

## Revision of ruleset

The ruleset for classification of the elements of an IFC model in terms of the Swiss Element-Based Cost Classification for Building Construction (eCC-BC) has been comprehensively revised and updated:

on the one hand, the building construction part of the IFC rulesets has been adapted in line with the revised eCC-BC 2020. On the other hand, due account has also been taken of various considerations regarding long-term mapping of the IFC data model during revision so as to pave the way for more detailed CRB catalogues and other applications.

## Rule elements

The new ruleset, like the previous one, relates to levels 1 to 3 of the eCC-BC. Now, however, the allocations of the individual entities are listed separately as so-called "rule elements". Allowance can thus be made for the fact that, under the definition, several different occurrences of parts of works – sometimes differently modelled – are often possible for a single eCC-BC element.

The rule elements indicate the most important entities that can normally be allocated to an element. The fact that they are now clearly designated will ensure a greater degree of transparency.

Level	Ebene	Code	Elementbezeichnung_ DE	Désignation_FR	Designazione dell'elemento_IT	Element designation_EN	Entität	Vordefinierter Typ	Objekt Typ	C O E
2	Elementgruppe	C02	Wandkonstruktion	Parois porteuses	Parete grezza	Structural walls				
3	Element	C02.01	Aussenwandkonstruktion	Parois porteuses extérieures	Parete grezza esterna	External walls				
4	IFC-Regelament	C02.01	Massivwand	Parois massives	Parete massiccia	Solid walls	ItcWall	SOLIDWALL		
4	IFC-Regelament	C02.01	Scherwand	Murs avec fuit	Parete di taglio	Shear walls	ItcWall	SHEAR		
4	IFC-Regelament	C02.01	Briistung	Parapets	Parapetto	Parapets	ItcWall	PARAPET		
4	IFC-Regelament	C02.01	Sturz	Linteaux	Architrave	Lintels	ItcBeam	LINTEL		
4	IFC-Regelament	C02.01	Massivwand	Parois massives	Parete massiccia	Solid walls	ItcWallStandardCase	-	SOLEWALL	
4	IFC-Regelament	C02.01	Scherwand	Murs avec fuit	Parete di taglio	Shear walls	ItcWallStandardCase	-	SHEAR	
4	IFC-Regelament	C02.01	Briistung	Parapets	Parapetto	Parapets	ItcWallStandardCase	-	PARAPET	
4	IFC-Regelament	C02.01	Fliesen	Mosaïques	Montante	Mullions	ItcMember	MULLION		
4	IFC-Regelament	C02.01	Platte	Plats	Lastra	Plates	ItcMember	PLATE		
4	IFC-Regelament	C02.01	Ständer	Montants	Profilo verticale	Studs	ItcMember	STUD		
3	Element	C02.02	Innenwandkonstruktion	Parois porteuses intérieures	Parete grezza interna	Internal walls				
4	IFC-Regelament	C02.02	Massivwand	Parois massives	Parete massiccia	Solid walls	ItcWall	SOLIDWALL		
4	IFC-Regelament	C02.02	Scherwand	Murs avec fuit	Parete di taglio	Shear walls	ItcWall	SHEAR		
4	IFC-Regelament	C02.02	Briistung	Parapets	Parapetto	Parapets	ItcWall	PARAPET		
4	IFC-Regelament	C02.02	Sturz	Linteaux	Architrave	Lintels	ItcBeam	LINTEL		
4	IFC-Regelament	C02.02	Massivwand	Parois massives	Parete massiccia	Solid walls	ItcWallStandardCase	-	SOLEWALL	
4	IFC-Regelament	C02.02	Scherwand	Murs avec fuit	Parete di taglio	Shear walls	ItcWallStandardCase	-	SHEAR	
4	IFC-Regelament	C02.02	Briistung (Galerie, Treppenbriistung)	Parapets (galerie; parapets d'escalier)	Parapetto (parapetto di galleria, sciv)	Parapets (gallery; stair parapet)	ItcWallStandardCase	-	PARAPET	
4	IFC-Regelament	C02.02	Fliesen	Mosaïques	Montante	Mullions	ItcMember	MULLION		
4	IFC-Regelament	C02.02	Platte	Plats	Lastra	Plates	ItcMember	PLATE		
4	IFC-Regelament	C02.02	Ständer	Montants	Profilo verticale	Studs	ItcMember	STUD		
2	Elementgruppe	C03	Stützenkonstruktion	Piliers	Pilastro	Structural columns				
3	Element	C03.01	Aussenstütze	Piliers extérieurs	Pilastro esterno	Perimeter columns				

