                },
                "Description": {

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        "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": [
        "123",
        "1200.56"
      ]
    },
    "Unit": {
      "type": "string",
      "examples": [
        "meter"
      ]
    },
    "AllowedValues": {
      "type": "string",
      "description": "A comma delimited list of one or more allowed values
for the \"Value\" data field of a particular item on the \"Attribute\" data table.",
      "examples": [
        "Inlet, Outlet",
        "5kVA, 10kVA, 15kVA",
        "Fixed, Variable",
        "n/a"
      ]
    },
    "additionalProperties": {
      "type": "string"
    }
  ]
},
"Coordinate": {
  "type": "array",
  "description": "Represents the simple geometric information associated with data in a
COBie deliverable.",
  "items": [
    {
      "type": "object",
      "required": [
        "Name",

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    "Table_Ref",
    "CoordinateXAxis",
    "CoordinateYAxis",
    "CoordinateZAxis",
    "ClockwiseRotation",
    "ElevationalRotation",
    "YawRotation"
  ],
  "properties": {
    "Name": {
      "type": "string",
      "title": "The name of the Coordinate.",
      "description": "This is the primary key for this data table and each
must 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"  
  }  
}  
]  
}  
}
```

DRAFT

## 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 "Facility" data table with "Scope" 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><b>New Terminology</b></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><b>PartOf</b></p> <p>Added new "PartOf" data field to data tables that would benefit. This includes:</p> <ul style="list-style-type: none"> <li>▪ Floor</li> <li>▪ Space</li> <li>▪ Zone</li> <li>▪ System</li> <li>▪ Job</li> </ul> <p>Because the value in this data field is a reference to other rows in the data table, it will be color coded as orange.</p>	<p>Allows for relationships between rows in a data table, so that some rows 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><b>CreatedBy and CreatedOn</b></p> <p>Removed the "CreatedBy" and "CreatedOn" fields from all data tables.</p>	<p>These data fields can violate privacy laws such as GDPR and are not necessary for every row 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><b>JSON</b></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>
00.13	<p><b>Classification System</b></p> <p>Added a data field on the Instruction data table to identify the standard classification systems used.</p>	<p>No data field in previous version to hold this information.</p>

ID	CHANGE	REASONING
00.14	<p><b>Table and Table.Name</b></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"> <li>▪ "SheetName" now becomes "Table"</li> <li>▪ "RowName" now becomes "Table.Name"</li> </ul>	Provides consistency by standardizing the naming of data fields that reference other data tables.
00.15	<p><b>Reorganized Fields</b></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"> <li>▪ <u>Identification</u> – data fields that identify the asset defined in the row (such as "Name" and "Description").</li> <li>▪ <u>Classification</u> – data fields that classify the asset defined in the row (such as "Type" and "Category").</li> <li>▪ <u>Location</u> – data fields that define the location of the asset defined in the row (such as the name of the Floor or the Space and the "PartOf" field).</li> <li>▪ <u>External</u> – data fields that represent external data, as color coded by purple.</li> <li>▪ <u>Required</u> – data fields that are required to contain a value for all COBie submittals, as color coded in yellow.</li> <li>▪ <u>Optional</u> – data fields that are only required to contain a value if specified in the contract, as color coded in green.</li> </ul>	Provides a consistent organization of the data fields across all data tables.
00.16	<p><b>Additional Statuses</b></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> <li>▪ If specified as required (reference to other data field), which adds a new blue color coding</li> </ul>	Previous version was confusing whether or not reference data fields were always required or only required if specified in the contract.



