IFC Rail Project

WP2 – Data Requirements Report

Data requirements specified by railway domains

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Contents

Executive Summary

The present document is a part of the official deliverables of the IFC Rail Project (Phase I), as shown in the picture below. This document is referenced by Requirement Analysis Report and Conceptual Model Report. Please refer to the IFC Rail – Context & Approach document for further details.

This document describes data requirements specified by the IFC Rail Project (Phase I). In general, each object is defined with name, description, optionally one or more images and a table of properties. Each property is defined with name, description and intended data type.

The names of objects match names of classes in conceptual model report. Since this document is intended to describe properties of objects, not all but classes which have specific properties in the Conceptual Model Report can be found in this document All the requirements are sorted by domains: Track, Signalling, Telecom and Energy. They are specified as objects and their properties. In each domain, objects are sorted in alphabetic order.

This Data Requirements Report is semi-automatically generated with data exported from BIMQ.

1   Introduction

This document contains a description of IFC Rail Data Requirements. Each description contains the name of the business concept, a short description, if available an illustration and a table with the properties which are required from the business side.

1.1   Detailed Data Requirements – Properties

The following table shows how the detailed data requirements are presented.

Name: Business term used for the Property

Description: explanation of the business term in natural language

Data type: what category of information can be expected for this Property

Property		
Name	**Description**	**Data type**

The properties shall be considered as an inventory of business requirements which will be added to the IFC Rail Model View Definitions (MVD).

2   Domain data requirements

2.1   Track

2.1.1   Ballast bed (RTR_OT_TR-200)

Consists of broken stones which are called ballast.

Main purpose: ensures stability of track, transfers forces from sleepers to substructure and allows to readjust the track geometry according to the correct alignment.

Wear and dirt reduce stability.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of ballast bed start to track edge origin / [m]	Real
To location	Distance of ballast bed end to track edge origin / [m]	Real
Reconditioning	Reconditioned ballast	Enum_Reconditioning
Ballast type	Type of ballast, e.g. first to third quality, standard ballast, etc.	Enum_BallastType
Ballast profile	Indication of whether the ballast shoulder is reinforced or not. A reinforced ballast shoulder increases the lateral resistance of the sleepers by increasing their weight (more material).	Enum_BallastProfile
Ballast depth	measured from the lower edge of the sleeper to the subgrade. Replaced the ballast bed size as of release 1/2016. / [cm]	Real
Minimum ballast bed depth	Indication of minimum ballast bed depth measured at rail position (left / right rail) from the lower edge of the sleeper to the subgrade upper surface / [cm]	Real
Stone type	Type of stone	Enum_StoneType
Grain size	Indication of grain size / [mm]	Integer
Origins	Where does the ballast come from – quarry	Enum_Origins
Work company	Who put the ballast bed in place?	Enum_WorkCompany
Installation date	Date on which the ballast bed was (or will be) installed.	Date
Disassembly date	Date on which the ballast bed was (or will be) removed.	Date
Manufacturing date	Date on which the ballast bed was (or will be) manufactured.	Date
Putting into operation date	Date on which the ballast bed was (or will be) put into operation.	Date
Ballast Layer Type	Layer in which the ballast is built in: topballast, subballast, space filled ballast	Enum_BallastLayerType

2.1.2   Ballast bed strengthening (RTR_OT_TR-210)

Structural elements which are usually applied to the sides sf ballast bed.

Reinforces the cross-resistance of the superstructure.

Can also be ballast bonding or similar.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of start of ballast bed strengthening to track edge origin / [m]	Real
To location	Distance of end of ballast bed strengthening to track edge origin / [m]	Real
Cross band	Distance to track edge +/- in track panel direction / [m]	Real
Ballast bed strengthening type	Retaining structure, Adhesion	Enum_BallastBedStrengtheningType
Height of retaining structure	height / [m]	Real
Adhesion material type	material adhesion	Enum_AdhesionMaterialType
Adhesion depth	Depth of adhesion / [m]	Real
Installation date	Date on which the ballast bed strengthening was (or will be) installed.	Date
Disassembly date	Date on which the ballast bed strengthening was (or will be) removed.	Date
Manufacturing date	Date on which the ballast bed strengthening was (or will be) manufactured.	Date
Putting into operation date	Date on which the ballast bed strengthening was (or will be) put into operation.	Date

2.1.3   Banquet element (RTR_OT_TR-380)

Usually at ballast level.

Outside of structure gauge.

Function: walkway, service path.

Access to track.

Property

Name	Description	Data type
Track edge	Referenced track edge	Identifier
From location	Distance of banquet element start to track edge origin / [m]	Real
To location	Distance of banquet element end to track edge origin / [m]	Real
Relative position	Indication of whether the track banquet element lies to the left or the right in the track edge direction	Enum_RelativePosition
Width	Width in m / [m]	Real
Extension walkside	Length of the section of the site where the path is present / [%]	Real
Left walkside distance	Distance of the axis of the left walkside from the inner edge of the nearest rail (Minimum value) / [m]	Real
Right walkside distance	Distance of the axis of the right walkside from the inner edge of the nearest rail (Minimum value) / [m]	Real
Installation date	Date on which the banquet element was (or will be) installed.	Date
Manufacturing date	Date on which the banquet element was (or will be) manufactured.	Date
Putting into operation date	Date on which the banquet element was (or will be) put into operation.	Date
Disassembly date	Date on which the banquet element was (or will be) removed.	Date
Type	Type of terminal/banquet: none, minimal refuge area, service path, footpath, other track	Enum_Type
Accessibility by vehicle	Is the banquet element accessible by vehicle? yes/no (type of accessibility where applicable)	Boolean
Restriction	Is there a topological restriction/object next to the track? Bridge, wall, rock, platform, none	Enum_Restriction
Access	Access to banquet/train path via road/country lane	Enum_Access

2.1.4   Bias loaded inspector (RTR_OT_TR-600)

Equipment installed on track to inspect whether the load of vehicles is biased.
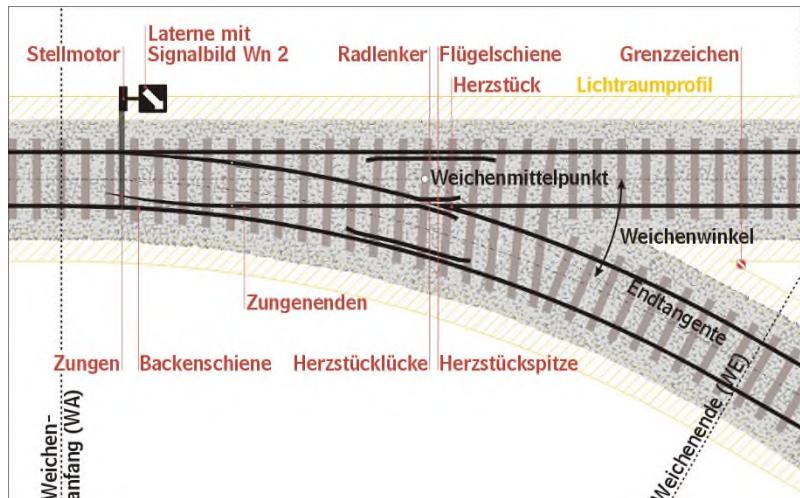
Property

Name	Description	Data type
Track edge	Referenced track edge	Identifier
From location	Distance of start of bias loaded inspector to track edge origin / [m]	Real
To location	Distance of end of bias loaded inspector to track edge origin / [m]	Real
Type	Type of bias loaded inspector	Enum_Type
Installation date	Date on which the inspector was (or will be) installed.	Date
Manufacturing date	Date on which the bias loaded inspector was (or will be) manufactured.	Date
Putting into operation date	Date on which the bias loaded inspector was (or will be) put into operation.	Date
Disassembly date	Date on which the bias loaded inspector was (or will be) removed.	Date

2.1.5   Blade (RTR_OT_TR-440)

Movable machined rail, often of special section, but fixed and/or joined at the heel end to a rail to provide continuity of wheel support.

"Half set of blades" is composed of one blade and one stock rail. Only replaceable as one unit during railway maintenance. Where blade or stock rail can be replaced separately (i.e. Metro) the objects are assigned as "blade elementary" and "stock rail elementary" in the conceptual model.

Property		
Name	Description	Data type
Turnout panel (or dilatation panel)	Reference to which turnout panel (or dilatation panel) the blade belongs to. Internal referencing	Identifier
Location in the turnout panel (or dilatation panel)	Internal referencing in turnout panel (or dilatation panel) in acc. with installation plan	Local Coordinates
Articulated blade	Indication of whether the turnout panel has flexible blades, articulated blade. Yes/no	Boolean
Type of installation	Design, type of fastening, profile height	Enum_TypeOfInstallation
Installation date	Date on which the blade was (or will be) installed.	Date
Disassembly date	Date on which the blade was (or will be) removed.	Date
Manufacturing date	Date on which the blade was (or will be) manufactured.	Date
Putting into operation date	Date on which the blade was (or will be) put into operation.	Date
Length	Length of blade from point of turnout blade / [m]	Real
Radius of blade	Within what radius is the blade bent? / [m]	Real
Type of turnout (in case of turnout panel/applies only to turnout panel)	Corresponding type of points (single turnout double-slip turnout)	Enum_TurnoutType
Function of turnout (in case of turnout panel/applies only to turnout panel)	Installed in main track or side track	Enum_TurnoutFunction
Fallback device	Does the blade always return to the same position (trailable turnout)	Boolean

2.1.6 Blocking device (RTR_OT_TR-580)

Equipment installed on classification yard (also named as shunting yard) to block rolling vehicles.

Property		
Name	Description	Data type
Track edge	Referenced track edge	Identifier
From location	Distance of blocking device start to track edge origin / [m]	Real
To location	Distance of blocking device end to track edge origin / [m]	Real
Type	Type of blocking device	Enum_Type
Installation date	Date on which the blocking device was (or will be) installed.	Date
Manufacturing date	Date on which the blocking device was (or will be) manufactured.	Date
Putting into operation date	Date on which the blocking device was (or will be) put into operation.	Date
Disassembly date	Date on which the blocking device was (or will be) removed.	Date

2.1.7   Bonded joint (RTR_OT_TR-70)

Transition between two neighbouring running rails.

Electrically connected.

Used for Continuous Welded Rails (CWR).

Inhomogeneity in the supporting strength of the running rail (longitudinal, vertical and lateral forces).

Inhomogeneity in the stability of the track panel.

Origin of noise emissions.
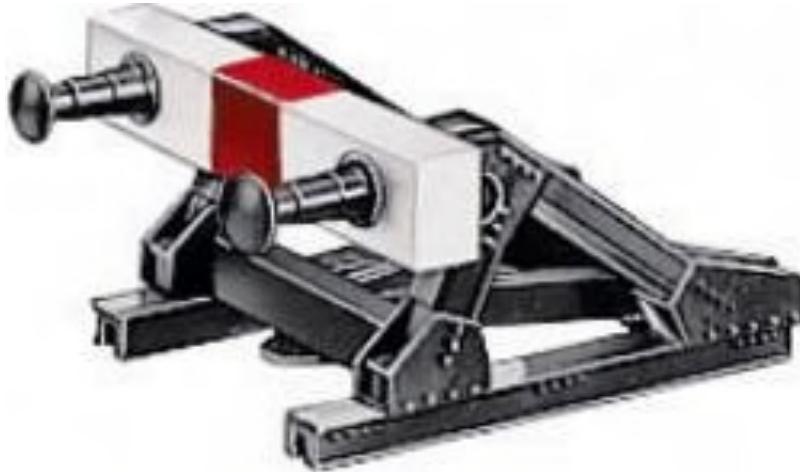
Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	Distance from beginning of the track edge / [m]	Real
Relative position	Indication of whether the bonded joint lies to the left or the right in the track edge direction	Enum_RelativePosition
Location in panel	Internal referencing in panel in acc. with installation plan of panel	Local coordinates
Length	Length of fish plate / [m]	Real
Type	Type of connection, material, type of screw, adhesion; emergency bond yes/no; speed restriction	Enum_Type
Arrangement	"twin sleeper"-type or "between sleepers"-type	Enum_Arrangement
Belongs to panel type	In a track panel or turnout panel	Enum_BelongsToPanelType
Number of screws	Number of screws/connections on each side / [screw(s)]	Real
Lifting bracket	Is it a connection between two different heights? Yes/no	Boolean
Joint Control Equipment	YES/NO – security equipment that check mechanical functionality (RFI)	Boolean
Rail properties of adjacent rails	Type of rail profiles which are connected by this joint	Enum_RailPropertiesOfAdjacentRails
Production type	Produced on the field or pre-manufactured	Enum_ProductionType
Manufacturer	Responsible for producing of the bonded joint	Text
Installation date	Date on which the "bonded joint" was (or will be) installed.	Date
Disassembly date	Date on which the bonded joint was (or will be) removed.	Date
Manufacturing date	Date on which the bonded joint was (or will be) manufactured.	Date
Putting into operation date	Date on which the bonded joint was (or will be) put into operation.	Date

2.1.8 Bumper (RTR_OT_TR-390)

Buffer, object at end of track.

Function: prevents driving over; can be fixed on rails or the track panel - Can also be a natural element (rock, sand).

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	<OR> Distance to start of track edge / [m]	Real
Position	<OR> X,Y,Z coordinates in case of bumper situated outside of edge	Coordinates
Type	Types of bumper	Enum_Type
Load retention	Maximum possible impact load retention / [t]	Real
Cushioning elements	Type of cushioning	Enum_CushioningElements
Absorbed energy	Absorbed Energy: Inherent bumper dimensions/design property / [kJ]	Real
Braking length	Length of the braking distance: Inherent bumper dimensions/design property / [m]	Real
Installation date	Date on which the bumper was (or will be) installed.	Date
Manufacturing date	Date on which the bumper was (or will be) manufactured.	Date
Putting into operation date	Date on which the bumper was (or will be) put into operation.	Date
Disassembly date	Date on which the bumper was (or will be) removed.	Date
Orientation	Direction in which the bumper is aligned; e.g. same direction as edge or opposite direction	Enum_Orientation
Removable	is bumper removable? (Y = Yes, N = no)	Boolean

2.1.9   Cess between rails (RTR_OT_TR-350)

Covering between rails for internal maintenance purposes.

Can be walked on.

Situated in the track.
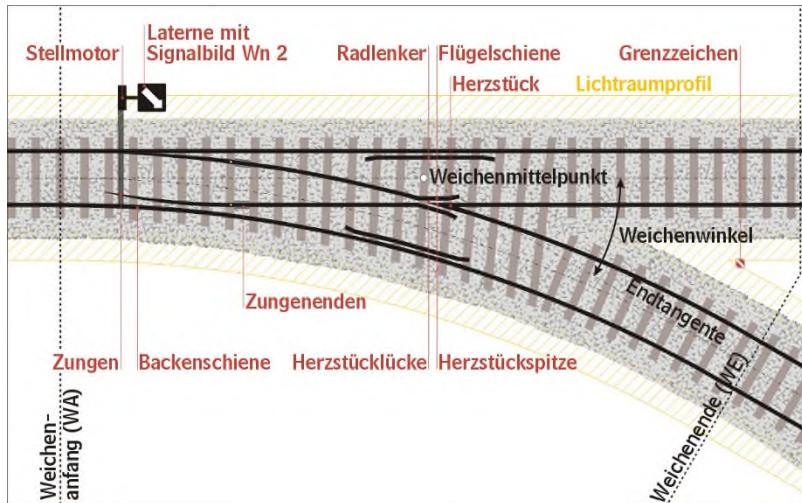
Not public.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of start of cess between rails to track edge origin / [m]	Real
To location	Distance of end of cess between rails end to track edge origin / [m]	Real
Relative position	Left, Right or in the middle or a combination	Enum_RelativePosition
Type	Type	Enum_Type
Width	Width of the route/permanent way / [m]	Real
Load capacity	What is the highest permissible load capacity? / [t]	Real
Installation date	Date on which the cess was (or will be) installed.	Date
Manufacturing date	Date on which the cess between rails was (or will be) manufactured.	Date
Putting into operation date	Date on which the cess between rails was (or will be) put into operation.	Date
Disassembly date	Date on which the cess between rails was (or will be) removed.	Date
User	Who can use the facility, e.g. maintenance, rescue services	Enum_User

2.1.10 Check Rail (RTR_OT_TR-20)

Rail laid close to gauge face of a running rail which does not carry a railway wheel but ensures, by guidance of the wheel, the safe passage of both wheels of the axle through small radius curves, turnouts, crossings by not allowing the flange of either wheel to ride up over the running surface of the running rails.

Property		
Name	**Description**	**Data type**
Turnout panel	Referenced panel	Identifier
Location in the track/turnout panel	Internal referencing in track/turnout panel in acc. with installation plan	Local coordinates
Type	Type of the check rail (length, ..)	Enum_Type
Fastening	Fastening type, type of fastening on the sleeper	Enum_Fastening
Design	Design of Check Rail	Enum_Design
Adjustable	Yes/no -> max. level of wear as an attribute?	Boolean
Installation plan	reference to external data/information source, e.g. construction plan	Identifier
Installation date	Date on which the check rail was (or will be) installed.	Date
Disassembly date	Date on which the check rail was (or will be) removed.	Date
Manufacturing date	Date on which the check rail was (or will be) manufactured.	Date
Putting into operation date	Date on which the check rail was (or will be) put into operation.	Date
Use	Where is the check rail used? In turnout, track dilatation, etc.	Enum_Use

2.1.11 Controllable retarder (RTR_OT_TR-570)

Equipment installed on classification yard (also named as shunting yard) to regulate the speed of rolling vehicles.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of controllable retarder start to track edge origin / [m]	Real
To location	Distance of controllable retarder end to track edge origin / [m]	Real
Relative position	Indication of whether the retarder lies to the left or right in the track panel direction	Enum_RelativePosition
Inside/Outside position	Indication of whether the retarder lies on the inside or outside in the track edge direction	Enum_Inside/OutsidePosition
Type	Type of retarder	Enum_Type
Number of units	How many retarders / [retarder(s)]	Real
Installation date	Date on which the retarder was (or will be) installed.	Date
Manufacturing date	Date on which the controllable retarder was (or will be) manufactured.	Date
Putting into operation date	Date on which the controllable retarder was (or will be) put into operation.	Date
Disassembly date	Date on which the controllable retarder was (or will be) removed.	Date

2.1.12 Dilatation panel (RTR_OT_TR-1030)

Sliding transition in the longitudinal direction between two neighbouring running rails.

Device which permits longitudinal relative rail movement of two adjacent rails (i.e. due to themical expansion forces), while maintaining correct guidance and support.

