

CIMを用いた維持管理 -COBie入門-

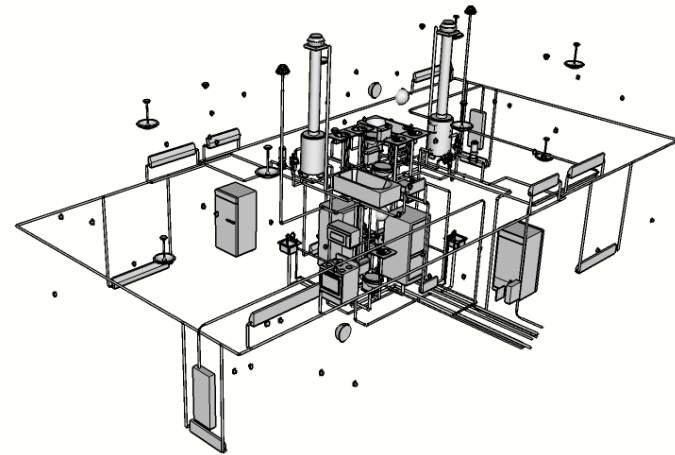
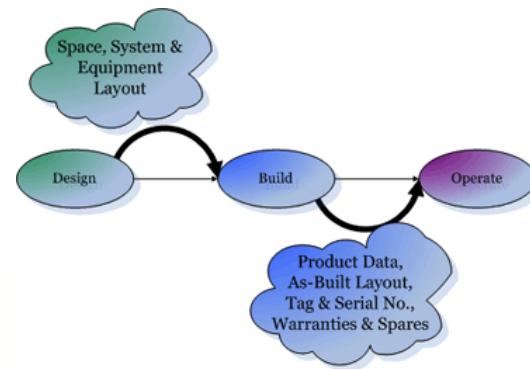
COBie入門

IAI日本 土木分科会
株式会社コンポート 有賀貴志

2015年5月27日（水） 13：25～17：00
オートデスク株式会社 セミナールーム

目的:COBieとIFCの関係を理解する

- COBieとは
- 情報源
- 技術文書
- 仕様
- 事例
- まとめ



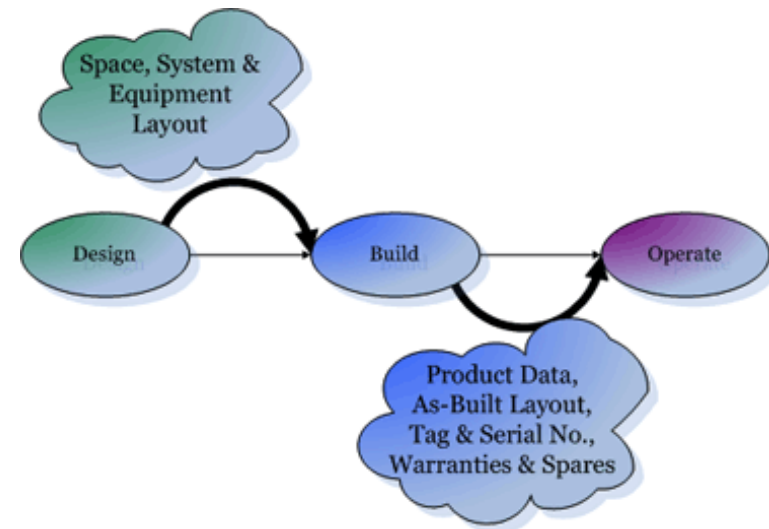
COBie

Construction Operations Building information exchange

COBieとは（２）

4

- COBieは、ライフサイクルの保存およびファシリティーマネージャーに必要とされる情報の伝達のための**情報交換**仕様.
- COBieは設計, 施工および維持管理のソフトウェアだけではなく, シンプルなスプレッドシートで見ることができる.
- COBieの多用途性は, 技術的に高度な知識や情報のサイズを気にすることなく, 様々なプロジェクトで使用することを可能としている.



COBieとは（３）

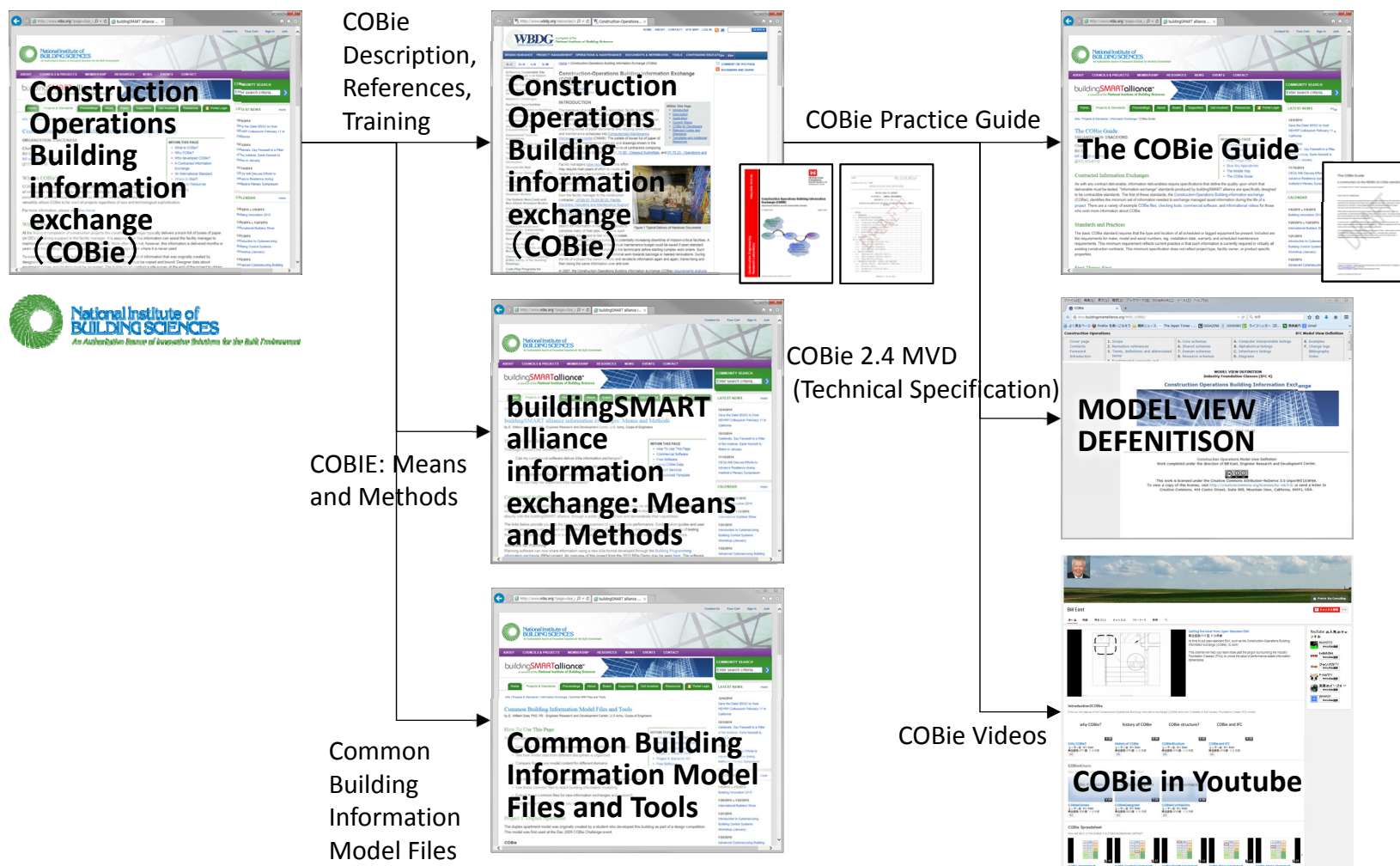
5

- 2005年、アメリカ航空宇宙局（NASA）とアメリカ合衆国科学技術政策局（OSTP）がプロジェクトの開始に際しての助成金を交付.
- アメリカ建築科学会（NIBS）の施設管理および運用委員会は、operations handoverにおける施工中に必要な情報交換のための要求事項を確認するために、設計者、施工者、所有者、管理者およびソフトウェアベンダーを代表するプロジェクトチームを組織.
- 2005年から2009年にかけて、COBieは全世界規模の商用ソフトウェアに実装され、国際的に認知された標準に成長.
- COBieのプロジェクトは、アメリカ陸軍工兵隊の工学研究開発センター（ERDC）が牽引している.



主要な組織

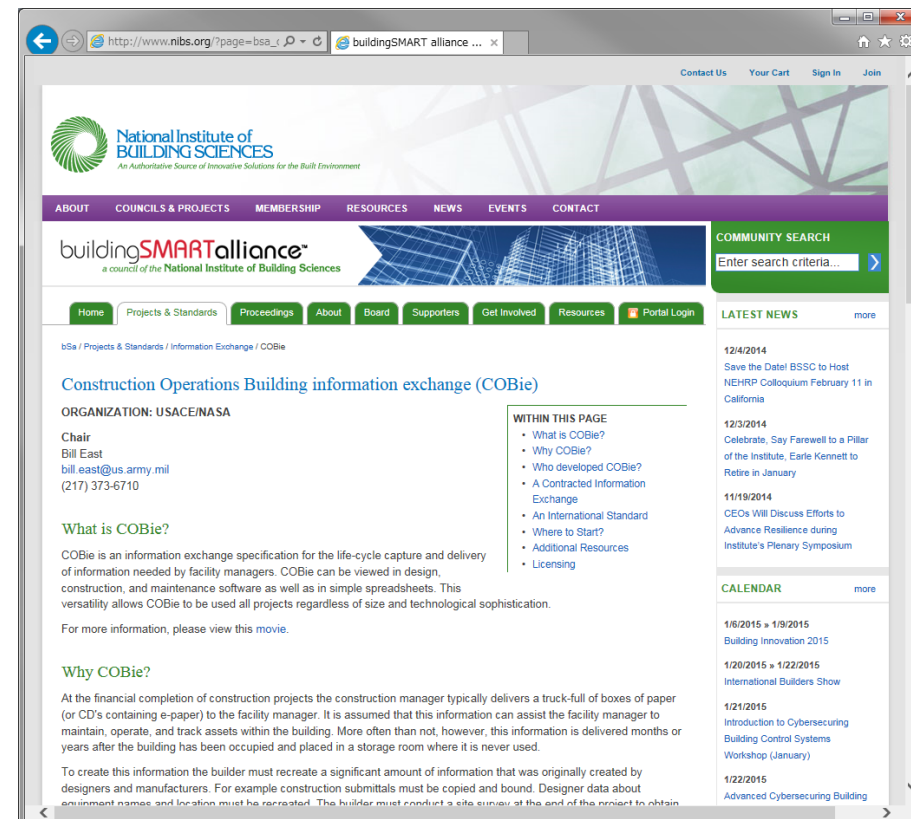
- National Institute of Building Sciences
- Whole Building Design Guide
- buildingSMART alliance
- Unified Facilities Guide Specification
- Engineering Research and Development Center
 - U.S. Army Corps of Engineers
- British Standard Institute



Construction Operations Building information exchange (COBie)

- What is COBie?
- Why COBie?
- Who developed COBie?
- A Contracted Information Exchange
- An International Standard
- Where to Start?
- Additional Resources
- Licensing

★COBieの概要



http://www.nibs.org/?page=bsa_cobie

Construction Operations Building Information Exchange (COBie)

- Introduction
- Description
- Application
- Current Status
- COBie for Developers
- Relevant Codes and Standards
- Templates and Additional Resources

★COBieの詳細

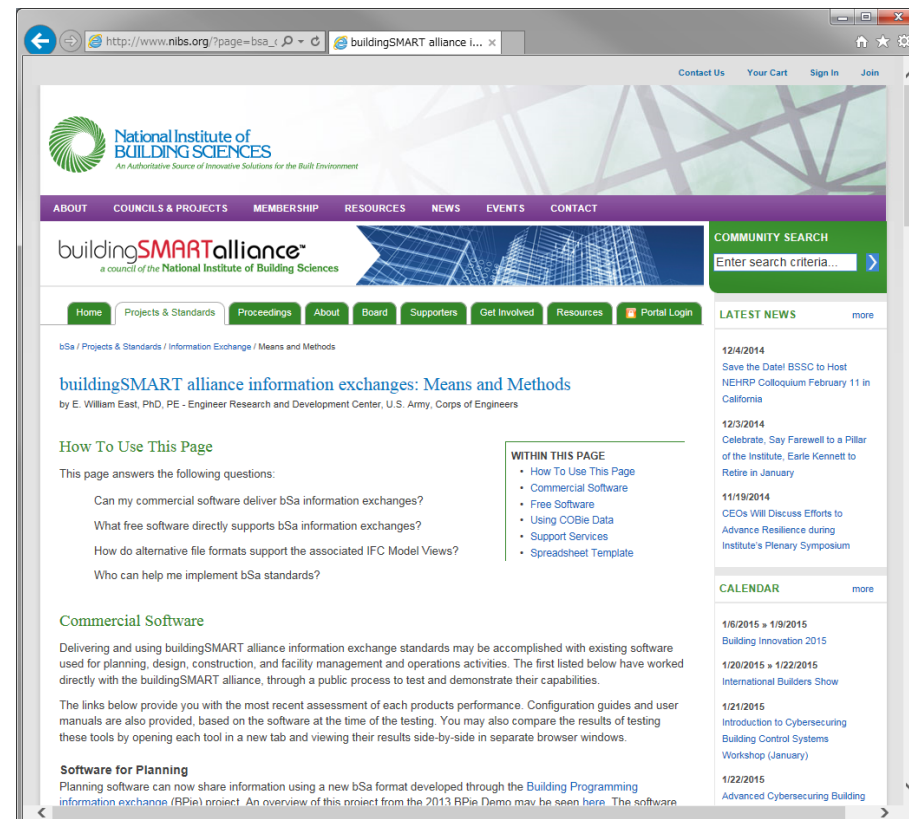


<http://www.wbdg.org/resources/cobie.php>

buildingSMART alliance information exchange: Means and Methods

- How To Use This Page
- Commercial Software
- Free Software
- Using COBie Data
- Support Services
- Spreadsheet Template

★COBieの使い方やテンプレート

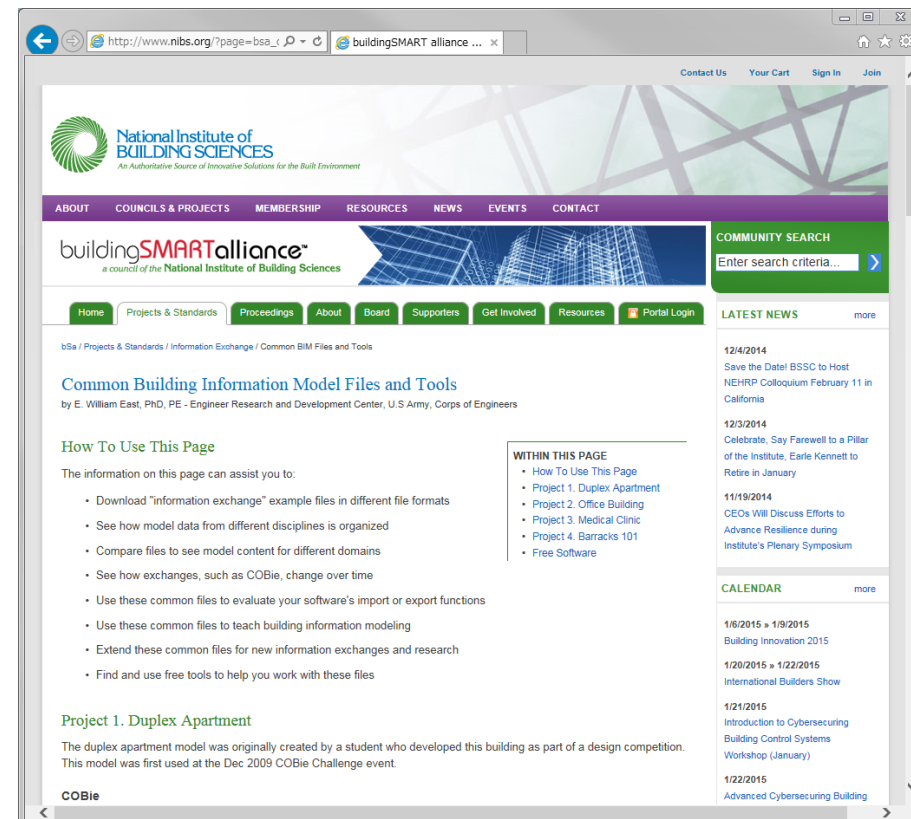


http://www.nibs.org/?page=bsa_cobiemmm

Common Building Information Model Files and Tools

- How To Use This Page
- Project 1. Duplex Apartment
- Project 2. Office Building
- Project 3. Medical Clinic
- Project 4. Barracks 101
- Free Software

★COBieの事例とフリーソフト

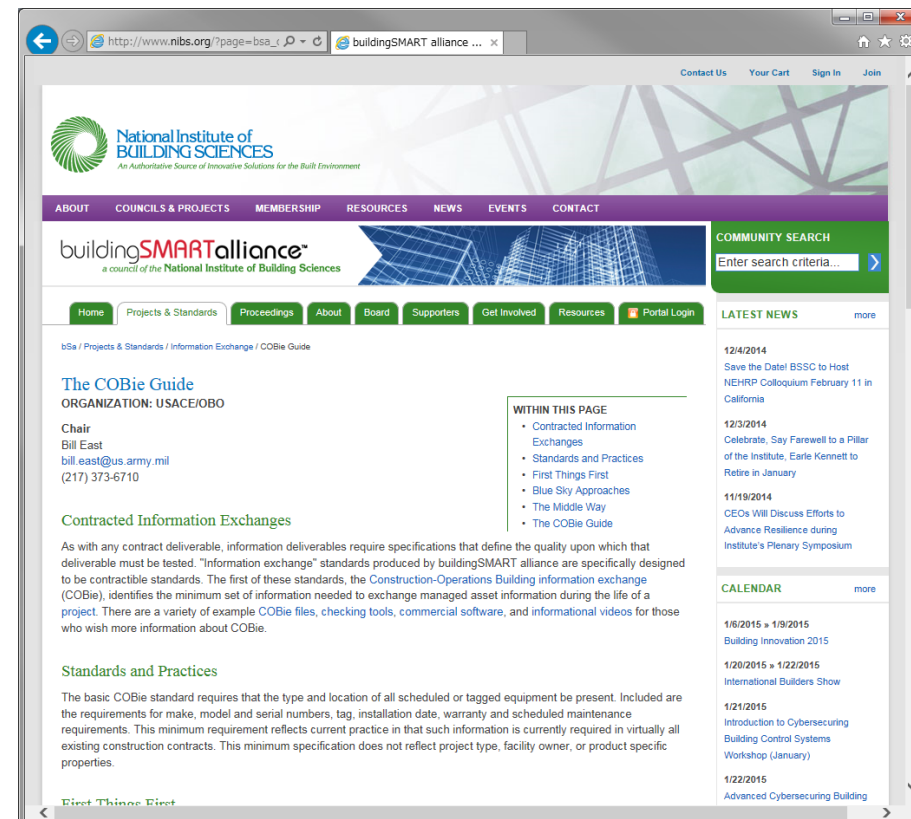


http://www.nibs.org/?page=bsa_commonbimfiles

The COBie Guide

- Contracted Information Exchanges
- Standards and Practices
- First Things First
- Blue Sky Approaches
- The Middle Way
- The COBie Guide