### 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.

	v2.4	v3	
1	Instruction	Instruction	1
2	Contact	<i>Company</i>	2
3	Facility	<i>Scope</i>	3
4	Floor	Floor	4
		<i>SpaceType</i>	21
5	Space	Space	5
6	Zone	Zone	6
7	Type	Type	7
8	Component	Component	8
9	System	System	9
10	Assembly		
11	Connection		
12	Spare		
13	Resource	Resource	13
14	Job	Job	14
		<i>Event</i>	22
		<i>Package</i>	23
15	Impact		
16	Document	Document	16
17	Attribute	Attribute	17
18	Coordinate	Coordinate	18
19	Issue	<i>Risk</i>	19
20	PickLists	PickLists	20

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	<b>Title Block</b>	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"> <li>▪ Time and date (“ExportDateTime”) to replace the removed “CreatedOn” data field</li> <li>▪ A new data field to describe the “Milestone”</li> <li>▪ 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)</li> <li>▪ 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</li> <li>▪ The area measurement data field was relocated here and renamed to “AreaMeasurementStandard”</li> <li>▪ Two new data fields to define the coordinate system description and origin</li> <li>▪ Five new data fields to define the classification systems used in the submission, one for each corresponding data table (Company, Scope, SpaceType, Type, and System)</li> </ul>	

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

**v2.4**

Version	COBie2.4
Region	en-US
Purpose	

**v3**

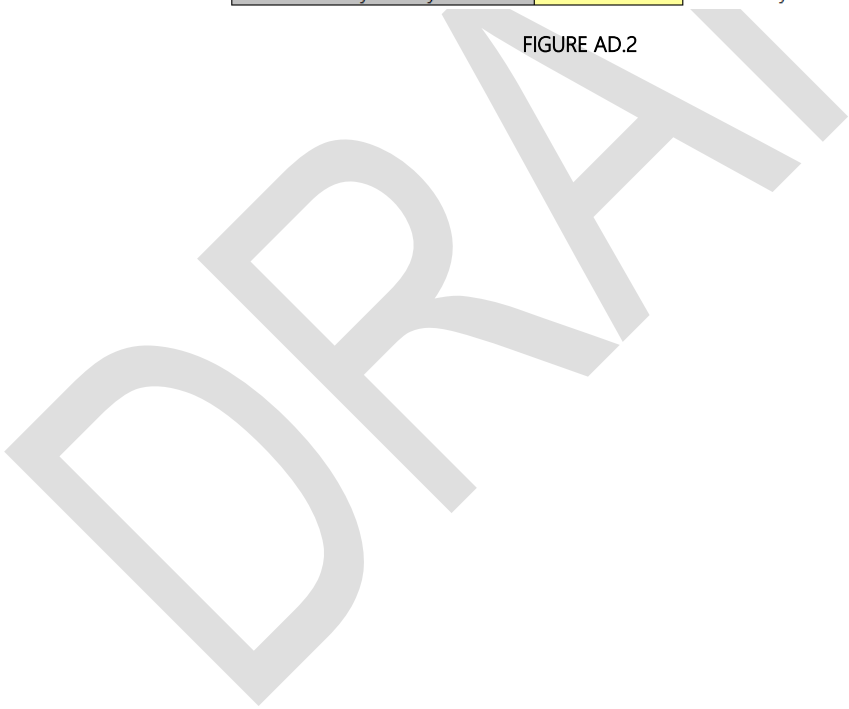
Title	COBie
Version	3
Release	1
Status	IFC4
Region	
ExportDateTime	
Milestone	
OriginatingCompany	
AreaUnit	
CurrencyUnit	
DurationUnit	
LinearUnit	
VolumeUnit	
WeightUnit	
AreaMeasurementStandard	
CoordinateSystemDescription	
CoordinateSystemOrigin	
ClassificationSystem.Company	
ClassificationSystem.Scope	
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	<b>Data Table Name Change</b> Name was changed from "Contact" to "Company".	This avoids violating personal privacy laws such as GDPR.
02.02	<b>Data Fields Renamed</b> Renamed "Email" to "Name".	This avoids violating personal privacy laws such as GDPR.
02.01 02.03	<b>Data Fields Removed</b> Removed the "Company", "GivenName", and "FamilyName" data fields.	Company is redundant. This avoids violating personal privacy laws such as GDPR.
02.04	<b>Data Fields Added</b> 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 only 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
26.01	<b>Data Table Name Change</b> Name was changed from "Facility" to "Scope".	To allow for more flexibility with project types, such as infrastructure projects.
03.05 03.06	<b>New Location Data Fields</b> Added data fields for "Address", "Latitude", "Longitude", and "Elevation".	To allow more accurate location of the project.
26.01	<b>New Type Data Field</b> 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	<b>Unit Data Fields Relocated</b> 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 only shown to better understand the new organization of the data fields.