Electrically connected

Inhomogeneity in the supporting strength of the running rail (longitudinal and lateral forces)

Inhomogeneity in the stability of the track panel

Special design with reinforcing elements in the track panel

Property		
Name	Description	Data type
Track edge	Referenced track edge	Identifier
From location	Distance of dilatation panel start to track edge origin / [m]	Real
To location	Distance of dilatation panel end to track edge origin / [m]	Real
Dilatation type	Similar to the elements specified in the turnout catalogue, specifies the design of the dilatation device, its basic structure (components used and how they are arranged).	Enum_DilatationType
Orientation	Enable to know what orientation inside blade have	Enum_Orientation
Expansion Direction	The Expansion Direction, e.g. single direction, bidirection	Enum_ExpansionDirection
Technical Standard	The technical standard which the track isolation layer should comply with.	Text
Installation plan	Similar to the elements specified in the turnout catalogue, specifies the design of the dilatation device, its basic structure (components used and how they are arranged).	Identifier
Installation date	Date on which the dilatation panel was (or will be) installed.	Date
Disassembly date	Date on which the dilatation panel was (or will be) removed.	Date
Manufacturing date	Date on which the dilatation panel was (or will be) manufactured.	Date
Putting into operation date	Date on which the dilatation panel was (or will be) put into operation.	Date

Dilatation length	Length of dilatation / [m]	Real

2.1.13 Dilatation superstructure (RTR_OT_TR_1008)
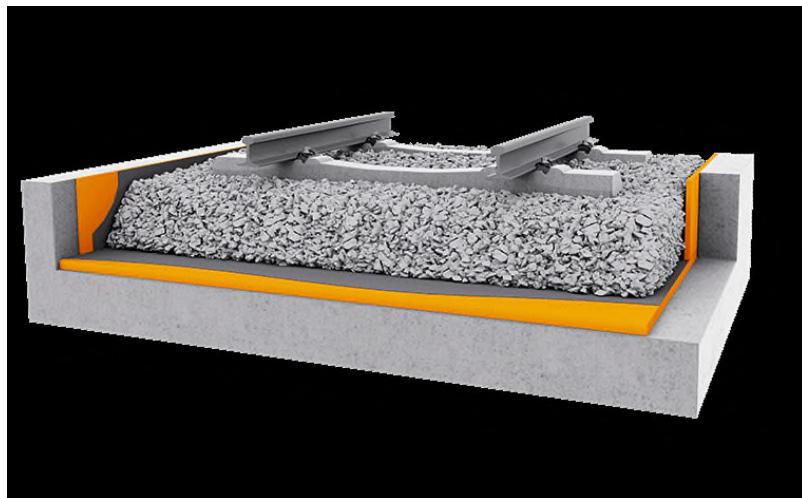
Dilatation superstructure is one subtype of track part with Dilatation panel.

Property		
Name	**Description**	**Data type**

2.1.14 Earth mat (RTR_OT_TR-220)

Located between the ballast bed and the top foundation layer.

Not necessarily required. Often used to control the elasticity of the whole track and prevents the ballast fast degradation (if there is a hard subgrade).
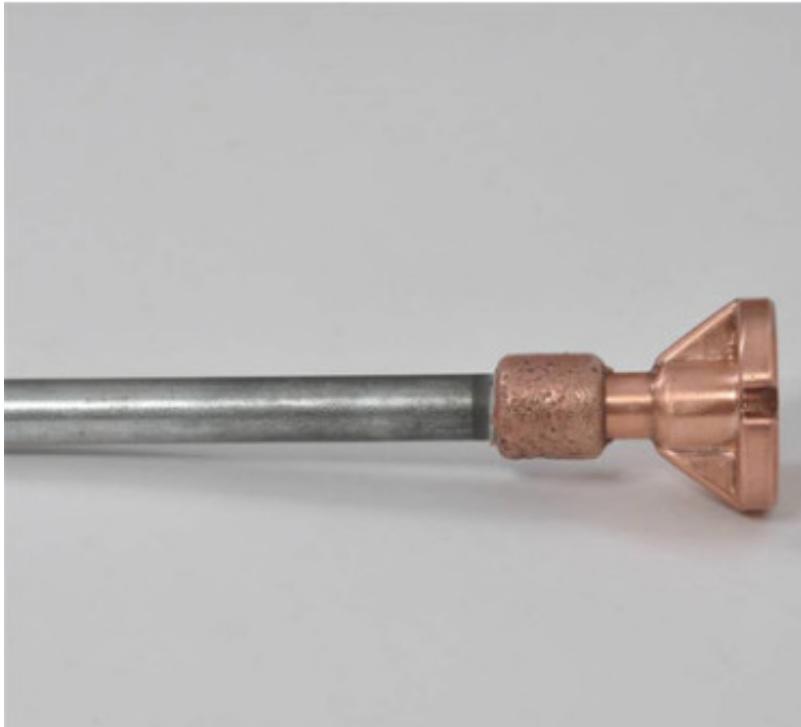
Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of earth mat start to track edge origin / [m]	Real
To location	Distance of earth mat end to track edge origin / [m]	Real
Type	Type of earth mat, material	Enum_Type
Transverse incline	Transverse incline / [deg]	Real
Installation date	Date on which the earth mat was (or will be) installed.	Date
Disassembly date	Date on which the earth mat was (or will be) removed.	Date
Manufacturing date	Date on which the earth mat was (or will be) manufactured.	Date
Putting into operation date	Date on which the earth mat was (or will be) put into operation.	Date
Installation depth	Ideal installation depth / [cm]	Real

2.1.15 Earthing Terminal (RTR_OT_TR-540)

Object used for earthing.

Installed in track slab or concrete slab.

Welded to reinforcing bar in track slab or concrete slab.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	Distance to start of track edge / [m]	Real

track slab/ concrete slab	Referenced track slab/ concrete slab	Identifier
Installation date	Date on which the erathing terminal was (or will be) installed.	Date
Manufacturing date	Date on which the eathing terminal was (or will be) manufactured.	Date
Putting into operation date	Date on which the eathing terminal was (or will be) put into operation.	Date
Disassembly date	Date on which the eathing terminal was (or will be) removed.	Date
Earthing Terminal Type	Type of track base	Enum_TrackBaseType
Technical Standard	The technical standard which the track isolation layer should comply with.	Text

2.1.16 Embedded track for traffic (RTR_OT_TR-330)

Tracks recessed into road surface.

Superstructure type usually specific (slab track/grooved rail).

Covering can be driven on in all directions.

Usually used in public areas.

Combined drainage systems normally used.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of start of embedded track for traffic to track edge origin / [m]	Real
To location	Distance of end of embedded track for traffic to track edge origin / [m]	Real
Relative position	Left, Right or in the middle or a combination	Enum_RelativePosition
Type	Type	Enum_Type
Name / Town/city	Street, square	Text

Covering material	Material of the covering, e.g. asphalt, paving stones, grass	Enum_CoveringMaterial
Contract	Are there any contractual agreements, e.g. cost-sharing factor, snow removal, etc.	Identifier
Installation date	Date on which the embedded track was (or will be) installed.	Date
Manufacturing date	Date on which the embedded track for traffic was (or will be) manufactured.	Date
Putting into operation date	Date on which the embedded track for traffic was (or will be) put into operation.	Date
Disassembly date	Date on which the embedded track for traffic was (or will be) removed.	Date
Drainage	Rail drainage yes/no (grooved rail)	Boolean
Rated load	Permissible road traffic load / [t]	Real
Accessibility by vehicle	Regular combined rail/road traffic yes/no	Boolean

2.1.17 Emergency fish plate (RTR_OT_TR-480)

A temporary joint with fishplate for safty reason, i.e. to prevent rail breakage in case of damage on rail running surface or within the rail.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	Distance from beginning of the track edge / [m]	Real
Relative position	Indication of whether the emergency fish plate lies to the left or the right in the track edge direction	Enum_RelativePosition
Location in panel	Internal referencing in panel in acc. with installation plan of panel	Local coordinates
Length	Length of fish plate / [m]	Real
Type	Type of connection, material, type of screw, adhesion; emergency bond yes/no; speed restriction	Enum_Type
Arrangement	"twin sleeper"-type or "between sleepers"-type	Enum_Arrangement
Belongs to panel type	In a track panel or turnout panel	Enum_BelongsToPanelType
Number of screws	Number of screws/connections on each side / [screw(s)]	Real
Lifting bracket	Is it a connection between two different heights? Yes/no	Boolean
Joint Control Equipment	YES/NO – security equipment that check mechanical functionality (RFI)	Boolean
Rail properties of adjacent rails	Type of rail profiles which are connected by this joint	Enum_RailPropertiesOfAdjacentRails
Production type	Produced on the field or pre-manufactured	Enum_ProductionType
Manufacturer	Responsible for producing of emergency fish plate	Text
Installation date	Date on which the "emergency fish plate" was (or will be) installed.	Date
Disassembly date	Date on which the emergency fish plate was (or will be) removed.	Date
Manufacturing date	Date on which the emergency fish plate was (or will be) manufactured.	Date
Putting into operation date	Date on which the emergency fish plate was (or will be) put into operation.	Date

2.1.18 Fastening (RTR_OT_TR-120)

Assembly of components which secures a rail to the supporting structure and retains it in the required position whilst permitting any necessary vertical, lateral and longitudinal movement.
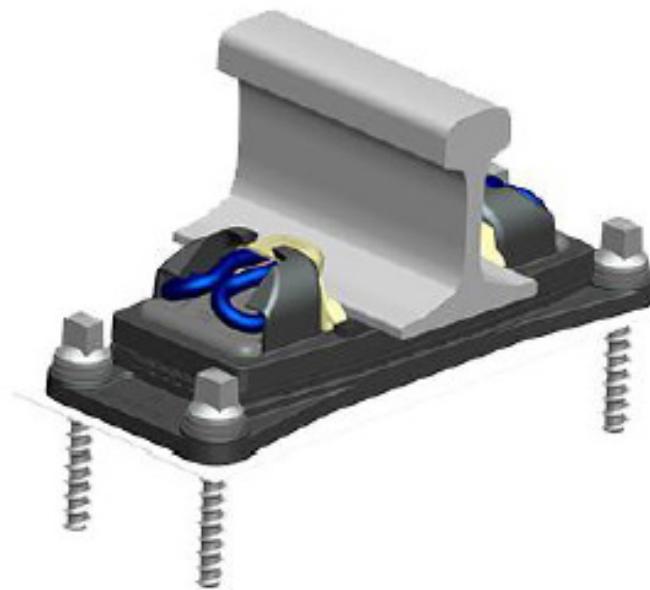
Essential for stability of the track panel.

Absorbes the shear forces from the rail.

Depending on the construction type the different effects regarding vertical and horizontal forces.

Proper contact prevents dynamic impacts on the track pannel (e.g. hits from the rail to the sleepers or risk of losing holding force in the sleepers due to dynamic loads from the traffic loads (hole bearing etc.)

Note: The major part of the vertical force absorbtion happended throught a direct contact of the rail an the track slab (fastening on the sleeper) or to the sleeper itself (depending on the type)
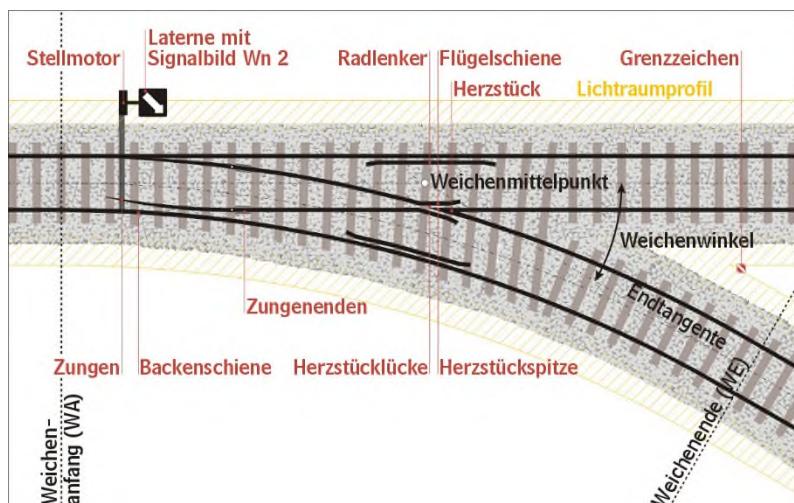
Property		
Name	**Description**	**Data type**
Sleeper	Reference to sleeper	Identifier
Relative position	Indication of whether the rail fastening lies to the left or right in the track panel direction	Enum_RelativePosition
Place of application	Application within track or turnout panel, internal referencing for turnout in accordance with installation plan where applicable	Coordinates (local)
Rail support	The type of support used to fix the running rail in place	Enum_RailSupport
Sleeper fastening	The system used to anchor the fastening in the sleeper	Enum_SleeperFastening

Rock bolt	The system used to fix the rock bolt (tram rail, slab track) in place	Enum_RockBolt
Ripped plate	The ripped plate with out or with spikes. Spikes increase the fixation in the wooden sleeper (in narrow curves)	Enum_RippedPlate
Type	Type of rail fastening	Enum_Type
TrackFasteningElasticityType	Track Fastening Elasticity Type	Enum_TrackFasteningElasticityType
Is Reduced Resistance Fastening	Is Reduced Resistance Fastening	Boolean
Technical standard	The name of technical standard which the rail shall comply with.	Text
Rail insulator	provides electrical insulation and protects the rail from abrasion. Installed between rail and sole plate.	Enum_RailInsulator
tie plate	fix together the rail fastening system	Enum_TiePlate
rail clip (fastening)	maintain rail in position applying controles force via elastic design	Enum_RailClip(Fastening)
sleeper screw	fix the elastic part to the sleeper	Enum_SleeperScrew
Installation date	Date on which the rail fastening was (or will be) installed.	Date
Disassembly date	Date on which the fastening was (or will be) removed.	Date
Manufacturing date	Date on which the fastening was (or will be) manufactured.	Date
Putting into operation date	Date on which the fastening was (or will be) put into operation.	Date

2.1.19 Frog (RTR_OT_TR-40)

Arrangement ensuring the intersection of two opposite running edges of turnouts or diamond crossings having crossing vees (single or double) and wing rails.

Direct contact with wheel (with running surface and wheel flange, depending on the design)

Property		
Name	**Description**	**Data type**

Turnout panel	Reference to which turnout panel belongs to which frog.	Identifier
Location in the turnout panel	Internal referencing in turnout panel in acc. with installation plan	Local Coordinates
Frog moveable	Indication of whether the frog moveable is dynamic or rigid.	Boolean
Frog bend	The frog in a set of turnout in the turnout catalogue can be straight or bent. This will be marked here.	Enum_FrogBend
Frog angle	Indication of the track angle in the frog (1:x)	Label
Incline of turnout end	The incline of the turnout end defines the angle α between the main track and deflection.	Enum_InclineOfTurnoutEnd
Type1	Standard, double frog	Enum_Type1
Type2	Low frog – high frog (wheel runs on wheel flange (tram))	Enum_Type2
Material	bainitic, indication of the material	Enum_Material
Installation date	Date on which the frog was (or will be) installed.	Date
Disassembly date	Date on which the frog was (or will be) removed.	Date
Manufacturing date	Date on which the frog was (or will be) manufactured.	Date
Putting into operation date	Date on which the frog was (or will be) put into operation.	Date

2.1.20 Gauge tie rod (RTR_OT_TR-140)

Device to ensure rail distance for simple track panel.

Can assure the function of a rail fastening or a sleeper.

Often used at build conditions oder in temporary solutions.

Also popular in forms of construction for driveable surfaces (e.g. tramways).

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	Distance to start of track edge / [m]	Real
Type	Design, type	Enum_Type
Installation date	Date on which the gauge tie rod was (or will be) installed.	Date

Disassembly date	Date on which the gauge tie rod was (or will be) removed.	Date
Manufacturing date	Date on which the gauge tie rod was (or will be) manufactured.	Date
Putting into operation date	Date on which the gauge tie rod was (or will be) put into operation.	Date
Purpose	Is the installation permanent or temporary (construction stage)?	Text

2.1.21 Guard Rail (RTR_OT_TR-30)

Non-running rail mounted either inside or outside the running rail to protect vehicle, bridge, viaduct and other structures in the event of a derailment.
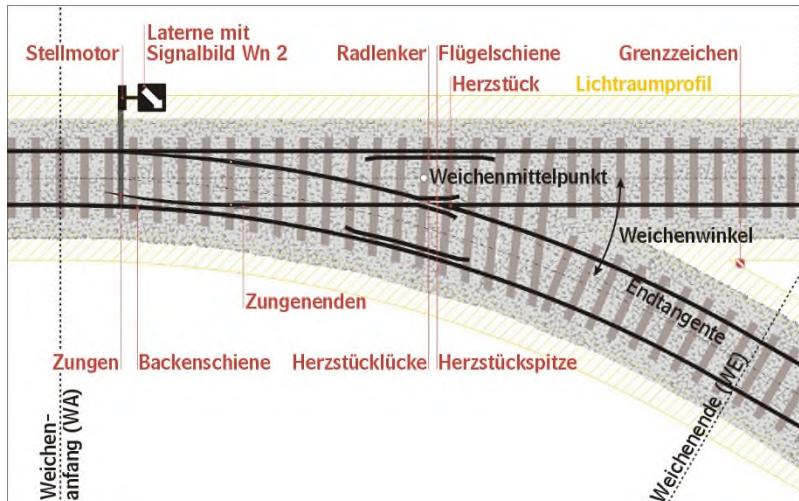
Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of guard rail start to track edge origin / [m]	Real
To location	Distance of guard rail end to track edge origin / [m]	Real
Relative position	Indication of whether the guard rail lies to the left or the right in the track edge direction	Enum_RelativePosition
Inside/Outside position	Indication of whether the guard rail lies on the inside or outside in the track edge direction	Enum_Inside/OutsidePosition
Type of guard rail	Type of guard rail design List with certain combination types, e.g. guard rail and/or spot sleeper	Enum_TypeOfGuardRail
Connection	How is the guard rail connected along its length (fish plate, weld, none)	Enum_Connection
Fastening	Indication of how it is fastened to each sleeper, type,	Enum_Fastening
Installation date	Date on which the guard rail was (or will be) installed.	Date
Disassembly date	Date on which the guard rail was (or will be) removed.	Date
Manufacturing date	Date on which the guard rail was (or will be) manufactured.	Date
Putting into operation date	Date on which the guard rail was (or will be) put into operation.	Date

2.1.22 Half set of blades (RTR_OT_TR-50)

"Half set of blades" is composed of one blade and one stock rail. Only replaceable as one unit during railway maintenance.

It is right or left hand as seen by an observer in the centre of the track facing the turnout heel from the turnout toe.

Function: change the direction.

Property		
Name	**Description**	**Data type**
Turnout panel (or dilatation panel)	Reference to which turnout panel (or dilatation panel) the half set of blades belongs to. Internal referencing	Identifier
Location in the turnout panel (or dilatation panel)	Internal referencing in turnout panel (or dilatation panel) in acc. with installation plan	Local coordinates

Turnout tongue	Indication of whether the turnout has flexible tongues, loose heel turnouts or flexible tongues with dry sliding plates.	Enum_TurnoutTongue
Type of installation	Design, type of fastening, profile height	Enum_TypeOfInstallation
Length	Length of turnout tongue from point of turnout tongue / [m]	Real
Radius of blade	Within what radius is the blade bent? / [m]	Real
Radius of stock rail	Within what radius is the stock rail bent? / [m]	Real
Producer	Manufacturer	Enum_Producer
Installation date	Date on which the half set of blades was (or will be) installed.	Date
Manufacturing date	Date on which the half set of blades was (or will be) manufactured.	Date
Putting into operation date	Date on which the half set of blades was (or will be) put into operation.	Date
Disassembly date	Date on which the half set of blades was (or will be) removed.	Date
Type of turnout (in case of turnout panel/applies only to turnout panel)	Corresponding type of turnout (single turnout double-slip turnout)	Enum_TurnoutType
Function of turnout (in case of turnout panel/applies only to turnout panel)	Installed in main track or side track	Enum_TurnoutFunction
Fallback device	Does the blade always return to the same position (trailable turnout)	Boolean

2.1.23 Hollow sleeper (RTR_OT_TR-170)

Special type of sleeper. Contains technical equipment (e.g. safety installations)

Protects equipment elements (e.g. turnout-setting mechanisms)

Allows equipment (e.g. cables) to safely run across the track panel

Limited absorption of force from running rail (via rail fastenings)

Limited dissipation of vertical load into ballast or supporting plate

Limited dissipation of longitudinal and lateral forces caused by friction/dovetailing (ballast) or supporting plate (slab track)

Can also be installed between normal sleepers.