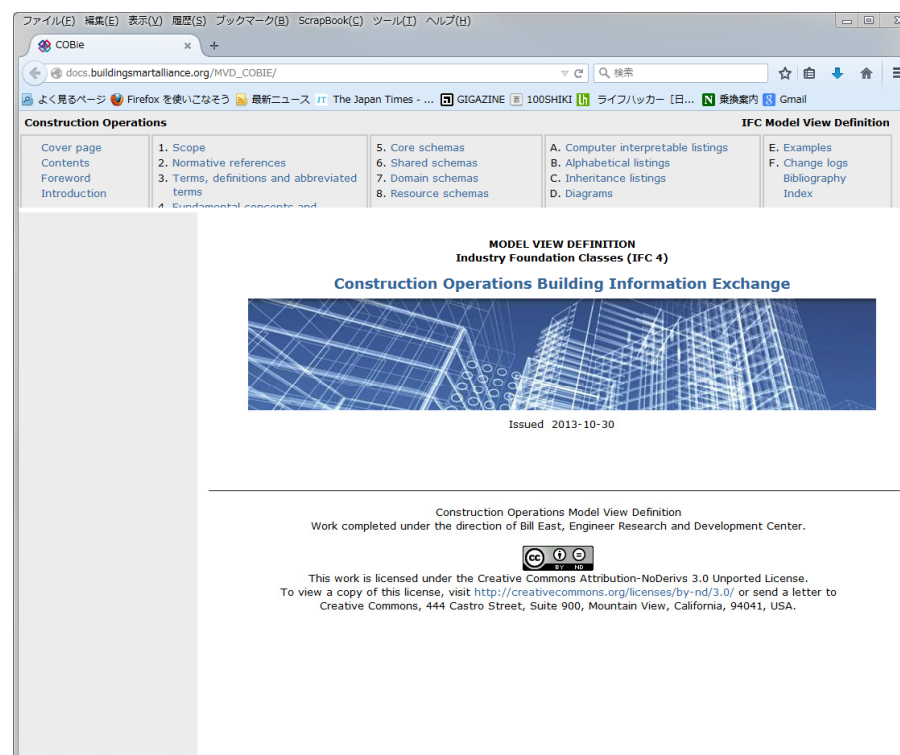
★COBie導入のガイドライン



http://www.nibs.org/?page=bsa_cobieguide

Model View Definition Construction Operations Building Information Exchange

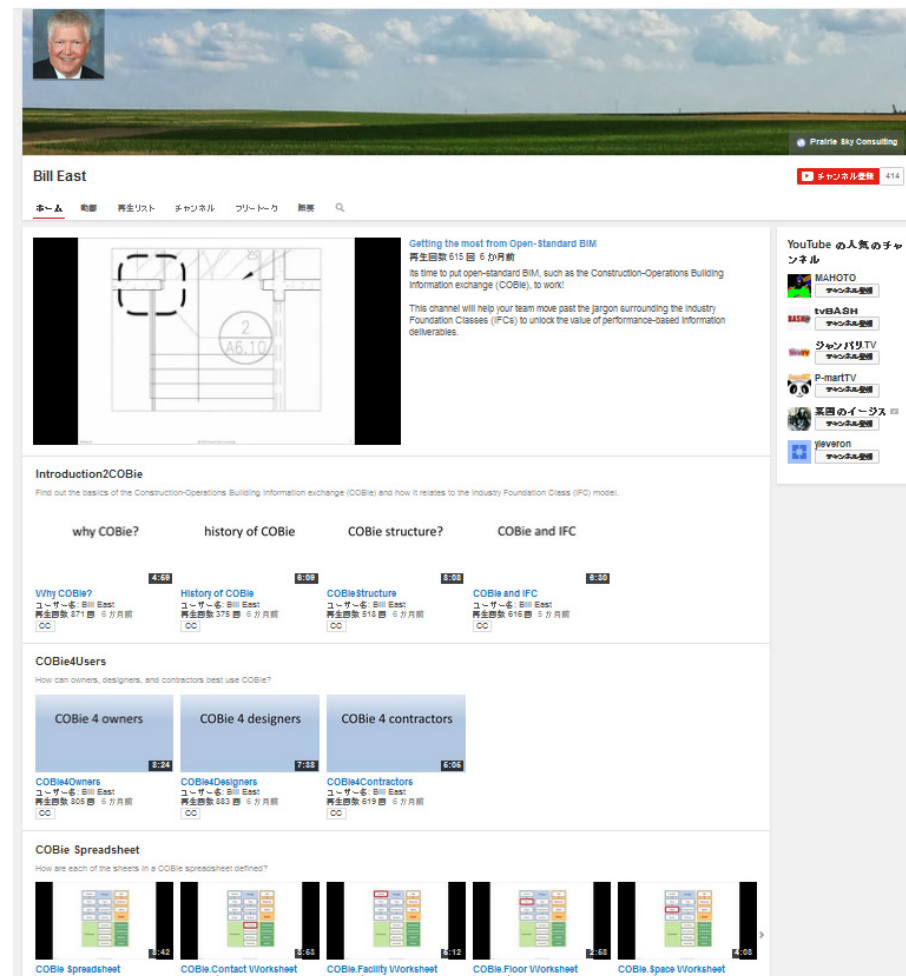
★COBieに関するIFCのMVD



http://docs.buildingsmartalliance.org/MVD_COBIE/

COBie in Youtube

- Why COBie
- History of COBie
- COBieStructure
- COBie and IFC
- COBie4Owners
- COBie4Designers
- COBie4Contractors
- COBie Spreadsheet Conventions
- COBie.Contact Worksheet
- COBie.Facility Worksheet
- COBie.Floor Worksheet
- COBie.Space Worksheet
- COBie.Zone Worksheet
- COBie.Type Worksheet
- COBie.Component Worksheet
- COBie.System Worksheet
- COBie.Assembly Worksheet
- COBie.Connection Worksheet
- COBie.Spare Worksheet
- COBie.Resource Worksheet
- COBie.Job Worksheet
- COBie.Document Worksheet
- COBie.Attribute Worksheet



Construction Operations Building Information Exchange(COBIE)

著者

Construction Engineering Research Laboratory
Engineering Research and Development Center
U.S. Army Corps of Engineers

発行日

2007年8月

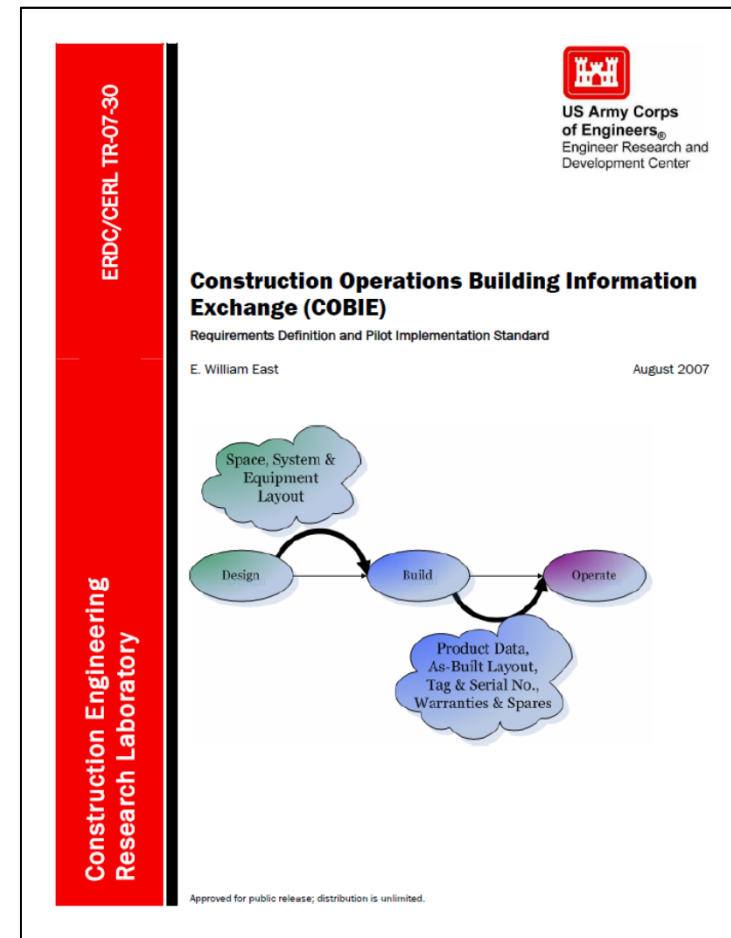
入手

<http://www.wbdg.org/resources/cobie.php>



In 2007, the Construction-Operations Building information exchange (COBie) [requirements analysis report](#) (PDF 1.1 MB) proposed a new way for designers and contractors to directly provide electronic operations, maintenance, and asset management information as that information is created. Following an on-site study of COBie at Fort Lewis Washington, a proposed [UFGS specification](#) was developed for design-build and construction contracts. Further investigation of COBie compared the [life-cycle costs of current and COBie-based processes](#) (PDF 8.3 MB) and demonstrated that tens of thousands of man-hours or large projects are spent in performing redundant tasks trying to handle information locked-in documents.

Simply understanding, documenting, and proposing the information needs of operators, maintainers, and facility managers is insufficient to have COBie be used in practice. In parallel efforts the Engineer Research and Development Center, through the buildingSMART alliance, worked to establish COBie as an internationally recognized open-standard [implemented](#) in over 30 Commercial Off-The-Shelf Software (COTS) systems.



2015.05.27

CIMを用いた維持管理 -COBie入門-

DIVISION 01 – GENERAL REQUIREMENTS Construction Operations Building Information Exchange(COBIE)

著者

Unified Facilities Guide Specifications
The department of Defense(?)

発行日

2014年2月

入手

<http://www.wbdg.org/resources/cobie.php>



RELEVANT CODES AND STANDARDS

- [Draft UFGS 01 79 00](#) (29-Jan-14) (PDF 213 KB)
- [COBIE Practice Guide](#)
- [COBIE 2.4 MVD](#) (Technical Specification)
- [COBIE Lite](#) (Technical Specification)
- [Change Logs](#)

DRAFT	UFGS- 01 XX XX (FEB 2014)

Drafting Activity: USACE	
UNIFIED FACILITIES GUIDE SPECIFICATION	

SECTION TABLE OF CONTENTS	
DIVISION 01 - GENERAL REQUIREMENTS	
SECTION 01 XX XX (FEB 2014)	
Construction-Operations Building information exchange (COBIE)	
02/2014	

1	GENERAL..... 3
1.1	REFERENCES..... 3
1.2	ADMINISTRATIVE REQUIREMENTS..... 4
1.2.1	Architectural Design Phase (30% Design)..... 4
1.2.2	Coordinated Design Phase (60% Design)..... 4
1.2.3	Construction Documents Phase (100% Design)..... 4
1.2.4	Construction Mobilization Phase..... 4
1.2.5	Construction 60% Complete..... 4
1.2.6	Beneficial Occupancy Phase..... 5
1.2.7	Fiscal Completion..... 5
1.3	SUBMITTALS..... 5
SD-11	Closeout Submittals..... 5
1.3.1	COBIE Information Delivery Plan..... 5
1.3.2	COBIE-Specific Submittals..... 5
1.3.3	COBIE-Formatted Submittals..... 5
1.3.4	COBIE Equipment Photographs..... 6
1.4	QUALITY ASSURANCE..... 6
1.4.1	COBIE-Specific Submittal Quality..... 6
1.4.2	COBIE-Formatted Submittal Quality..... 7
1.4.3	COBIE Data File Quality..... 7
1.5	INFORMATION DELIVERY, STORAGE, AND HANDLING..... 8
1.5.1	Delivery Method - COBIE-Specific Submittals..... 8
1.5.2	Electronic Media..... 8
1.5.3	Transmission of Physical Media..... 8
1.5.4	Encryption..... 8
SECTION 01 XX XX Page 1	

2015.05.27

CIMを用いた維持管理 -COBie入門-

The COBie Guide: a commentary to the NBIMS-US COBie standard

著者

Dr. Bill East

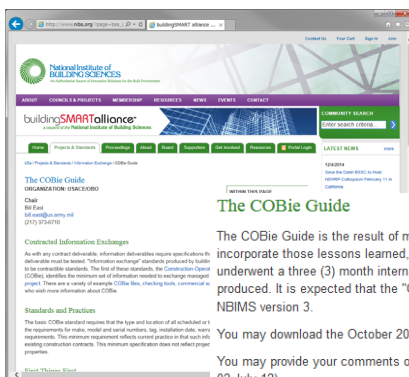
buildingSMART alliance

発行日

2013年3月

入手

http://www.nibs.org/?page=bsa_cobieguide



The COBie Guide:

a commentary to the NBIMS-US COBie standard

by Dr. Bill East, PhD, PE, F.ASCE¹, Mariangelica Carrasquillo-Mangual²

EXECUTIVE SUMMARY

The Construction-Operations Building information exchange (COBie) format is the international standard for the exchange of information about managed facility assets. COBie does not add new requirements to contracts; it simply changes the format of existing deliverables from paper documents and proprietary formats, to an open, international standard format.

While COBie provides the format for the exchange of required asset information, it does not provide details on what information is to be provided when, and by whom. This Guide provides best-practice guidelines for these requirements. This Guide can be considered the "commentary" that accompanies the COBie format specification.

To use this guide, customizations reflecting regional practices, specialized project types, and client's requirements should be documented in Appendix A. The correct application of the COBie Guide may then be reference directly in appropriate specifications.

As of 2012 over twenty commercial software products support COBie. These products cover the entire facility life-cycle from planning, design, construction, commissioning to operations, maintenance, and space management. Software implementers will find the information in Appendix B helpful for low-level mapping of required properties.

¹ Research Civil Engineer, Engineer Research and Development Center, 2902 Newmark Dr, Champaign, IL 61822, bill.east@us.army.mil, 271-373-6710.

² Research Civil Engineer, Engineer Research and Development Center

2013-03-12-COBieGuide-Public-v05

1

2015.05.27

CIMを用いた維持管理 -COBie入門-

BS 1192-4:2014 Collaborative Production of information Part4: Fulfilling employer's information Exchange requirements using COBie- Code of practice

著者

British Standard Institution

発行日

2014年9月

入手

<http://shop.bsigroup.com/forms/BS-1192-4/>



BIM for Facility Managers

著者

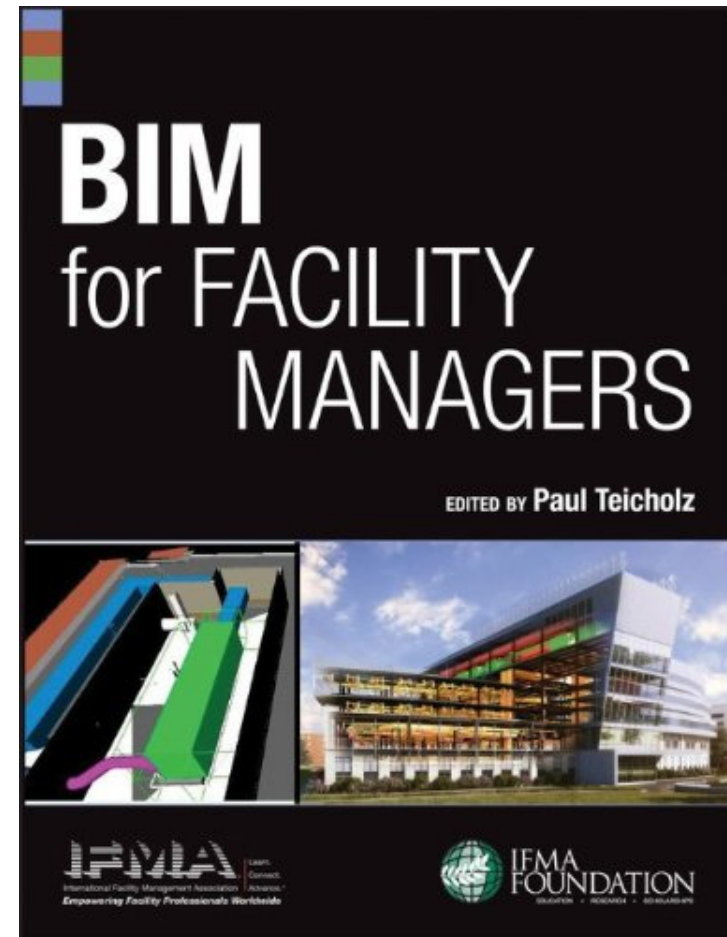
International Facility Management
Association(IFMA)
Paul Teciholz

発行日

2013年4月

入手

Amazon.com



仕様 (1)

20

スプレッドシートによるCOBieのデータ表示

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Version	COBie2.4												
2	Region	en-US												
3	Purpose	A handover-stage COBie spreadsheet template. The color coding of sheets and columns identifies the default requirements.												
4														
5	All Phases	Sheet	Contents											
6		Contact	People and Companies referenced in the COBie data set											
7														
8	Spaces	Sheet	Contents											
9		Facility	Project, Site, and Facility. COBie data is delivered in one file per facility.											
10		Floor	Vertical building levels, Site and Roof											
11		Space	Spaces listed in floor plans/finish schedules, and Roof/Site locations for managed equipment.											
12		Zone	Sets of spaces sharing a specific attribute											
13														
14	Products/Equipment	Sheet	Contents											
15		Type	Types of equipment, products, and materials identified in design schedules.											
16		Component	Individual instances of equipment, products and materials											
17		System	Sets of components providing a service											
18		Assembly	n/a											
19		Connection	n/a											
20														
21	Operations and Maintenance Worksheets	Sheet	Contents											
22		Spare	Onsite and replacement parts											
23		Resource	Required materials, tools, and training											
24		Job	PM, Safety, and other job plans											
25		Impact	Economic, Environmental and Social Impacts at various stages in the life cycle											
26														
27	All Phases	Sheet	Contents											
28		Document	All applicable document references											
29		Attribute	Values corresponding to design schedules for Spaces, Products, and Equipment											
30		Coordinate	n/a											
31		Issue	n/a											
32														
33	Legend													
34														
35		text	required											
36														
37		text	reference to other sheet or pick list											
38														

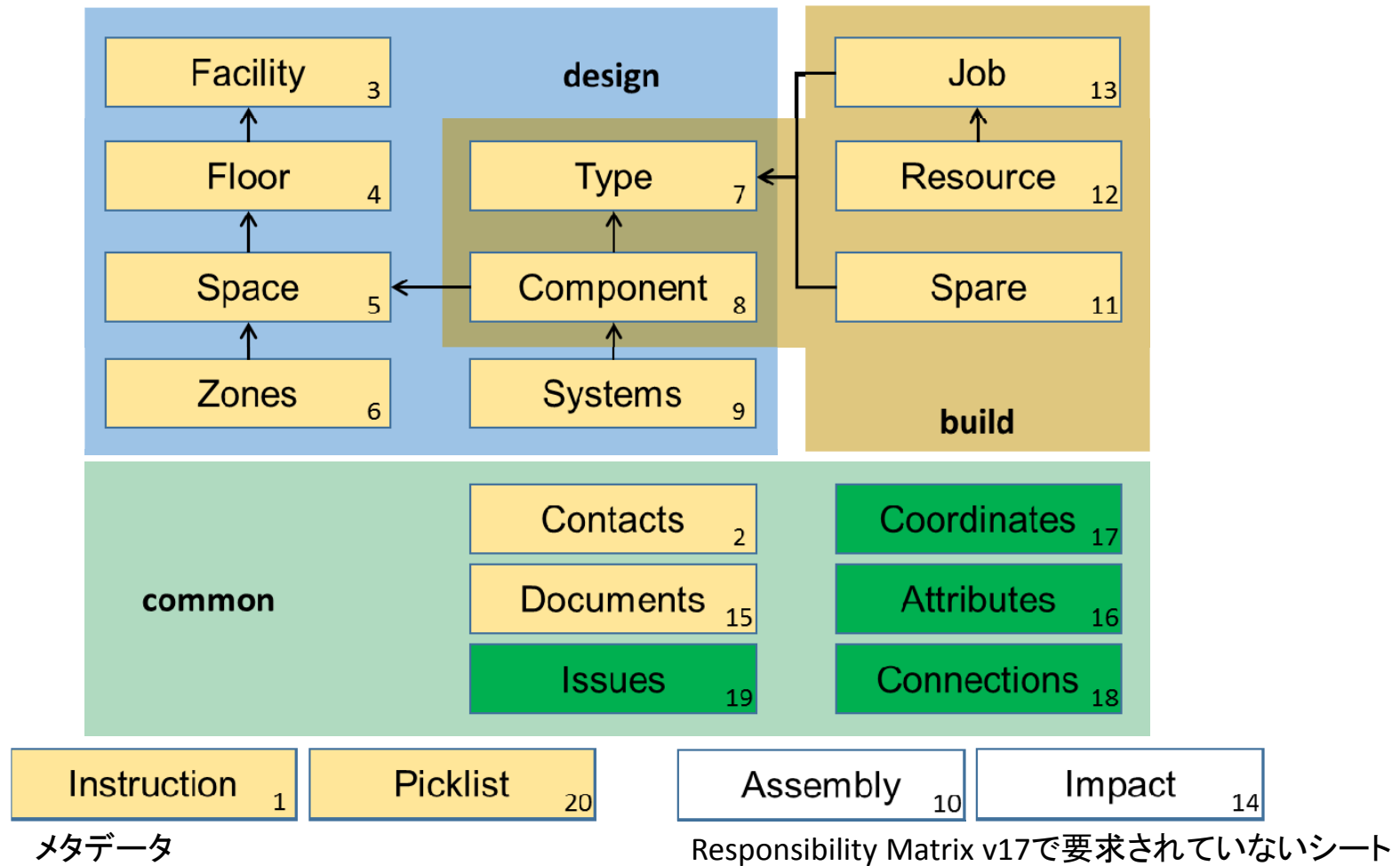
2015.05.27

CIMを用いた維持管理 -COBie入門-

仕様 (2)

21

スプレッドシートの構成(20シート COBie2.4)