## PROVISIONFORVOID and IfcVoidingFeature

Different model phases can sometimes be accommodated within a single element using different rule elements:

in Element C05.01 (Holes/chases formed in structure), for instance, "Provision for void for services" (IfcBuildingElementProxy/PROVISIONFORVOID) can be passed on to the building services model for co-ordination and subsequent documentation in the form of specific openings, holes, chases etc. (IfcVoidingFeature.xxxx) (see standard SIA 400) in the architectural and/or structural model.

Level	Ebene	Code	Elementbezeichnung_DE	Désignation_FR	Designazione dell'elemento_IT	Element designation_EN	Entität	Vordefinierter Typ	Objekt
4	IFC-Regellement	C04.08	Balkonplatte	Dalles de balcon	Soletta di balcone	Balcony slab	IfcSlab	USERDEFINED	BALCONY
2	Elementgruppe	C05	Ergänzende Leistung zu Konstruktion	Prestations complémentaires au gros oeuvre	Prestazione complementare alla costr	Builder's work in connection (for structure)			
3	Element	C05.01	Durchbruch, Schlitz zu Konstruktion	Percements et saignées dans le gros oeuvre	Breccia, scanalatura nella costruzione gr	Holes/chases formed in structure			
4	IFC-Regellement	C05.01	Wandöffnung	Ouvertures de paroi	Apertura nella parete	Wall openings	IfcOpeningElement		
4	IFC-Regellement	C05.01	Deckenöffnung	Troümes	Apertura nella soletta	Suspended slab openings	IfcOpeningElement		
4	IFC-Regellement	C05.01	Wanddurchbruch (WD)	Percement minagés dans un mur (PM)	Breccia nella parete	Cut-outs in wall	IfcVoidingFeature	CUTOUT	
4	IFC-Regellement	C05.01	Deckendurchbruch (DD)	Percement minagés dans une dalle (PD)	Breccia nella soletta	Cut-outs in suspended slab	IfcVoidingFeature	CUTOUT	
4	IFC-Regellement	C05.01	Bodendurchbruch (BD)	Percement minagés dans un sol (PS)	Breccia nella platea	Cut-outs in ground slab	IfcVoidingFeature	CUTOUT	
4	IFC-Regellement	C05.01	Fundamentdurchbruch (FD)	Percement minagés dans une fondation (PF)	Breccia nella fondazione	Cut-outs in foundation	IfcVoidingFeature	CUTOUT	
4	IFC-Regellement	C05.01	Wandschlitz (WS)	Evidements minagés dans un mur (EM)	Scanalatura nella parete	Wall chases	IfcVoidingFeature	NOTCH	
4	IFC-Regellement	C05.01	Deckenschlitz (DS)	Evidements minagés dans une dalle (ED)	Scanalatura nella soletta	Suspended slab chases	IfcVoidingFeature	NOTCH	
4	IFC-Regellement	C05.01	Bodenschlitz (BS)	Evidements minagés dans un sol (ES)	Scanalatura nella platea	Ground slab chases	IfcVoidingFeature	NOTCH	
4	IFC-Regellement	C05.01	Fundamentschlitz (FS)	Evidements minagés dans une fondation (EF)	Scanalatura nella fondazione	Foundation chases	IfcVoidingFeature	NOTCH	
4	IFC-Regellement	C05.01	Kernbohrung	Carottages	Carotaggio	Core drillings	IfcVoidingFeature	HOLE	
4	IFC-Regellement	C05.01	Bestellkörper (Ausspannung) Gebäudetechnik	Éléments à commander (évidements), installations du bâtiment	Elemento da ordinare (spasmi) impiantistica	Provision for voids for services	IfcBuildingElementProxy	PROVISIONFORVOID	
3	Element	C05.02	Maschensocket, Einlage	Socles de machines, incorporés	Basamento di macchine, inserto	Machine bases, components incorporated for services			
4	IFC-Regellement	C05.02	Futternohr durch Wand (WFR)	Manchons incorporés dans un mur (MM)	Tubo fodera attraverso parete	Pipe sleeves through wall	IfcVoidingFeature	HOLE	LINKTUB
4	IFC-Regellement	C05.02	Futternohr durch Decke (DFR)	Manchons incorporés dans une dalle (MD)	Tubo fodera attraverso soletta	Pipe sleeves through suspended	IfcVoidingFeature	HOLE	LINKTUB
4	IFC-Regellement	C05.02	Futternohr durch Boden (BFR)	Manchons incorporés dans un sol (MS)	Tubo fodera attraverso platea	Pipe sleeves through ground slab	IfcVoidingFeature	HOLE	LINKTUB
4	IFC-Regellement	C05.02	Futternohr durch Fundament (FFR)	Manchons incorporés dans une fondation (MF)	Tubo fodera attraverso fondazione	Pipe sleeves through foundation	IfcVoidingFeature	HOLE	LINKTUB
4	IFC-Regellement	C05.02	Maschensocket	Socles de machines	Basamento di macchine	Machine bases	IfcSlab	USERDEFINED	SOCKET
4	IFC-Regellement	C05.02	Gerätesockel	Socles d'appareils	Basamento di apparecchi	Movable equipment bases	IfcPlate	USERDEFINED	SOCKET