Property

Name	Description	Data type
Panel	Referenced track panel or turnout panel or dilatation panel	Identifier
Track-Panel-Sequence	Sequence of sleepers within the track panel <OR> to Position	Integer
Track-Panel-Position	<OR> to Sequence / [m]	Real
Condition	Indication of whether the hollow sleeper was new/used when it was installed	Label
Sleeper type	Type of sleeper. This is determined by its material and structural properties/geometry.	Enum_SleeperType
Undersleeperpad	Indication of whether the sleeper has an undersleeperpad and, if so, what type.	Enum_Undersleeperpad
Coating	Indication of whether and by what means the sleeper has been waterproofed (esp. wooden sleepers) à contamination, for special disposal	Enum_Coating
Turnout-Panel-Position	Reference of corresponding installation plan of the turnout	Identifier
Dilatation-Panel-Position	Reference of corresponding installation plan of the dilatation	Identifier
Manufacturer	How and by whom was the hollow sleeper manufactured?	Label
Installation date	Date on which the hollow sleeper was (or will be) installed.	Date
Disassembly date	Date on which the hollow sleeper was (or will be) removed.	Date
Manufacturing date	Date on which the hollow sleeper was (or will be) manufactured.	Date
Putting into operation date	Date on which the hollow sleeper was (or will be) put into operation.	Date
Sleeper dimension	Length, width, hight / [m] / t.b.d. ask CRBIM@Düsseldorf	Real

| Equipment | Does the sleeper have any special equipment for fastening components (e.g. balise, SIGNUM magnet)? Yes/no | Boolean |
| Purpose | What's the purpose of the hollow sleeper? Eg. cable trenching, protection of turnout mechanism | Text |

2.1.24 Insulated joint (RTR_OT_TR-60)

Transition between two neighbouring rails.

Electrically insulated for use of track circuits (incl. return electric traction circuit)

Usage has relevance for operations.

Used for Continuous Welded Rails (CWR).

Inhomogeneity in the supporting strength of the running rail (longitudinal, vertical and lateral forces).

Inhomogeneity in the stability of the track panel.

Origin of noise emissions.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	Distance from beginning of the track edge / [m]	Real
Relative position	Indication of whether the insulated joint lies to the left or the right in the track edge direction	Enum_RelativePosition
Location in panel	Internal referencing in panel in acc. with installation plan of panel	Local coordinates
Length	Length of joint / [m]	Real
Type	Type of insulation, material, type of screw, adhesion	Enum_Type
Production type	Produced on the field or pre-manufactured	Enum_ProductionType
Arrangement	"twin sleeper"-type or "between sleepers"-type	Enum_Arrangement
Belongs to panel type	In a track panel or turnout panel	Enum_BelongsToPanelType
Joint Control Equipment	YES/NO – security equipment that check mechanical functionality (RFI)	Boolean
Rail properties of adjacent rails	Type of rail profiles which are connected by this joint	Enum_RailPropertiesOfAdjacentRails
Number of screws	Number of screws/connections on each side / [screw(s)]	Real
Manufacturer	Responsible for producing of the insulated joint	Text
Installation date	Date on which the "insulated joint" was (or will be) installed.	Date
Disassembly date	Date on which the insulated joint was (or will be) removed.	Date
Manufacturing date	Date on which the insulated joint was (or will be) manufactured.	Date
Putting into operation date	Date on which the insulated joint was (or will be) put into operation.	Date
Temporaraly Bonded	YES / NO (for maintenance or work)	Boolean

2.1.25 Insulated joint with fish plate (RTR_OT_TR-460)

Transition between two neighbouring running rails but in not continuous rail zone.

Electrically insulated.

Used for jointed track.

Inhomogeneity in the supporting strength of the running rail (longitudinal, lateral and vertical forces).

Inhomogeneity in the stability of the track panel.

The gap between the rails is the origin of noise emissions.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	Distance from beginning of the track edge / [m]	Real
Relative position	Indication of whether the Insulated joint with fish plate lies to the left or the right in the track edge direction	Enum_RelativePosition
Location in panel	Internal referencing in panel in acc. with installation plan of panel	Local coordinates
Type	Type of connection, material, type of screw, adhesion	Enum_Type
Arrangement	"twin sleeper"-type or "between sleepers"-type	Enum_Arrangement
Belongs to panel type	In a track panel or turnout panel	Enum_BelongsToPanelType
Number of screws	Number of screws/connections on each side / [screw(s)]	Real
Lifting bracket	Is it a connection between two different heights? Yes/no	Boolean
Rail properties of adjacent rails	Type of rail profiles which are connected by this joint	Enum_RailPropertiesOfAdjacentRails
Installation date	Date on which the "Insulated joint with fish plate" was (or will be) installed.	Date
Disassembly date	Date on which the insulated joint with fish plate was (or will be) removed.	Date
Manufacturing date	Date on which the insulated joint with fish plate was (or will be) manufactured.	Date
Putting into operation date	Date on which the insulated joint with fish plate was (or will be) put into operation.	Date
Length	Length of fish plate / [cm]	Real
Rail Gap	The Gap between rails / [mm]	Integer

2.1.26 Lubrication (RTR_OT_TR-110)

Prevent wearing of the rails throught the flange of wheel.

Reduce noise emissions.

Often located at inner side of the outer rail in a curve or near turnouts (depends from function wearing or noise reduction)

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	Distance from beginning of the track edge / [m]	Real
Relative position	Indication of whether the affected lubrication lies to the left or right in the track panel direction	Enum_RelativePosition
Type	Design and type of lubricating system, active/passive?	Enum_Type
Lubricating material	Oil type, lubricating type, wetting	Enum_LubricatingMaterial
Type of supply	alimentation (Electric/photovoltaic)	Enum_TypeOfSupply
dispenser devices	Type of dispenser mode	Enum_DispenserDevices
Manufacturer	Manufacturer	Text
Installation date	Date on which the lubricating system was (or will be) installed.	Date
Disassembly date	Date on which the lubrication was (or will be) removed.	Date
Manufacturing date	Date on which the lubrication was (or will be) manufactured.	Date
Putting into operation date	Date on which the lubrication was (or will be) put into operation.	Date
Purpose	Reducing wear, noise	Text
Noise limit value	Is there a mandatory limit on noise emissions at this location? / [dB]	Real

2.1.27 Not Insulated joint with fish plate (RTR_OT_TR-470)

Transition between two neighbouring running rails.
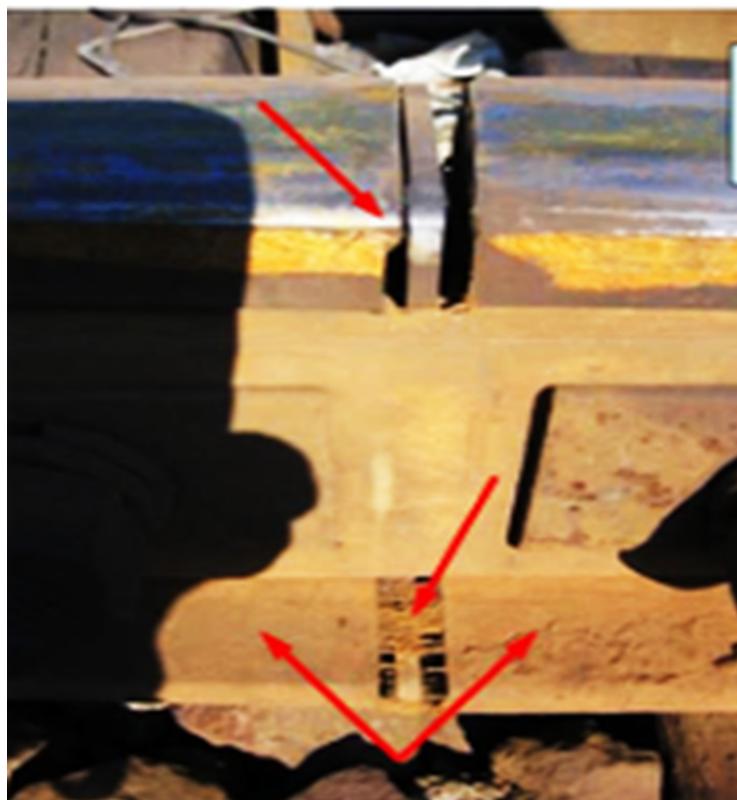
Electrically connected.

Used for jointed track.

Inhomogeneity in the supporting strength of the running rail (longitudinal, lateral and vertical forces).

Inhomogeneity in the stability of the track panel.

The gap between the rails is the origin of noise emissions.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	Distance to track edge origin / [m]	Real
Relative position	Indication of whether the not insulated joint with fish plate lies to the left or the right in the track edge direction	Enum_RelativePosition
Location in panel	Internal referencing in panel in acc. with installation plan of panel	Local coordinates
Type	Type of connection, material, type of screw, adhesion	Enum_Type
Arrangement	"twin sleeper"-type or "between sleepers"-type	Enum_Arrangement
Belongs to panel type	In a track panel or turnout panel	Enum_BelongsToPanelType
Number of screws	Number of screws/connections on each side / [screw(s)]	Real
Lifting bracket	Is it a connection between two different heights? Yes/no	Boolean
Rail properties of adjacent rails	Type of rail profiles which are connected by this joint	Enum_RailPropertiesOfAdjacentRails
Installation date	Date on which the "not insulated joint with fish plate" was (or will be) installed.	Date
Disassembly date	Date on which the not insulated joint with fish plate was (or will be) removed.	Date
Manufacturing date	Date on which the not insulated joint with fish plate was (or will be) manufactured.	Date
Putting into operation date	Date on which the not insulated joint with fish plate was (or will be) put into operation.	Date
Length	Length of fish plate / [cm]	Real
Rail Gap	The Gap between rails / [mm]	Integer

2.1.28 Panel strengthening (RTR_OT_TR-190)

Used in transitions of diffrent types of superstructure (e.g. from ballast to slab track or bridges/tunnels with diffrent stiffness in the substructure).

Distributes the dynamic load peaks.

Improves stability and minimize shocks on the substructure.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of panel strengthening start to track edge origin / [m]	Real
To location	Distance of panel strengthening end to track edge origin / [m]	Real
Type	List of types and designs	Enum_Type
Installation date	Date on which the panel strengthening was (or will be) installed.	Date
Disassembly date	Date on which the panel strengthening was (or will be) removed.	Date
Manufacturing date	Date on which the panel strengthening was (or will be) manufactured.	Date
Putting into operation date	Date on which the panel strengthening was (or will be) put into operation.	Date

2.1.29 Plain track super structure (RTR_OT_TR-1006)

Plain track super structure is one subtype of track part without turnout panel or dilatation panel.

Property		
Name	**Description**	**Data type**

2.1.30 Rack-rail (RTR_OT_TR-100)

Building module for enhancing traction and break performance (mountains)

Reinforces the track panel.

Located centrical in the track panel on the rail axes.

(Formerly also known as ""Rack"".)

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of rack-rail-rail start to track edge origin / [m]	Real
To location	Distance of rack-rail end to track edge origin / [m]	Real
Type	Indication of the type of rack-rail (Abt, Morgan, Riggenbach, Strub, etc.)	Enum_Type
Design	Specific types and fastening types? Height, tooth spacing	Enum_Design
Type of entrance	Design/structure of the rack-rail entrance at the start of the section	Enum_TypeOfEntrance
Type of exit	Design/structure of the rack-rail exit at the end of the section	Enum_TypeOfExit
Installation date	Date on which the rack-rail was (or will be) installed.	Date
Disassembly date	Date on which the rack-rail was (or will be) removed.	Date
Manufacturing date	Date on which the rack-rail was (or will be) manufactured.	Date
Putting into operation date	Date on which the rack-rail was (or will be) put into operation.	Date

2.1.31 Rail (RTR_OT_TR-10)
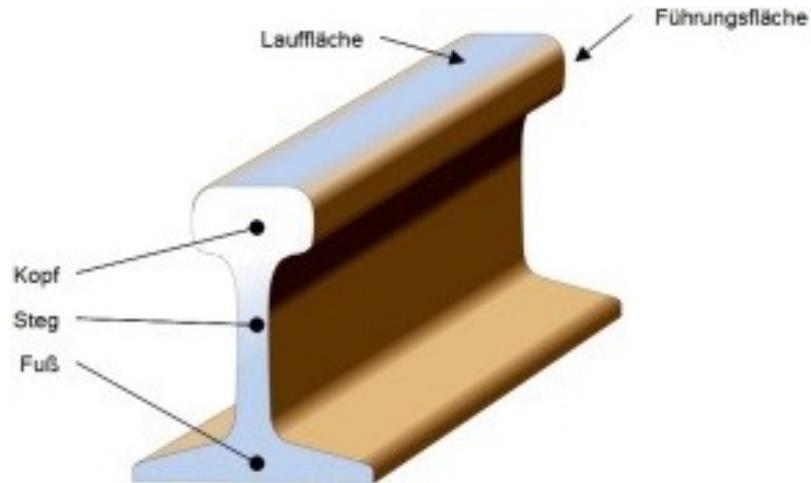
Absorption of force in the wheel/rail system (running surface and wheel flange), hunting oscillation

Distribution of force in the longitudinal direction (static and dynamic traffic loads)

Absorption of force in the longitudinal direction (temperature)

In case of a Switch: Special components are modeled separately.

Depending from location/panel function: different specifications are possible (eg Wing rail)

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of rail start to track edge origin / [m]	Real
To location	Distance of rail end to track edge origin / [m]	Real
Relative position	Indication of whether the rail lies to the left or right in the track edge direction	Enum_RelativePosition
Reused rail	Assessment of the condition of the installed running rail (New / Used)	Boolean
Delivery state	The delivery state of rail	Enum_DeliveryState
Steel grade	Steel grade (material) of the rail	Enum_SteelGrade
Rail profile	Profile of the rail. The profile defines the geometric form and size of the rail cross-section.	Enum_RailProfile
Rail installation	Information about how the rail is installed with regard to welds and joints (Needed for maintenance)	Enum_RailInstallation
Minimum tensile strength	Minimum tensile strength / [Mpa]	Real
Processing status of the end	Final treatment of the end of the rail in manufacturing	Text
Technical standard	The name of technical standard which the rail shall comply with.	Text
Stainless	Stainless rail or not (inox or not)	Boolean
Milling plant	The milling plant where the rail was milled (manufactured).	Enum_MillingPlant
Installation date	Date on which the rail was (or will be) installed.	Date
Disassembly date	Date on which the rail was (or will be) removed.	Date
Manufacturing date	Date on which the rail was (or will be) manufactured.	Date
Putting into operation date	Date on which the rail was (or will be) put into operation.	Date
Rail inclination	Angle, inclination of the rail to the axle / [deg]	Enum_RailInclination
Length of elementary rail	The length of rail is proposed to supply from Milling plant	Enum_LengthOfElementaryRail
Panel	Reference to which track panel or turnout panel the rail lies.	Identifier

2.1.32 Rail brace (RTR_OT_TR-490)

Device to prevent rails from tipping and twisting.

Ensures track spacing between two running rails.

Property		
Name	**Description**	**Data type**
Fastening	Referenced fastening	Identifier
Type	The type of rail brace	Enum_Type
Installation date	Date on which the Rail brace was (or will be) installed.	Date
Disassembly date	Date on which the rail brace was (or will be) removed.	Date
Manufacturing date	Date on which the rail brace was (or will be) manufactured.	Date
Putting into operation date	Date on which the rail brace was (or will be) put into operation.	Date
Purpose	Is the installation permanent or temporary (construction stage)?	Text

2.1.33 Rail-pads (RTR_OT_TR-130)
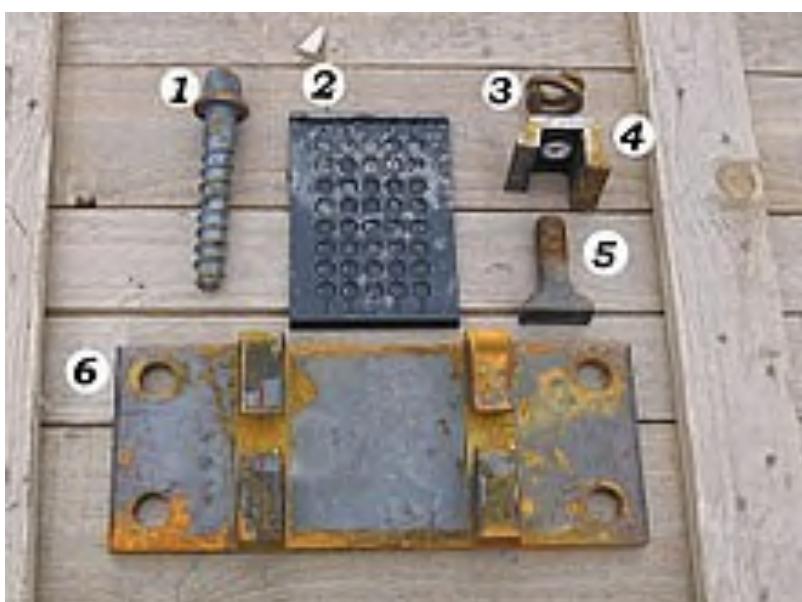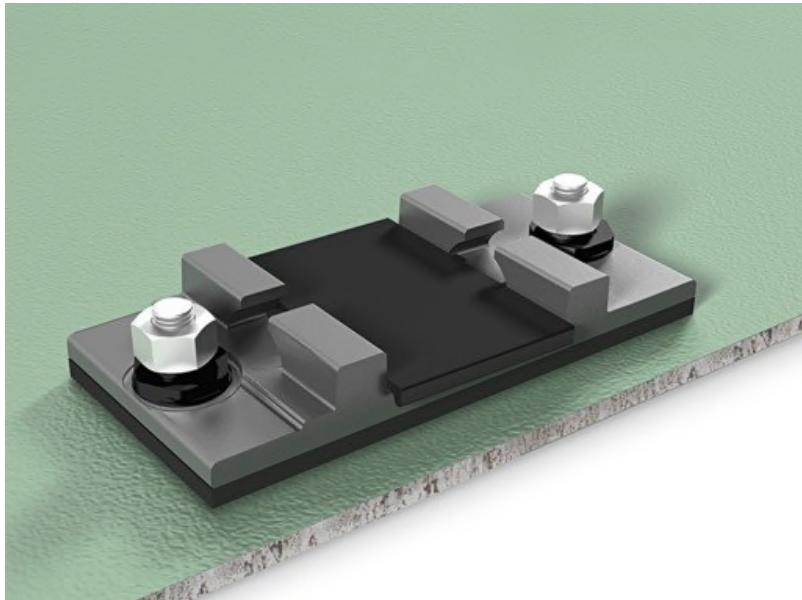
Non-metallic pad placed between rail and baseplate or rail and sleeper, bearer or slab.