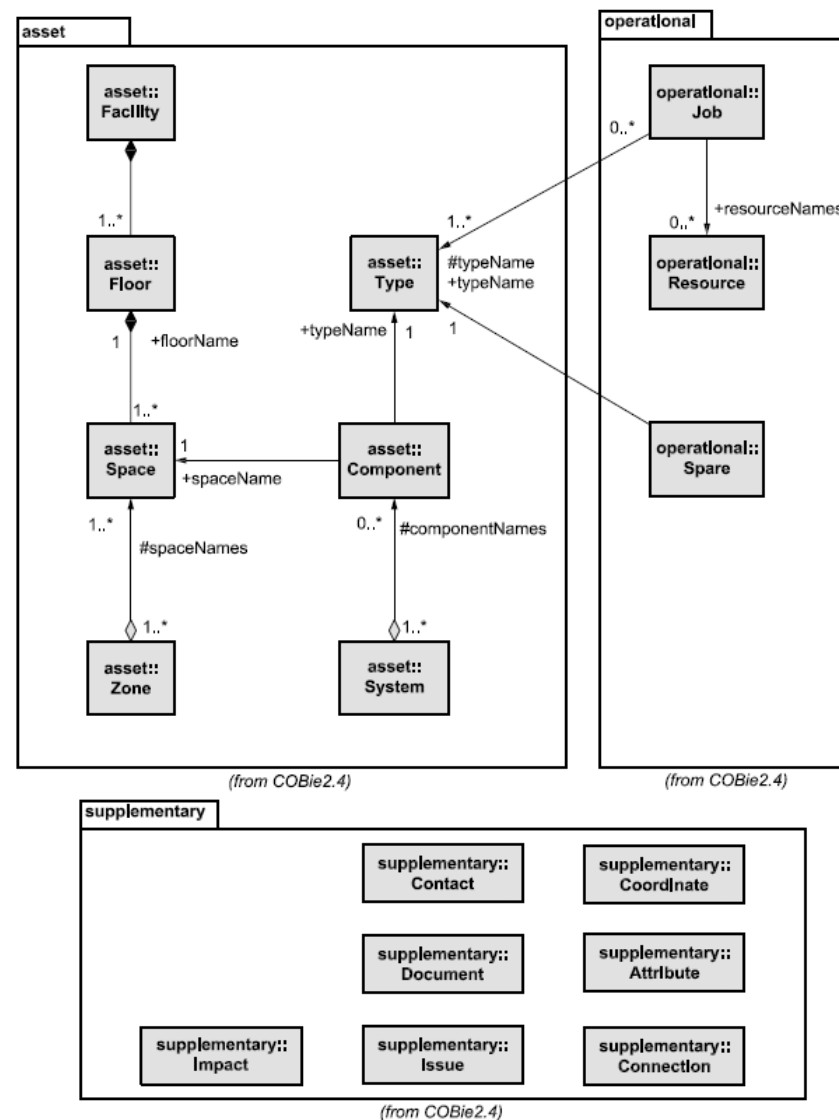
仕様 (3)

スプレッドシートの構成

UML表記



BS 1192-4:2014 Collaborative Production of information Part4:
Fulfilling employer's information Exchange requirements using COBie-Code of practice



COBieの作成方法

- ① COBieに準拠したソフトウェアを使う.
- ② 正確に構造化されたプロパティセットを持つIFCファイルをエクスポートする.
- ③ BIMのアトリビュートデータを抽出して, COBieに準拠したファイルに入れる.
- ④ COBieスプレッドシートに手作業で入力する. （最後の手段！）

COBieの制約

- ひとつの施設に対してひとつのCOBieファイルを作成しなければならない。
- 施設名称は固有でなければならない。
- Contact、Facility、Floor、Space、Type、Component、Spare、Resourceの名称の値は固有でなければならない。
- ワークシートの名称、列の名称、列の並びは変更できない。

仕様 (6)

25

スプレッドシートの制約

Email	CreatedBy	CreatedOn	Category	Company	Phone	ExternalSystem	ExternalObject	ExternalIdentifier	Department	OrganizationCode	GivenName	FamilyName	Street	PostalBox	Town	StateRegion	PostalCode	Country
bill.east@u	bill.east@u	2009-02-12T	34-55 14 11	Engineer Re	217.373.671	n/a	n/a	n/a	U.S. Army, C	USACE-CEC	Bill	East	2902 Newm	PO BOX 900	Champaign	IL	61826-9005	USA
constan2@i	constan2@i	2011-05-25T	34-35 17: Su	Engineer Re	217-352-653	n/a	n/a	n/a	U.S. Army, C	USACE-CEC	Travis	Constantine	2902 Newm	n/a	Champaign	IL	61853	USA
danielle.r.l	danielle.r.l	2011-05-25T	34-55 14 11	Engineer Re	217-373-347	n/a	n/a	n/a	U.S. Army, C	USACE-CEC	Danielle	Love	2903 Newm	n/a	Champaign	IL	61853	USA
mariangelid	mariangelid	2010-02-08T	34-55 14 11	Engineer Re	217.352.651	n/a	n/a	n/a	U.S. Army, C	USACE-CEC	Mariangelid	Carrasquillo	2902 Newm	n/a	Champaign	IL	61853	USA

text

required
必須

text

reference to other sheet or pick list
他のシートまたはpick listへの参照

text

external reference
外部参照

text

if specified as required
指定された場合、必要に応じて

text

secondary information when preparing product data
プロダクトデータが準備されている場合の第二の情報

n/a: not available or not applicable

COBie Responsibility Matrix v17

2013_Responsibility_Matrix_v17_wAssetLists.xlsx
http://www.nibs.org/?page=bsa_cobiemm

Worksheet ->	Contact	Facility	Floor	Space	Zone	Type	Component	System	Assembly	Connection	Spare	Resource	Job	Impact	Document	Attribute
1	Email	Name	Name	Name	Name	Name	Name	Name	Name	Name	Name	Name	Name	Name	Name	Name
2	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy	CreatedBy
3	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn	CreatedOn
4	Category	Category	Category	Category	Category	Category	Category	Category	Category	Category	Category	Category	Category	Category	Category	Category
5	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName	ProjectName
6	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName	SiteName
7	ExtSystem	LinearUnits	ExtIdentifier	ExtSystem	ExtObject	Manufacturer	ExtSystem	ExtObject	AssemblyType	RowName2	ExtSystem	ExtIdentifier	Description	RowName	SheetName	Value
8	ExtObject	AreaUnits	Description	ExtObject	ExtIdentifier	ModelNumber	ExtObject	ExtIdentifier	RealizingElement	ExtObject	Description	Duration	Value	RowName	Unit	
9	ExtIdentifier	VolumeUnits	Elevation	ExtIdentifier	Description	WarrantyGuarantorParts	ExtIdentifier	Description	ExtObject	PortName1	ExtIdentifier	DurationUnit	ImpactUnit	Directory	ExtSystem	
10	Department	CurrencyUnit	Height	RoomTag	UsableHeight	WarrantyDurationLabor	SerialNumber	InstallationDate	ExtIdentifier	PortName2	Description	Start	LeadTime	File	ExtObject	
11	OrganizationCode	AreaMeasurement				WarrantyDurationLabor	InstallationDate	Description	ExtSystem	SetNumber	TaskStartUnit	Duration	ExtSystem	ExtIdentifier	ExtIdentifier	
12	GivenName	ExternalSystem				WarrantyDurationLabor	WarrantyStartDate	Description	ExtObject	PartNumber	Frequency	LeadOutTime	ExtObject	Description	Description	
13	FamilyName	ExternalProjectObject				WarrantyDurationUnit	TaoNumber		ExtIdentifier		FrequencyUnit	ExtSystem	ExtIdentifier	AllowedValues		

ワークシートとデータ項目(列)の規定

COBie Responsibility Matrix v17

2013_Responsibility_Matrix_v17_wAssetLists.xlsx
http://www.nibs.org/?page=bsa_cobiemm

Sheet	Column Name	Column	All	Criteria	Start	Rmmts	Design	Construction	O & M	Recycle
Email	A	RP	RS	C	C	C	C	C	C	C
CreatedBy	B	RS	C	C	C	C	C	C	C	C
CreatedOn	C	RI	C	C	C	C	C	C	C	C
Category	D	RL	C	C	C	C	C	C	C	C
Company	E	RI	C	C	C	C	C	C	C	C
Phone	F	RI	C	C	C	C	C	C	C	C
ExtSystem	G	RA	RA	RA	RA	RA	RA	RA	RA	RA
ExtObject	H	RA	RA	RA	RA	RA	RA	RA	RA	RA
ExtIdentifier	I	RA	RA	RA	RA	RA	RA	RA	RA	RA
Department	J	RS	RS	RS	RS	RS	RS	RS	RS	RS
OrganizationCode	K	RS	RS	RS	RS	RS	RS	RS	RS	RS
GivenName	L	RS	RS	RS	RS	RS	RS	RS	RS	RS
FamilyName	M	RS	RS	RS	RS	RS	RS	RS	RS	RS
Street	N	RS	RS	RS	RS	RS	RS	RS	RS	RS
PostalBox	O	RS	RS	RS	RS	RS	RS	RS	RS	RS
Town	P	RS	RS	RS	RS	RS	RS	RS	RS	RS
StateRegion	Q	RS	RS	RS	RS	RS	RS	RS	RS	RS
PostalCode	R	RS	RS	RS	RS	RS	RS	RS	RS	RS
Country	S	RS	RS	RS	RS	RS	RS	RS	RS	RS
Name	A	RP	C	C	C	C	C	C	C	C
CreatedBy	B	RF	C	C	C	C	C	C	C	C
CreatedOn	C	RI	C	C	C	C	C	C	C	C
Category	D	RL	C	C	C	C	C	C	C	C
ProjectName	E	RI	C	C	C	C	C	C	C	C
SiteName	F	RI	C	C	C	C	C	C	C	C
LinearUnits	G	RL	C	C	C	C	C	C	C	C
AreaUnits	H	RL	C	C	C	C	C	C	C	C
VolumeUnits	I	RL	C	C	C	C	C	C	C	C
CurrencyUnit	J	RL	C	C	C	C	C	C	C	C
AreaMeasurement	K	RL	C	C	C	C	C	C	C	C
ExternalSystem	L	RA	RA	RA	RA	RA	RA	RA	RA	RA
ExternalProjectObject	M	RA	RA	RA	RA	RA	RA	RA	RA	RA
ExternalProjectIdentifier	N	RA	RA	RA	RA	RA	RA	RA	RA	RA

データの要求区分

COBie Responsibility Matrix v17

2013_Responsibility_Matrix_v17_wAssetLists.xlsx
http://www.nibs.org/?page=bsa_cobiemm

Sheet	Column	Column Name	Primary	Compound	Foreign Key	Required	System	As Specified	Type	Max. Len.	Constraints/Notes	IFC 2.4 Mapping
Contact	A	Email	X	-	-	X	-	-	AlphaNumeric	255	Value must be unique in this worksheet	IfcTelecomAddress ElectronicMailAddresses
	B	CreatedBy	-	-	Contact Email	X	-	-	Contact Email	255	Value must be found in referenced Foreign Key List	IfcTelecomAddress ElectronicMailAddresses
	C	CreatedOn	-	-	ISO Date	X	-	-	ISO Date	19	ISO datetime info added/updated or default "1900-12-31T23:59:59"	IfcOwnerHistory CreationDate
	D	Category	-	-	PickList Category-Role	X	-	-	AlphaNumeric	255	Value must be found in referenced Foreign Key List	IfcActorRole UserDefinedRole
	E	OrganizationCode	-	-	-	-	-	-	AlphaNumeric	255	Value must be provided or 'nil'	IfcOrganization Name
	F	Phone	-	-	-	X	-	-	AlphaNumeric	255	Value must be provided or 'nil'	IfcTelecomAddress TelephoneNumbers
	G	ExtSystem	-	-	Creating System Name	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	IfcApplication ApplicationFullName
	H	ExtObject	-	-	Creating System Object	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	PickList objType = IfcPersonAndOrganization
	I	ExtIdentifier	-	-	Creating System ID	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	IfcPerson Identification
	J	Department	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcPostalAddress InternalLocation
	K	OrganizationCode	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcOrganization Identification (id in 2x3)
	L	GivenName	-	-	-	-	-	-	AlphaNumeric	255	Default value must equal 'nil'	IfcPerson GivenName
	M	FamilyName	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcPerson FamilyName
	N	Street	-	-	-	-	-	-	AlphaNumeric	255	Default value must equal 'nil'	IfcPostalAddress AddressLines
	O	PostaBox	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcPostalAddress PostaBox
	P	Town	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcPostalAddress Town
	Q	StateRegion	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcPostalAddress Region
	R	PostaCode	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcPostalAddress PostaCode
	S	Country	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcPostalAddress Country
Facility	A	Name	X	-	-	X	-	-	AlphaNumeric	255	Value must be unique in this worksheet	IfcBuilding Name
	B	CreatedBy	-	-	Contact Email	X	-	-	Contact Email	255	Value must be found in referenced Foreign Key List	IfcTelecomAddress ElectronicMailAddresses
	C	CreatedOn	-	-	ISO Date	X	-	-	ISO Date	19	ISO datetime info added/updated or default "1900-12-31T23:59:59"	IfcOwnerHistory CreationDate
	D	Category	-	-	PickList Category-Facility	X	-	-	PickList Category-Facility	255	Value must be found in referenced Foreign Key List	IfcClassificationReference Identification = "*" + IfcClassificationReference Name (IfcClassificationReference Name)
	E	ProjectName	-	-	-	-	-	-	AlphaNumeric	255	Value must be provided or 'nil'	IfcProject Name
	F	SiteName	-	-	-	-	-	-	AlphaNumeric	255	Value must be provided or 'nil'	IfcSite Name
	G	LinearUnits	-	-	PickList LinearUnits	X	-	-	PickList LinearUnits	255	Value must be found in referenced Foreign Key List	IfcUnitAssignment Units
	H	AreaUnits	-	-	PickList AreaUnits	X	-	-	PickList AreaUnits	255	Value must be found in referenced Foreign Key List	IfcUnitAssignment Units
	I	VolumeUnits	-	-	PickList VolumeUnits	X	-	-	PickList VolumeUnits	255	Value must be found in referenced Foreign Key List	IfcUnitAssignment Units
	J	CurrencyUnit	-	-	PickList CurrencyUnit	X	-	-	PickList CurrencyUnit	255	Value must be found in referenced Foreign Key List	IfcMonetaryUnit Currency
	K	AreaMeasurement	-	-	-	-	-	-	AlphaNumeric	255	Value must be provided or 'nil'	IfcNameQuantity MethodOfMeasurement
	L	ExtSystem	-	-	Creating System Name	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	IfcApplication ApplicationFullName
	M	ExtObject	-	-	Creating System Object	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	PickList objType = IfcProject
	N	ExtIdentifier	-	-	Creating System ID	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	IfcProject GlobalId
	O	ExtSiteObject	-	-	Creating System Site	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	PickList objType = IfcSite
	P	ExtFacilityObject	-	-	Creating System Facility	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	IfcSite GlobalId
	Q	ExtFacilityObject	-	-	Creating System Facility	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	PickList objType = IfcBuilding
	R	ExtFacilityObject	-	-	Creating System Facility	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	IfcBuilding GlobalId
	S	Description	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcBuilding Description
Floor	T	ProjectDescription	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcProject Description
	U	SiteDescription	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcSite Description
	V	Phase	-	-	-	-	-	X	AlphaNumeric	255	Default value must equal 'nil'	IfcBuildingStorey Name
	A	Name	X	-	-	X	-	-	AlphaNumeric	255	Value must be unique in this worksheet	IfcBuildingStorey Name
	B	CreatedBy	-	-	Contact Email	X	-	-	Contact Email	255	Value must be found in referenced Foreign Key List	IfcTelecomAddress ElectronicMailAddresses
	C	CreatedOn	-	-	ISO Date	X	-	-	ISO Date	19	ISO datetime info added/updated or default "1900-12-31T23:59:59"	IfcOwnerHistory CreationDate
	D	Category	-	-	PickList FloorType	X	-	-	PickList FloorType	255	Value must be found in referenced Foreign Key List	IfcClassificationReference Identification = "*" + IfcClassificationReference Name (IfcClassificationReference Name)
	E	ExtSystem	-	-	Creating System Name	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	IfcApplication ApplicationFullName
	F	ExtObject	-	-	Creating System Object	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	IfcBuildingStorey
	G	ExtIdentifier	-	-	Creating System ID	-	X	-	AlphaNumeric	255	Provided only by automated export from software system	IfcBuildingStorey GlobalId

データの詳細規定とIFCとのマッピング

仕様 (10)

29

Design Template

2013-09-13-COBiev24-DesignTemplate.xlsx
http://www.nibs.org/?page=bsa_cobiemm

	A	B	C
1	Version	COBie2.4	
2	Region	en-US	
3	Purpose	A design-stage COBie spreadsheet template. The color coding of sheets and columns identifies the default requirements.	
4			
5	All Phases	Sheet	Contents
6		Contact	People and Companies referenced in the COBie data set
7			
8	Spaces	Sheet	Contents
9		Facility	Project, Site, and Facility. COBie data is delivered in one file per facility.
10		Floor	Vertical building levels, Site and Roof
11		Space	Spaces listed in floor plans/finish schedules, and Roof/Site locations for managed equipment.
12		Zone	Sets of spaces sharing a specific attribute
13			
14	Products/Equipment	Sheet	Contents
15		Type	Types of equipment, products, and materials identified in design schedules.
16		Component	Individual instances of equipment, products and materials
17		System	Sets of components providing a service
18		Assembly	n/a
19		Connection	n/a
20			
21	Operations and Maintenance Worksheets	Sheet	Contents
22		Spare	n/a
23		Resource	n/a
24		Job	n/a
25		Impact	n/a
26			
27	Common	Sheet	Contents
28		Document	All applicable document references
29		Attribute	Values corresponding to design schedules for Spaces, Products, and Equipment
30		Coordinate	n/a
31		Issue	n/a
32			
33	Legend		
34			
35		required	required
36			
37		lookup	reference to other sheet or pick list
38			

While the most effective way to create and use COBie is within software systems listed above, some may be interested in directly using the COBie in the spreadsheet version.

COBieのテンプレート(設計段階)

Handover Template

2013-09-13_COBiev2_4_HandoverTemplate.xlsx
http://www.nibs.org/?page=bsa_cobiemm

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Version	COBie2.4												
2	Region	en-US												
3	Purpose	A handover-stage COBie spreadsheet template. The color coding of sheets and columns identifies the default requirements.												
4														
5	All Phases	Sheet	Contents											
6		Contact	People and Companies referenced in the COBie data set											
7														
8	Spaces	Sheet	Contents											
9		Facility	Project, Site, and Facility. COBie data is delivered in one file per facility.											
10		Floor	Vertical building levels, Site and Roof											
11		Space	Spaces listed in floor plans/finish schedules, and Roof/Site locations for managed equipment.											
12		Zone	Sets of spaces sharing a specific attribute											
13														
14	Products/Equipment	Sheet	Contents											
15		Type	Types of equipment, products, and materials identified in design schedules.											
16		Component	Individual instances of equipment, products and materials											
17		System	Sets of components providing a service											
18		Assembly	n/a											
19		Connection	n/a											
20														
21	Operations and Maintenance Worksheets	Sheet	Contents											
22		Spare	Onsite and replacement parts											
23		Resource	Required materials, tools, and training											
24		Job	PM, Safety, and other job plans											
25		Impact	Economic, Environmental and Social Impacts at various stages in the life cycle											
26														
27	All Phases	Sheet	Contents											
28		Document	All applicable document references											
29		Attribute	Values corresponding to design schedules for Spaces, Products, and Equipment											
30		Coordinate	n/a											
31		Issue	n/a											
32														
33	Legend													
34														
35		text	required											
36														
37		text	reference to other sheet or pick list											
38														

COBieのテンプレート(引渡し段階)