Both options are listed as rule elements under the element so as to enable the ruleset to function independently of the project phase or agreements within the project team regarding the co-ordination of voids.

## Relationship with systems (IfcBuiltSystem, IfcDistributionSystem)

Even as early as 2000, with version IFC 2x1, it was possible to allocate parts of works to a system and thereby group them together by their role in the building. This is actively used, for example, to distinguish between different systems in building services models. This allocation to systems serves far more than the purposes of cost-based modelling considerations and should therefore be used more intensively.

The specific advantage of using systems consists in the resulting possibility of objects entering several different relationships with systems. This is the case, for example, with a door that is connected to the access control system and features in both the "INTERIOR" and the "SECURITY" systems.

In the IFC data model, parts of works are allocated to a built system (IfcBuildingSystem, as of IFC 4x3 IfcBuiltSystem) and building services elements to a distribution system or installation (IfcDistributionSystem). For both systems, the IFC data model already contains predefined enumerations (IfcBuiltSystemTypeEnum, IfcDistributionSystemEnum), which CRB, during revision of the eCC-BC, is complementing with its own consolidated concepts for Switzerland.

- CRB\_IfcGroupExtension

IfcBuiltSystem	USERDEFINED	LANDSCAPE	Landscaping	Umgebungsgestaltung
IfcBuiltSystem	USERDEFINED	OFFICE	Office furniture	Büromöbiliar
IfcBuiltSystem	USERDEFINED	RAIL_CONDUCTOR	RAIL_CONDUCTOR	Bahn_Fahrleitung
IfcBuiltSystem	USERDEFINED	RAIL_SECURITY	RAIL_SECURITY	Bahn_Sicherungsanlage
IfcBuiltSystem	USERDEFINED	RAIL_SUPERSTRUCTURE	RAIL_SUPERSTRUCTURE	Bahn_Trasse
IfcBuiltSystem	USERDEFINED	REPAIR	Repairs	Wiederherstellung und Schadensbehebung
IfcBuiltSystem	USERDEFINED	ROAD_SIGNAGE	ROAD_SIGNAGE	Strasse_Signaletik
IfcBuiltSystem	USERDEFINED	ROAD_SUPERSTRUCTURE	ROAD_SUPERSTRUCTURE	Strasse_Oberbau
IfcBuiltSystem	USERDEFINED	ROOFING	Roofing elements	Dachhaut und Bedachung
IfcBuiltSystem	USERDEFINED	SCAFFOLDING	Scaffolding	Gerüst
IfcBuiltSystem	USERDEFINED	SHELTER	Shelter equipment	Schutzraumeinrichtung
IfcBuiltSystem	USERDEFINED	SIGNAGE	Signage	Signaletik
IfcBuiltSystem	USERDEFINED	STABILIZATION	Stabilization	Baugrundverbesserung, Bauwerkssicherung
IfcBuiltSystem	USERDEFINED	TERRAINSHELL	Facade underground	Fassade im Erdreich
IfcBuiltSystem	USERDEFINED	TEXTILE	Textiles	Textilien
IfcBuiltSystem	USERDEFINED	UNDERGROUND	Underground	Untertagbau
<b>IfcDistributionSystem</b>				
IfcDistributionSystem	AIRCONDITIONING	MAINCONNECTION	Building Airconditioning Distribution	Hausanschluss Fernkälte
IfcDistributionSystem	AIRCONDITIONING	MUNICIPAL	Municipal Airconditioning Distribution	Werkleitungen Fernkälte
IfcDistributionSystem	AIRCONDITIONING		Air conditioning	Kältetechnische Anlage
IfcDistributionSystem	AUDIOVISUAL		Audio/Visual Distribution	Audio/Visuelle Übertragung
IfcDistributionSystem	CATENARY_SYSTEM		Catenary System	Längsverteilungssystem
IfcDistributionSystem	CHEMICAL		Chemical Distribution	Verteilung von Chemikalien
IfcDistributionSystem	CHILLEDWATER		Chilled water (nonpotable)	Kühlwasser