Frequent replacemets are necessary.
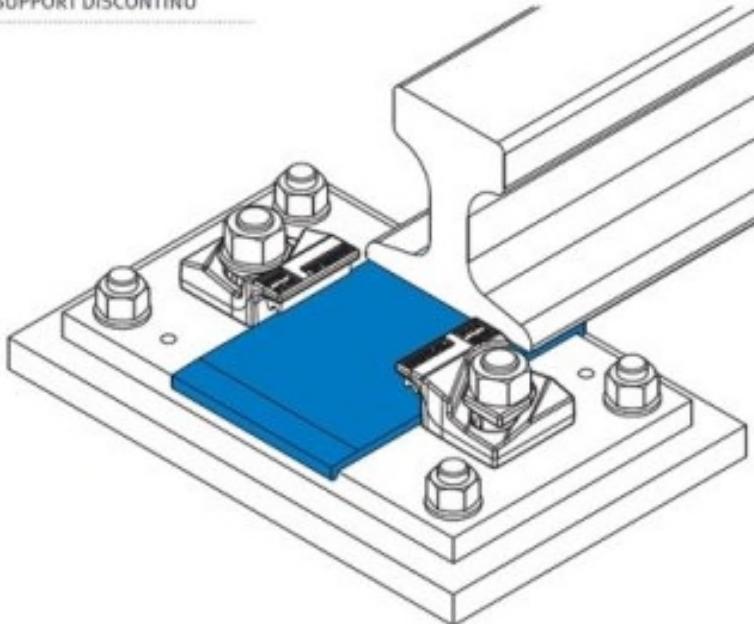
Absorbing shocks and reduce vibrations in the rail (leads to a better wheel-rail contact).

Reduce damages to the rail, wearing and noise issues.
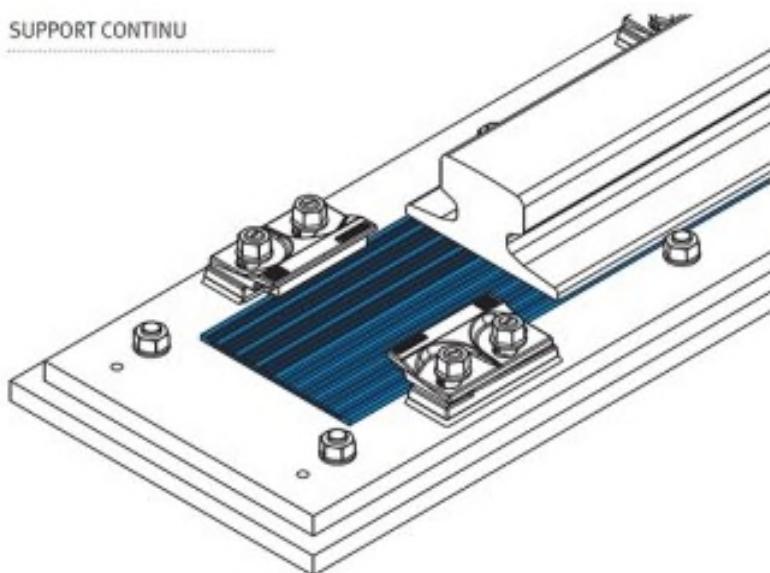
Often used on heavy-load routes and/or curves.

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Property		
Name	**Description**	**Data type**
Rail fastening	Reference to rail fastening	Identifier
Type	Type, design, characteristics, material	Enum_Type
Installation date	Date on which the rail pads was (or will be) installed.	Date
Disassembly date	Date on which the rail-pads was (or will be) removed.	Date
Manufacturing date	Date on which the rail-pads was (or will be) manufactured.	Date
Putting into operation date	Date on which the rail-pads was (or will be) put into operation.	Date

2.1.34 Railway crossing (RTR_0T_TR-340)

Railway crossing covering for roads (secured/unsecured).

Superstructure type also possible with ballast.

Covering can be driven on in the transverse direction.

Usually used in public areas.

Often entails changes to the stiffness of the superstructure/substructure.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of railway crossing start to track edge origin / [m]	Real
To location	Distance of railway crossing end to track edge origin / [m]	Real
Relative position	Left, Right or in the middle or a combination	Enum_RelativePosition
Type of railway crossing	The type of railway crossing plate	Enum_TypeOfRailwayCrossing
Name / Town/city	Descriptive name of the railway crossing: route/road name	Text
Road signaling system	Type of road signaling system: none/level crossing, warning signs, flashing lights, barriers	Enum_RoadSignalingSystem
Contract	Are there any contractual agreements, e.g. cost-sharing factor, snow removal, etc.	Identifier
Road owner	To whom does the crossing belong?	Enum_RoadOwner
Private ownership	Y = Yes or N = No	Boolean
Installation date	Date on which the railway crossing was (or will be) installed.	Date
Manufacturing date	Date on which the railway crossing was (or will be) manufactured.	Date
Putting into operation date	Date on which the railway crossing was (or will be) put into operation.	Date
Disassembly date	Date on which the railway crossing was (or will be) removed.	Date
Width	Width of transition (with regard to road axis) / [m]	Real
Angle	Crossing angle: 0 < 180 degrees / [deg]	Real

Height of the guard strand	Height of the guard strand placed to control the interference of the vehicle shapes with electric contact line / [m]	Real
Rail / barrier distance	Distance between the external rail and the barrier used to prevent the passage of vehicles during the transit of the train / [m]	Real
Crossing of	Type of crossing: Private footpath, public, level crossing, cycle path, side road, main road, train path, motorway	Enum_CrossingOf
Permanent way slab material	Gravel/"dirt"; wood, asphalt, permanent way slabs, concrete, grass	Enum_PermanentWaySlabMaterial
Drainage	Rail drainage yes/no (grooved rail)	Boolean
Rated load	Permissible road traffic load / [t]	Real
Accessibility by vehicle	Regular combined rail/road traffic yes/no	Boolean
Traffic intensity	Number of cars using the railway crossing per day / [car(s)/day]	Enum_TrafficIntensity
Special route	Route for exceptional transport (load, structure gauge, road)	Boolean
Structure gauge	Requirements from road/railway crossing	Enum_StructureGauge
Secured by signal system	Secured in line with signal box yes/no	Boolean

2.1.35 Sleeper (RTR_OT_TR-160)

Transverse components of the track which control the gauge and transmit loads from the rail to the ballast or other sleeper support.

Dissipation of longitudinal and lateral forces caused by friction/dovetailing (ballast) or supporting plate (slab track).

When it's used for turnouts and crossings, it's also called "bearer".

Often a special sleeper spacing is used under joints (i.e. insulated joint).

Property		
Name	**Description**	**Data type**
Panel	Referenced track panel or turnout panel or dilatation panel	Identifier
Track-Panel-Sequence	Sequence of sleepers within the track or turnout panel <OR> to Position	Integer
Track-Panel-Position	<OR> to Sequence / [m]	Real

Location of "variable spacing" start	Indication of kilometers on referenced track edge indicating the start of a section where the distance between the sleepers is not constant / [m]	Real
Location of "variable spacing" end	Indication of kilometers on referenced track edge indicating the end of a section where the distance between the sleepers is not constant / [m]	Real
Condition	Indication of whether the sleeper was new/used when it was installed	Enum_Condition
Contamination	Sleeper contaminated, special disposal required yes/no	Boolean
Type of fastening	The type of fastening defines the fastening objects used (ribbed plates, screws, clamps, ...) in order to generate traction between the foot of the rail and the sleeper. It depends on but is not uniquely identified by the type of sleeper.	Enum_TypeOfFastening
Sleeper type	Type of sleeper. This is determined by its material and structural properties/geometry.	Enum_SleeperType
Sleeper Model	Sleeper Model	Enum_SleeperModel
Undersleeperpad	Indication of whether the sleeper has an undersleeperpad and, if so, what type.	Enum_Undersleeperpad
Coating	Indication of whether and by what means the sleeper has been waterproofed (esp. wooden sleepers) à contamination, for special disposal	Enum_Coating
Number of axles	Number of track centres (edges in accordance with BNT) running over the sleepers (points, diamond turnoutes, three-rail system) / [axles]	Real
Electrical insulation	Is the sleeper electrically insulated due to its design or the running rails? Yes/no	Boolean
Technical standard	The technical standard which the sleeper should comply with	Text
Turnout-Panel-Position	Reference of corresponding installation plan of the turnout	Identifier
Dilatation-Panel-Position	Reference of corresponding installation plan of the dilatation	Identifier
Manufacturer	Who or which company is the manufactor of the sleeper?	Enum_Manufacturer
Work company	Who put the sleeper in place?	Enum_WorkCompany
Installation date	Date on which the sleeper was (or will be) installed.	Date
Disassembly date	Date on which the sleeper was (or will be) removed.	Date
Manufacturing date	Date on which the sleeper was (or will be) manufactured.	Date
Putting into operation date	Date on which the sleeper was (or will be) put into operation.	Date
Sleeper dimension	Length, width, height / [m]	Text
Equipment	Does the sleeper have any special equipment for fastening components (e.g. balise, SIGNUM magnet)? Yes/no	Boolean

2.1.36 Sleeper Cap (RTR_OT_TR-180)

Main function: Increasing the lateral stability (Often used in low radius curves in the case of continuous welded rail.)

Dovetailed with ballast.

Assigned to a sleeper.

Property		
Name	**Description**	**Data type**
Sleeper	Referenced sleeper	Identifier
Relative position	Indication of whether the tack strengthening equipment lies to the left or right in the track panel direction	Enum_RelativePosition
Sleeper cap type	Type of sleeper cap type	Enum_SleeperCapType
Sleeper Type compatibility	Sleeper Type compatibility	Enum_SleeperTypeCompatibility
Type / model	Type of track strengthening equipment	Enum_Type/Model
Manufacturer	Manufacturer	Enum_Manufacturer
Installation date	Date on which the track strenghtening component was (or will be) installed.	Date
Disassembly date	Date on which the track strengthening equipment was (or will be) removed.	Date
Manufacturing date	Date on which the track strengthening equipment was (or will be) manufactured.	Date
Putting into operation date	Date on which the track strengthening equipment was (or will be) put into operation.	Date

2.1.37 Sliding chair (RTR_OT_TR-150)

Part which supports and retains the stock rail and a flat surface upon which the foot of the switch rail slides.

Only used in turnouts.

Different types of construction (rolls, bearing plates, lubricated or dry-running).

Property		
Name	**Description**	**Data type**
Turnout panel	Referenced turnout panel	Identifier
Location in the turnout panel	Internal referencing in turnout panel in acc. with installation plan	Local coordinates
Type of sliding chair	Product/system which is installed as a sliding chair,. F.e. rollers, lubricating/dry-running bearing plates Does the sliding chair require maintenance? Yes/no Self lubricating / traditional	Enum_TypeOfSlidingChair
Installation date	Date on which the sliding chair was (or will be) installed.	Date
Disassembly date	Date on which the sliding chair was (or will be) removed.	Date
Manufacturing date	Date on which the sliding chair was (or will be) manufactured.	Date
Putting into operation date	Date on which the sliding chair was (or will be) put into operation.	Date

2.1.38 Sound absorption (RTR_OT_TR-370)

Components in the track for sound absorption.

May also absorb vibrations.

Not included noise barriers at track side.

Often used in combination with slab track.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of sound absorption start to track edge origin / [m]	Real
To location	Distance of sound absorption end to track edge origin / [m]	Real
Relative position	Left, Right or in the middle or a combination	Enum_RelativePosition
Type	Type of the system	Enum_Type
Limit value	Mandatory limit values / [dB]	Real
Installation date	Date on which the sound absorption was (or will be) installed.	Date
Manufacturing date	Date on which the sound absorption was (or will be) manufactured.	Date
Putting into operation date	Date on which the sound absorption was (or will be) put into operation.	Date
Disassembly date	Date on which the sound absorption was (or will be) removed.	Date

2.1.39 Speed regulator (RTR_OT_TR-560)
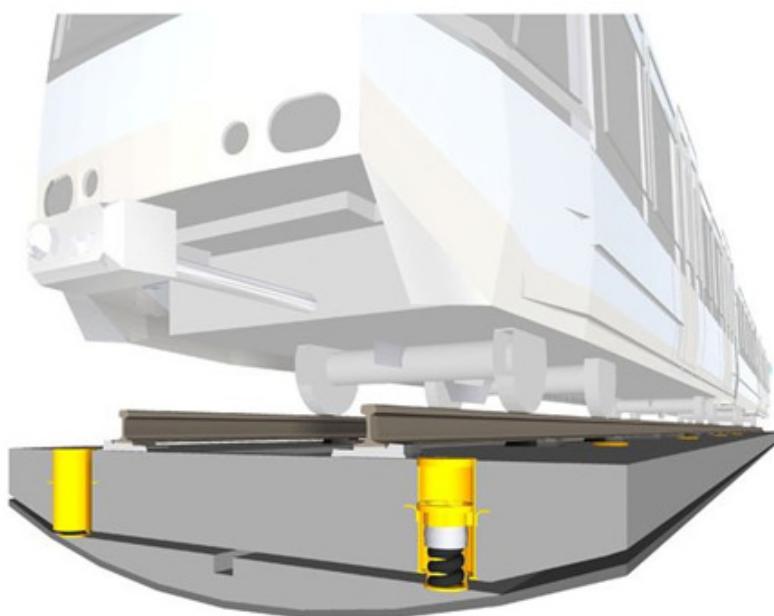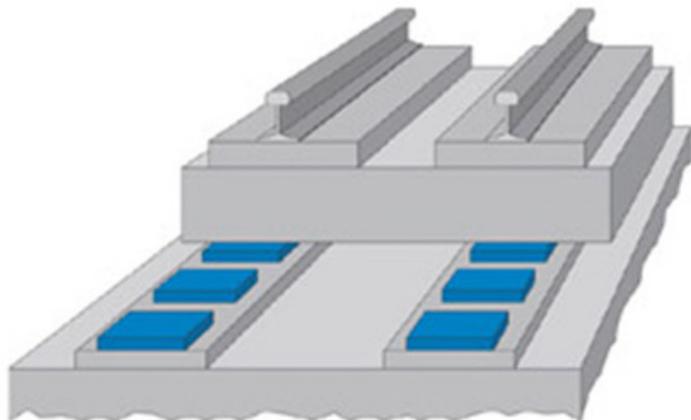
Equipment installed on railway hump and classification yard (also named as shunting yard) to regulate the speed of rolling vehicles.
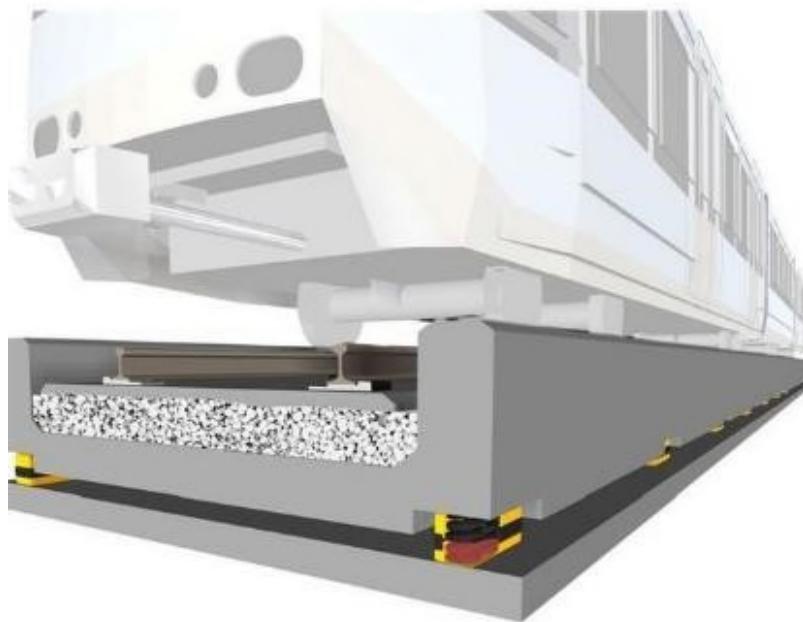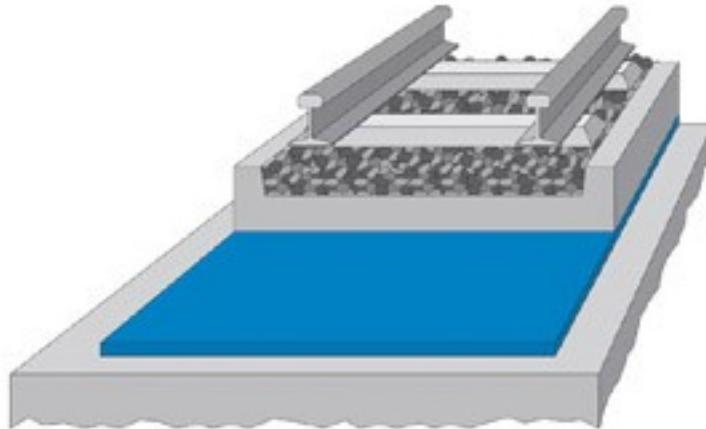
Property		
Name	Description	Data type
Track edge	Referenced track edge	Identifier
From location	Distance of speed regulator start to track edge origin / [m]	Real
To location	Distance of speed regulator end to track edge origin / [m]	Real
Type	Type of speed regulater	Enum_Type
Installation date	Date on which the speed regulator was (or will be) installed.	Date
Manufacturing date	Date on which the speed regulator was (or will be) manufactured.	Date
Putting into operation date	Date on which the speed regulator was (or will be) put into operation.	Date
Disassembly date	Date on which the speed regulator was (or will be) removed.	Date

2.1.40 Spring-Damping system (RTR_OT_TR-260)

Elastic elements are inserted between the superstructure (track and plate on slab track or ballast bed with ballast inserted in) and concrete structure (tunnel, bridge or others). Some of the elastic elements have a partial decoupling effect between the superstructure and underground due to vibrations. Both helical springs and elastomer blocks or elastomer strips can be used as suspension systems.
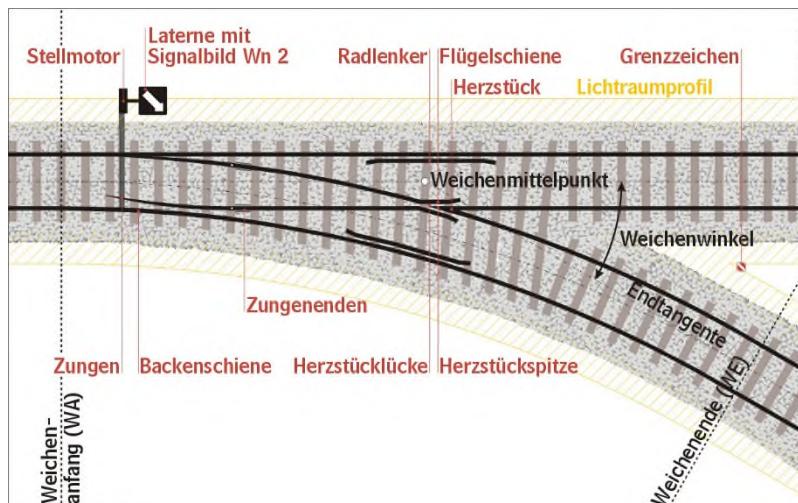
Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	
From location	Distance of spring-damping system start to track edge origin / [m]	Real
To location	Distance of spring-damping system end to track edge origin / [m]	Real
Relative position	Indication of whether the track bench lies to the left or the right in the track edge direction	Enum_RelativePosition
Type	The type of SMS used	Enum_Type
Installation date	Date on which the spring-mass system (SMS) was (or will be) installed.	Date

Disassembly date	Date on which the spring-damping system was (or will be) removed.	Date
Manufacturing date	Date on which the spring-damping system was (or will be) manufactured.	Date
Putting into operation date	Date on which the spring-damping system was (or will be) put into operation.	Date

2.1.41 Stock rail (RTR_OT_TR-450)

Fixed machined rail, ensuring the continuity on the main or diverging track with the switch in the open position. The machined part of the stock rail supports its switch rail in the closed position, giving continuity of line through this switch rail.