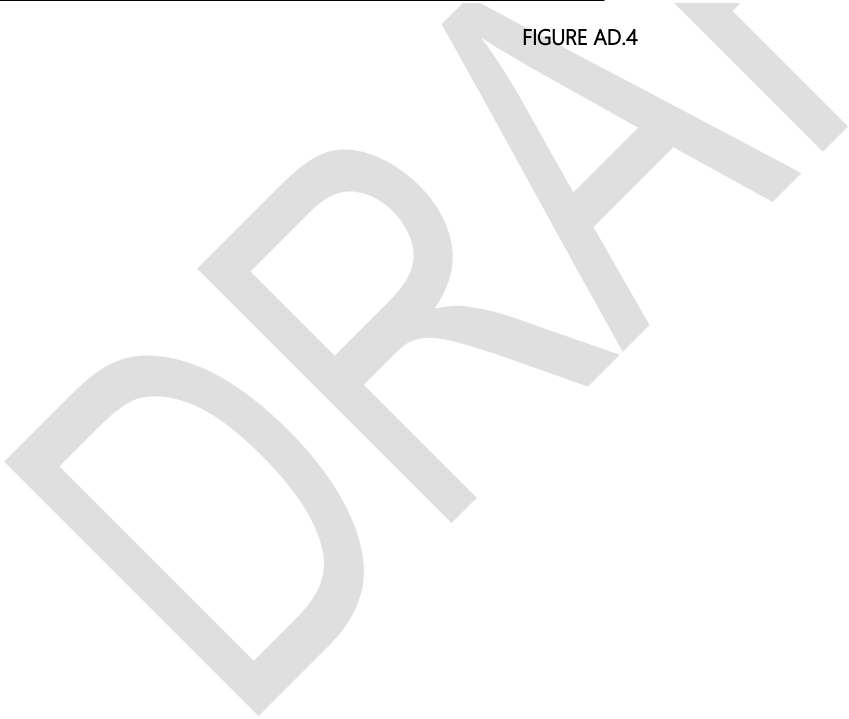
**v2.4**

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
00.08	<p><b>PartOf</b></p> <p>Added new "PartOf" data field as a reference to other rows in the data table, it will be color coded as orange.</p>	<p>Allows for relationships between rows in a data table, so that some rows may be a part of another.</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 only 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	<b>New Space Type Data Field</b> 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	<b>Data Fields Renamed</b> Renamed the "FloorName" data field to "Floor.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	<b>PartOf</b> Added new "PartOf" data field as a reference to other rows in the data table, it will be color coded as orange.	Allows for relationships between rows in a data table, so that some rows 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 only shown to better understand the new organization of the data fields.

**v2.4**

Name	CreatedBy	CreatedOn	Category	FloorName	Description	ExtSystem	ExtObject	ExtIdentifier	RoomTag	UsableHeight	GrossArea	NetArea

**v3**

IDENTIFICATION			CLASS	LOCATION		EXTERNAL			OPTIONAL		
Name	Description	RoomTag	SpaceType.Name	Floor.Name	PartOf	ExtSystem	ExtObject	ExtIdentifier	GrossArea	NetArea	UsableHeight

FIGURE AD.6



**TABLE 6: ZONE**

ID	CHANGE	REASONING
06.01 00.14	<b>Data Fields Renamed</b> Renamed the "SpaceNames" data field to "Space.Name".	To align with the new naming convention.
00.08	<b>PartOf</b> Added new "PartOf" data field as a reference to other rows in the data table, it will be color coded as orange.	Allows for relationships between rows in a data table, so that some rows 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 only 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><b>Documentation Updated</b></p> <p>Documentation will provide a better explanation of how to populate the "NominalLength", "NominalWidth", and "NominalHeight" data fields.</p>	It is often confusing to know what value to put in these data fields.
07.04 07.09	<p><b>Unit Data Fields Relocated</b></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>	Consolidates units and standard classifications into the new "Title Block" area.
07.08	<p><b>New Weight Data Field</b></p> <p>Added a new "NominalWeight" field. <b>Need better descriptions for how all "Nominal" fields are measured</b> field.</p>	This information can be important for assets.
07.10 thru 07.20	<p><b>Data Fields Removed</b></p> <p>Removed data fields that are not often used:</p> <ul style="list-style-type: none"> <li>▪ "Shape"</li> <li>▪ "Size"</li> <li>▪ "Color"</li> <li>▪ "Finish"</li> <li>▪ "Grade"</li> <li>▪ "Material"</li> <li>▪ "Constituents"</li> <li>▪ "Features"</li> <li>▪ "AccessibilityPerformance"</li> <li>▪ "CodePerformance"</li> <li>▪ "SustainabilityPerformance"</li> </ul>	To simplify the standard and remove data fields that are rarely used.

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 only shown to better understand the new organization of the data fields.