IfcDistributionSystem	COMMUNICATION	MAINCONNECTION	Building Communication Distribution	Hausanschluss Schwachstrom
IfcDistributionSystem	COMMUNICATION	MUNICIPAL	Municipal Communication Distribution	Werkleitungen Schwachstrom
IfcDistributionSystem	COMMUNICATION		Electrical low current	Elektroanlage Schwachstrom
IfcDistributionSystem	COMPRESSED AIR		Compressed air Distribution	Druckluft
IfcDistributionSystem	CONDENSERWATER		Condenser water (nonpotable)	Kondensatwasser
IfcDistributionSystem	CONTROL	AUTOMATION	Building automation	Gebäudeautomation Automationssebene
IfcDistributionSystem	CONTROL	FIELD	Building automation	Gebäudeautomation Feldebene
IfcDistributionSystem	CONTROL	INTEGRATION	Building automation	Gebäudeautomation Systemintegration
IfcDistributionSystem	CONTROL	MANAGEMENT	Building automation	Gebäudeautomation Managementebene
IfcDistributionSystem	CONTROL	NETWORK	Building automation	Gebäudeautomation Automationsnetzwerk
IfcDistributionSystem	CONTROL	ROOM	Building automation	Gebäudeautomation Raumautomation
IfcDistributionSystem	CONTROL	SWITCHGEAR	Building automation	Gebäudeautomation Schaltgerätekombination
IfcDistributionSystem	CONTROL	TRAFFIC	Traffic control	Verkehrsbeeinflussung
IfcDistributionSystem	CONTROL		Building automation	Gebäudeautomation
IfcDistributionSystem	CONTROL		Building automation	Gebäudeautomation

It should be mentioned at this point that similar provision is planned for spaces in the IFC data model. These can be allocated to zones or spatial zones (IfcZone, IfcSpatialZone). This, for example, allows the modelling of groups of spaces that form an apartment. This strategy is particularly useful for Main Group H as it allows simple specification (without any additional user-defined characteristics) of those spaces, for example, to be allocated to a "H02 Laboratory facilities" usable area and analysis of the associated reference parameter.

## Standardized attributes of parts of works (PredefinedType and ObjectType)

In the IFC data model, the characteristics of elements undergo a further technical subdivision into attributes and properties. Properties are grouped together in sets (Pset) and can, in principle, be assigned to several parts of works. Attributes differ from these solely in that their occurrence (e.g. value range) has a specific significance for each particular part of works. The most typical attributes are:

- GlobalId                      Globally unique identifier
- Name                            Designation/number
- Description                    Explanatory statement
- ObjectType\*                    Designates a specific type that more closely defines the object
- PredefinedType                General type for a part of works that is predefined in an enumeration.

(\* Contains the user-defined type where the enumeration of the PredefinedType attribute is set to USERDEFINED.)

Wherever possible, the values in the enumerations of the IFC data model were factored into the ruleset. Where these are inadequate, the PredefinedType is set to "USERDEFINED" and the ObjectType used for a closer definition. Here too, as part of the eCC-BC revision, CRB has added its own consolidated concepts for Switzerland to the ObjectType in order to guarantee continuity in allocation.