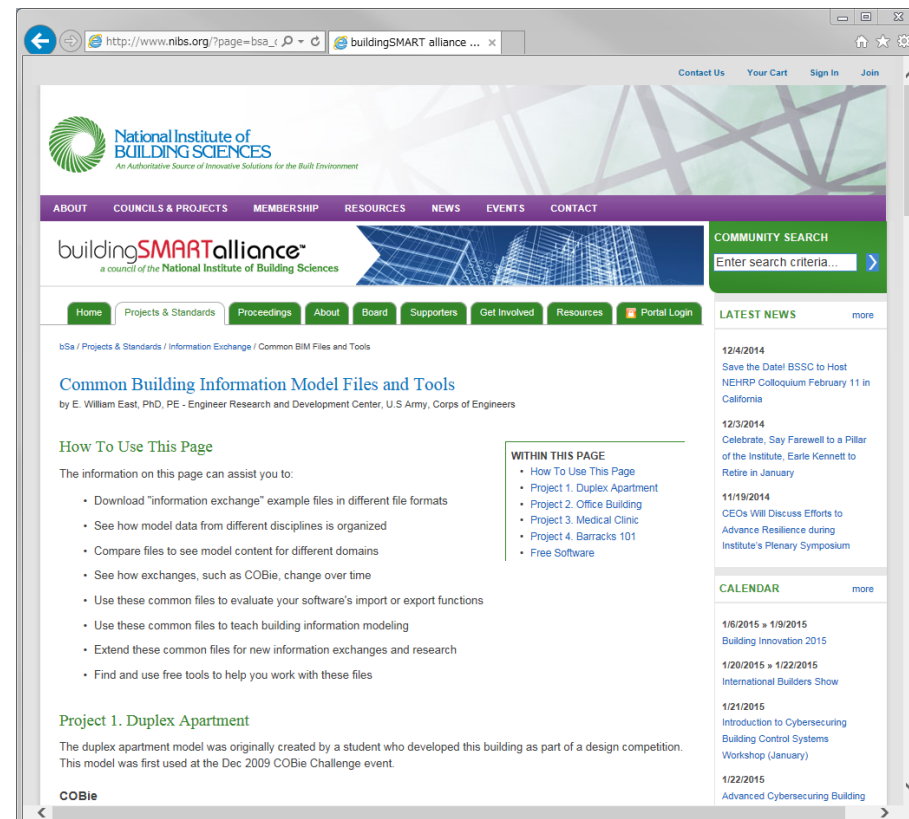
作成段階によるシートの要求の比較

SheetName	Design	Handover	Contents
Instruction			
Contact	required	required	People and Companies referenced in the COBie data set
Facility	required	required	Project, Site, and Facility. COBie data is delivered in one file per facility.
Floor	required	required	Vertical building levels, Site and Roof
Space	required	required	Spaces listed in floor plans/finish schedules, and Roof/Site locations for managed equipment.
Zone	required	required	Sets of spaces sharing a specific attribute
Type	required	required	Types of equipment, products, and materials identified in design schedules.
Component	required	required	Individual instances of equipment, products and materials
System	required	required	Sets of components providing a service
Assembly	n/a	n/a	n/a
Spare	n/a	required	Onsite and replacement parts
Resource	n/a	required	Required materials, tools, and training
Job	n/a	required	PM, Safety, and other job plans
Impact	n/a	required, if specified	Economic, Environmental and Social Impacts at various stages in the life cycle
Document	required	required	All applicable document references
Attribute	required	required	Values corresponding to design schedules for Spaces, Products, and Equipment
Coordinate	n/a	n/a	n/a
Connection	n/a	n/a	n/a
Issue	n/a	n/a	n/a
PickLists			

Common Building Information Model Files and Tools

- How To Use This Page
- Project 1. Duplex Apartment
- Project 2. Office Building
- Project 3. Medical Clinic
- Project 4. Barracks 101
- Free Software

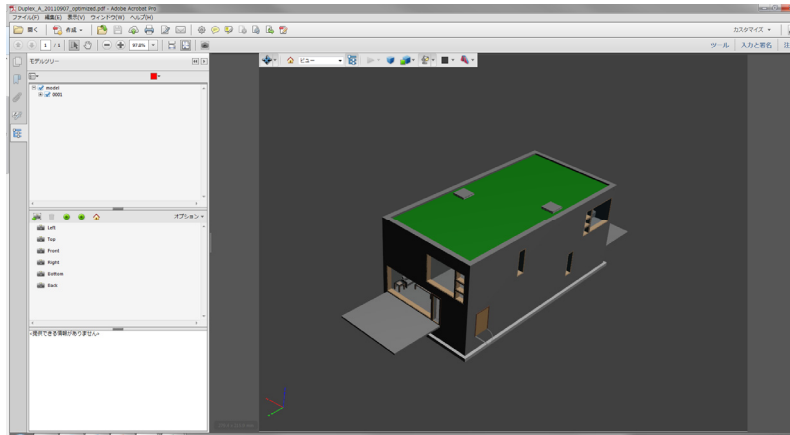
★COBieの事例とフリーソフト



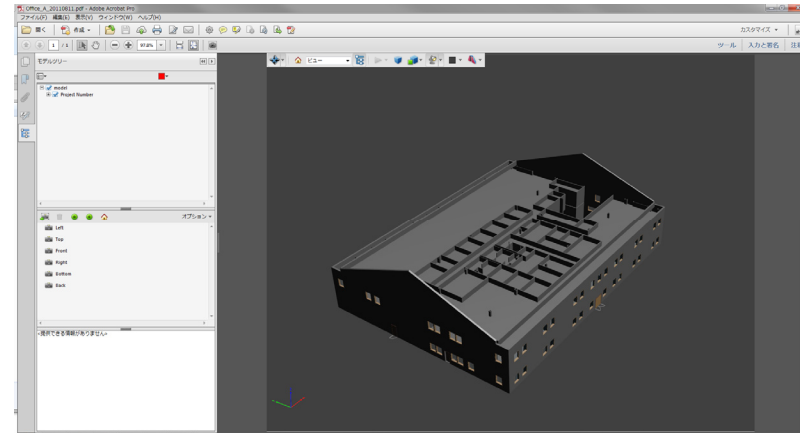
http://www.nibs.org/?page=bsa_commonbimfiles

事例（2）

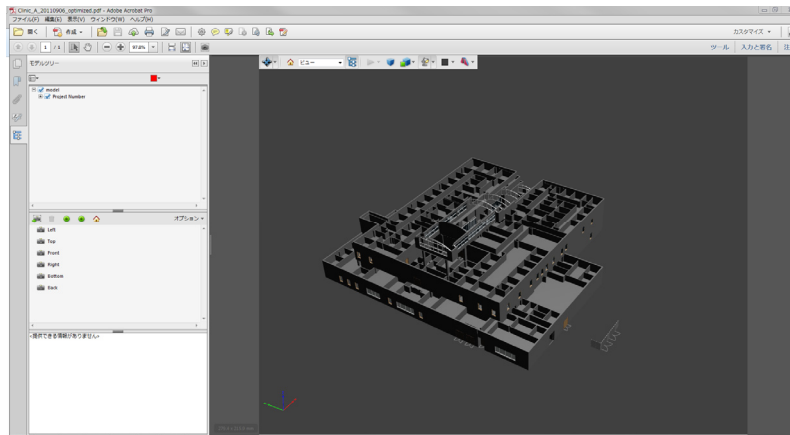
33



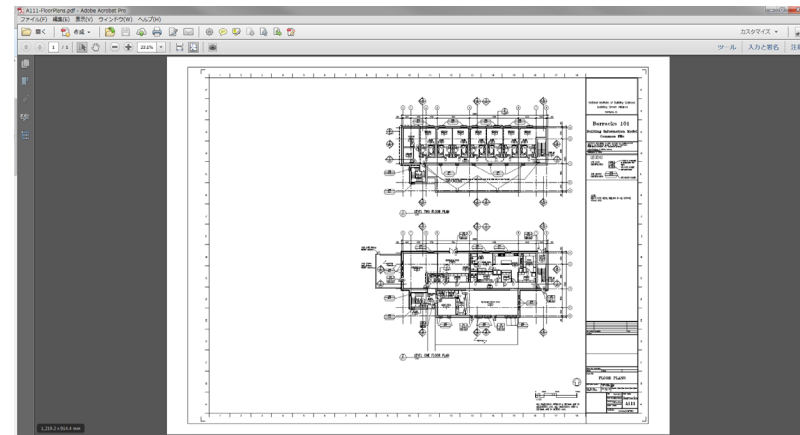
- Project 1. Duplex Apartment



- Project 2. Office Building



- Project 3. Medical Clinic



- Project 4. Barracks 101

2015.05.27

CIMを用いた維持管理 -COBie入門-

Project 1. Duplex Apartment

The duplex apartment model was originally created by a student who developed this building as part of a design competition. This model was first used at the Dec 2009 COBie Challenge event.

COBie

- 2012-03-23-Duplex-01-Programming
- 2012-03-23-Duplex-02-Design
- 2012-03-23-Duplex-03-ProductSelect
- 2012-03-23-Duplex-04-ProductInstall
- 2012-03-23-Duplex-05-Handover

5つのライフサイクルに
対応したCOBieのファイル

Coordination Model View

- 2011-09-14-Duplex IFC 2x3 Coordination MVD
- 2011-09-14-Duplex-IFCAnalyzer
- 2011-09-14-Duplex-PDF
- 2011-09-14-Duplex-RVT (as documented in this [report](#) and [shared parameter information](#))

形状を含んだファイル

Electrical System information exchange (Sparkie) at Design

- 2012-12-07 IFC 2x3 Sparkie
- 2012-01-02 Native Model (report in editorial review)

HVAC information exchange (HVACie) at Design

- 2011-11-24 IFC 2x3
- 2011-11-24 Native Model (report in editorial review)
- 2011-11-24 Native Model supplement

Water System information exchange (WSie) at Design

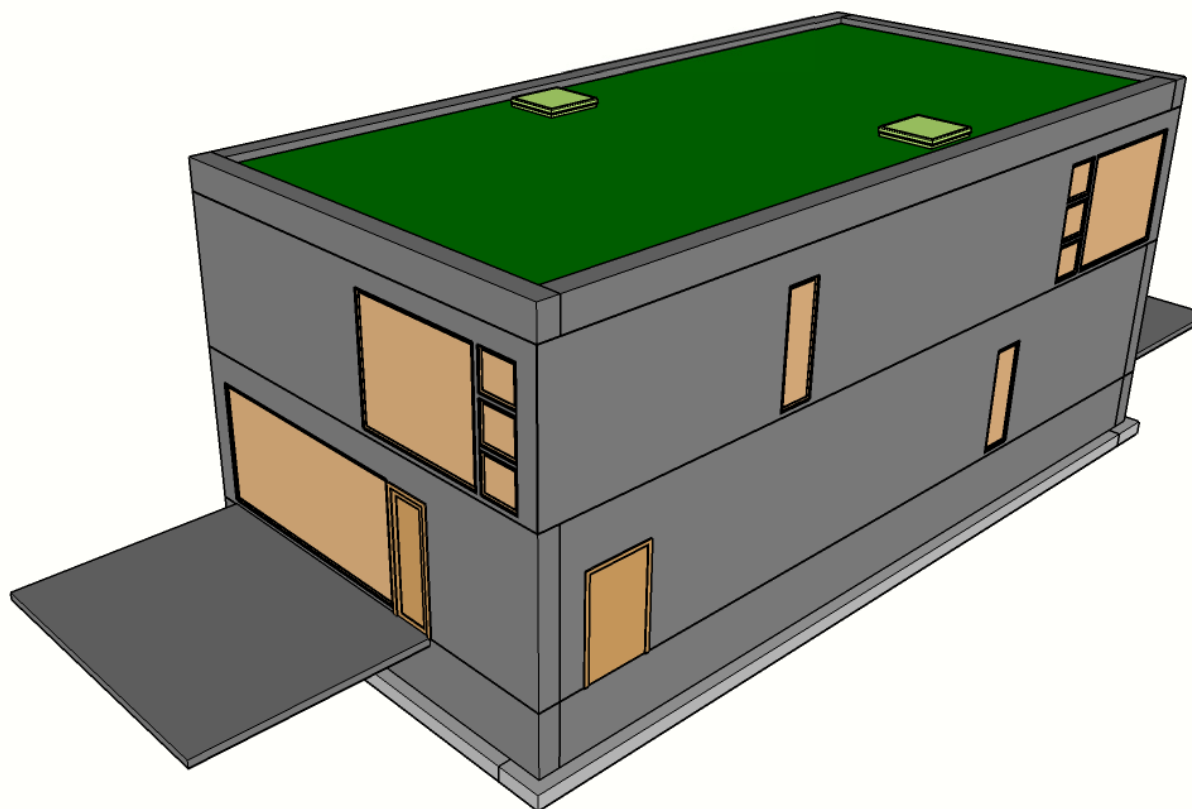
- 2012-11-13 IFC 2x3
- 2013-02-01 Native Model (report in editorial review)

Duplex Apartment (1)

35

Duplex Apartment - Coordination Model View
建物外観

二世帯住居



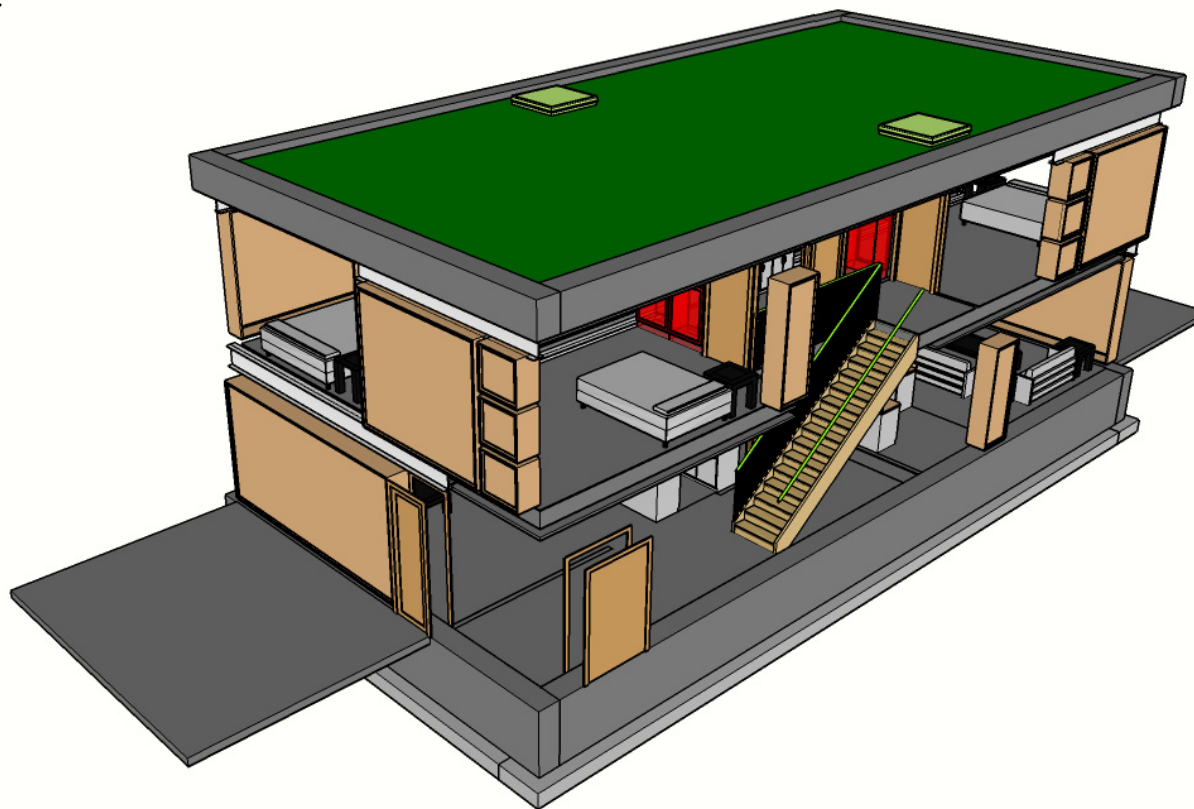
Duplex_A_20110907_optimized.ifc

Duplex Apartment (2)

36

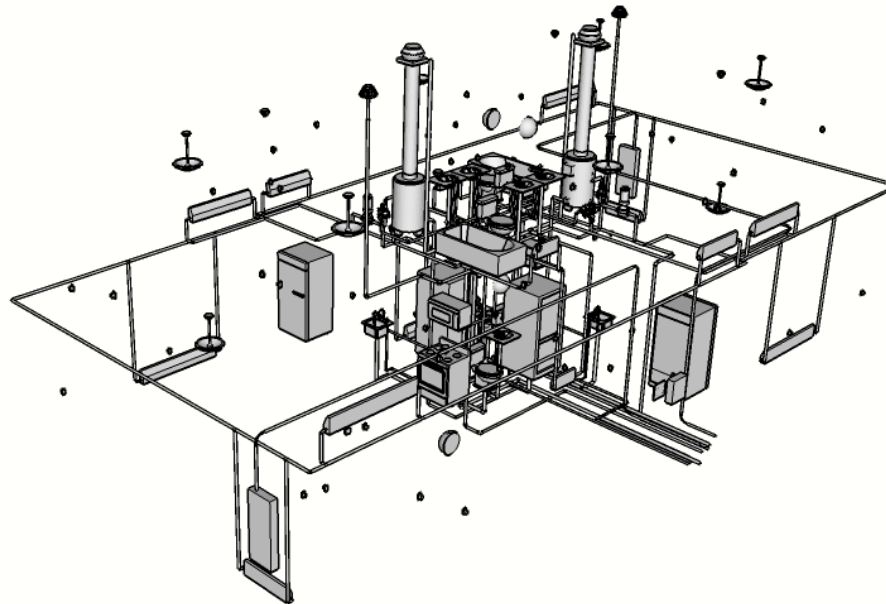
Duplex Apartment - Coordination Model View

壁を非表示



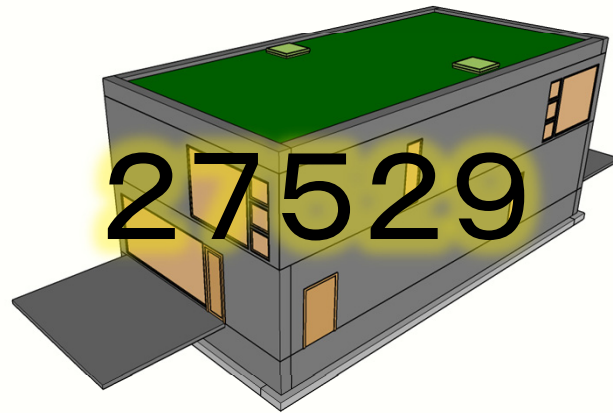
Duplex_A_20110907_optimized.ifc

Duplex Apartment - Coordination Model View 設備外観

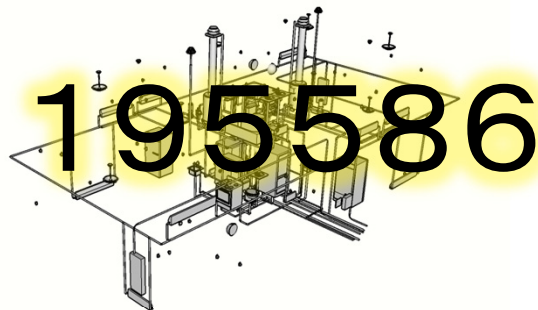


Duplex_MEP_20110907_optimized.ifc

COBieでは形状は要求されていない



Duplex_A_20110907_optimized.ifc



Duplex_MEP_20110907_optimized.ifc

COBie

4704

2012-03-23-Duplex-Handover.ifc

2.1%

Duplex Apartment (5)

39

データ変化

Life cycle

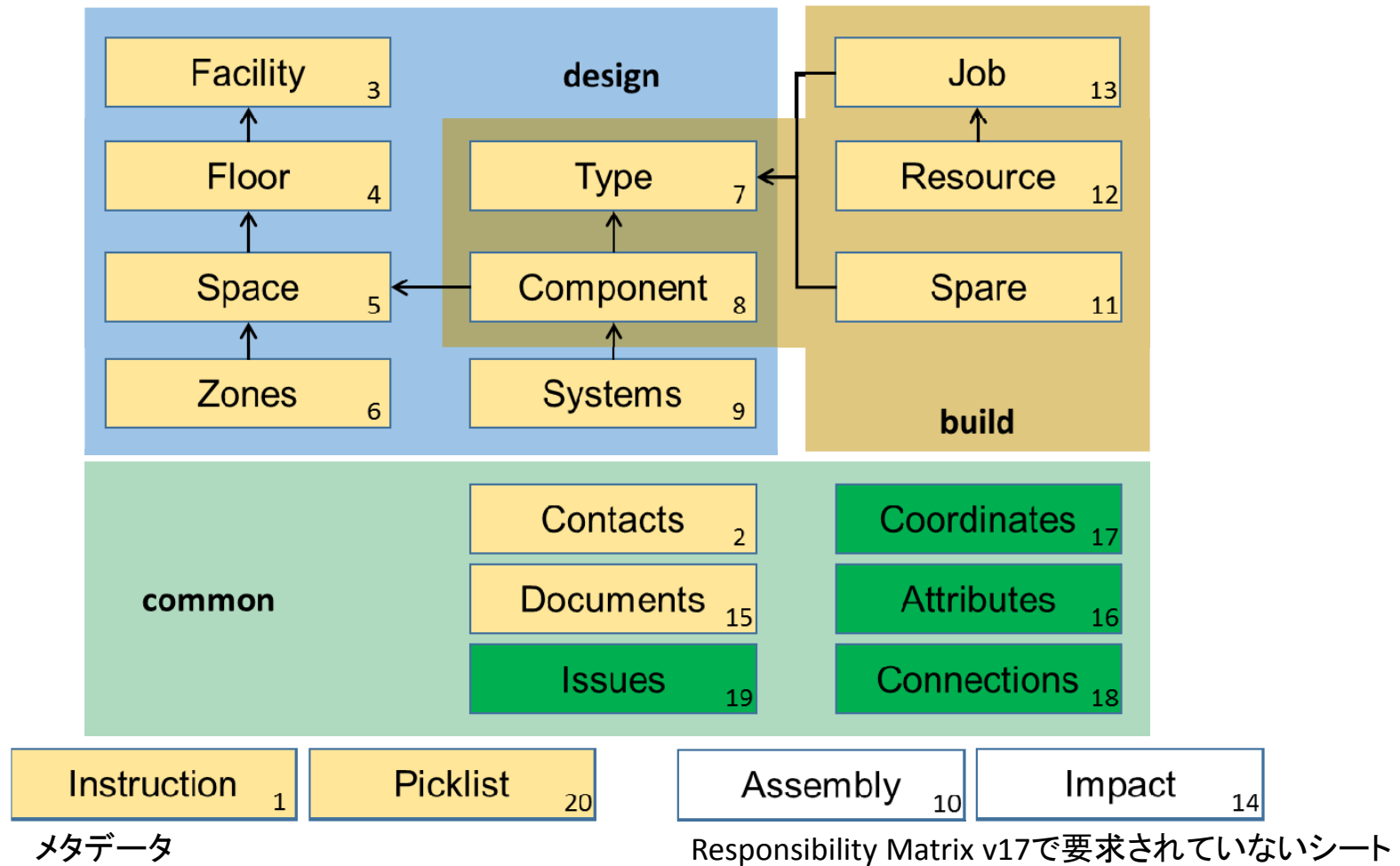
design

build

common

SheetName	Programming	Design	ProductSelect	ProductInstall	Handover
Instruction					
Contact	4	4	58	58	58
Facility	1	1	1	1	1
Floor	4	4	4	4	4
Space	22	22	22	22	22
Zone	20	20	20	20	20
Type		43	43	43	43
Component		232	232	232	232
System		36	36	36	36
Assembly					
Spare					3
Resource					10
Job					94
Impact					
Document			43	48	48
Attribute	88	88	94	94	94
Coordinate	42	42	42	42	42
Connection					
Issue					
PickLists	3262	3262	3262	3262	3262

スプレッドシートの構成(20シート)



Worksheet 1 : Introduction (1)

41

Title	COBie2	
Version	2	
Release	4	
Status	IFC2x3	
Region	en-US	
Purpose		This spreadsheet supports the exchange of building, system and product information through the life of the project.
Outline		Individual worksheets are organized by project phase as shown below
All Phases	Sheet	Contents
	Contact	People and Companies
Early Design Worksheets	Sheet	Contents
	Facility	Project, Site, and Facility
	Floor	Vertical levels and exterior areas
	Space	Spaces
	Zone	Sets of spaces sharing a specific attribute
	Type	Types of equipment, products, and materials
Detailed Design Worksheets	Sheet	Contents
	Component	Individually named or schedule items
	System	Sets of components providing a service
	Assembly	Constituents for Types, Components and others
	Connection	Logical connections between components
	Impact	Economic, Environmental and Social Impacts at various stages in the life cycle
Construction Worksheets	Sheet	Contents
		Note: submittals and approvals added on Documents
		Note: manufacturer and model added on Type
		Note: serial and tag added on Component

各シートの記載内容や説明が記載されている

Worksheet 2 : Contact (1)

42

プロジェクトのライフサイクルを通じて参照される個人や組織のリスト.