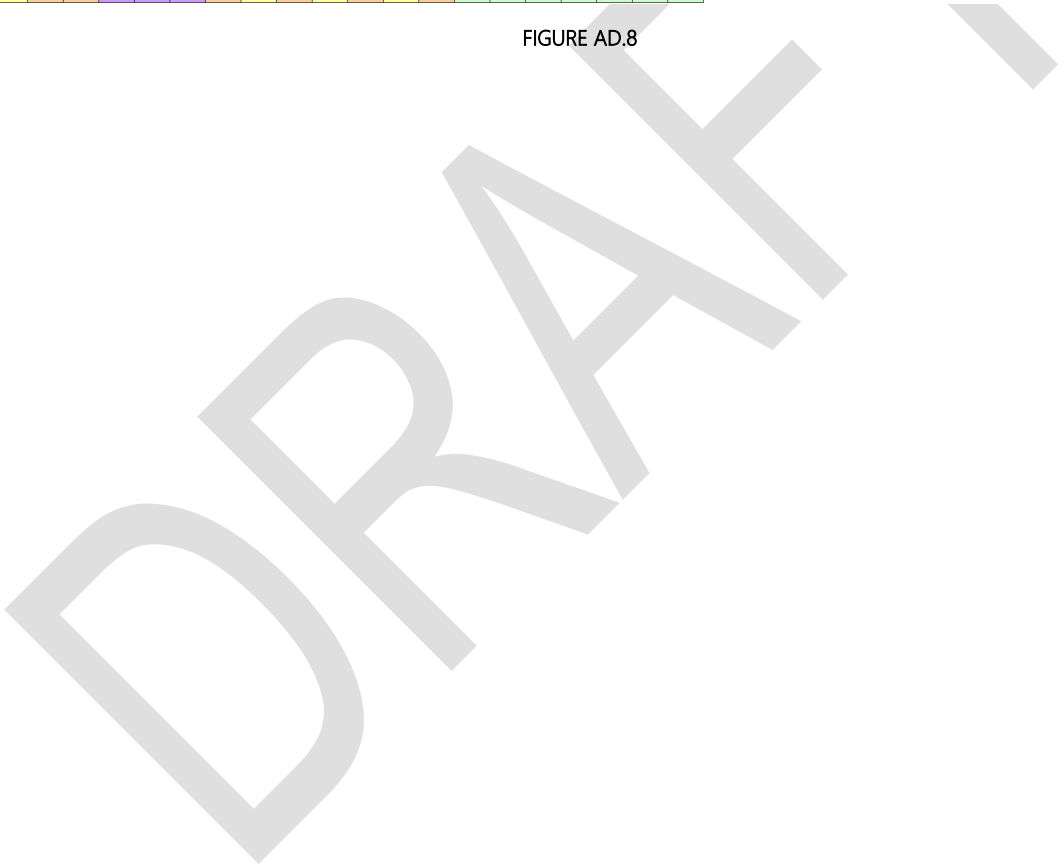
**v2.4**

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	<b>Data Fields Renamed</b> 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	<b>Data Fields Added</b> 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 only 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	<b>Data Fields Renamed</b> Renamed the "ComponentNames" data field to "Component.Name".	To align with the new naming convention.
00.08	<b>PartOf</b> Added new "PartOf" data field as a reference to other rows in the data table, it will be color coded as orange.	Allows for relationships between rows in a data table, so that some rows 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 only 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><b>Data Table Removed</b></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><b>Data Table Removed</b></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><b>Data Table Removed</b></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, aside from 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 only 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	<b>Data Fields Renamed</b> Renamed "Frequency" to "Interval" and "FrequencyUnit" to "IntervalUnit".	To better describe when the job takes place.
14.01 14.04	<b>Data Fields Removed</b> 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	<b>Data Fields Added</b> Added a new "Table" and "Table.Name" data fields.	To reference other rows 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 only 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><b>Data Table Removed</b></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	<b>Data Fields Renamed</b>	<p>To align with the new naming convention.</p> <p>Update to better reflect modern terminology.</p>
16.02	Renamed "SheetName" to "Table" and "RowName" to	
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 only 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 only 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	<p><b>Data Fields Renamed</b></p> <p>Renamed "SheetName" to "Table" and "RowName" to "Table.Name".</p>	To align with the new naming convention.
18.03	<p><b>Data Fields Added</b></p> <p>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.</p>	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 only 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	ElevationalRotation	YawRotation

**v3**

IDEN	CLASS	LOCATION							EXTERNAL				
Name	Category	Table	Table.Name	CoordinateXAxis	CoordinateYAxis	CoordinateZAxis	ClockwiseRotation	ElevationalRotation	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	<b>Data Table Name Change</b>  Name was changed from "Issue" to "Risk".	Better describes the purpose of this data table.