"Half set of blades" is composed of one blade and one stock rail. Only replaceable as one unit during railway maintenance. Where blade or stock rail can be replaced separately (i.e. Metro) the objects are assigned as "blade elementary" and "stock rail elementary" in the conceptual model.
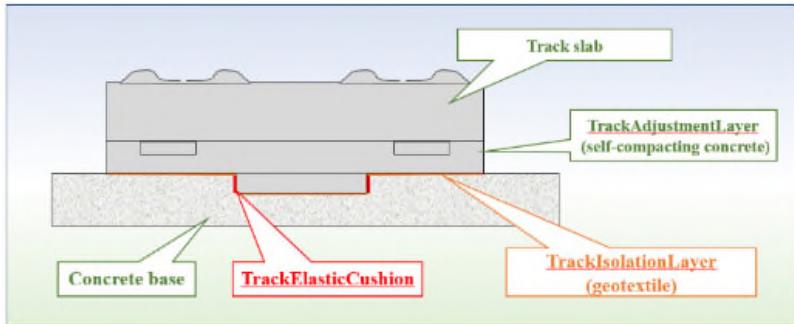
Property		
Name	**Description**	**Data type**
Turnout panel (or dilatation panel)	Reference to which turnout panel (or dilatation panel) the stock rail belongs to. Internal referencing	Identifier
Location in turnout panel	Internal referencing in turnout panel in acc. with installation plan	Local coordinates
Type of installation	Design, type of fastening, profile height	Enum_InstallationType
Installation date	Date on which the stock rail was (or will be) installed.	Date
Disassembly date	Date on which the stock rail was (or will be) removed.	Date
Manufacturing date	Date on which the stock rail was (or will be) manufactured.	Date
Putting into operation date	Date on which the stock rail was (or will be) put into operation.	Date
Length	Length of stock rail from point of turnout blade / [m]	Real
Radius of stock rail	Within what radius is the stock rail bent? / [m]	Real
Type of turnout	Corresponding type of points (single points, double-slip turnout)	Enum_TurnoutType
Function of turnout	Installed in main track or side track	Enum_TurnoutFunction

2.1.42 Track Adjustment Layer (RTR_OT_TR-520)

Track adjustment layer is a concrete layer or mortar layer cast or paved in-situ, which is used for supporting track slabs or track concrete slabs.

Track adjustment layer shall only appear in ballastless track structures.
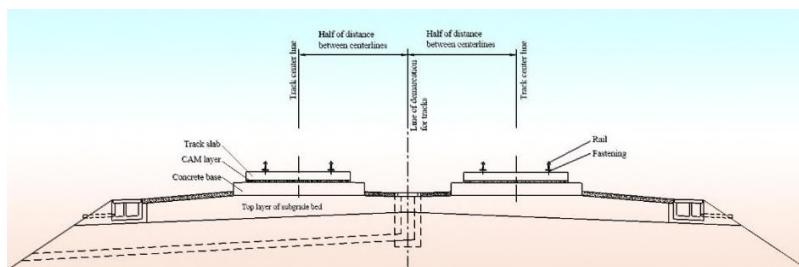
Property		
Name	**Description**	**Data type**
Track / concrete slab	Referenced track slab/concrete slab	Identifier
Adjustment layer Type	Adjustment layer Type	Enum_AdjustmentLayerType
Technical Standard	The technical standard which the track adjustment layer should comply with.	Text
Installation date	Date on which the Adjustment layer was (or will be) installed.	Date
Disassembly date	Date on which the track adjustment layer was (or will be) removed.	Date
Manufacturing date	Date on which the track adjustment layer was (or will be) manufactured.	Date
Putting into operation date	Date on which the track adjustment layer was (or will be) put into operation.	Date

2.1.43 Track Base (RTR_OT_TR-530)

Concrete base is a kind of reinforced foundation cast in-situ, which is used for supporting track slabs or track concrete slabs.

Concrete base shall only appear in ballastless track structures.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of track base start to track edge origin / [m]	Real
To location	Distance of track base end to track edge origin / [m]	Real
IsSurfaceGalling	If the surface is needed to gall. Yes/No.	Boolean
SurfaceGallingArea	The galling area of the object surface. / [mm2]	Real
SurfaceGallingMaterial	surface galling material	Enum_SurfaceGallingMaterial
Installation date	Date on which the track base was (or will be) installed.	Date

Disassembly date	Date on which the track base was (or will be) removed.	Date
Manufacturing date	Date on which the track base was (or will be) manufactured.	Date
Putting into operation date	Date on which the track base was (or will be) put into operation.	Date

2.1.44 Track Elastic Cushion (RTR_OT_TR-510)

Track elastic cushion is a kind of layer set on grooved sides of a concrete base, which is used for mitigating the impact of longitudinal and lateral load on track structures.

Track elastic cushion shall only appear in ballastless track structures.

Property		
Name	**Description**	**Data type**
Track / concrete slab	Referenced track slab/concrete slab	Identifier
Elastic Cushion Type	The Type of Elastic Cushion	Enum_ElasticCushionType
Structure Composition	The description of Structure Composition	Enum_StructureComposition
Technical Standard	The technical standard which the track elastic cushion should comply with.	Text
Installation date	Date on which the Elastic cushion was (or will be) installed.	Date
Disassembly date	Date on which the track elastic cushion was (or will be) removed.	Date
Manufacturing date	Date on which the track elastic cushion was (or will be) manufactured.	Date
Putting into operation date	Date on which the track elastic cushion was (or will be) put into operation.	Date

2.1.45 Track Isolation Layer (RTR_OT_TR-500)

Track isolation layer is a structure layer placed on top surface of track bases. It may implement functions of damage repair of track superstructure under special circumstances and coordinate temperature deformation.

Track isolation layer shall only appear in ballastless track structures.
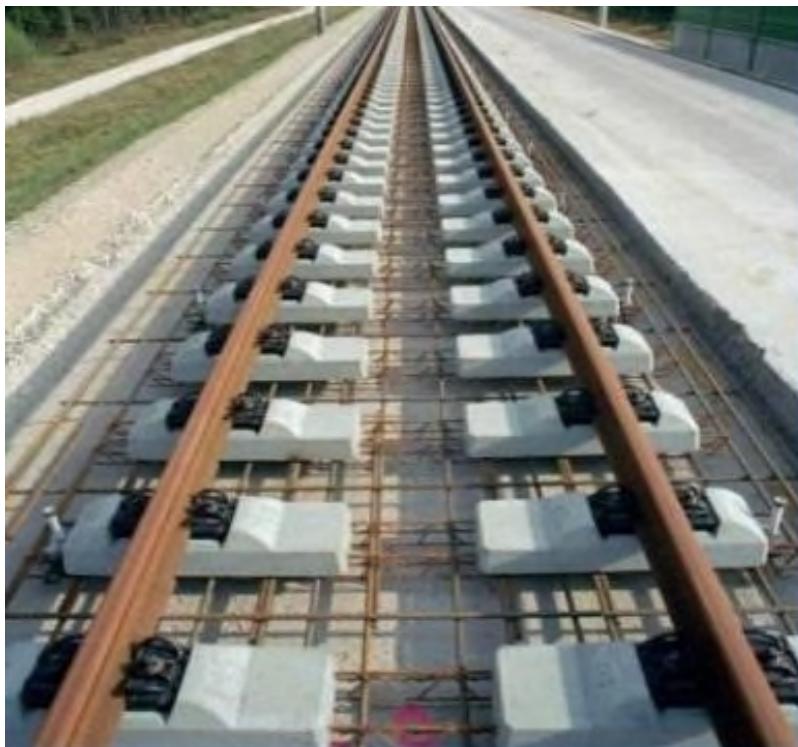
Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of track isolation layer start to track edge origin / [m]	Real
To location	Distance of track isolation layer end to track edge origin / [m]	Real
Track Isolation Layer Type	The type of track isolation layer	Enum_TrackIsolationLayerType
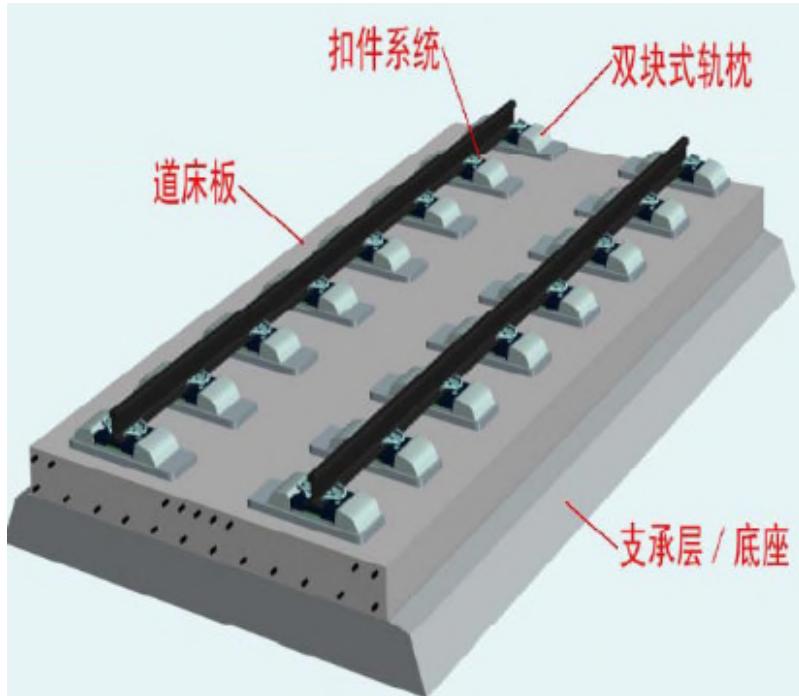
Structure Composition	The description of Structure Composition	Enum_StructureComposition
Technical Standard	The technical standard which the track isolation layer should comply with.	Text
Installation date	Date on which the Track Isolation Layer was (or will be) installed.	Date
Disassembly date	Date on which the track isolation layer was (or will be) removed.	Date
Manufacturing date	Date on which the track isolation layer was (or will be) manufactured.	Date
Putting into operation date	Date on which the track isolation layer was (or will be) put into operation.	Date

2.1.46 Track concrete slab (RTR_OT_TR-240)

Track concrete slab is an integral reinforced concrete layer cast in-situ, in which bi-block sleepers, concrete turnout sleepers or other sleepers are embedded.

Track concrete slab shall only appear in ballastless track structures.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of start of track concrete slab to track edge origin / [m]	Real
To location	Distance of end of track conrete slab to track edge origin / [m]	Real
Concrete Slab Type	Type of Concrete Slab	Enum_ConcreteSlabType
Installation date	Date on which the concrete slab was (or will be) installed.	Date
Disassembly date	Date on which the track concrete slab was (or will be) removed.	Date
Manufacturing date	Date on which the track concrete slab was (or will be) manufactured.	Date
Putting into operation date	Date on which the track concrete slab was (or will be) put into operation.	Date

2.1.47 Track element at end of alignment (RTR_OT_TR-400)

Alignment stop

Special functional installations such as axle-gauge changeover point; transporter wagon loading point.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
At location	<OR> Distance to start of track edge / [m]	Real
Position	<OR> X,Y,Z coordinates in case of track element is situated outside of edge	Coordinates
Type	Type of Track element at end of an alignment	Enum_Type
Installation date	Date on which the track element at end of alignment was (or will be) installed.	Date
Manufacturing date	Date on which the track element at end of alignment was (or will be) manufactured.	Date

Putting into operation date	Date on which the track element at end of alignment was (or will be) put into operation.	Date
Disassembly date	Date on which the track element at end of alignment was (or will be) removed.	Date
Orientation	Direction in which the Track element at end of alignment is aligned; e.g. same direction as edge or opposite direction	Enum_Orientation
Purpose	Reason for installation	Text

2.1.48 Track panel (RTR_OT_TR-1010)

The track panel is a functional view made up of the running rail, rail fastening and sleeper. One property of the track panel is that the components are permanently assembled and cannot be moved independently.

The track panel as a whole absorbs and transfers the forces into the superstructure. This may consist of a ballast bed or a slab track. In extreme cases (on simple railways), the track panel may lie on bare soil.

The track panel follows the routing in 3D space. It is uniquely identified by the track centre (routing/alignment) and the track centre's characteristics. It runs in the centre between the upper edges of the running rail. The track panel therefore has parameters regarding the horizontal and vertical routing and also carries information regarding cant.

In processes, the track panel is often considered as one unit, not just when planning for projects but also as part of numerous superstructure maintenance measures.

A track panel may consist of the following object types but does not necessarily have to have all of them according to the conceptual model:

- Running rail

- Rail fastening

- Sleepers

- Rail joints

- Other objects

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of track panel start to track edge origin / [m]	Real
To location	Distance of track panel end to track edge origin / [m]	Real
accessible by vehicle	Still accessible by vehicle yes/no	Boolean
Type of overgrowth	dirt, sand, grass, bushes, trees, rock	Enum_TypeOfOvergrowth
Curvature expansion	Curvature expansion to fit in curves with low radius / [mm]	Text
Installation plan	Number of corresponding installation plans	Identifier
Installation date	Date on which the track panel was (or will be) installed.	Date
Manufacturing date	Date on which the track panel was (or will be) manufactured.	Date
Putting into operation date	Date on which the track panel was (or will be) put into operation.	Date
Disassembly date	Date on which the track panel was (or will be) removed.	Date
Track gauge	Basic track gauge of permanent way / [cm]	Real
Sleeper spacing	The underlying spacing between individual sleepers. / [cm]	Real
Track category	Requirements from traffic/axle loads, degree of permanent way dimensioning /	Text

2.1.49 Track part (RTR_OT_TR-1005)

Track part is the basic volume object for all objects of track superstructure. It refers to a segment of track system engineering which is part of the track system and has a unique structural type and functional type.

Property		
Name	**Description**	**Data type**
Is CWR	Continuous Welded Rail	Boolean
Isballast	Ballast / ballastless track	Boolean
TrackSuporting_Structure	bridge, tunnel, concreate, subgrade layer, …	Enum_Tracksuporting_Structure
Exposure	Might it be helpful to know if the joint is in an exposed position (sunshine,?)	Text
Project detailed drawing	Project detailed drawings (to be defined while discussing the use cases)	Identifier
Owner	Who is the owner?	Label
Track usage	Principal track, secondary track, siding track	Enum_TrackUsage
Track part type	The type of track part (maybe obsolete with regard to subtypes Plain track / Turnout / dilatation superstructures, if there isn't a usecase with this property, it can be deleted)	Enum_TrackPartType
Structure gauge	Type of structure gauge	Enum_StructureGauge

2.1.50 Track reference marker (RTR_OT_TR-430)

Generally bolts which are firmly fixed to permanent components such as foundations, platform edges or civil engineering structures. Their position and elevation are known to the nearest mm (planar, x/y/z coordinates).

Serve as a reference for inspecting or ensuring (e.g. by mechanical tamper) the ideal location and elevation of the track panel and other installation elements.

Serve to hold technical measuring elements (e.g. prism mirrors)

Property		
Name	**Description**	**Data type**
Real elevation	Real elevation / [m]	Real
Real easting	Real easting / [m]	Real
Real northing	Real northing / [m]	Real
Track edge or track nodes	Referenced track edge or track nodes	Identifier
Route	Route	Identifier
Line	Line	Identifier
Kilometerage	Kilometerage / [m]	Real
Installation	Type of object where the marker is installed, e.g. wall, fundament	Enum_Installation
Type	Type of track stabiliser used	Enum_Type
Real easting standard deviation	Real easting standard deviation / [m]	Real
Real northing standard deviation	Real northing standard deviation / [m]	Real
Real elevation standard deviation	Real elevation standard deviation / [m]	Real
Type of geodetic reference system	Type of geodetic reference system	Enum_TypeOfGeodeticReferenceSystem
Installation date	Date on which the marker was (or will be) installed.	Date
Date of last inspection	Date of last inspection	Date
Manufacturing date	Date on which the track reference marker was (or will be) manufactured.	Date
Putting into operation date	Date on which the track reference marker was (or will be) put into operation.	Date
Disassembly date	Date on which the track reference marker was (or will be) removed.	Date

2.1.51 Track scale (RTR_OT_TR-590)

Equipment installed on track of freight yard to measure the weight of vehicles.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of track scale start to track edge origin / [m]	Real
To location	Distance of track scale end to track edge origin / [m]	Real
Type	Type of track scale	Enum_Type
Installation date	Date on which the track scale was (or will be) installed.	Date
Manufacturing date	Date on which the track scale was (or will be) manufactured.	Date
Putting into operation date	Date on which the track scale was (or will be) put into operation.	Date
Disassembly date	Date on which the track scale was (or will be) removed.	Date
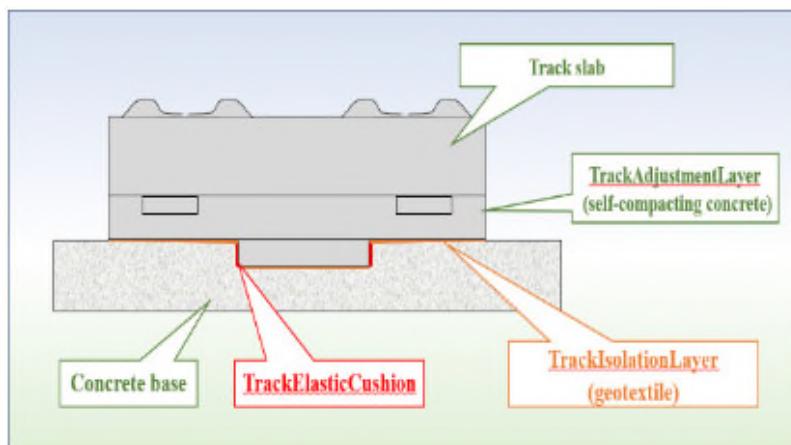
2.1.52 Track slab (RTR_OT_TR-230)

Track slab is prefabricated reinforced concrete slab or prestressed reinforced concrete slab, which is a main element of slab track.