Email	bill.east@us.army.mil	IfcTelecomAddress.ElectronicMailAddresses
CreatedBy	bill.east@us.army.mil	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2009-02-12T11:00:00	IfcOwnerHistory.CreationDate
Category	34-55 14 11: Consultant	IfcActorRole.UserDefinedRole
Company	Engineer Research and Development Center	IfcOrganization.Name
Phone	217.373.6710	IfcTelecomAddress.TelephoneNumbers
ExtSystem	n/a	IfcApplication.ApplicationFullName
ExtObject	n/a	PickList.objType = IfcPersonAndOrganization
ExtIdentifier	n/a	IfcPerson.Identification
Department	U.S. Army, Corps of Engineers	IfcPostalAddress.InternalLocation
OrganizationCode	USACE-CECER-CFN	IfcOrganization.Identification
GivenName	Bill	IfcPerson.GivenName
FamilyName	East	IfcPerson.FamilyName
Street	2902 Newmark Dr	IfcPostalAddress.AddressLines
PostalBox	PO BOX 9005	IfcPostalAddress.PostalBox
Town	Champaign	IfcPostalAddress.Town
StateRegion	IL	IfcPostalAddress.Region
PostalCode	61826-9005	IfcPostalAddress.PostalCode
Country	USA	IfcPostalAddress.Country

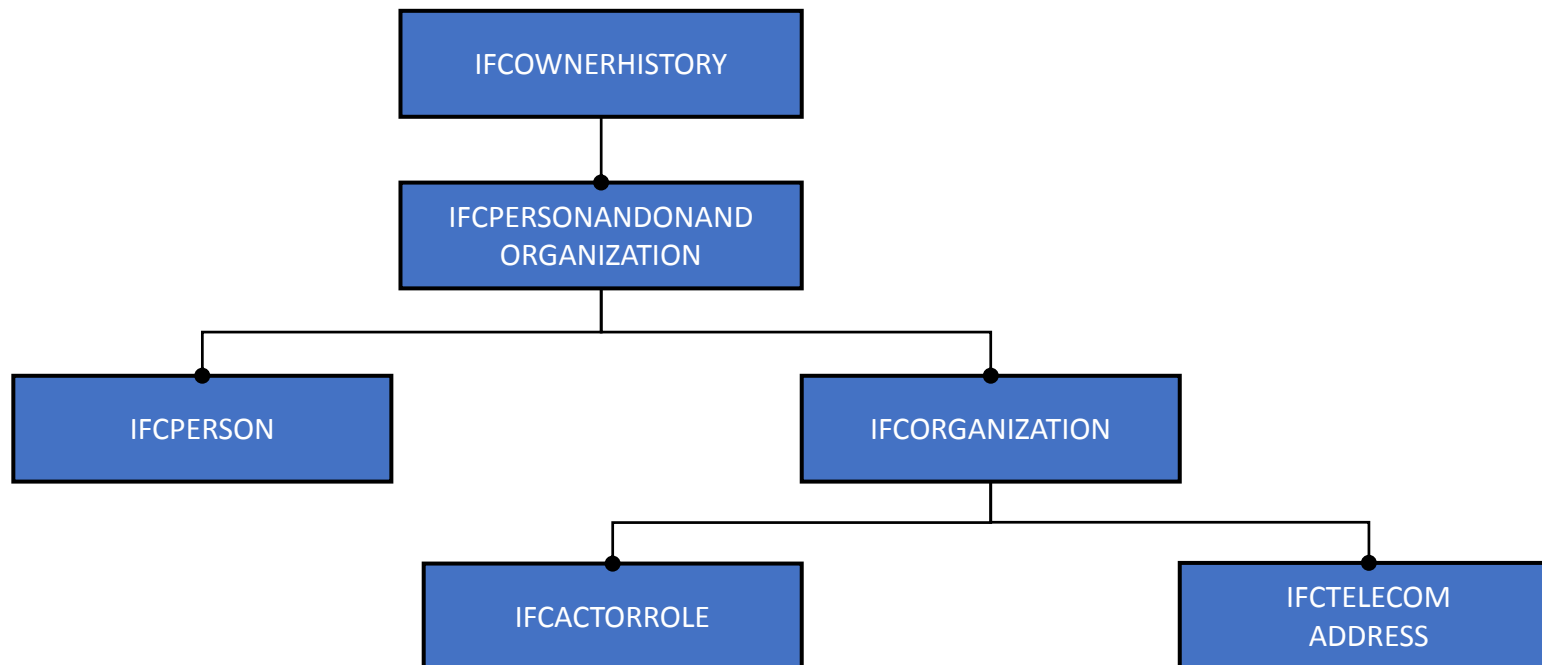
以降のワークシートのレコードから必ず参照される

データ数: Desing(4) → Handover(58)

Worksheet 2 : Contact (2)

43

- #529170= IFCOWNERHISTORY(#529169,#529161,\$,\$,\$,\$,\$,1234458000);
- #529169 = IFCPERSONANDORGANIZATION(#529165,#529168,\$);
- #529165 = IFCPERSON('n/a','East','Bill',\$,\$,\$,\$);
- #529168 = IFCORGANIZATION('USACE-CECER-CFN','Engineer Research and Development Center','U.S. Army, Corps of Engineers',(#529167),(#529166));
- #529167 = IFCACTORROLE(.USERDEFINED.,'34-55 14 11: Consultant',\$);
- #529166 = IFCTELECOMADDRESS(\$,\$,\$,('217.373.6710'),\$,\$,('bill.east@us.army.mil'),\$);



The diagram illustrates the hierarchical structure of an IFC model, organized into four main levels: Facility, System, Floor, and Space.

- Facility:**
 - IFCPROJECT (1)
 - IFCRELAGGREGATES
 - IFCSITE (Duplex Apartment)
 - IFCRELAGGREGATES
 - IFCBUILDING (Duplex Apartment)
- System:**
 - IFCZONE (Apartment A)
 - IFCZONE (Apartment B)
- Floor:**
 - IFCBUILDINGSTOREY (Roof)
 - IFCBUILDINGSTOREY (Level1)
 - IFCBUILDINGSTOREY (Level2)
 - IFCBUILDINGSTOREY (T/roDn)
- Space:**
 - IFCSPACE (Roof)
 - IFCSPACE (A101 Foyer)
 - IFCSPACE (A102 Livingroom)
 - IFCSPACE (A103 Kitchen)
 - IFCSPACE (A104 Bathroom)
 - IFCSPACE (A105 Stair)
 - IFCSPACE (Outside of building)
 - IFCSPACE (B102 Livingroom)
 - IFCSPACE (B103 Kitchen)
 - IFCSPACE (B104 Bathroom)
 - IFCSPACE (B105 Stair)
 - IFCSPACE (A201 Hallway)
 - IFCSPACE (A202 Bedroom)
 - IFCSPACE (A203 Bedroom)
 - IFCSPACE (A204 Bathroom)
 - IFCSPACE (A205 Utility)
 - IFCSPACE (B101 Foyer)
 - IFCSPACE (B202 Bedroom)
 - IFCSPACE (B203 Bedroom)
 - IFCSPACE (B204 Bathroom)
 - IFCSPACE (B205 Utility)

Worksheet 3 : Facility (2)

45

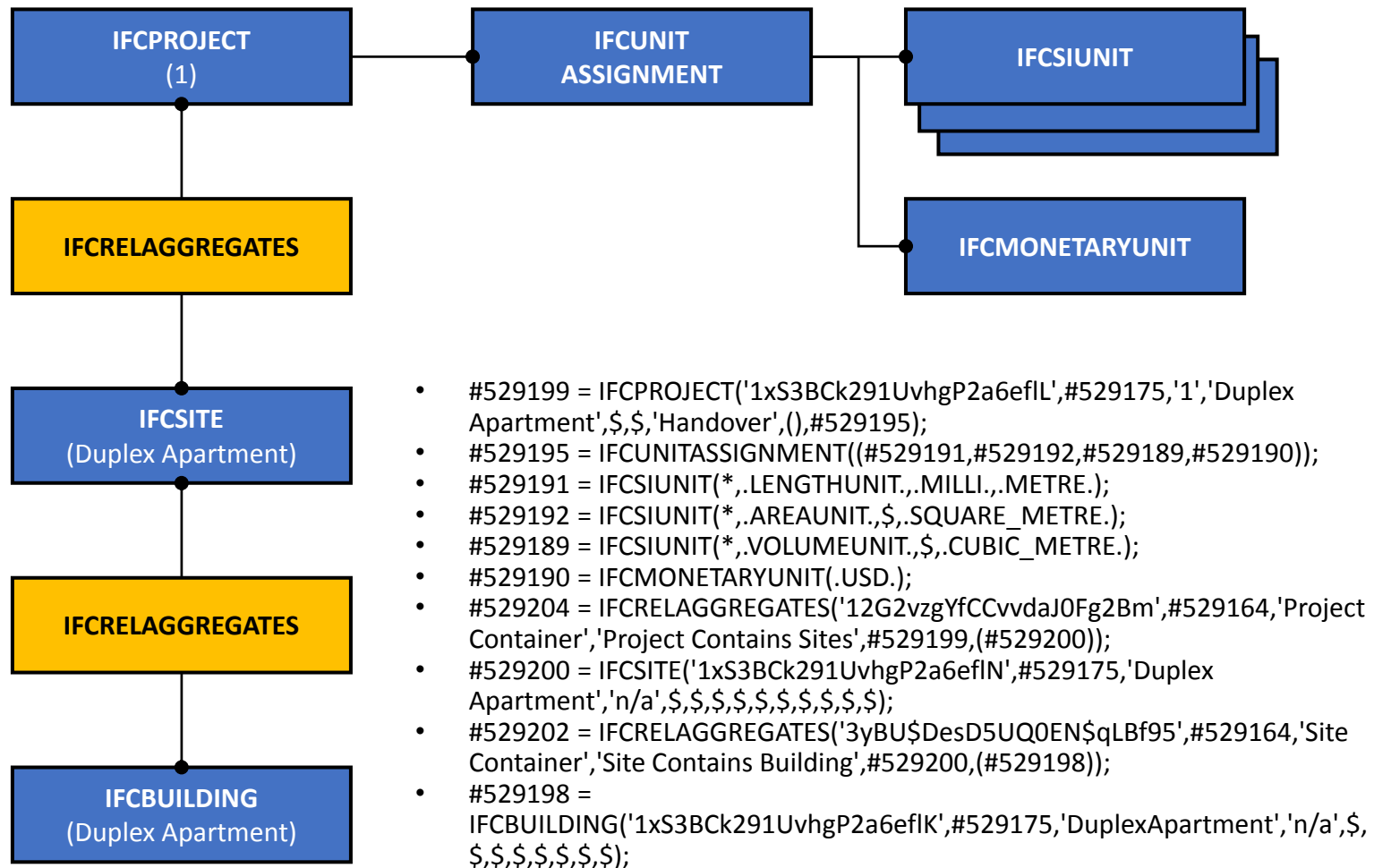
サイトや仮の範囲および詳細部分を加えた独立して運用する建物

Name	DuplexApartment	IfcBuilding.Name
CreatedBy	constan2@illinois.edu	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-05-25T19:06:43	IfcOwnerHistory.CreationDate
Category	11-16 21 11: Duplex	IfcClassificationReference.Identification
ProjectName	1	IfcProject.Name
SiteName	Duplex Apartment	IfcSite.Name
LinearUnits	meters	IfcUnitAssignment.Units
AreaUnits	squaremeters	IfcUnitAssignment.Units
VolumeUnits	cubicmeters	IfcUnitAssignment.Units
CurrencyUnit	Dollars	IfcMonetaryUnit.Currency
AreaMeasurement	See Autodesk Documentation	IfcElementQuantity.MethodOfMeasurement
ExternalSystem	Autodesk Revit Architecture 2011	IfcApplication.ApplicationFullName
ExternalProjectObject	IfcProject	PickList.objType = IfcProject
ExternalProjectIdentifier	1xS3BCK291UvhgP2a6eflL	IfcProject.GlobalId
ExternalSiteObject	IfcSite	PickList.objType = IfcSite
ExternalSiteIdentifier	1xS3BCK291UvhgP2a6eflN	IfcSite.GlobalId
ExternalFacilityObject	IfcBuilding	PickList.objType = IfcBuilding
ExternalFacilityIdentifier	1xS3BCK291UvhgP2a6eflK	IfcBuilding.GlobalId
Description	n/a	IfcBuilding.Description
ProjectDescription	Duplex Apartment	IfcProject.Description
SiteDescription	n/a	IfcSite.Description
Phase	Handover	IfcProject.Phase

データ数: Desing(1) → Handover(1)

Worksheet 3 : Facility (3)

46



Worksheet 4 : Floor (1)

47

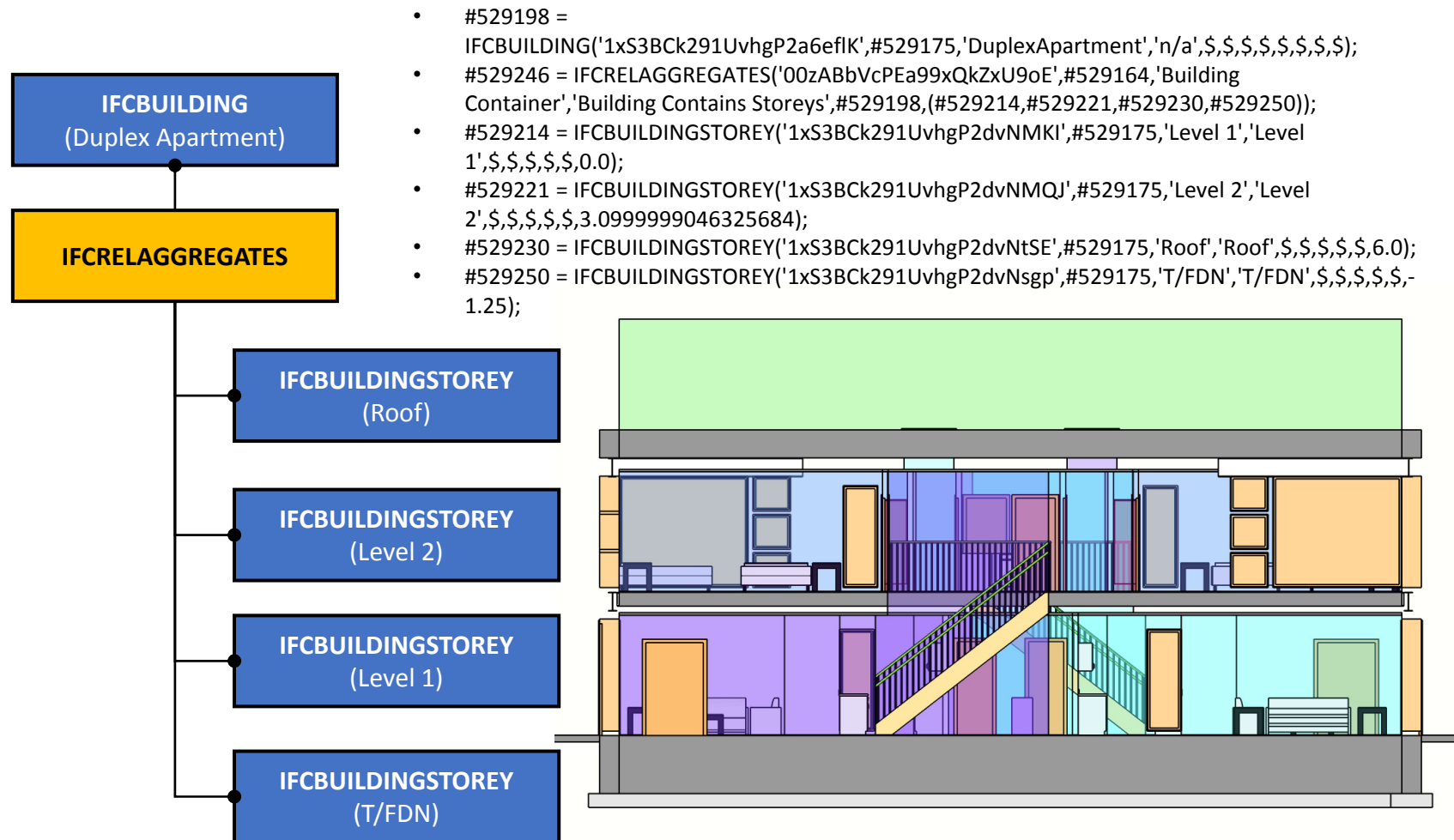
施設の鉛直方向の階層. 屋上, 基礎および施設外のエリアも含まれる.