27.01	<b>Data Fields Removed</b>  Removed the following data fields: <ul style="list-style-type: none"> <li>▪ "Type"</li> <li>▪ "Risk"</li> <li>▪ "Chance"</li> <li>▪ "Impact"</li> <li>▪ "SheetName1"</li> <li>▪ "RowName1"</li> <li>▪ "SheetName2"</li> <li>▪ "RowName2"</li> <li>▪ "Description"</li> <li>▪ "Owner"</li> </ul>	To better align with the purpose of this data table, which is to track the risks of a job or event.
27.01	<b>Data Fields Added</b>  Added the following data fields: <ul style="list-style-type: none"> <li>▪ "Category"</li> <li>▪ "SpatialTable"</li> <li>▪ "SpatialTable.Name"</li> <li>▪ "PhysicalTable"</li> <li>▪ "PhysicalTable.Name"</li> <li>▪ "ProcessTable"</li> <li>▪ "ProcessTable.Name"</li> <li>▪ "Description"</li> <li>▪ "Mitigation"</li> <li>▪ "Likelihood"</li> <li>▪ "Consequence"</li> <li>▪ "LevelOfRisk"</li> <li>▪ "Company.Name"</li> </ul>	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 only 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 have this data table align 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><b>New Data Field Names</b></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 "Floor.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>	This makes it much easier to identify the picklist values for a particular data field on a particular data table.
20.01	<p><b>OBJ Data Fields Removed</b></p> <p>All 20 data fields beginning with "obj" have been removed.</p>	To simplify the deliverable, as these data fields were not often used
20.01	<p><b>Data Fields Removed</b></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"> <li>▪ "Assembly-AssemblyType"</li> <li>▪ "Category-Connection"</li> <li>▪ "Category-Impact"</li> <li>▪ "Category-Issue"</li> <li>▪ "Category-Spare"</li> <li>▪ "Impact-ImpactStage"</li> <li>▪ "SheetName-Assembly"</li> <li>▪ "Units-Impact"</li> </ul>	These data fields are no longer necessary.
20.01	<p><b>Data Fields Optional</b></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>	To help make it clearer that not all picklists are required.

ID	CHANGE	REASONING
24.01	<b>Data Fields Added</b>	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"><li>▪ "Attribute.Category"</li><li>▪ "Event.Category"</li><li>▪ "Package.Category"</li><li>▪ "Scope.Type"</li><li>▪ "Units.Weight"</li></ul>	

DRAFT

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 only 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	Scope.Category
Company.Category	Scope.Type
Coordinate.Category	SpaceType.Category
Coordinate.TabletName	System.Category
Document.ApprovalBy	Table
Document.Category	Type.AssetType
Document.Stage	Type.Category
Event.Category	Zone.Category
Floor.Category	Units.Area
Job.Category	Units.Currency
Job.Status	Units.Duration
Package.Category	Units.Linear
Resource.Category	Units.Volume
Risk.Category	Units.Weight
Risk.Consequence	
Risk.LevelORisk	
Risk.Likelihood	

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><b>New Data Table</b></p> <p>This data table will contain six new data fields:</p> <ul style="list-style-type: none"> <li>▪ "Name"</li> <li>▪ "Description"</li> <li>▪ "Category"</li> <li>▪ "ExtSystem"</li> <li>▪ "ExtObject"</li> <li>▪ "ExtIdentifier"</li> </ul> <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 only 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 your facility. An event is a component or an instance of a Job (existing data table).

ID	CHANGE	REASONING
24.01	<p><b>New Data Table</b></p> <p>This data table will contain 12 new data fields:</p> <ul style="list-style-type: none"> <li>▪ "Name"</li> <li>▪ "Company.Name"</li> <li>▪ "Category"</li> <li>▪ "Description"</li> <li>▪ "Job.Name"</li> <li>▪ "StartDate"</li> <li>▪ "EndDate"</li> <li>▪ "Table"</li> <li>▪ "Table.Name"</li> <li>▪ "ExtSystem"</li> <li>▪ "ExtObject"</li> <li>▪ "ExtIdentifier"</li> </ul> <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 only 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><b>New Data Table</b></p> <p>This data table will contain ten new data fields:</p> <ul style="list-style-type: none"> <li>▪ "Name"</li> <li>▪ "Company.Name"</li> <li>▪ "Category"</li> <li>▪ "Description"</li> <li>▪ "Event.Name"</li> <li>▪ "StartDate"</li> <li>▪ "EndDate"</li> <li>▪ "ExtSystem"</li> <li>▪ "ExtObject"</li> <li>▪ "ExtIdentifier"</li> </ul> <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 only 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