It transfers the load from rails and fastenings to sub-structures uniformly and longitudinal and lateral load of track structures to displacement-stopping structures.

Track Slab shall only appear in ballastless track structures.

The line where install track slab provide the place for installing fastening system. No sleeper is needed.

Property		
Name	**Description**	**Data type**
Track edge	Referenced track edge	Identifier
From location	Distance of track slab start to track edge origin / [m]	Real
To location	Distance of track slab end to track edge origin / [m]	Real
Track slab type	Type of track slab	Enum_TrackSlabType
Track Slab Serial Number	Common specification number	Text
Technical standard	The technical standard which the track slab should comply with.	Text
Installation date	Date on which the track slab was (or will be) installed.	Date
Disassembly date	Date on which the track slab was (or will be) removed.	Date
Manufacturing date	Date on which the track slab was (or will be) manufactured.	Date
Putting into operation date	Date on which the track slab was (or will be) put into operation.	Date

2.1.53 Track system (RTR_OT_TR-1000)

Track System refers to a functional track with the explicit terminals. It refers a continuous sequence of track parts.

Property		
Name	**Description**	**Data type**

Line ID	Unique identification of the line. Conceptual key	Text
Track number	Local identification number (operating)	Text
Track ID	Unique identification number	Text
Line classification for controls	It define the maintenance programm but it has to be puted in IFC national (RFI)	Text
Line characteristic	Passenger / freight line / enter depot line (voie de service) / ….	Enum_LineCharacteristic
Speed limit	Several line speed limits (depends on trains characteristics, line zones) To be discuss later, how to deal with speed limits restrictions (work, maintenance, ..) / [km/h]	Text
Traffic axle loads	Inherited from upper level / [t]	Real
UIC group	Inherited from upper level	Text
Number of train a day	Number of train a day / [train(s)/day]	Real
Out of gauge	Inherited from upper level or other domain	Boolean
electrified	Inherited from upper level or other domain	Boolean
Type	Does the line have any other special equipment? Select from normal, rack, funicular, with rigid overhead conductor rail ("and" selection)	Enum_TractionPostType

2.1.54 Turnout panel (RTR_OT_TR-1020)

Like the track panel, the turnout panel is a functional view made up of the running rail, rail fastening and sleeper. Turnout panels also include specific turnout objects such as frogs, check rail, half set of blades, etc.

One property of the turnout panel is that the components are permanently assembled and cannot be moved independently. Often, "turnout panels" are even supplied and installed as a single unit.

The turnout panel as a whole absorbs and transfers the forces into the superstructure. This may consist of ballast or a slab track. In extreme cases (on simple railways), the turnout panel may lie on bare soil. The internal geometric restrictions on turnout between the tip of the turnout and the last continuous sleeper (no bends, curvatures, etc.) must be taken into account for the Placement of the objects.

The turnout panel follows the routing in 3D space. It is uniquely identified by the track centre and the track centre's characteristics. It runs in the centre between the upper edges of the running rail. The turnout panel therefore has parameters regarding the horizontal and vertical routing and also carries information regarding cant.

In processes, the turnout panel is often considered one unit, not just when planning for projects from a topological point of view but also as part of numerous superstructure upgrade measures.

The turnout panel has an internal reference system which is recorded in the "Installation plan".

The entire rail system is defined as a seamless sequence of track and turnout panels which follows the topology and routing.

Property		
Name	**Description**	**Data type**
Track edge	Referenced adjacent track edge(s)	
From location	Distance of turnout panel start to track edge origin / [m]	Real
To location	Distance of turnout panel end to track edge origin / [m]	Real
Track node	Referenced track node(s)	
pin point	Origin point of the turnout panel to link the internal reference system with the track node	
accessible by vehicle	Still accessible by vehicle yes/no	Boolean
Type of overgrowth	dirt, sand, grass, bushes, trees, rock	
Curvature expansion	Curvature expansion to fit in curves with low radius / [mm]	Integer
Percent shared	Percent of costs paid by the other infrastructure owner / [%]	Real
Turnout Name	Unique name of the turnout panel. Uniqueness is guaranteed over time.	Text
Installation plan	Reference of corresponding installation plan	
Owner	Who is the owner?	
Installation date	Date on which the turnout panel was (or will be) installed.	Date
Manufacturing date	Date on which the turnout panel was (or will be) manufactured.	Date
Putting into operation date	Date on which the turnout panel was (or will be) put into operation.	Date
Disassembly date	Date on which the turnout panel was (or will be) removed.	Date
Curved radius turnout	If turnout is curved => curvature radius of the main branch / [m]	Real
Type of turnout	Type of turnout	
Turnout catalogue	Differs from railway to railway (includes tangent value, rail profile, sleeper material, Frog type,..)	
Track gauge	Basic track gauge of permanent way / [mm]	Integer
Track category	Requirements from traffic/axle loads, degree of permanent way dimensioning	Text
Curved turnout	Are the turnout/crossing curved? No; yes, steadily; yes, clothoid	
Branch line direction	Left turnout, right turnout, symmetrical (does not apply to double-slip turnouts)	
Shared turnout	Does the turnout makes a connection to another infrastructure owner (for sharing costs)	Boolean
orientation	Front or back regarding the orientation of the edge	

Motorised / manual drive	electric, manual, hydraulic, pneumatic	
Turnout drive	Number of turnout drives / [turnout drive(s)]	Integer
Maximum speed limit (diverging line)	To be confirmed if it is defined by alignment / [km/h]	Integer
Turnout heater	What kind of turnout heater is installed (electric,gas, nothing)	
Technical Standard	The technical standard which the track isolation layer should comply with.	Text
Maximum speed limit (main line)	To be confirmed if it is defined by alignment / [km/h]	Integer

2.1.55 Turnout superstructure (RTR_OT_TR-1007)

Turnout superstructure is one subtype of track part with turnout panel.

Property		
Name	**Description**	**Data type**

2.1.56 Welded joint (RTR_OT_TR-80)

Continuous transition between two neighbouring running rails.

Electrically connected.

Special quality requirements for ensuring the continuous supporting strength of the running rail (primarily temperature fluctuations in the continuously welded track).

Property		

Name	Description	Data type
Track edge	Referenced track edge	Identifier
At location	Distance from beginning of the track edge / [m]	Real
Relative position	Indication of whether the welded joint lies to the left or the right in the track edge direction	Enum_RelativePosition
Location in panel	Internal referencing in panel in acc. with installation plan of panel	Local coordinates
Type	Welding type	Enum_Type
Temperature during installation	normalising temperature / [°C]	Real
Belongs to panel type	In a track panel or turnout panel	Enum_BelongsToPanelType
Is welding in factory	Is welding in factory	Boolean
Lifting bracket	Is it a connection between two different heights? Yes/no	Boolean
Rail properties of adjacent rails	Type of rail profiles which are connected by this joint	Enum_RailPropertiesOfAdjacentRails
Created	Which company do the job on site？	Enum_Created
Welding supplier	Welding material manufacturer / supplier	Enum_WeldingSupplier
Installation date	Date on which the "welded joint" was (or will be) installed.	Date
Disassembly date	Date on which the welded joint was (or will be) removed.	Date
Manufacturing date	Date on which the welded joint was (or will be) manufactured.	Date
Putting into operation date	Date on which the welded joint was (or will be) put into operation.	Date

2.2   Signalling

In Phase 1, we have detailed the specific property requirements of Signal, Marker (Sign), Fixing, Signal frame, and Signal aspect.
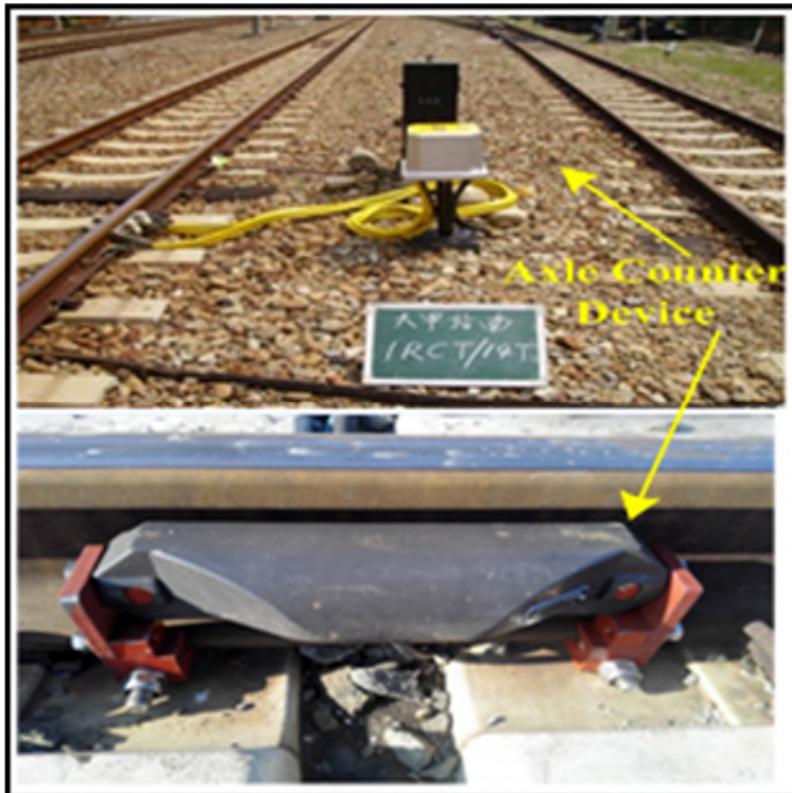
For the other signaling objects, we have considered the preliminary property requirements to be more detailed in the next phase 2.

However we have defined the ''Generic Signaling Objects'' that include the shared properties for all the signaling objects.

The property requirements considered are not functional but objects property requirements.

2.2.1   Axle counting equipment (RSI_OT_AX)

system using counting points with a wheel detector and a counter which detects the occupancy of a section of track by comparing the number of axles which enter the section with the number of axles which leave the section, parity of the numbers being necessary to give a clear indication.

Property		
Name	**Description**	**Data type**
Weight	the weight of the axle counting device	Mass
Vibration parameter	Maxium tolerable vibration level of axle counting device.	Text
Impact parameter	Impact parameter of axle counter	Text
Response time	The time that axle counter can detect the the axles of locomotive and vehicle	Time
Detection zone	Physical range of data transmission between Balise and its receiver. e.g.15m	Length (positive, >0)
Environment temprature	The temperature range in which the transponder operates normally. e.g.-15℃~50℃	ThermodynamicTemperature
MTBF(MeanTimeBetweenFailure)	MeanTimeBetweenFailure of axle counter	Time
Insulation resistance	not defined	Electric Resistance
Insulation and voltage resistance	not defined	Real
Alarm information	the information for failure decription	Text
Axle counting equipment type	The type of axle counting equipment.	

2.2.2   Balise (RSI_OT_BA)

apparatus in the track by means of which data are transmitted to a train to update the train-borne automatic protection equipment regarding the track and signal conditions of the line ahead.

Property		
Name	**Description**	**Data type**
Length	Length of the equipment	Length
Width	Width of the equipment	Length
Height	Height of the equipment	Length
Weight	Weight of the equipment	Mass
Information transmission rate	Data transmission rate between Balise and the receiving module	Real
Information length	Bytes of the data Information, e.g.127 bytes	Real
Protection grade	IP is the international code used to identify the protection level. The IP level consists of two numbers. The first number is dust-proof; the second number is water-proof. The larger the number, the better the protection level.	Integer
Detection zone	Physical range of data transmission between Balise and its receiver. e.g.15m	Length (positive, >0)
Environment temprature	The temperature range in which the transponder operates normally. e.g.-15℃~50℃	ThermodynamicTemperature
Alarm information	the information for failure decription	Text
Balise type	The allowed value is active or passive.	

2.2.3 Battery (RSI_OT_BAT)

A device that stores and releases electrical energy. When charging, electrical energy can be converted into chemical energy, and when discharging, chemical energy can be converted into electrical energy to power the load equipment.

Property		
Name	Description	Data type
Rated voltage	Rated voltage refers to the best voltage for electrical equipment to work normally for a long time.	Electric Voltage
Assemble description	Instructions to guide installation.	Text
Voltage regulation rate	When the input side voltage changes from the lowest allowable input value to the specified maximum value, the relative change value of the output voltage is the percentage of the rated output voltage.	Ratio
Current regulation rate	It shows the ability of DC regulated power supply to suppress the fluctuation of output voltage caused by the change of load current (output current) when the input voltage is constant.	Ratio
Input voltage range	Allowable input voltage range.	Electric Voltage
Output voltage	Voltage output.	Electric Voltage
Input current	Current input.	Electric Current
Output current	Current output.	Electric Current
Power supply panel	e.g. power-driven	Text
Capacity of Power supply panel	e.g ≤1kVA, ≤10kVA	Power

2.2.4   Box (RSI_OT_BO)

1.Housing for placing equipment/objects and and having protective functions.

2.It is used to place outdoor signal devices/objects, and realize wiring, electrical connection and protection of the device (with certain protection functions)

Property		
Name	**Description**	**Data type**
Box type	the type of Box. e.g. direction box, terminal box, transformer box...	Label
Main equipment	Box used for which equipment	Text
Length	Length of the box	Length
Width	Width of the box	Length
Height	Height of the box	Length

2.2.5 Cabinet (RSI_OT_CA)

The equipment cabinet is usually made of cold-rolled steel or alloy for storing computer and related control equipment, and provides protection against electromagnetic interference.
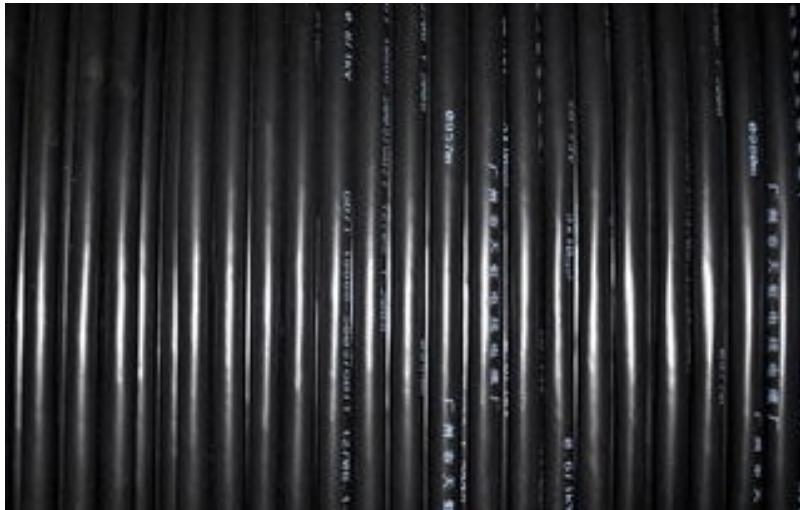
Property

Name	Description	Data type

Cabinet type	the type of cabinet. e.g. Cabinet of local interlocking system, Cabinet of station unit block, Cabinet of station frequency-shift...	Label
Number of layers	Number of cabinet layers	Integer
Is grounding	Wether the cabinet is grounding.	Boolean
Number of Columns	Number of cabinet layers.	Integer
Distance to the wall	The distance from the cabinet installation location to the wall	Length
Space between cabinets	Spacing between cabinets, e.g.0.8m,1m.	
Main equipment	the main equipment in the cabinet	Text
Electrical characteristic	Electrical characteristic requirements of cabinets	Time
Power supply mode	Power supply mode of cabinets.	Enum_PowerSupplyMode
Connection resistance in cabinets	to be added	Text
Type of distributing terminal board or cabinet	E.g. 8,16 terminal blocks	
Cabling rack type	e.g. hot galvanizing, stainless stee	Text

2.2.6   Cable and Wire (RSI_OT_CW)

A cable segment is a flow segment used to carry electrical power, data, or telecommunications signals.A cable segment is used to typically join two sections of an electrical network or a network of components carrying the electrical service.

Property		
Name	**Description**	**Data type**
The number of cable	The number of core wires included in a cable, e.g. 6,12…	Integer
Length	Length of a cable	Length
Number of cable cores	e.g. 4,6,8,9,12,14,16,19...	Integer
Sheathed type	External protection types of cables, e.g aluminium sheath …	Label
CSA	Cross-sectional area, e.g. 40mm2, 70mm2	Area
Flame retardant wire type	e.g. shielded wire	Label
Voltage	It indicates the wire-to-ground (metal sheath) insulation voltage or the insulation voltage between the wires.	Electric Voltage
Current	The current that the cable can withstand	Electric Current
Cable marker post	It is a buried cable route indicator	
Terminal type	e.g. Sleeve typing, Winding wire loop	Label
Cable or wire type	Whether the element is a general cable or an optical cable. Or it's detailed type, e.g. ZR-RV, ZR-BVR (Chinese type)	Label

2.2.7   Crocodile (RSI_OT_CRO)

Component of a train protection system. It is an electrical contact placed between the rails which, in case of a danger situation, may cause a warning horn to beep in the driver's cab.

Property		
Name	Description	Data type

2.2.8 Derailer (RSI_OT_DER)

fixed device which, when placed on the rail, derails the wheels of a vehicle, and serves to protect a converging line.

Property

Name	Description	Data type
derailment block height in protection state	Height of derailment block when derailer in protection state	Length
Derailment wheel diameter	Wheel diameter requirements for differernt type rerailers	Length
Derailment maximum speed limit	Maximum allowable train speed for derailers，e.g.12km,15km	Linear Velocity
applied line type	e.g. 43kg/m, 50kg/m	Mass Per Length

2.2.9 Detector (RSI_OT_DET)

Generic element for all kind of sensors which detect e. g. the passage of a wheel, falling rocks, strong wind etc.

Property		
Name	Description	Data type
Detector type	The type of Detector. e.g wheel detector, fall detector, hot axle box detector...	

2.2.10 External locking device (RSI_OT_EL)

1.An external locking device is a mechanical device that locks the switch machine in a certain position from the outside .
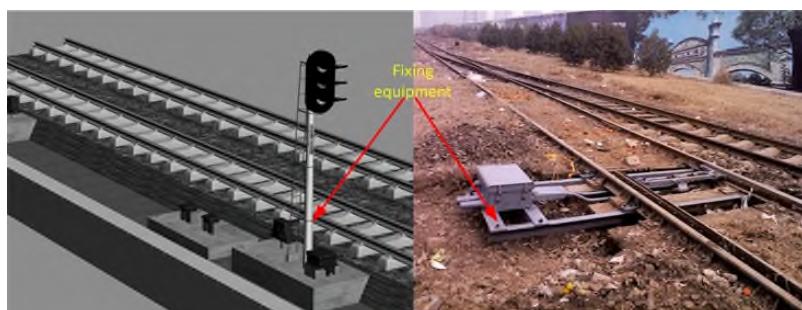
2.The hook type external locking device locks the basic rail and the turnout sharp, the movable rail and the wing rail safely, and ensures the safety, stability and reliability of the switch under the lock state (in the process of high-speed and heavy-duty train running).