- CRB\_ObjectTypeExtension

Ifc_Entity	PredefinedType	ObjectType	CRB-ObjectTypeExtension	Elementbezeichnung_DE	Désignation_FR	Designazione dell'elemento_IT	Element designation_EN	eBKP-H Code
<b>IfcElectricAppliance</b>								
IfcElectricAppliance	*			Schwachstromverteiler	Récepteurs de courant faible	Frutore di corrente debole	Low-current-using equipment	D01.11
IfcElectricAppliance	DISHWASHER			Geschirrspülmaschine	Lave-vaisselle	Lavastoviglie	Dishwashers	G05.02
IfcElectricAppliance	ELECTRICCOOKER			Herd	Cuisinière	Cucina	Stoves	G05.02
IfcElectricAppliance	FREESTANDINGELECTRICHATER			Elektroheizung	Chauffages électriques	Riscaldamento elettrico	Electric heaters	D01.06
IfcElectricAppliance	FREESTANDINGFAN			Ventilator	Ventilateurs	Ventilatore	Fans	J02.03
IfcElectricAppliance	FREESTANDINGWATERCOOLER			Wasserkühlergerät	Réfrigérateurs à eau	Apparecchio di raffreddamento dell'acqua	Water coolers	J02.03
IfcElectricAppliance	FREESTANDINGWATERHEATER			Wasserspeicher	Chauffe-eau	Scaldeoacqua	Water heaters	D01.06
IfcElectricAppliance	FREEZER			Gefrierschrank	Congélateurs	Congelatore	Freezers	G05.02
IfcElectricAppliance	FREEZE_FREEZER			Kühl-Gefrierkombi	Réfrigérateurs-congélateurs	Frigorifero-congelatore combinato	Fridge-freezers	G05.02
IfcElectricAppliance	HANDDRYER			Handtrockner	Séchoirs	Asciugamani elettrici	Hand driers	J02.03
IfcElectricAppliance	KITCHENMACHINE			Küchenmaschine	Robots de cuisine	Elettrodomestico da cucina	Kitchen machines	G05.02
IfcElectricAppliance	MICROWAVE			Mikrowelle	Micro-ondes	Microwave	Microwaves	G05.02
IfcElectricAppliance	PRINTER			Drucker	Imprimantes	Stampante	Printers	J02.03
IfcElectricAppliance	REFRIGERATOR			Kühlschrank	Réfrigérateurs	Frigorifero	Refrigerators	G05.02
IfcElectricAppliance	SCANNER			Scanner	Scanner	Scanner	Scanners	J02.03
IfcElectricAppliance	TUMBLERDRYER			Wäschetrockner	Sèche-linge	Asciugatrice	Laundry driers	D01.06
IfcElectricAppliance	USERDEFINED	CLOCK	WAHR	Uhr	Horloges	Orologio	Clocks	D01.11
IfcElectricAppliance	USERDEFINED	COFFINMACHINE	WAHR	Kaffeautomat	Machine à café	Micchine per caffè	Coffee machines	J02.03
IfcElectricAppliance	USERDEFINED	MULTIFUNCTIONALDEVICE	WAHR	Multifunktionsgerät	Appareils multifonctions	Apparecchio multifunzione	Multi-functional devices	J02.03
IfcElectricAppliance	USERDEFINED	OVEN	WAHR	Ofen	Pofée	Forno	Ovens	G05.02
IfcElectricAppliance	USERDEFINED	STEAMER	WAHR	Steamer	Pouss à vapeur	Steamer	Steamers	G05.02
IfcElectricAppliance	USERDEFINED	TIMELOG	WAHR	Zeiterfassungstation	Station de saisie des temps	Stazione di rilevamento dei tempi	Time-logging stations	D01.11
IfcElectricAppliance	USERDEFINED	VENDINGMACHINE	WAHR	Verkaufsautomat	Distributeurs automatiques	Distributore automatico	Vending machines	J02.03
IfcElectricAppliance	WASHINGMACHINE			Waschmaschine	Lave-linge	Lavatrice	Washing machines	D01.06
<b>IfcElectricDistributionBoard</b>								
IfcElectricDistributionBoard	DISTRIBUTIONBOARD			Brandmeldeverteiler	Tableaux de distribution de détection d'incendie	Distributore per rilevatore di incendio	Fire-alarm control panels	D04.01
IfcElectricDistributionBoard	DISTRIBUTIONBOARD			Brandmeldeverteiler	Tableaux de distribution de détection d'incendie	Distributore per rilevatore di incendio	Fire-alarm control panels	D04.02
<b>IfcElectricFlowStorageDevice</b>								
IfcElectricFlowStorageDevice	BATTERY	SECURITYLIGHTING		Notstromanlage	Installations d'éclairage d'urgence	Impianti luce di emergenza	Security lighting systems	D01.09