Name	Level 1	IfcBuildingStorey.Name
CreatedBy	constan2@illinois.edu	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-09-27T16:15:03	IfcOwnerHistory.CreationDate
Category	Floor	IfcClassificationReference.Identification
ExtSystem	Autodesk Revit Architecture 2011	IfcApplication.ApplicationFullName
ExtObject	IfcBuildingStorey	IfcBuildingStorey
ExtIdentifier	1xS3BCk291UvhgP2dvNMKI	IfcBuildingStorey.GlobalId
Description	Level 1	IfcBuildingStorey.Description
Elevation	0	IfcBuildingStorey.Elevation
Height	0	IfcQuantityLength.LengthValue

データ数: Desing(4) → Handover(4)

Worksheet 4 : Floor (2)

48



Worksheet 5 : Space (1)

49

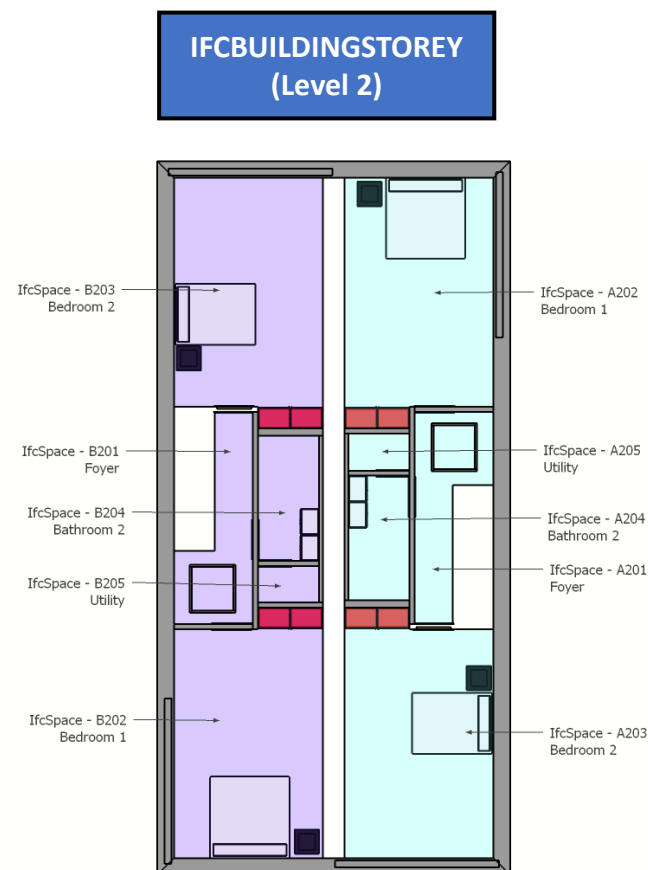
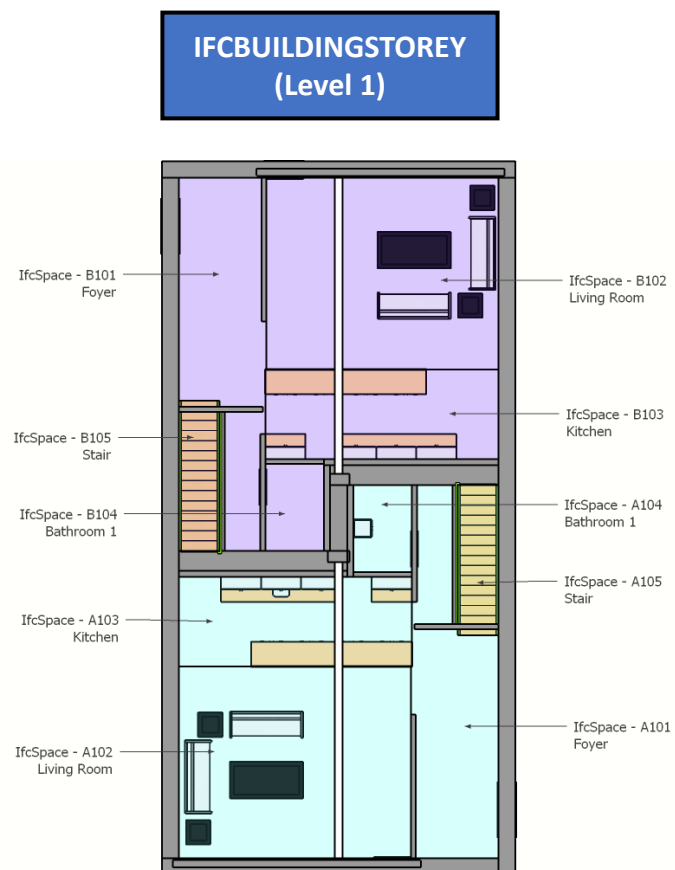
Floorにある空間の水平方向の構成. 一般的には部屋.

Name	A104	IfcSpace.Name
CreatedBy	danielle.r.love@usace.army.mil	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-09-27T16:15:03.421-05:00	IfcOwnerHistory.CreationDate
Category	13-41 11 14 11: Bathroom	IfcClassificationReference.Identification
FloorName	Level 1	IfcBuildingStorey.Name
Description	Bathroom 1	IfcSpace.Description
ExtSystem	Autodesk Revit Architecture 2011	IfcApplication.ApplicationFullName
ExtObject	IfcSpace	PickList.objType = IfcSpace
ExtIdentifier	0BTBFw6f90Nfh9rP1dIXru	IfcSpace.GlobalId
RoomTag	n/a	IfcPropertySingleValue.NominalValue
UsableHeight	0	IfcQuantityLength.LengthValue
GrossArea	3.998	IfcQuantityArea.AreaValue
NetArea	3.998	IfcQuantityArea.AreaValue

データ数: Desing(22) → Handover(22)

Worksheet 5 : Space (2)

50

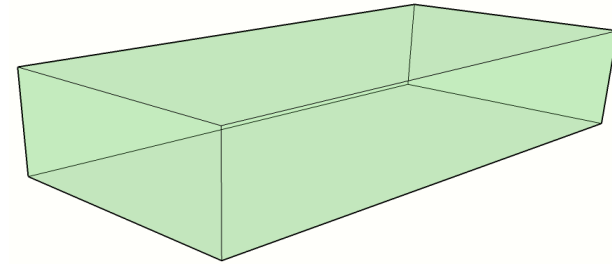


2015.05.27

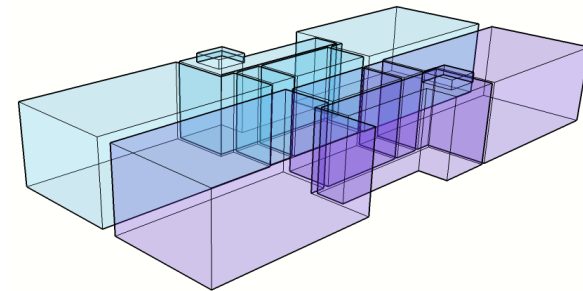
CIMを用いた維持管理 -COBie入門-

Worksheet 5 : Space (3)

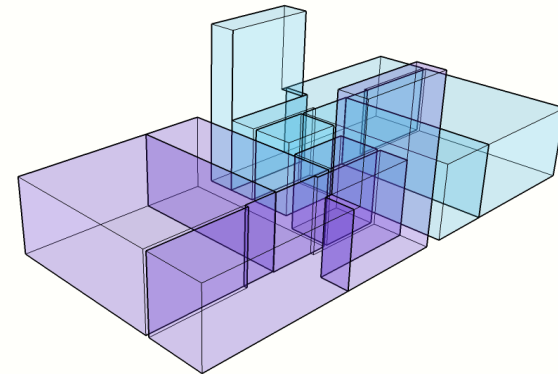
51



計10個 A201..A205,B201..B205



計11個 A101..A105,B101..B105,Site



Worksheet 6 : Zone (1)

52

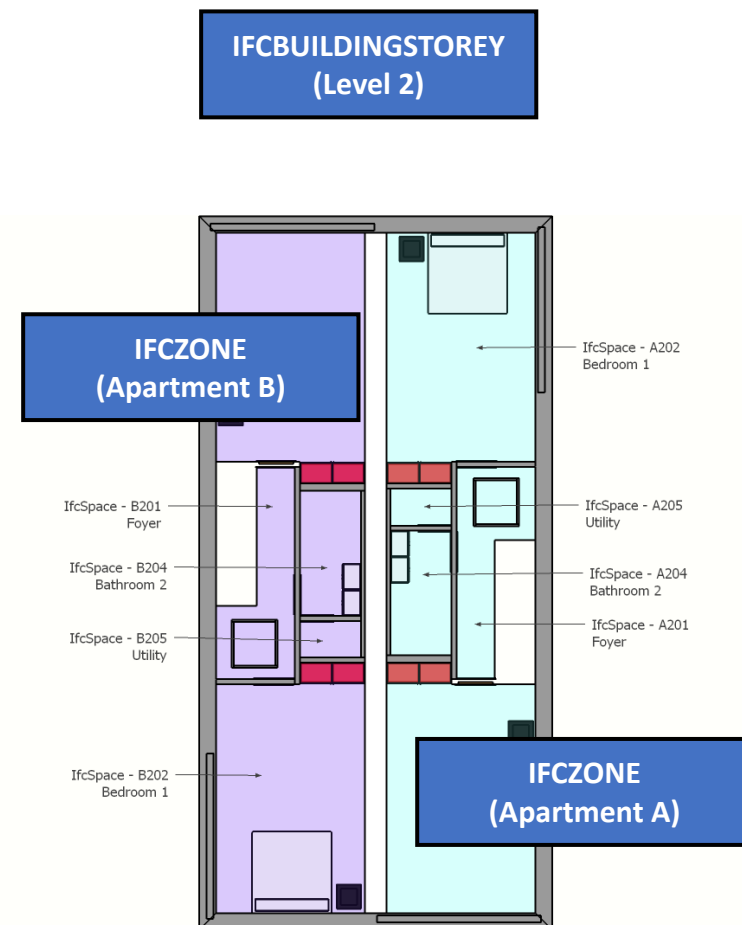
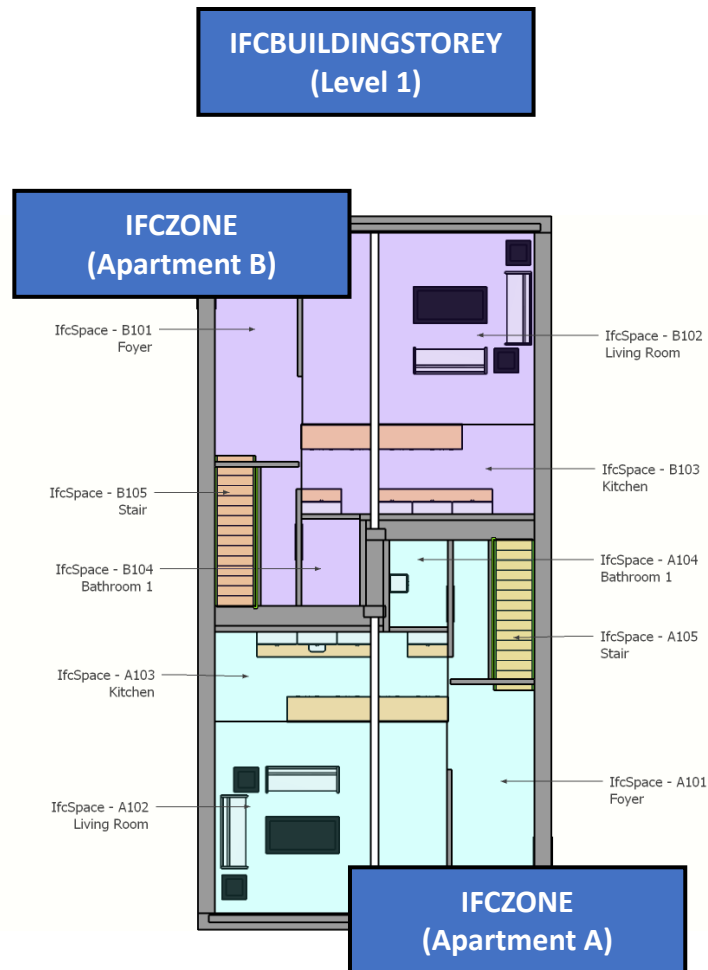
施設に関して設計上または運用上の機能を表すカテゴリに整理したスペースのグループ。ゾーンはネストできる

Name	Apartment A	IfcZone.Name
CreatedBy	constan2@illinois.edu	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-05-25T19:06:43	IfcOwnerHistory.CreationDate
Category	OccupancyZoneName	IfcClassificationReference.Identification
SpaceNames	A101	IfcSpace.Name
ExtSystem	Autodesk Revit MEP 2011	IfcApplication.ApplicationFullName
ExtObject	IfcPropertySingleValue	PickList.objType = IfcZone
ExtIdentifier	n/a	IfcZone.GlobalId
Description	Unit A OccupancyZoneName	IfcZone.Description

データ数: Desing(20) → Handover(20)

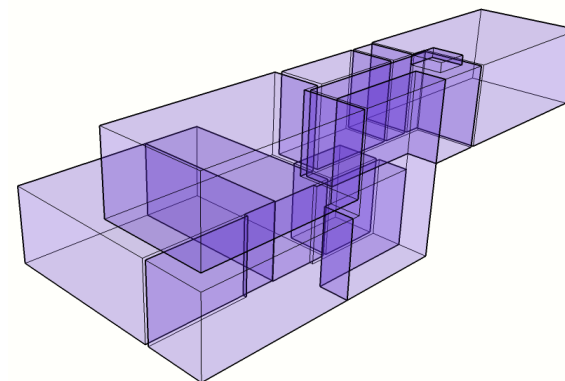
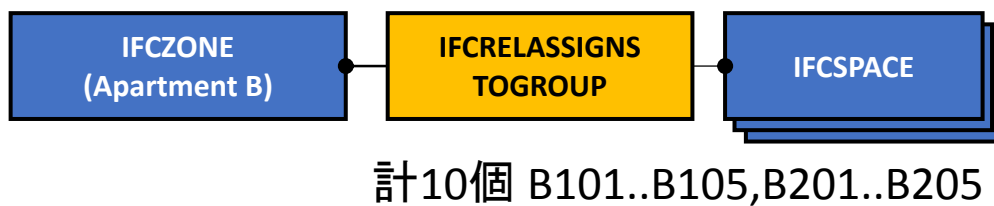
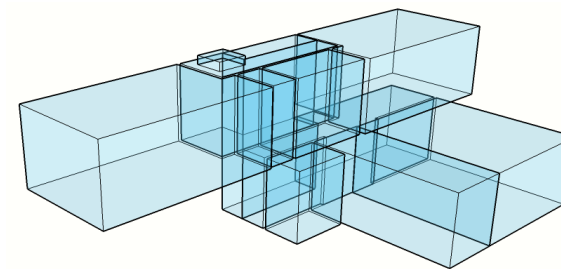
Worksheet 6 : Zone (2)

53



Worksheet 6 : Zone (3)

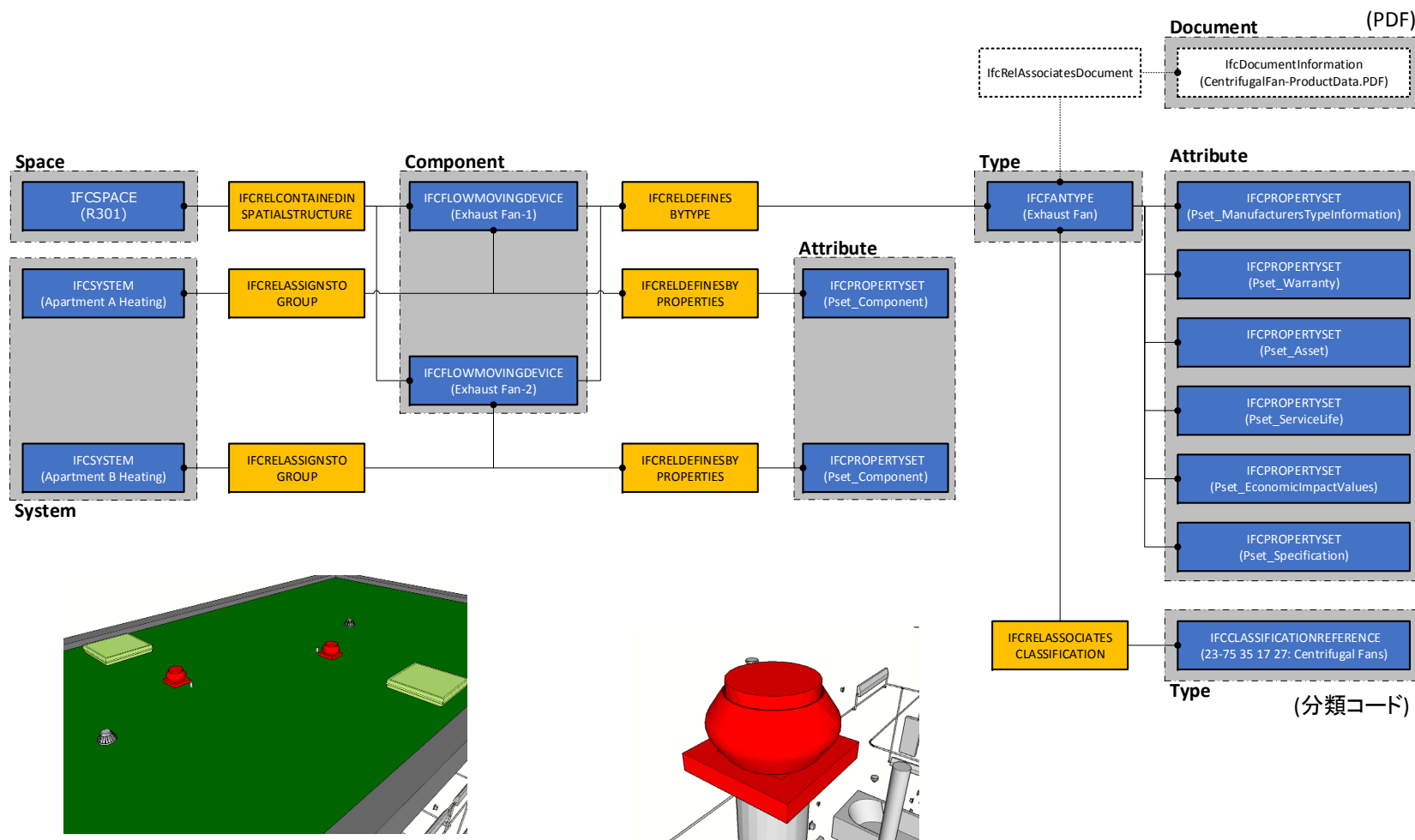
54



Worksheet 7 : Type (1)

55

Exhaust Fanの構成



2015.05.27

CIMを用いた維持管理 -COBie入門-

Worksheet 7 : Type (2)

56

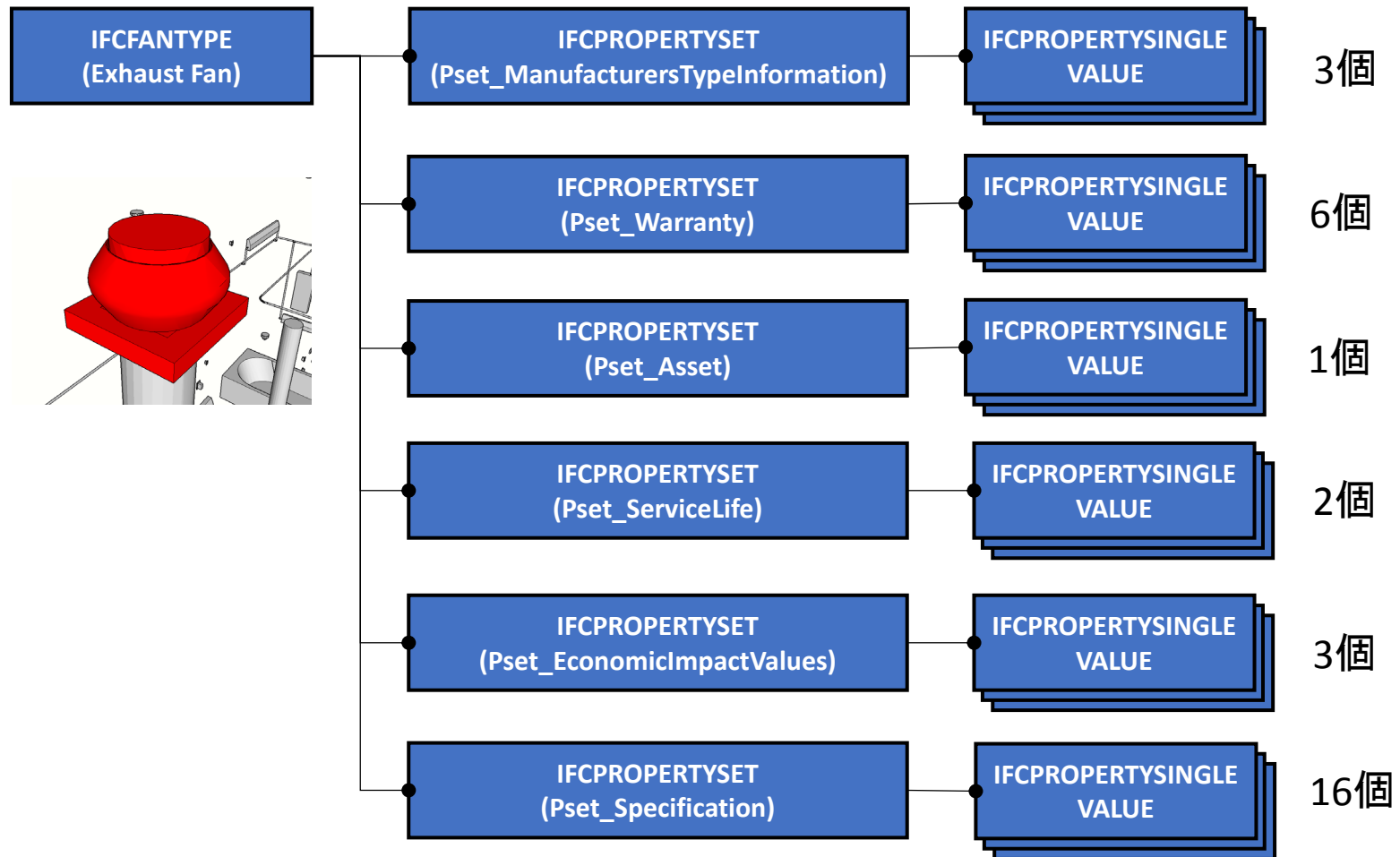
管理対象のアセットに関する情報. すべての情報は特定の製造者および型式情報にリンクされる.