External locking device

Property		
Name	Description	Data type
Installation limit	Installation requirements of external locking device	Text
closure spacing limit	requirements of closure spacing	Integer

2.2.11 Fixing (RSI_OT_FI)

Physical structure that supports equipment (e. g. signal frames as components of a signal, the foundation of signaling equipment.

Property		
Name	Description	Data type
Signal fixing reference	Reference to a another fixing where the fixing is mounted on (e. g. a suspension structure is mounted on a gantry).	Identifier
Fixing type	Type of the fixing (e. g. post, pole, gantry).	Label
Post height	Height of the signal post, e.g. 8.5m, 11m.	Length (positive, >0)

2.2.12 Full Electronic Execution Unit (RSI_OT_FEEU)

Full-electronic execution unit is the execution and expression circuit of Computer based Interlocking,which is composed of different electronic modules with diffferent functions. e.g. signal module, turnout module,etc.

Property		
Name	**Description**	**Data type**

2.2.13 Impedance transformer (RSI_OT_IT)

 In the AC electrified section track circuit, the impedance transformer makes the traction current cross the rail insulation, and connects the track circuit transmitting and receiving equipment to the rail by transformer coupling.

It is installed at the connection between the traction backflow and the rail, used to conduct the traction current and balance the traction current of the up and down track circuit, so that the traction current circuit and track signal circuit form a conducting circuit respectively, and do not interfere with each other.

Property		
Name	**Description**	**Data type**

2.2.14 Induction loop (RSI_OT_INI)

equipment for detection of the presence of a vehicle where a cable in the form of a loop between the rails, energized by alternating current derived from a local generator, detects the metallic mass of a vehicle, by its influence on the field of the loop, in order to provide an electric signal.

Property

Name	Description	Data type

2.2.15 Input/Output device of track circuit (RSI_OT_IOTC)
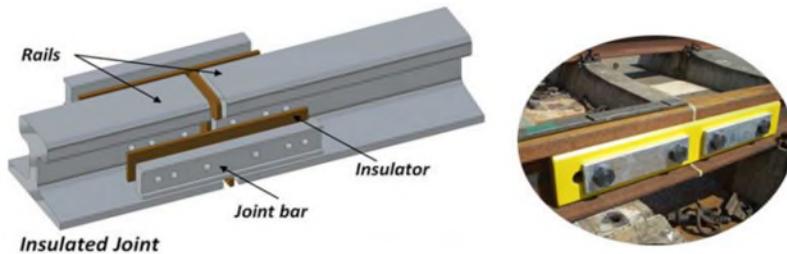
e.g. Track circuit receiver, Track circuit transmitter

Property		
Name	**Description**	**Data type**
Type	the type of input/output device,e.g. transmitter, receiver.	

2.2.16 Insulating joint (RSI_OT_IJ)

It is set at the boundary of a track circuit to achieve electrical insulation with an adjacent rail. It can be "mechanical" insulation or "electrical" insulation.

Rails

Insulator

Joint bar

Insulated Joint

Property		
Name	**Description**	**Data type**

2.2.17 Level Crossing Equipment (RSI_OT_LCE)

A level crossing is an intersection where a railway line crosses a road or path at the same level. The purpose of LCSE is to prevent vehicles or pedestrians from crossing the railway after the train has been notified. It includes: LC Traffic signal, LC Traffic sign, LC Barrier, LC Engine, Obstacle detector, etc.

Property		
Name	**Description**	**Data type**
Level Crossing Equipment type	the type of Level Crossing equipment. e.g. LC Traffic sign, LC Traffic sign... "LC" -"Level Crossing".	
LC Traffic signal type		

2.2.18 Local operation device (RSI_OT_LOD)

Installation providing push buttons, indicators and switching devices , lever for local operation.

Property		
Name	**Description**	**Data type**
Local operation device type		

2.2.19 Lock (RSI_OT_LO)

Mechanical device to fix an element (point, derailer, level crossing) in a certain position.

Property		
Name	**Description**	**Data type**

2.2.20 Lock combination (RSI_OT_LCO)

Mechanical device for release of several dependent keys by a main key.

Property		
Name	**Description**	**Data type**

2.2.21 Lockable device release (RSI_OT_LDE)
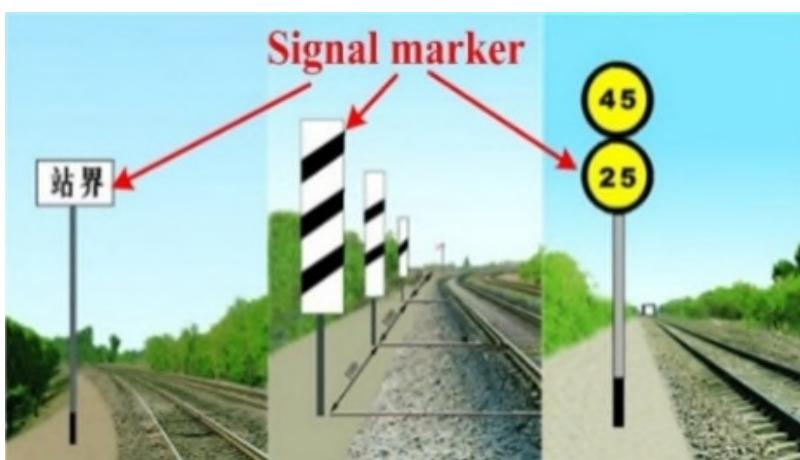
Electro-mechanical device related to the interlocking to include locally operated elements. The lockable device release checks the presence of a key and releases the key by command.

Property		
Name	**Description**	**Data type**

2.2.22 Marker (Sign) (RSI_OT_MA)

A sign on the side of a rail track that information for driver and staff.

Property		
Name	**Description**	**Data type**
Marker (Sign) type	the type of Marker (Sign) type. e.g. stop signal, restriction signal, track circuit tuning zone sign...	
Approach speed	Speed of trains approaching the signal if different from the line speed.	Linear Velocity

Available reading distance	Reading distance without having any mitigation works.	Length
Achievable reading distance	Reading distance which is achievable with the help of mitigation works.	Length
Required reading distance	Minimal distance in which the signal has to be readable.	Length
Post height	Height of the Marker(Sign).	Length (positive, >0)
Symbol	Content which is shown on the sign, e. g. text, number, arrow or icon. The string can also be a pointer to a symbol catalogue.	
Legend		Text
Width	width in m	Length (positive, >0)

2.2.23 Passive electronic component of track circuit (RSI_OT_PETC)
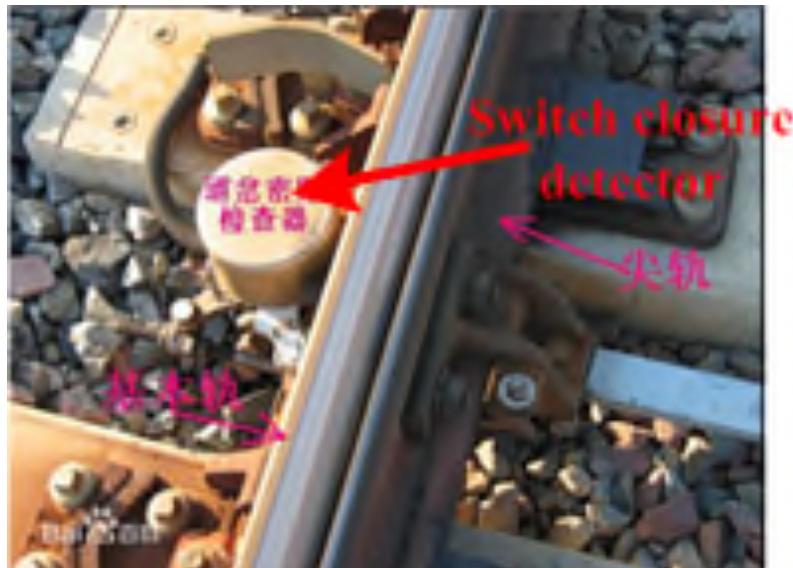
Generic passive two-terminal electronic component. e.g. Tuning & matching unit, Outdoor Compensation capacitor, Impedance transformer.

Property		
Name	**Description**	**Data type**
Passive Electronic component of track circuit type	the type of PETC, e.g. tuning & matching unit, air-core coil, outdoor compensation capacitor...	

2.2.24 Point closure detector (RSI_OT_SCD)

device checking the position of a blade.

Property		
Name	**Description**	**Data type**
Detect distance	Requirements of closure inspection distance.	Length
Indication rod movement	The movement of the bar which indicates the indication rod position.	

2.2.25 Point machine (RSI_OT_PO)

The point machine is a device that can switch and lock the turnout and indicate its position.

Property		
Name	**Description**	**Data type**
Locking type	e.g. internal or external	Label
The number of traction points	e.g. 1,2,3,4,5,9	Integer
Point machine type	e.g.DC point machine or AC point machine…	Label
Conversion force	Traction force of point machine	Force
Action bar movement	The movemnet of the bar that pulls the point of a turnout	Real
Marking rod movement	The movemnet of the bar which indicates the turnout position	Real
Rated voltage	Voltage at optimum working condition	Electric Voltage
Working current and current type	Current when the point machine working, Current type: e.g. AC, DC	Text
Minimum speed	Minimum operation speed of point machine	Integer
Conversion time	Turnout conversion completion time, e.g. 5s	Time
Maximum operating time	e.g. 7s,10s …	Time
Locking force	Locking force of motor，eg.98KN,95KN	Force
Single-wire resistance	e.g.42Ω，45Ω	Electric Resistance
Installation limit	Installation requirements of point machine	Text
Point type	Type of the railway point，different types of point allow trains to pass at different speeds。	Label

2.2.26 Point machine mounting device (RSI_OT_PMD)

A device used to install a point machine and to connect the point machine to a turnout components (to fix the point machine and connect it to the turnout)

Property		
Name	**Description**	**Data type**
Installation limit	Installation requirements of point machine mouting device	Text
device type （Corresponding to the type of point machine）	Type of point machine mouting device，which is corresponding to the type of point machine	Label

2.2.27 Railway detonator (RSI_OT_RD)

Explosive capsule placed on the rail to give an audible danger signal to driver

Property		
Name	**Description**	**Data type**

2.2.28 Relay (RSI_OT_REL)

1.It is an electromagnetic device that is remotely or automatically controlled to switch on the state of the circuit and converting other devices (such as converters, current circuit breakers) in the same circuit or different circuits.
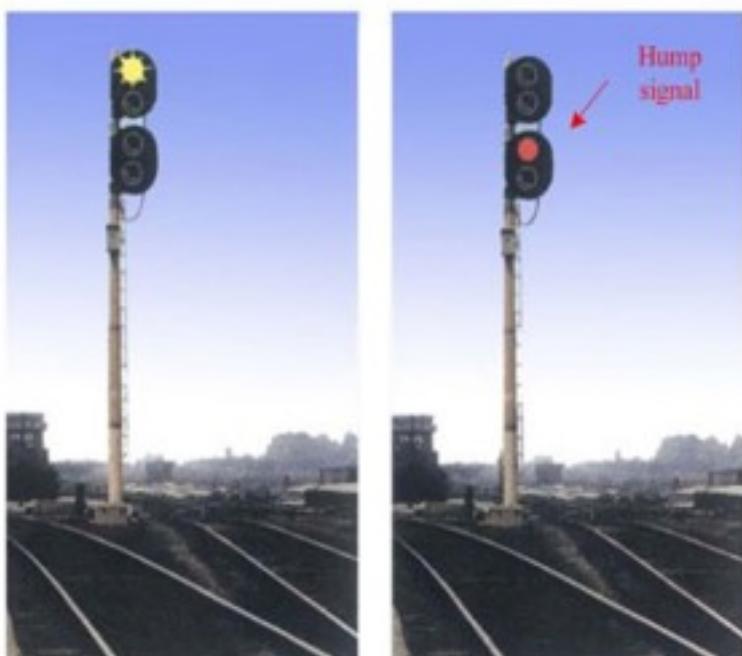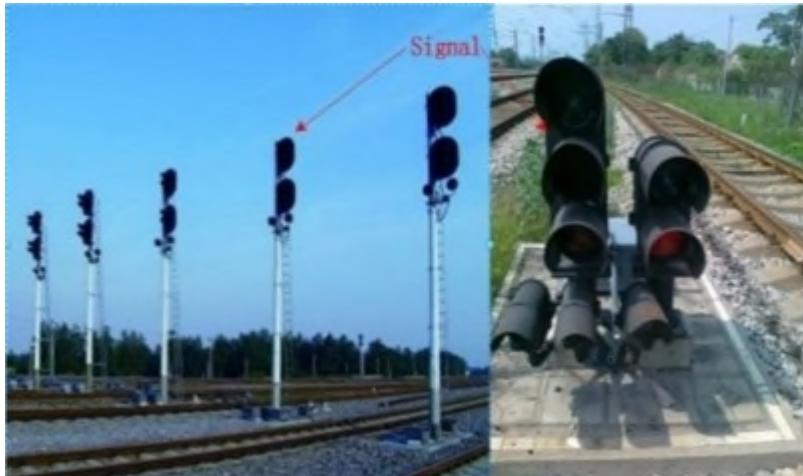
2.Relays are usually used in automated control circuits. They are actually "automatic switches" that use small currents to control the operation of large currents. It can control multiple loops and multiple control objects, and can also control remote objects. It plays the role of automatic regulation, security protection, conversion circuit and so on in the circuit.

Property		
Name	Description	Data type
Working voltage	When electrical equipment works, the actual voltage at both ends is called working voltage.	Electric Voltage
Working current	Working current is determined by electrical resistance and working voltage, and it is a fixed value.	Electric Current
Pull-in voltage	Working voltage of relay in excitation state	Electric Voltage
Release voltage	The maximum volatage to guarantee the drop of relay node	Electric Voltage
Contact resistance	Resistance when electrical node is closed	Electric Resistance
insulation resistance	Resistance when electrical node is open	Electric Resistance
Length	length of the relay	Length
Width	Width of the relay	Length
Height	Height of the relay	Length
Type	The specific location of the relay at the cabinet。	

2.2.29 Signal (RSI_OT_SI)

apparatus by means of which a conventional indication is given.

Block signal

Level crossing signal
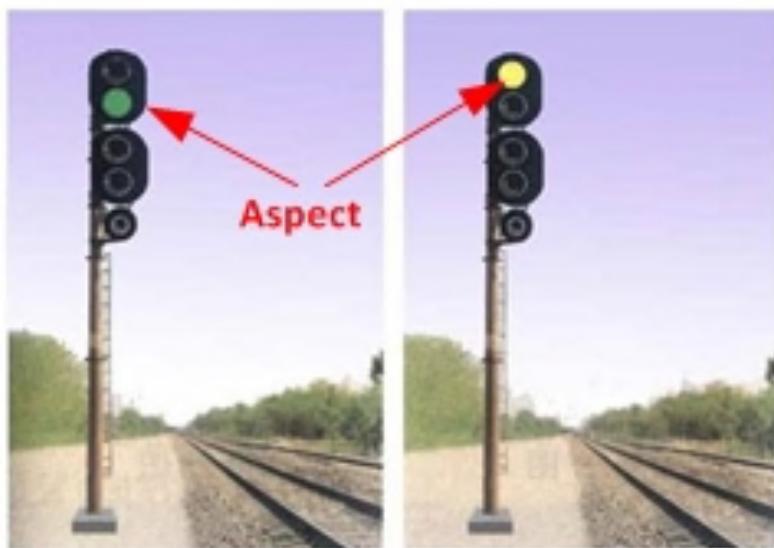
Property		
Name	**Description**	**Data type**
Signal type	the type of signal,e.g. home signal, starting signal, shunting signal, level crossing signal.	

Number of lamps	Number of lamps a signal is composed of.	Integer
Display distance required	The maximum distance that has to be displayed. The value relates only to the signal type, not to the circumstances at a special position.	Length
Display distance	The maximum distance that can be displayed. The value relates only to the signal type, not to the circumstances at a special position.	Length
Signal messages	All possible information available at this signal. e.g. 3/4- display automatic blocking.	Text
Number of lamps not used	Number of lamps which are not needed and blanked out (sealed), e.g. 0,1,2,3,4,5.	Integer
High/dwarf type	Information if the signal is high or dwarf (ground mounted).	Boolean
Elevation angle	e.g. for the dwarf signals, 3°-5°	Plane Angle
Alignment point	Location beside the track to which the signal shall be aligned in special cases.	Identifier
Alignment point distance	Distance to the alignment point on the track which marks the target of the light beam. This information is meant to ensure visibility to the driver and is typically checked during the installation and testing phases.	Length
Alignment point height	Height to which the signal shall be aligned(target of the light beam).	Length
Beam width type	Type of the lens diffuser or beam width the signal is equiped with.	Label
Lens diffuser orientation type	Orientation the lens diffuser has to have.	Label
Hot strip orientation	Position of the hot strip which indicates the direction of the focus of the light beam and is given in terms like "left upper quadrant (LUQ)" or "5 o'clock ".	Label
Hood length	Type of the cover of the signal lamp against glaring sun.	Length
Signal sighting minimum	Minimal distance in which the signal has to be readable.	Length
Signal sighting preferred	Preferred distance in which the signal shall be readable.	Length
Signal sighting achievable	Reading distance which is achievable with the help of mitigation works.	Length
Signal sighting available	Reading distance without having any mitigation works.	Length
Signal sighting combined with repeater	Combined reading distance for the signal and any associated repeaters.	Length
Signal viewing minimum in front of signal	Smallest distance where the signal has to be readable (for train very close to the signal).	Length
Confusion with other signals	Information if there is a possible confusion with other signals (yes, no, not applicable).	
Signal beyond visible	Information if the next signal is visible (yes, no, not applicable).	
Read through risk type	Type of risk to read any other signal instead of the current one (yes, no, not applicable).	
Background features	Description of features that may present confusion risk such as station lights or road lights.	Text
Stations view all staff positions	If there are any obstructions effecting the sighting for the staff in the station.	Text
Limited clearances	Special condition for placing signal post telephone: Tunnels, bridges, viaducts.	Text
Hand signalling prohibited	For signal post telephone: If hand signalling is prohibited in case of any failure.In this case, a special board is needed.	Label

Safety handrail required	If safety handrail is required? (Yes/No)	Boolean
Conductor rail guard board required	Wether a guard board is provided (e. g. third rail electrification).	Boolean
Walkway	Wether a walkway from signal to signal post telephone is provided (details, distance).	Label
Approach speed	Speed of trains approaching the signal if different from the line speed.	Linear Velocity
Distance to stop marks	Distance from the signal to the nearest stop mark at a platform.	Length
Banner signal required	In case a repeater is needed: distance in meter to the banner repeater signal. Otherwise the value NO is given.	
Special position arrangement	Type of special position the signal is placed.	Label
Signal fixing type	General information about the fixing of a signal (mainly used in early design phase and cost calculations).	Label
Signal post telephone type	Type of the telephone, e.g. locked, direct line, dial phone.	Label
Signal post telephone location	Description of the position of the telephone in relation to the associated signal (distance and offset from track).	Text
Signal post telephone reference	Reference to the signal post telephone.	Identifier
OLEMesh	Wether an OLE mesh is required to protect the signal & maintainer.	Boolean
Indicator type	Type of the indicators on a signal, e.g. route indicator, speed restriction indicator etc.	
Post height	Height of the signal post, e.g. 8.5m, 11m.	Length (positive, >0)
Signal sighting route indicator	Required reading distance for the route indicator.	Length
GridLocationX	X-Location of the signal frame or signal frame component in the design grid.	Integer
GridLocationY	Y-Location of the signal frame or signal frame component in the design grid.	Integer

2.2.30 Signal aspect (RSI_OT_AS)

Single information shown to the train driver.