The procedure for setting a PredefinedType varies depending on the authoring system (CAD software). This may, for example, be directly assigned under Style/Type/Family of the part of works or may only be set for the adopted instance of the part of works. All standard authoring systems, however, make provision for assigning the user's own values to parts of works. These values must then be mapped onto the correct property in the IFC data model. The resellers can provide the necessary support in this respect.

The considerations regarding the CRB ruleset were based on the latest IFC4.3 RC2, with due attention given at all times to maintaining downward compatibility with IFC 2x3. In particular cases (e.g. IfcDoor), there was no PredefinedType, only a ObjectType in IFC 2x3.

A similar situation exists with IfcWallStandardCase, which is mostly exported from IFC 2x3 authoring systems and is now exported as IfcWall in IFC4. The concept with "subentities" (...StandardCase or ...ElementedCase) was already rejected in IFC4 ADD2 TC1 (ISO 16739-1:2018).

## Notes on built system (IfcBuiltSystem)

For allocation to the built system, IFC already has a standardized enumeration, which CRB has added to and consolidated for Switzerland. The ruleset makes use of the consolidated concepts in the enumeration *CRB\_IfcGroupExtension*.

A distinction needs to be drawn between the "LOADBEARING" system and the actual "loadbearing" property for part of works (e.g. in Pset\_WallCommon.LoadBearing). Allocation to the "LOADBEARING" system denotes a general affiliation to the "building structure" that in no way anticipates any particular structural concept. Such a statement can also be made by the architect in early phases in which the eCC-BC is adopted.

This means that the parts of works allocated to "LOADBEARING" under Main Group "C Building structure" may, for example, include non-structural masonry walls or elements with a purely stiffening function, i.e. all parts of works belonging to the building's structural fabric, whether loadbearing or not.

The "TERRAIN SHELL" system has been added to the existing "OUTER SHELL" system, thereby allowing identification of the parts of works belonging to the above- and below-ground facade sections. This eliminates the need for laboriously assigning properties such as "underground", "buried" or "in contact with the ground" to parts of works. The use of a system for the relevant parts of works improves modelling efficiency.

The flexibility of the systems is particularly useful in the case of Main Groups G, I and J. These elements are often presented as furniture (IfcFurnishingElement), though should actually belong to various groups or indeed systems.