Name	Exhaust Fan	IfcTypeObject.Name
CreatedBy	constan2@illinois.edu	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-05-25T19:06:43	IfcOwnerHistory.CreationDate
Category	23-75 35 17 27: Centrifugal Fans	IfcClassificationReference.Identification
Description	Centrifugal Fan - Rooftop - Upblast:991-1905 LPS:991-1905	IfcTypeObject.Description
AssetType	Fixed	IfcTypeObject IfcPropertySet
Manufacturer	sales@twincity.com	IfcTypeObject IfcPropertySet
ModelNumber	PCLP	IfcTypeObject IfcPropertySet
WarrantyGuarantorParts	warranty@twincity.com	IfcTypeObject IfcPropertySet
WarrantyDurationParts	1	IfcTypeObject IfcPropertySet
WarrantyGuarantorLabor	warranty@twincity.com	IfcTypeObject IfcPropertySet
WarrantyDurationLabor	1	IfcTypeObject IfcPropertySet
WarrantyDurationUnit	year	IfcConversionBasedUnit.Name
ExtSystem	Autodesk Revit MEP 2011	IfcApplication.ApplicationFullName
ExtObject	IfcFanType	Subclasses of IfcTypeObject
ExtIdentifier	2Rz4AOKDzDwO7k0TYgCbNX	IfcTypeObject.GlobalId
ReplacementCost	n/a	IfcTypeObject IfcPropertySet
ExpectedLife	5	IfcTypeObject IfcPropertySet
DurationUnit	year	IfcConversionBasedUnit.Name
WarrantyDescription	n/a	IfcTypeObject IfcPropertySet
NominalLength	0.4	IfcTypeObject IfcPropertySet
NominalWidth	0.32	IfcTypeObject IfcPropertySet
NominalHeight	0.1825	IfcTypeObject IfcPropertySet
ModelReference	n/a	IfcTypeObject IfcPropertySet
Shape	Rectangular	IfcTypeObject IfcPropertySet
Size	0.000	IfcTypeObject IfcPropertySet
Color	n/a	IfcTypeObject IfcPropertySet
Finish	Painted	IfcTypeObject IfcPropertySet
Grade	n/a	IfcTypeObject IfcPropertySet
Material	Wood	IfcTypeObject IfcPropertySet
Constituents	n/a	IfcTypeObject IfcPropertySet
Features	n/a	IfcTypeObject IfcPropertySet
AccessibilityPerformance	n/a	IfcTypeObject IfcPropertySet
CodePerformance	n/a	IfcTypeObject IfcPropertySet
SustainabilityPerformance	n/a	IfcTypeObject IfcPropertySet

データ数: Desing(0) → Handover(43)

Worksheet 7 : Type (3)

57



Worksheet 7 : Type (4)

- #88942 = IFCFANTYPE('2Rz4AOKDzDwO7k0TYgCbNX',#86462,'Exhaust Fan','Centrifugal Fan - Rooftop - Upblast:991-1905 LPS:991-1905',\$,(#88589,#88869,#88873,#88889,#88917,#88945),\$,\$,\$,\$);
- #88589 = IFCPROPERTYSET('3OQOa2h5v4bAuNVhJocLF9',#86441,'Pset_ManufacturersTypeInfo', 'Defines characteristics of manufactured products that may be given by the manufacturer. Note that the term may also be used to refer to products that are supplied and identified by the supplier or that are assembled off site by a third party provider.',(#88593,#88591,#88588));
 - #88593= IFCPROPERTYSINGLEVALUE('Manufacturer',\$,IFCLABEL('sales@twincity.com'),\$);
 - #88591= IFCPROPERTYSINGLEVALUE('ModelLabel',\$,IFCLABEL('PCLP'),\$);
 - #88588= IFCPROPERTYSINGLEVALUE('ModelLabel',\$,IFCLABEL('PCLP'),\$);
- #88869 = IFCPROPERTYSET('2LM_mh1d16TvLHj5oi5dM4',#86441,'Pset_Warranty','Warranty Information.',(#88587,#88584,#88582,#88580,#88578,#88868));
 - #88587= IFCPROPERTYSINGLEVALUE('WarrantyName','The name of the warranty',\$,\$);
 - #88584= IFCPROPERTYSINGLEVALUE('WarrantyDescription','Description of the Warranty',\$,\$);
 - #88582= IFCPROPERTYSINGLEVALUE('WarrantyGuarantorParts','Organization acting as guarantor of parts warranty',IFCLABEL('warranty@twincity.com'),\$);
 - #88580= IFCPROPERTYSINGLEVALUE('WarrantyDurationParts','Duration of parts warranty (years)',IFCREAL(1.0),\$);
 - #88578= IFCPROPERTYSINGLEVALUE('WarrantyGuarantorLabor','Organization acting as guarantor of labor warranty',IFCLABEL('warranty@twincity.com'),\$);
 - #88868= IFCPROPERTYSINGLEVALUE('WarrantyDurationLabor','Duration of labor warranty (years)',IFCREAL(1.0),\$);
- #88873 = IFCPROPERTYSET('1aiL29HwTAOhkv2Q6dhCO',#86441,'Pset_Asset','An asset is a uniquely identifiable element which has a financial value and against which maintenance actions are recorded.',(#88872));
 - #88872= IFCPROPERTYSINGLEVALUE('AssetAccountingType','Identifies the predefined types of asset from which the type required may be set.',IFCLABEL('Fixed'),\$);
- #88889 = IFCPROPERTYSET('3ZSbQ9gB58hZDELFbVz',#86441,'Pset_ServiceLife','A typical service life that is quoted for an artifact under reference operating conditions.',(#88876,#88882));
 - #88876= IFCPROPERTYSINGLEVALUE('ServiceLifeDuration','The length or duration of a service life.',IFCREAL(5.0),\$);
 - #88882= IFCPROPERTYENUMERATEDVALUE('ServiceLifeType','A typical service life that is quoted for an artifact under reference operating conditions.',(),#88883);
- #88917 = IFCPROPERTYSET('3sMBI9oUDEHh14er9FMAD',#86441,'Pset_EconomicImpactValues','Properties for economic impact values for Type.',(#88887,#88893,#88914));
 - #88887= IFCPROPERTYSINGLEVALUE('MethodOfMeasurement','MethodOfMeasurement',\$,\$);
 - #88893= IFCPROPERTYSINGLEVALUE('Cost','Replacement Cost',IFCREAL(0.0),#86722);
 - #88914= IFCPROPERTYENUMERATEDVALUE('LifeCyclePhase','Life Cycle Phase as defined in ISO 15978',IFCLABEL('LifeCyclePhase')),#88915);
- #88945 = IFCPROPERTYSET('3VUe1Ff3j8FkuJZ97xLPI',#86441,'Pset_Specification','Properties for IfcFanType',(#88918,#88920,#88922,#88925,#88927,#88929,#88928,#88936,#88937,#88934,#88935,#88932,#88933,#88930,#88931,#88944));
 - #88918= IFCPROPERTYSINGLEVALUE('NominalLength','Value for NominalLength',IFCLABEL('0.4'),\$);
 - #88920= IFCPROPERTYSINGLEVALUE('NominalWidth','Value for NominalWidth',IFCLABEL('0.32'),\$);
 - #88922= IFCPROPERTYSINGLEVALUE('NominalHeight','Value for NominalHeight',IFCLABEL('0.1825'),\$);
 - #88925= IFCPROPERTYSINGLEVALUE('ModelReference','Value for ModelReference',\$,\$);
 - #88927= IFCPROPERTYSINGLEVALUE('Shape','Value for Shape',IFCLABEL('Rectangular'),\$);
 - #88928= IFCPROPERTYSINGLEVALUE('Color','Value for Color',\$,\$);
 - #88929= IFCPROPERTYSINGLEVALUE('Size','Value for Size',IFCLABEL('0'),\$);
 - #88930= IFCPROPERTYSINGLEVALUE('CodePerformance','Value for CodePerformance',\$,\$);
 - #88931= IFCPROPERTYSINGLEVALUE('SustainabilityPerformance','Value for SustainabilityPerformance',\$,\$);
 - #88932= IFCPROPERTYSINGLEVALUE('Features','Value for Features',\$,\$);
 - #88933= IFCPROPERTYSINGLEVALUE('AccessibilityPerformance','Value for AccessibilityPerformance',\$,\$);
 - #88934= IFCPROPERTYSINGLEVALUE('Material','Value for Material',\$,\$);
 - #88935= IFCPROPERTYSINGLEVALUE('Constituents','Value for Constituents',\$,\$);
 - #88936= IFCPROPERTYSINGLEVALUE('Finish','Value for Finish',\$,\$);
 - #88937= IFCPROPERTYSINGLEVALUE('Grade','Value for Grade',\$,\$);
 - #88944= IFCPROPERTYSINGLEVALUE('Update','Value for Update',\$,\$);
- #88940= IFCRELASSOCIATESCLASSIFICATION('2CvUMYg5HEQH0NDb4dudzQ',\$',ASSOCIATION FROM (23-75 35 17 27: Centrifugal Fans) to (Exhaust Fan)',\$,#88942),#88596);
- #88596= IFCCLASSIFICATIONREFERENCE('23-75 35 17 27: Centrifugal Fans','23-75 35 17 27: Centrifugal Fans','23-75 35 17 27: Centrifugal Fans',\$);

Worksheet 7 : Type (5)

59

Entity	n	Name
IfcBoilerType	1	Boiler
IfcDoorStyle	4	Door Type A, Door Type B, Door Type C, Door Type D
IfcElectricApplianceType	9	Appliance – Microwave, Appliance – Range, Appliance – Refrigerator, Duplex Receptacle, Fire Alarm, Intercom Panelboard, Telophone Outlet, Thermostat
IfcFanType	1	Exhaust Fan
IfcFurnitureType	11	Cabinet Type A, Cabinet Type B, Cabinet Type C, Cabinet Type D, Cabinet Type E, Counter Top, Furniture - King Bed, Furniture - Coffee Table, Furniture - Queen Bed, Furniture - Side Table, Furniture - Sofa
IfcHeatExchangerType	1	Radiator
IfcLightFixtureType	3	Light Fixture Type A, Light Fixture Type B, Single Pole Switch
IfcProtectiveDeviceType	1	Smoke Detector
IfcPumpType	1	Inline Pump
IfcSanitaryTerminalType	6	Bath/Shower, Shower Stall, Sink Type A, Sink Type B, Sink Type C, Toilet
IfcWindowStyle	5	Skylight, Window Type A, Window Type B, Window Type C, Window Type D
	43	

Worksheet 8 : Component (1)

60

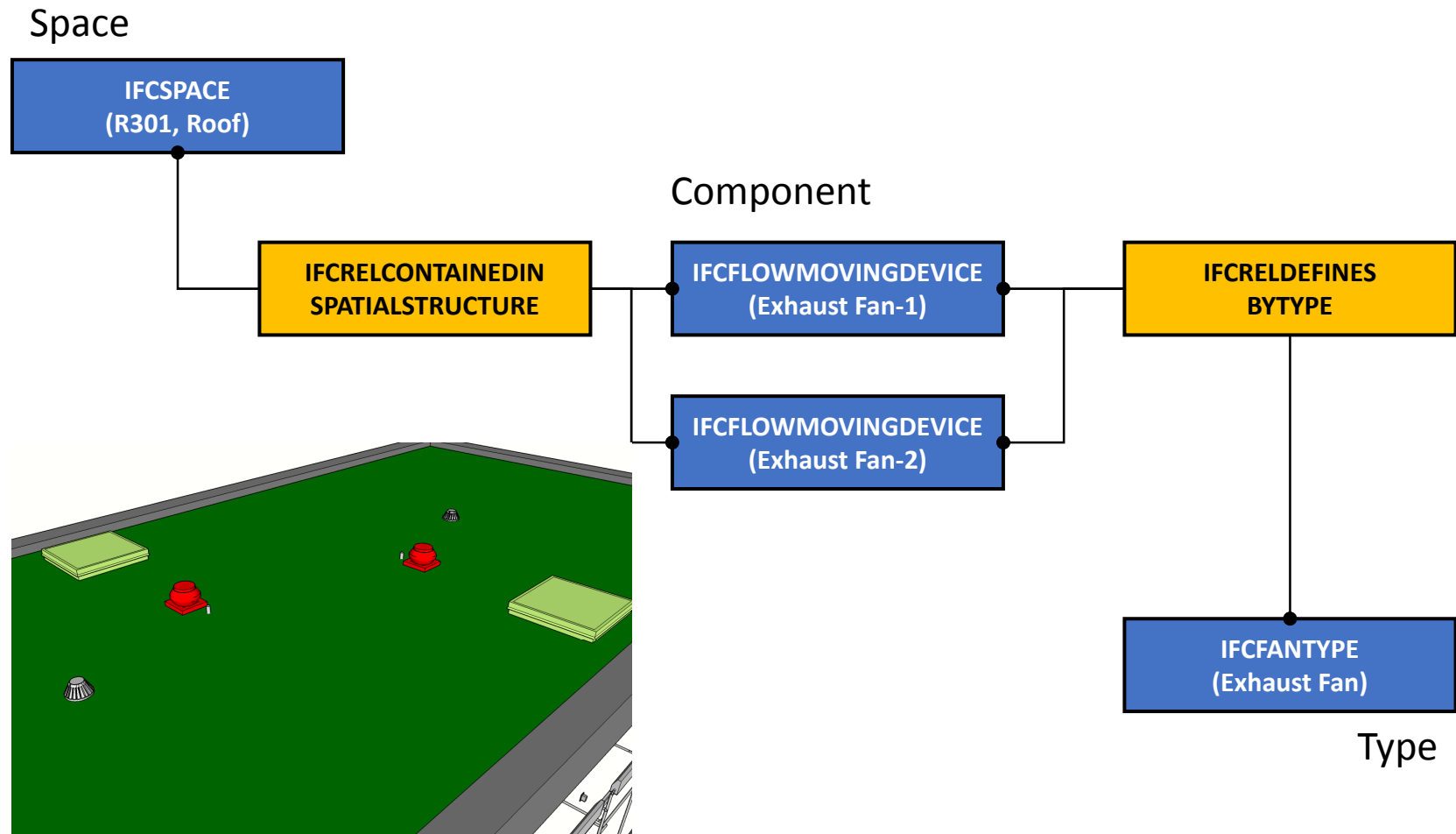
管理または維持されているすべての設備を個別に識別したもの

Name	Exhaust Fan-1	IfcProduct.name
CreatedBy	mariangelica.carrasquillo@usace.army.mil	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-09-27T16:15:52	IfcOwnerHistory.CreationDate
TypeName	Exhaust Fan	IfcTypeObject.Name
Space	R301	IfcSpace.Name
Description	M_Centrifugal Fan - Rooftop - Upblast:991-1905 LPS:991-1905 LPS:602113	IfcProduct.Description
ExtSystem	Autodesk Revit MEP 2011	IfcApplication.ApplicationFullName
ExtObject	IfcFlowMovingDevice	Subclasses of IfcProduct
ExtIdentifier	3RBA0TgZf479N6ijjYOyFM	IfcProduct.GlobalId
SerialNumber	DGRF43679	IfcPropertySet
InstallationDate	2010-04-20T09:00:00	IfcPropertySet
WarrantyStartDate	2010-04-20T09:00:00	IfcPropertySet
TagNumber	n/a	IfcPropertySet
BarCode	n/a	IfcPropertySet
AssetIdentifier	n/a	IfcPropertySet

データ数: Desing(0) → Handover(232)

Worksheet 8 : Component (2)

61



Worksheet 9 : System (1)

62

機能を発揮するために必要なコンポーネントのグループ。一般的には冷暖房, 防火監視設備, 配管, 電気配線等

Name	Apartment A Plumbing	IfcSystem.Name
CreatedBy	constan2@illinois.edu	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-05-25T19:06:43	IfcOwnerHistory.CreationDate
Category	21-51 31 11: Water for Single Facility	IfcClassificationReference.Identification
ComponentNames	Shower Stall-1	IfcProduct.Name
ExtSystem	Autodesk Revit MEP 2011	IfcApplication.ApplicationFullName
ExtObject	IfcPropertySingleValue	IfcSystem and subclasses
ExtIdentifier	n/a	IfcGloballyUniqueId
Description	n/a	IfcSystem.Description

データ数: Desing(0) → Handover(36)

Worksheet 9 : System (2)

63

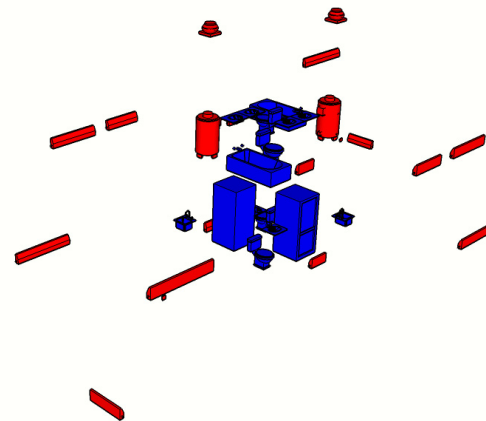
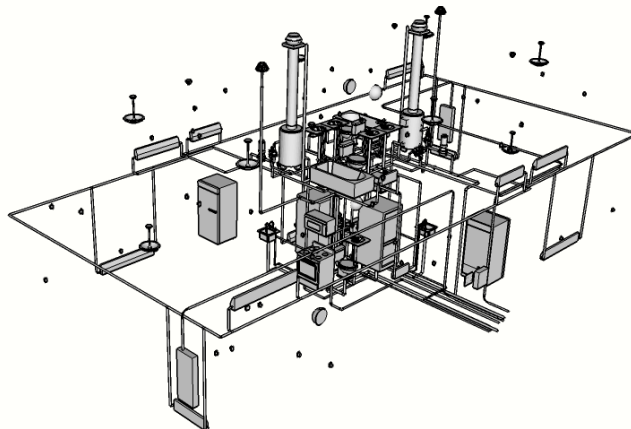
- #92788 = IFCFLOWMOVINGDEVICE('3RBA0TgZf479N6ijjYOyFM',#86542,'Exhaust Fan-1','M_Centrifugal Fan - Rooftop - Upblast:991-1905 LPS:991-1905 LPS:602113',\$,\$,\$,\$,\$);
- #95211 = IFCRELASSIGNSTOGROUP('3_vqZAXjD5yg7Vmb7PIM6P',#86441,'Apartment A Heating to Exhaust Fan-1 relation',\$,(#92788),\$,#95208);
- #95208 = IFCSYSTEM('3G\$LL_vor2RhKqgBMU7_QT',#86462,'Apartment A Heating','n/a','21-51 51 16 11: Ventilation');



Worksheet 9 : System (3)

64

Entity	n	Name
Apartment A Heating	6	Boiler-1, Exhaust Fan-1, Radiator-12, Radiator-5, Radiator-8, Thermostat-1
Apartment A Plumbing	8	Bath/Shower-1, Shower Stall-1, Sink Type A-1, Sink Type B-1, Sink Type C-1, Sink Type C-2, Toilet-1, Toilet-2
Apartment B Heating	14	Boiler-2, Exhaust Fan-2, Radiator-1, Radiator-10, Radiator-11, Radiator-13, Radiator-14, Radiator-2, Radiator-3, Radiator-4, Radiator-6, Radiator-7, Radiator-9, Thermostat-2
Apartment B Plumbing	8	Bath/Shower-2, Shower Stall-2, Sink Type A-2, Sink Type B-2, Sink Type C-3, Sink Type C-4, Toilet-3, Toilet-4
	36	



Worksheet 10 : Assembly

65

個別に管理が必要なコンポーネントで構成されている, または危険な操作を行うコンポーネントを含む, コンポーネント. 冷却装置, ファンコイルユニット, 分電盤など

Name		IfcRelAggregates.Name
CreatedBy		IfcTelecomAddress.ElectronicMailAddresses
CreatedOn		IfcOwnerHistory.CreationDate
SheetName		PickList.sheetType
ParentName		IfcProduct.Name or IfcTypeObject.Name
ChildNames		IfcProduct.Name or IfcTypeObject.Name
AssemblyType		hardcoded as "Fixed" mapping to IFC is n/a
ExtSystem		IfcApplication.ApplicationFullName
ExtObject		IfcProduct or IfcTypeObject subclasses
ExtIdentifier		IfcRelAggregates.GlobalId
Description		IfcRelAggregates.Description

サンプルファイルではIFCに含まれていない

データ数: Desing(0) → Handover(0)

Worksheet 11 : Spare

66

施設を運営するために必要な予備部品, 交換部品および消耗部品等のリスト

Name	Boiler Parts Lists	IfcConstructionProductResource.Name
CreatedBy	bill.east@us.army.mil	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2009-02-12T11:00:00	IfcOwnerHistory.CreationDate
Category	PartSet	IfcClassificationReference.Identification
TypeName	Boiler	IfcTypeObject.Name
Suppliers	parts@ps.com	IfcPropertySet
ExtSystem	n/a	IfcApplication.ApplicationFullName
ExtObject	n/a	PickList.objType
ExtIdentifier	n/a	IfcGloballyUniqueId
Description	n/a	IfcConstructionProductResource.Description
SetNumber	n/a	IfcPropertySet
PartNumber	n/a	IfcPropertySet