Ifc.Entity	PredefinedType	ObjectType	Elementbezeichnung_DE	Systemwahl	System.PredefinedType	System.ObjectType	IsExternal	IsBuiltIn	eBKP-H Code
<b>IfcFurniture</b>									
IfcFurniture	*		Schreibtisch	IfcSubSystem =	FURNISHING	OFFICE		Nein	J01.02
IfcFurniture	*		Bürostuhl	IfcSubSystem =	FURNISHING	EDUCATION		Nein	J01.02
IfcFurniture	*		Personenrechner, Mobiltelefon	IfcSubSystem =	FURNISHING			Nein	B03.05
IfcFurniture	BED		Bett	IfcSubSystem =	FURNISHING			Nein	J01.01
IfcFurniture	CHAIR		Stuhl	IfcSubSystem =	FURNISHING			Nein	J01.01
IfcFurniture	CHAIR		Stuhl	IfcSubSystem =	USERDEFINED	LANDSCAPE		Nein	I06.01
IfcFurniture	CHAIR		Stuhl	IfcSubSystem =	USERDEFINED	LANDSCAPE		Ja	I06.02
IfcFurniture	DESK		Schreibtisch	IfcSubSystem =	FURNISHING			Nein	J01.01
IfcFurniture	FILECABINET		Altschrank	IfcSubSystem =	FURNISHING			Ja	G05.01
IfcFurniture	FILECABINET		Altschrank	IfcSubSystem =	FURNISHING			Nein	J01.01
IfcFurniture	SHelf		Regal	IfcSubSystem =	FURNISHING			Ja	G05.01
IfcFurniture	SHelf		Regal	IfcSubSystem =	FURNISHING			Nein	J01.01
IfcFurniture	SOFA		Sofa	IfcSubSystem =	FURNISHING			Nein	J01.01
IfcFurniture	TABLE		Tisch	IfcSubSystem =	FURNISHING			Nein	J01.01
IfcFurniture	TABLE		Tisch	IfcSubSystem =	USERDEFINED	LANDSCAPE		Nein	I06.01
IfcFurniture	TABLE		Tisch	IfcSubSystem =	USERDEFINED	LANDSCAPE		Ja	I06.02
IfcFurniture	USERDEFINED	BASKET	Korb für Ballspiel	IfcSubSystem =	USERDEFINED	LEISURE		Ja	I06.03
IfcFurniture	USERDEFINED	BENCH	Bank	IfcSubSystem =	USERDEFINED	LANDSCAPE		Nein	I06.01
IfcFurniture	USERDEFINED	BENCH	Bank	IfcSubSystem =	USERDEFINED	LANDSCAPE		Ja	I06.02
IfcFurniture	USERDEFINED	BICYCLESTAND	Fahrradständer	IfcSubSystem =	USERDEFINED	EQUIPMENT	Nein	Ja	G05.07
IfcFurniture	USERDEFINED	BOLLARD	Altsäulen	IfcSubSystem =	USERDEFINED	LANDSCAPE		Ja	I06.02
IfcFurniture	USERDEFINED	CABINET	Körperschrank	IfcSubSystem =	FURNISHING			Nein	J01.01
IfcFurniture	USERDEFINED	CLOTHESLINE	Wäscheleine	IfcSubSystem =	USERDEFINED	EQUIPMENT	Nein	Ja	G05.07
IfcFurniture	USERDEFINED	CUPBOARD	Einrichtung	IfcSubSystem =	FURNISHING			Nein	J01.01
IfcFurniture	USERDEFINED	FIREPLACE	Cheminee	IfcSubSystem =	USERDEFINED	INTERIORS		Ja	G05.06
IfcFurniture	USERDEFINED	FIREPLACESTOVE	Schweidenofen	IfcSubSystem =	USERDEFINED	INTERIORS		Ja	G05.06
IfcFurniture	USERDEFINED	FLAGPOLE	Fahnenmasten	IfcSubSystem =	USERDEFINED	LANDSCAPE		Ja	I06.02
IfcFurniture	USERDEFINED	FOUNTAIN	Brunnen	IfcSubSystem =	USERDEFINED	LANDSCAPE		Ja	I06.02
IfcFurniture	USERDEFINED	GASOVEN	Geschirrspülmaschine	IfcSubSystem =	FURNISHING			Ja	G05.02
IfcFurniture	USERDEFINED	GASSTOVE	Gasherd	IfcSubSystem =	FURNISHING			Ja	G05.02
IfcFurniture	USERDEFINED	GOAL	Tor für Ballspiel	IfcSubSystem =	USERDEFINED	LEISURE		Ja	I06.03

**Notes on distribution system/installation (IfcDistributionSystem)**

For allocation to distribution systems, IFC already has a standardized enumeration, which CRB has added to and consolidated for Switzerland. The ruleset makes use of the consolidated concepts in the enumeration *CRB\_IfcGroupExtension*.

With building services, the same systems often feature in several different eCC-BC groups. Cold water pipes, for example, are found in the following groups:  
 B04.05 Water pipes  
 D08 Water installations  
 I05.05 External sanitary installations

These all belong to the same building services system – in this case "water" – and are thus allocated to the same IfcDistributionSystem.PredefinedType, in this case "WATERSUPPLY". This, then, offers a means of maintaining the continuity of the system in design.

The necessary distinctions in the eCC-BC element system are drawn using the associated IfcDistributionSystem.ObjectType. Here, all pipes and systems in Element Group B04 (Utility services) are assigned the ObjectType "MUNICIPAL". All pipes and systems in Element Group I05 (External services installations) are assigned the ObjectType "LANDSCAPE". This allows analyses to be performed on the overall system "water" as well as on the basis of the element classification. The distinction between temporary and permanent utilities on the site (B03.02 / B04) is drawn using the status "TEMPORARY", which then needs to be assigned for the temporary utility services.

The distinction within the **eCC-BC element system** between generation (Dxx.01) and distribution (Dxx.04) is drawn using the relevant `IfcDistributionSystem.ObjectType`.

In this way, all pipes within the building belonging to generation (Dxx.01), e.g. cold water pipes, are additionally defined by "MAINCONNECTION".

Ifc.Entity	PredefinedType	ObjectType	Elementbezeichnung_DE	Systemwahl	System.PredefinedType	System.ObjectType	IsExternal	IsBuiltin	eBKP-H Code
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	CONDENSERWATER	MUNICIPAL			B04.04
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	CONDENSERWATER	MAINCONNECTION			D06.01
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	FIREPROTECTION	FIREEXTINGUISHING			D04.03
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	FIREPROTECTION	DRYEXTINGUISHING			D04.04
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	GAS	MUNICIPAL			B04.08
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	HEATING	MUNICIPAL			B04.03
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	HEATING	MAINCONNECTION			D05.01
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	HEATING	LANDSCAPE			I05.03
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	RAINWATER	MUNICIPAL			B04.07
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	RAINWATER	MAINCONNECTION			D09.01
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	RAINWATER				D09.04
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	STORMWATER				I05.06
IfcPipeSegment	+		CO2-Hauptanschluss-Rohr	IfcDistributionSystem =	USERDEFINED	CO2_MAINCONNECTION			D11.01
IfcPipeSegment	+		Sauerstoff-Hauptanschluss-Rohr	IfcDistributionSystem =	USERDEFINED	O2_MAINCONNECTION			D11.01
IfcPipeSegment	+		Arbeitsgas-Hauptanschluss-Rohr	IfcDistributionSystem =	USERDEFINED	AMETHETICGAS_MAINCONNECTION			D11.01
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	USERDEFINED	DEEPDRAINAGE			I01.02
IfcPipeSegment	+		Vakuum-Hauptanschluss-Rohr	IfcDistributionSystem =	VACUUM	MAINCONNECTION			D11.01
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	WASTEWATER	MUNICIPAL			B04.06
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	WASTEWATER	MAINCONNECTION			D09.01
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	WASTEWATER				D09.04
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	WASTEWATER	MUNICIPAL			B04.05
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	WATERSUPPLY	MAINCONNECTION			D08.01
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	WATERSUPPLY				D08.04
IfcPipeSegment	+		Rohr	IfcDistributionSystem =	WATERSUPPLY	LANDSCAPE			I05.05
IfcPipeSegment	USERDEFINED	ESCAPE	Fluchtröhren und Notausstiege	IfcBldgSystem =	USERDEFINED	LANDSCAPE			I02.06
IfcPipeSegment			Druckluftrohr	IfcDistributionSystem =	COMPRESSEDAIR				D11.04
IfcPipeSegment			Rohr	IfcDistributionSystem =	GAS	MAINCONNECTION			D10.01
IfcPipeSegment			Rohr	IfcDistributionSystem =	GAS				D10.04
IfcPipeSegment			CO2-Rohr	IfcDistributionSystem =	USERDEFINED	CO2			D11.04
IfcPipeSegment			Sauerstoffrohr	IfcDistributionSystem =	USERDEFINED	O2			D11.04
IfcPipeSegment			Arbeitsgasrohr	IfcDistributionSystem =	USERDEFINED	AMETHETICGAS			D11.04

### IfcCostItem

For some elements (e.g. A01.01 Site acquisition ff.), the standard prescribes cash totals in Swiss francs as the reference parameter. Here, `IfcCostItem` is now proposed as an entity for posting budget amounts.

### Trusses and struts (IfcMember)

Although a number of proposals have been made, no definitive review and allocation have yet been performed.

### BuildingElementProxy

Wherever possible, the entity "BuildingElementProxy" should be avoided for the representation of building construction elements as it often cannot be used to extract any meaningful quantities. It is, however, possible that various IFC allocations are not (yet) supported by some of the software solutions. In such cases, of course, this entity can be adopted.