サンプルファイルではIFCに含まれていない

データ数: Desing(0) → Handover(3)

Name	CreatedBy	CreatedOn	Category	TypeName	Suppliers	ExtSystem	ExtObject	ExtIdentifier	Description	SetNumber	PartNumber
Boiler Parts Lists	bill.east@us.army.mil	2009-02-12T11:00:00	PartSet	Boiler	parts@ps.com	n/a	n/a	n/a	n/a	n/a	n/a
Radiator Parts Lists	bill.east@us.army.mil	2009-02-12T11:00:00	PartSet	Radiator	parts@hongbo.com	n/a	n/a	n/a	n/a	n/a	n/a
Shower Stall Parts Lists	bill.east@us.army.mil	2009-02-12T11:00:00	PartSet	Shower Stall	parts@kholer.com	n/a	n/a	n/a	n/a	n/a	n/a

Worksheet 12 : Resource

67

器具, 設備およびメンテナンス活動に必要なトレーニングなど

Name	Basic Electricity Course	IfcConstructionEquipmentResource.Name
CreatedBy	parts@ps.com	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2010-02-13T12:09:09	IfcOwnerHistory.CreationDate
Category	Training	IfcConstructionEquipmentResource.ObjectType
ExtSystem	n/a	IfcApplication.ApplicationFullName
ExtObject	n/a	PickList.objType
ExtIdentifier	n/a	IfcConstructionEquipmentResource.GlobalId
Description	Training	IfcConstructionEquipmentResource.Description

サンプルファイルではIFCに含まれていない

データ数: Desing(0) → Handover(10)

Name	CreatedBy	CreatedOn	Category	ExtSystem	ExtObject	ExtIdentifier	Description
Basic Electricity Course	parts@ps.com	2010-02-13T12:09:09	Training	n/a	n/a	n/a	Training
Boiler Certification Course	parts@ps.com	2010-02-13T12:09:09	Training	n/a	n/a	n/a	Training
Cad Call Relay Switch Flame Sensors	parts@hongbo.com	2010-02-13T12:09:09	Material	n/a	n/a	n/a	Flame sensing device on oil-fired heating appliance
Door Hinge Lubricant	customercare@lowes.com	2010-02-13T12:09:09	Material	n/a	n/a	n/a	Lubricant for door hinges
Halide Leak Detector Kit	sales@grainger.com	2010-02-13T12:09:09	Tools	n/a	n/a	n/a	Grainger (HVAC) - Model No. 3JH45, Qty-1.
Ladder	mariangelica.carrasquillo@usace.army.mil	2010-02-05T12:09:09	Tools	n/a	n/a	n/a	10 foot step ladder, drawn from your shop
Limit Switch	parts@hongbo.com	2010-02-13T12:09:09	Material	n/a	n/a	n/a	Single-function heating boiler limit control
Radiator Certification Course	parts@ps.com	2010-02-13T12:09:09	Training	n/a	n/a	n/a	Training
Snap Ring Pliers	sales@grainger.com	2010-02-13T12:09:09	Tools	n/a	n/a	n/a	Grainger (Tools) - Model No. T-3
Voltmeter	sales@grainger.com	2010-02-13T12:09:09	Tools	n/a	n/a	n/a	Grainger (Electric) Model No 9666

Worksheet 13 : Job (1)

68

施設の維持に必要なタスクで, 予防保全, テスト要件, 起動, 停止, 危急事態の
処理手順, 安全手順など施設の所有者が指揮する必要のある活動

Name	Boiler - Lockout	IfcTask.Name
CreatedBy	mariangelica.carrasquillo@usace.army.mil	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2010-02-05T12:09:09	IfcOwnerHistory.CreationDate
Category	Safety	IfcTask.ObjectType
Status	Not Yet Started	IfcTask.Status
TypeName	Boiler	IfcTypeObject.Name
Description	Boiler - Lockout Turn off boiler at the control panel. Turn off control power on control panel. Turn off power at main breaker panel. Lock out the control panel and main breaker panel. Shut off main gas valve and lock with the provided chain and keyed lock. Close pilot light valve. After boiler has stopped generating steam, close main header valve and lock the chain. Lock blow down line in closed position with provided chain and lock. Switch feed water pump off to boiler. Close feed water valve. Open atmospheric valve on main steam header valve.	IfcTask.Description
Duration	8	IfcTaskTime.ScheduledDuration
DurationUnit	minute	IfcConversionBasedUnit.Name
Start	2010-10-01T00:00:00	IfcTaskTime.ScheduleStart
TaskStartUnit	as required	IfcConversionBasedUnit.Name
Frequency	n/a	IfcRecurrencePattern.Occurences
FrequencyUnit	as required	IfcConversionBasedUnit.Name
ExtSystem	n/a	IfcApplication.ApplicationFullName
ExtObject	n/a	PickList.objType (IfcTask)
ExtIdentifier	n/a	IfcTask.GlobalId
TaskNumber	0	IfcTask.Identification
Priors	0	IfcTask.Name
ResourceNames	n/a	IfcConstructionEquipmentResource.Name

サンプルファイルではIFCに含まれていない
データ数: Desing(0) → Handover(94)

Worksheet 13 : Job (2)

69

Name	n	Category	TypeName	FrequencyUnit
Boiler - Lockout	1	Safety	Boiler	As required
Boiler Inspection - Shutdown	6	PM	Boiler	As required
Boiler Inspection - Annual	17	PM	Boiler	Year
Boiler Inspection - Bi Weekly	9	PM	Boiler	week
Boiler Inspection - Start Up	10	PM	Boiler	As required
Emergency Lights (Closed Systems)	11	PM	Light Fixture Type B	Month
Fluorescent Light Fixture Relamping Only	9	PM	Light Fixture Type B	Year
Plubming Inspection - Annual	22	PM	Bath/Shower, Sink Type B, Sink Type C	Year
Radiator - Annual Service	8	PM	Radiator	year
Radiator Lockout	1	Safety	Radiator	As required
	94			

Worksheet 13 : Job (3)

70

Boiler Inspection – Annual Frequency: 1 year

Category	Description	Duration	Duration Unit
PM	Annual Boiler Inspection	112 minute	
PM	Shut down boiler - secure fuel supply and electric power. Lockout/Tagout as required.	7 minute	
PM	Inspect and clean boiler tubes.	7 minute	
PM	Check combustion chamber for air and/or gas leaks.	7 minute	
PM	Check fuel lines and connections for damage.	7 minute	
PM	Check for proper operational response of burner to thermostat controls. Adjust as required.	7 minute	
PM	Check and lubricate burner and blower motors.	7 minute	
PM	Check main flame failure protection and main flame detection scanner on boiler equipment with spark ignition (oil burner).	7 minute	
PM	Check electrical wiring to burner controls and blower.	7 minute	
PM	Clean firebox (sweep and vacuum).	7 minute	
PM	Check operation of control switches (i.e. steam pressure, hot water temperature limit, atomizing or combustion air proving, etc.).	7 minute	
PM	Check hot water pressure gages.	7 minute	
PM	Check condition of flue pipe, damper and exhaust stack.	7 minute	
PM	Check boiler operation through complete cycle (approximately 30 minutes).	7 minute	
PM	Clean area around equipment.	7 minute	
PM	Complete work order time and materials. Mandatory comments required!!	7 minute	
PM	Report outstanding discrepancies to supervisor for corrective action.	7 minute	

※PM Preventive Maintenance(予防保全)

Worksheet 14 : Impact

71

施設が持つ環境上の影響またはテナントが取得できる影響など

Name		IfcProperty.Name
CreatedBy		IfcTelecomAddress.ElectronicMailAddresses
CreatedOn		IfcOwnerHistory.CreationDate
ImpactType		Picklist.ImpactType
ImpactStage		PickList.ImpactStage
SheetName		PickList.sheetType
RowName		n/a
Value		IfcPropertySingleValue.NominalValue
ImpactUnit		IfcPropertySingleValue.Unit (Prefix + Name)
LeadInTime		IfcPropertySingleValue.NominalValue
Duration		IfcPropertySingleValue.NominalValue
LeadOutTime		IfcPropertySingleValue.NominalValue
ExtSystem		IfcApplication.ApplicationFullName
ExtObject		PickList.objType
ExtIdentifier		IfcPropertySet.GlobalId
Description		IfcProperty.Description

サンプルファイルではIFCに含まれていない

データ数: Desing(0) → Handover(0)

Worksheet 15 : Document (1)

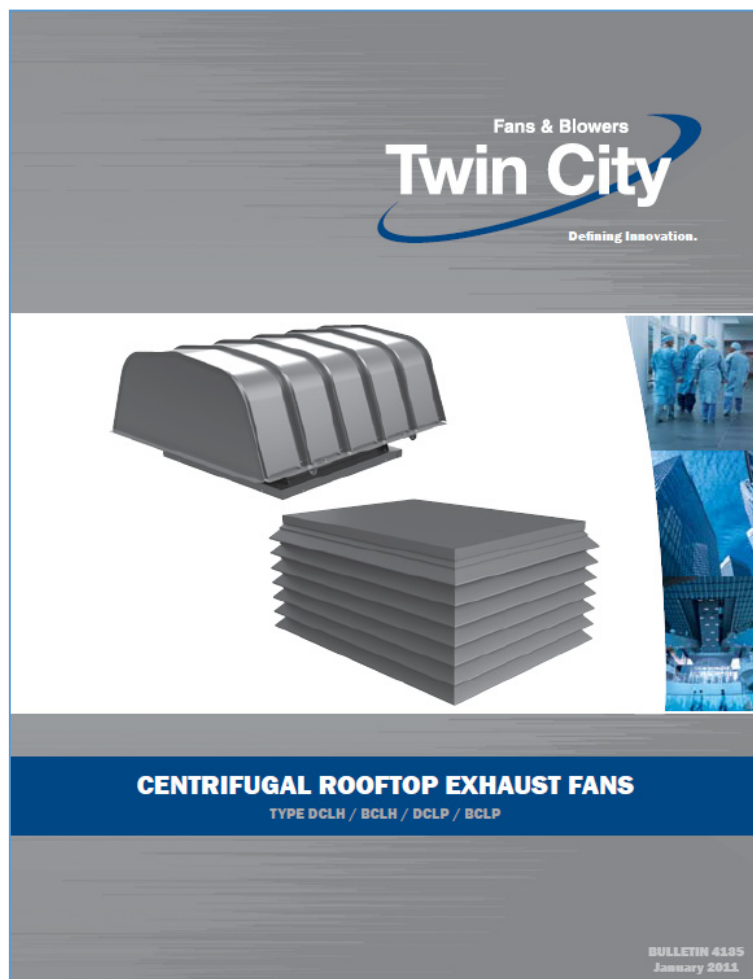
72

プロジェクトの期間中に施設のアセットの識別のために作成されたドキュメントをリンクする

Name	Exhaust Fan Product Data	IfcDocumentInformation.Name
CreatedBy	mariangelica.carrasquillo@usace.army.mil	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-05-25T19:06:43	IfcOwnerHistory.CreationDate
Category	Product Data	IfcClassification.Name
ApprovalBy	Contractor Certified	IfcDocumentInformation.IntendedUse
Stage	Submitted	IfcDocumentInformation.Scope
SheetName	Type	n/a
RowName	Exhaust Fan	n/a
Directory	document	IfcDocumentInformation.Location
File	CentrifugalFan-ProductData.PDF	IfcDocumentInformation.Identification
ExtSystem	Autodesk Revit MEP 2011	IfcApplication.ApplicationFullName
ExtObject	IfcFanType	PickList.objType
ExtIdentifier	2Rz4AOKDzDwO7k0TYgCbNX	IfcDocumentInformation.DocumentId
Description	Exhaust Fan	IfcDocumentInformation.Description
Reference	n/a	IfcDocumentInformation.Name

サンプルファイルではIFCに含まれていない

データ数: Desing(0) → Handover(48)



DCLH/BCLH/DCLP/BCLP Low Profile Hooded & Louvered Penthouse Roof Ventilators

Twin City Fan & Blower's line of Low Profile Centrifugal Roof Exhausters provide quiet and efficient ventilation in general, clean air applications. These units are designed to offer world class performance and quality. The compact design and low contour minimizes the extension above the roof line and gives the BCL and DCL series an inconspicuous appearance. This makes them the ideal choice for installations viewed from street level to maintain an attractive architectural appearance.

Models

Type DCLH and BCLH

Hooded models DCLH (direct drive) and BCLH (belt driven) are available for exhaust service in general, clean air applications. They feature a hinged, removable galvanized steel hood for cleaning and servicing the fan and a galvanized steel wire birdscreen along the perimeter of the hood.

Type DCLP and BCLP

Louvered penthouse models DCLP (direct drive) and BCLP (belt driven) are available for exhaust service in general, clean air applications. These models feature a tiered aluminum louvered penthouse enclosure with a removable aluminum top cover and a galvanized steel mesh birdscreen positioned vertically behind the louvers.

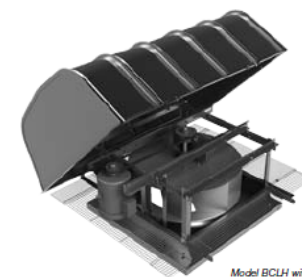
Sizes and Performance

Direct Drive

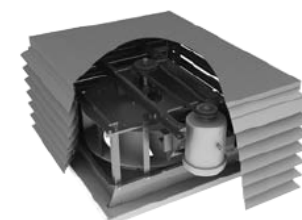
- 8 exhaust sizes from 060 through 120
- Capacities ranging from 100 to 2,000 CFM
- Static pressure capability to 1" w.g.
- Speed control available on all sizes with specific ODP 115V motors

Belt Driven

- 11 exhaust sizes from 100 to 480
- Capacities ranging from 400 to 29,500 CFM
- Static pressure capability to 2.5" w.g.



Model BCLH with Pivoting Hood



Cutaway of Model BCLP



DCLH, BCLH, DCLP & BCLP models are cULus 705 listed for electrical, File No. E158660.



Twin City Fan & Blower is a registered member of the USGBC, a non-profit community of leaders working to make green buildings available to everyone within a generation.

©2010 Twin City Fan Companies, Ltd. All rights reserved throughout the world. Bulletin illustrations cover the general appearance of Twin City Fan & Blower products at the time of publication and we reserve the right to make changes in design and construction at any time without notice.

CentrifugalFan-ProductData.pdf

Worksheet 15 : Document (3)

74

Entity	n	Name
IfcBoilerType	1	Boiler
(IfcControllerType)	1	Thermostat
IfcDoorStyle	4	Door Type A, Door Type B, Door Type C, Door Type D
IfcElectricApplianceType	9	Appliance – Microwave, Appliance – Range, Appliance – Refrigerator, Duplex Receptacle, Fire Alarm, Intercom Panelboard, Telephone Outlet, Thermostat
IfcFanType	1	Exhaust Fan
IfcFurnitureType	11	Cabinet Type A, Cabinet Type B, Cabinet Type C, Cabinet Type D, Cabinet Type E, Counter Top, Furniture - King Bed, Furniture - Coffee Table, Furniture - Queen Bed, Furniture - Side Table, Furniture - Sofa
IfcHeatExchangerType	1	Radiator
IfcLightFixtureType	3	Light Fixture Type A, Light Fixture Type B, Single Pole Switch
(IfcOutletType)	1	Duplex Receptacle
IfcProtectiveDeviceType	1	Smoke Detector
IfcPumpType	1	Inline Pump
IfcSanitaryTerminalType	7	Bath/Shower, Bath/Shower, Shower Stall, Sink Type A, Sink Type B, Sink Type C, Toilet
IfcWindowStyle	5	Skylight, Window Type A, Window Type B, Window Type C, Window Type D
(n/a)	2	Appliance – Microwave, Range-O&M
	48	

Worksheet 16 : Attribute

75

属性情報のリスト。プロパティセットの内容を記述

Name	Perimeter	IfcProperty.Name
CreatedBy	mariangelica.carrasquillo@usace.army.mil	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-09-27T16:15:04	IfcOwnerHistory.CreationDate
Category	As Built	IfcClassificationReference.Identification
SheetName	Space	n/a
RowName	B205	n/a
Value	5.404	IfcPropertySingleValue.NominalValue
Unit	meter	IfcPropertySingleValue.Unit (Prefix + Name)
ExtSystem	Autodesk Revit Architecture 2011	IfcApplication.ApplicationFullName
ExtObject	PSet_Revit_Dimensions	PickList.objType
ExtIdentifier	3Sx0flAK1DcOgyP_hApnz9	IfcPropertySet.Name or IfcObject.GlobalId
Description	Perimeter	IfcProperty.Description
AllowedValues	n/a	IfcPropertyEnumeration.EnumerationValues

データ数: Desing (88) → Handover (94)

Worksheet 17 : Coordinate

76

点、線、および矩形等のジオメトリの最小セットが参照されたオブジェクトのために指定することができるメカニズム

Name	A101	IfcBuildingStorey.Name, IfcSpace.Name, or IfcProduct.Name
CreatedBy	constan2@illinois.edu	IfcTelecomAddress.ElectronicMailAddresses
CreatedOn	2011-05-25T19:06:43	IfcOwnerHistory.CreationDate
Category	box-lowerleft	n/a
SheetName	Space	PickList.sheetType
RowName	A101	n/a
CoordinateXAxis	0	IfcCartesianPoint.Coordinates[0]
CoordinateYAxis	0	IfcCartesianPoint.Coordinates[1]
CoordinateZAxis	0	IfcCartesianPoint.Coordinates[2]
ExtSystem	Autodesk Revit MEP 2011	IfcApplication.ApplicationFullName
ExtObject	IfcSpace	IfcBuildingStorey.GlobalId, IfcSpace.GlobalId, or IfcProduct.GlobalId
ExtIdentifier	0CRPz_SEr94Ah74P8LhwD0	PickList.objType
ClockwiseRotation	0	not currently mapped
ElevationalRotation	0	not currently mapped
YawRotation	0	not currently mapped

Spaceの位置を、box-lowerleftおよびbox-upperright のCoordinateXAxis、CoordinateYAxis、CoordinateZAxisで示す

データ数: Desing(42) → Handover(42)

Worksheet 18 : Connection

77

タイプあるいはコンポーネントの論理的な接続の情報

Name		IfcRelConnectsElements.Name
CreatedBy		IfcTelecomAddress.ElectronicMailAddresses
CreatedOn		IfcOwnerHistory.CreationDate
ConnectionType		IfcRelConnectsElements.Description
SheetName		PickList.sheetType
RowName1		IfcProduct.name
RowName2		IfcProduct.name
RealizingElement		IfcConnectsPorts.RealizingElement.Name
PortName1		IfcRelConnectsPorts.RelatingPort
PortName2		IfcRelConnectsPorts.RelatedPort
ExtSystem		IfcApplication.ApplicationFullName
ExtObject		IfcRelConnectsElements.GlobalId
ExtIdentifier		PickList.objType
Description		IfcRelConnectsElements.Description

データ数: Desing(0) → Handover(0)

プロジェクトの関連する過程の課題と意思決定を記述するメカニズム

Name		IfcApproval.Name
CreatedBy		IfcTelecomAddress.ElectronicMailAddresses
CreatedOn		IfcOwnerHistory.CreationDate
Type		Pset_Risk.RiskType
Risk		Pset_Risk.RiskRating
Chance		Pset_Risk.AssessmentOfRisk
Impact		Pset_Risk.RiskConsequence
SheetName1		PickList.sheetType
RowName1		n/a
SheetName2		PickList.sheetType
RowName2		n/a
Description		IfcApproval.Description
Owner		IfcTelecomAddress.ElectronicMailAddresses
Mitigation		Pset_Risk.PreventiveMeasures
ExtSystem		IfcApplication.ApplicationFullName
ExtObject		PickList.objType
ExtIdentifier		IfcApproval.GlobalId

データ数: Desing(0) → Handover(0)

Worksheet 20 : Pick List

79

他の選択リストの中で使用される値

Category-Facility	11-11: Assembly Facilities	IfcClassificationReference.Location
Category-Space	13-11: Interaction Spaces	IfcClassificationReference.Location
Category-Element	21-21: Grade and Subgrade	IfcClassificationReference.Location
Category-Product	23-10: Site Products	IfcClassificationReference.Location
Category-Role	34-11: Management	IfcClassificationReference.Location

データ数: Desing(3262) → Handover(3262)

- COBieは、ライフサイクルの保存およびファシリティーマネージャーに必要とされる情報の伝達のための情報交換仕様。
- COBieは、設備の情報伝達（点検要領を含む）が主な機能である。
- COBieは、構造物や設備の形状を要求していない。
- COBieは、リレーショナルデータベースではない。
- COBieを適切に運用するためには、維持管理の対象物および作業等の整理、並びにIFC(BIM)の知識が欠かせない。

ご清聴ありがとうございました

CIMを用いた維持管理 -COBie入門-
COBie入門

IAI日本 土木分科会
株式会社コンポート 有賀貴志

2015年5月27日（水） 13：25～17：00
オートデスク株式会社 セミナールーム