Property		
Name	**Description**	**Data type**
Symbol	Content which is shown on the sign, e. g. text, number, arrow or icon. The string can also be a pointer to a symbol catalogue.	
Legend	Text information written on the sign.	Text
Apply to train category	Sign information relative to train category, e.g. freight, passenger.	Text
Aspect id	Pre-defined name of aspect.	Identifier
Aspect type	The type of aspect, e.g. 2-display aspect for distant signal, 3-display aspect for block signal...	Label

2.2.31 Signal frame (RSI_OT_SF)

Trackside component, most often part of a signal, that sends a message to the driver.
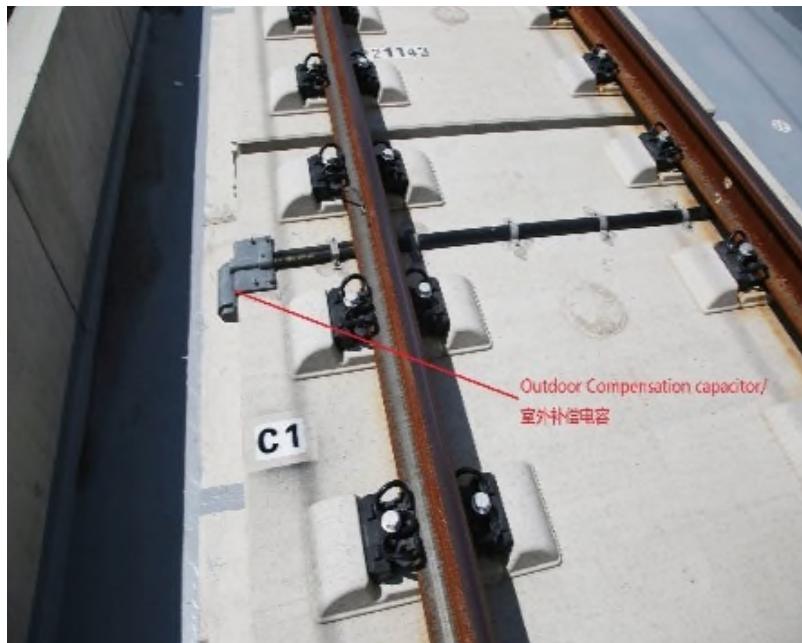
Property		
Name	**Description**	**Data type**
Signal sighting required for indicator	Required reading distance for the route indicator.	Length
GridLocationX	X-Location of the signal frame or signal frame component in the design grid.	Integer
GridLocationY	Y-Location of the signal frame or signal frame component in the design grid.	Length
Frame type	Type of frame, e.g. main frame, route indicator, speed indicator, direction indicator, etc.	
Width	width in m	Length (positive, >0)
IS Miniature	General size type of frame.	Boolean
Indicator type	Type of the indicators on a signal, e.g. route indicator, speed restriction indicator etc.	
Backboard diameter		Length
Backboard height		Length

Backboard type		Label

2.2.32 Track Circuit (RSI_OT_TC)

electric circuit of which the rails of a track section form a part, with usually a source of current connected at one end and a detection device at the other end for detecting whether this track section is clear or occupied by a vehicle. In a continuous signalling system, the track circuit can be used to transmit information between the ground and the train.

Property		
Name	**Description**	**Data type**
Main equipment	the main equipment in the cabinet	Text
Type of Sending/Receiving end	Track Circuit transmission or receiving end	
Coding type	coding or none-coding	Text
Choking type	e.g. none-choking, double choking...	Text
level of Ampere	e.g. 400A, 600A, 800A...	Electric Current
level of Choking	e.g. BE-400/25, BE-600/25...	Text
Installation type of track circuit section	e.g. Double ended electrical insulation, One end electrical and one end mechanical...	Text
Insulation type of Air-core coil	Electrical or mechanical	Text
Compensation capacitor type	e.g. box protection / track bed	Text
Isolation box type	e.g. electrified 25HZ WGL-U (Chinese type)	Text
Section type	e.g. main line	Boolean
Rail type	e.g. 43kg, 50kg, 60kg	Text
Insulation type	enhanced or ordinary	Boolean

Track length	e.g. 12.5m or 25m	Length
Installation of track	e.g. electrowelding	Text
Type of railway electrification	Electrification or none-electrification	Boolean
Cross sectional area of jumper or connector	e.g. 40mm2, 70mm2	Area
Type of turnout	Manganese steel / combination	Text
Connection length	e.g. 5m,10m,15m...	Length
The connection method	e.g. Midpoint and rail connection 2m	Text
Rail impedance	Resistance of the rail	Force
Railway ballast resistance	It refers to the resistance between the ballast and the rail.	Force
Alarm information	the information for failure decription	Text

2.2.33 Trackside vehicle barring devices (RSI_OT_TVBA)

Device stopping any accidental vehicle movement.

Property		
Name	**Description**	**Data type**
Type		

2.2.34 Trackside vehicle braking devices (RSI_OT_TVBR)

A train stop is a set of pneumatic, mechanical or electric components causing a breaking in the case the train is passing at danger.

Property		
Name	**Description**	**Data type**
Type	Does the line have any other special equipment? Select from normal, rack, funicular, with rigid overhead conductor rail ("and" selection)	Enum_TractionPostType

2.2.35 Transformer (RSI_OT_TR)
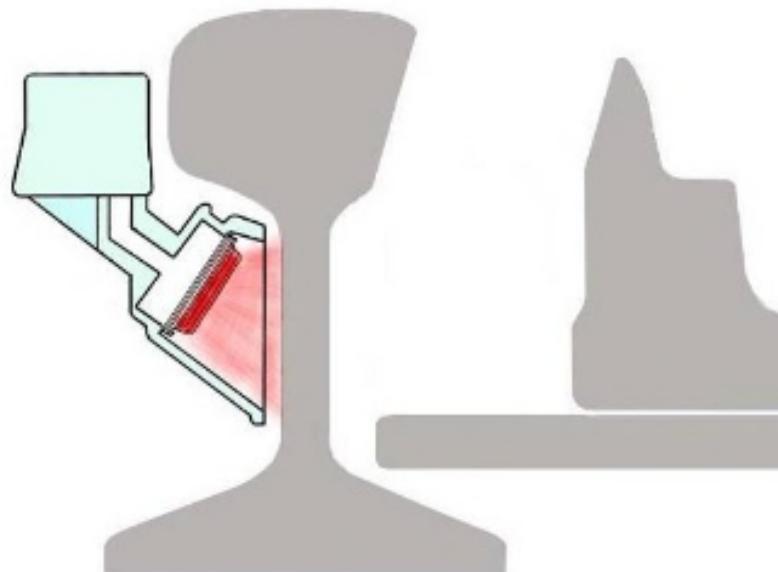
A transformer is an inductance device that transfers electric energy from one circuit to another. It is used for voltage transformation, current change, impedance transformation, isolation, voltage regulation and so on.

Property		
Name	**Description**	**Data type**

2.2.36 Turnout heating (RSI_OT_TH)

A series of devices used to remove snow from railways. E.g. electric heating device, sensor of rail temperature, electric control cabinet, isolating transformer, etc.

Property		
Name	Description	Data type

2.2.37 UPS (RSI_OT_UPS)

Uninterruptible power supply refers to the power supply equipment which will not be interrupted due to short power outages, and can always supply high-quality power, and effectively protect precision instruments. It provides continuous, stable and uninterrupted power supply for load equipment.

Property		
Name	**Description**	**Data type**
Rated voltage	Rated voltage refers to the best voltage for electrical equipment to work normally for a long time.	Electric Voltage
Assemble description	Instructions to guide installation	Text
Voltage regulation rate	When the input side voltage changes from the lowest allowable input value to the specified maximum value, the relative change value of the output voltage is the percentage of the rated output voltage.	Ratio
Current regulation rate	It shows the ability of DC regulated power supply to suppress the fluctuation of output voltage caused by the change of load current (output current) when the input voltage is constant.	Ratio
Input voltage range	Allowable input voltage range	Electric Voltage
Output voltage	Voltage output	Electric Voltage
Input current	Current input	Electric Current
Output current	Current output	Electric Current
Power supply panel	e.g. power-driven	Text
Capacity of Power supply panel	e.g ≤1kVA, ≤10kVA	Power

2.3 Telecom

2.3.1 Abs_Telecom object (RTC_OT_ABSTO)

A general telecom object with some general property groups, which can be inherited by its sub-classes.

Property		
Name	**Description**	**Data type**
Code	Code of the object.	Identifier
Is extended warranty	Indication of whether this is an extended warranty whose duration is greater than that normally assigned to an artefact (=TRUE) or not (= FALSE).	Boolean
Assembly place	Defining where the assembly is intended to take place, either in a factory or on the building site.	Enum_AssemblyPlace
Supplier	Supplier of the object.	Label
Brand	Commercial reference / product family name.	Label
Exclusions	Items, conditions or actions that may be excluded from the warranty or that may cause the warranty to become void.	Text
Warranty end date	The date on which the warranty expires.	Date
Acquisition date	The date that the manufactured item was purchased.	Date
Warranty content	The content of the warranty.	Text
Production year	The year of production of the manufactured item.	Date
Price	Unit Price of the object.	Monetary
Warranty period	The time duration during which a manufacturer or supplier guarantees or warrants the performance of an equipment.	Duration
Warranty identifier	The identifier assigned to a warranty.	Identifier
Warranty start date	The date on which the warranty commences.	Date
Mileage	Used to locate an item along the railway line together with "Mileage Prefix". Each mileage data consists of a prefix and a data, such as"K120+300", corresponding to a unique 2D point along the railway.	Length
Mileage prefix	Used to locate an item along the railway line together with "Mileage". Each mileage data consists of a prefix and a data, such as"K120+300", corresponding to a unique 2D point along the railway.	Identifier
Width	Width of the object.	Length
Height	Height of the object.	Length
Lengh	Length of the object.	Length
Weight	Weight of the object.	Mass
Type of screw	Indicate the type of surface coating screw.	Label
Type of mounting	Indicate the mounting type of the passive/active equipment.	Label
Solar radiation	Maximum level of solar radiation that the equipment complies with, usually measured by duration of solar radiation.	Real
Minimum storage temperature	Minimum storage temperature that system complies with (C°)	ThermodynamicTemperature
Minimum humidity	Minimum Humidity that system complies with (%)	Ratio
Maximum humidity	Maximum Humidity that system complies with (%)	Ratio
Salt mist	Maximum level of salt mist that the equipment complies with	Real
Maximum storage temperature	Maximum storage temperature that system complies with (C°)	ThermodynamicTemperature
Maximum windspeed	Maximum resistance to wind load exposure (m/s)	Linear Velocity
Smoke	Maximum level of smoke that the equipment complies with	Real
Seismic resistance	Maximum level of earthquake that the equipment complies with	Real
Rain intensity	Maximum level of rain intensity that the equipment complies with	Linear Velocity

Atmospheric pressure	Maximum level of atmospheric pressure that the equipment complies with	Pressure
Maximum working temperature	Maximum working temperature that system complies with (C°)	ThermodynamicTemperature
Minimum working temperature	Minimum working temperature that system complies with (C°)	ThermodynamicTemperature
Storage condition	Indicate the storage condition of equipment	Text
Maintenance type	Indicate the maintenance type of equipment, which can be Predictive, Corrective, Preventive,...	Label
Mean time to repair	Mean Time To Repair	Time
Life duration	Indicates the estimated life duration of the system as defined by the manufacturer.	IfcDuration
Mean time between failures	Mean Time Between Failures	Time
Assessment frequency	Indicate how often the equipment is assessed, to have a clear estimation on its working state, based on which the maintenance staff can decide whether it requires maintenance or requires to be updated or replaced.	Frequency

2.3.2   Access point (RTC_OT_AP)

In a network, a point at which wireless devices may connect to the network. Access point allows a Wi-Fi device to connect to a wired network.

Property		
Name	**Description**	**Data type**
Type of access point	Indicate the type of access point, whether it's a box, hot-spot Wi-Fi, etc.	Label
User capacity	Indicate the capacity of the access point.	Integer
Number of antenna	Indicate the number of antennas integrated in the access point.	Integer
Type of interface	Indicate the type of interface of the access point.	Label

Data encryption type	Indicate the type of security protocols that can be used in the access point to protect the wireless network.	Label
Bandwidth	Indicate the bandwidth of the access point in Hz.	Frequency
Number of interface	Indicate the number of different interfaces of the access point.	Integer
Type of antenna	Indicate the type of radio antenna integrated in the access point.	Label
Data exchange rate	Indicate the data transfer rate of the access point in bit per second (bps).	Integer Count Rate

2.3.3   Anemometrograph (RTC_OT_ANE)

Device used to measure wind speed and direction.

Property		
Name	**Description**	**Data type**
Type of anemometrograph	Indicate the type of anemometrograph.	Enum_AnemometrographType
Wind speed range	Indicate the range of wind speed the anemometrograph can monitor.	Linear Velocity
Wind direction range	Indicate the range of wind direction the anemometrograph can monitor.	Plane Angle
Resolution	Indicate the resolution of the anemometrograph.	Linear Velocity
Margin of error	Indicate the margin of error of the anemometrograph.	Ratio
Starting wind speed	Indicate the starting wind speed of the anemometrograph.	Linear Velocity
Time constant	Indicate the time constant of the anemometrograph.	Time
Damping ratio	Indicate the damping ratio of the anemometrograph.	Ratio
Type of data collection	Indicate the type/manner of data collection.	Enum_DataCollectionType
Sampling frequency	Indicate the sampling frequency of the anemometrograph.	Frequency
Interface of anemometrograph	Indicate the type of interface of Anemometrograph.	Enum_AnemometrographInterfaceType
State of anemometrograph	Indicate the working state of Anemometrograph.	Label

2.3.4   Antenna (RTC_OT_ANT)

Antenna is a device that effectively radiates or receives electromagnetic waves, coupling a transmission line to space or other media.

Property		
Name	**Description**	**Data type**
Type of antenna	Indicate the type of antenna	Enum_AntennaType
Antenna gain	Indicate the gain of antenna	Sound Power Level
Polarization mode	Indicate the polarization mode of antenna	Label
Radiation pattern	Indicate the radiation pattern of antenna.	Enum_AntennaRadiationPattern

2.3.5 Automatic gate (RTC_OT_AG)

An equipment for ticket inspection and processing. Passengers are allowed or forbidden to pass according to the validity of tickets.

Property		
Name	**Description**	**Data type**
Is bidirectional	Indicate whether the automatic gate is bidirectional.	Boolean
Type of automatic gate	Indicate the type of AG.	Enum_AutomaticGateType
Width of wide channel	Indicate the width of wide channel.	Length
Ticket stuck rate	Indicate the stuck rate of ticket.	Ratio
Passenger throughput	Indicate the throughput of the passengers.	Real
Ticket processing time	Indicate the processing time of the ticket.	Time
Width of narrow channel	Indicate the width of narrow channel.	Length

2.3.6   Base transceiver station (RTC_OT_BTS)

Base transceiver station (BTS) is a network component which serves one cell.

It completes the conversion between BSC and wireless channel, and realize the wireless transmission and related control functions between BSC and MS through the air interface.

BTS has the functions of rate matching, channel coding/decoding, modulation/demodulation and other air interface physical layer.

Property		
Name	**Description**	**Data type**
Number of carriers	Indicate how many carrier frequencies can be offered by the BTS.	Integer
Downlink radio band	Indicate the frequency range, delimited by a lower frequency and an upper frequency, allocated for downlink transmission.	Frequency
Number of antenna	Indicate the number of antennas integrated in the BTS.	Integer
Number of interface	Indicate the number of different interfaces of BTS.	Integer
Uplink radio band	Indicate the frequency range, delimited by a lower frequency and an upper frequency, allocated for uplink transmission.	Frequency
Radiated output power per antenna	Indicate the power of radio waves emitted by each antenna of the BTS.	Power
Type of interface	Indicate the type of interface of the BTS.	Label
Type of antenna	Indicate the type of radio antenna integrated in the BTS.	Label
Number of transceiver per antenna	Indicate the number of transceivers per antenna.	Integer
Number of emergency transceiver	Indicate the number of emergency transceivers in the BTS.	Integer

2.3.7 Baseband unit (RTC_OT_BBU)

A component of a distributed base station for implementing baseband processing functions.

Property		
Name	Description	Data type
Number of maximum connected remote radio unit	Indicate the maximum number of RRU which can be connected to the BBU.	Integer
Number of carriers	Indicate how many carrier frequencies can be offered by the BBU.	Integer
Type of interface	Indicate the type of interfaces of the BBU.	Label
Number of interface	Indicate the number of different interfaces of the BBU.	Integer
Number of emergency transceiver	Indicate the number of emergency transceivers in the BBU.	Integer

2.3.8 Cable (RTC_OT_CABLE)

This class collects all the objects which describe type of cables, containing either fiber or copper wire used in telecom or power supply systems.

Always contained in a linearly placed object, thus it is generally positioned with respect to local reference.

Property		
Name	Description	Data type
Type of cable	To distinguish between Telecom and Power Supply cables	Label
Outer diameter	Outer diameter of the cable(mm)	Length (positive, >0)
Outer jacket color	Indicate the color of the outer jacket of the cable	Label
Spool length	Maximum Length of the cable in a single spool (m)	Length (positive, >0)
Type of cable armour	The armour type of the cable for mechanical protection	Enum_CableArmourType
Fire retardant class	Indicate fire retardant class of the cable.	Label
Is fire resistant	Whether or not the cable is fire resistant	Boolean
Ending point	Indicate the ending point of the cable	Identifier
Starting point	Indicate the starting point of the cable	Identifier
Attenuation of cable	Indicate the Optical or Electrical Attenuation of the cable measured in dB, always changing with the length of the cable.	Sound Power

2.3.9 Cable fitting (RTC_OT_CFIT)

Installed in a rack, used for arranging the wires.

Property		
Name	**Description**	**Data type**
Type of cable fitting	Indicates the type of cable fitting.	Label
Position of cable fitting	Indicate the position of the cable fitting : vertical / horizontal/front/rear.	Label

2.3.10 Cabling accessory (RTC_OT_CABAC)

This class collects all the required accessories in cabling work.

Property		
Name	**Description**	**Data type**
Type of cabling accessory	Indicate the type of cabling accessory.	Label

2.3.11 Closure (RTC_OT_CLO)

Box to contain a cable junction, a component for the uninterrupted connection of two pipes or cables.

Property		
Name	**Description**	**Data type**
Type of use	Indicate the type of use of the closure, copper pair or fiber use.	Enum_TypeOfUse
Number of cable entry	Indicate the number of cable entry of the closure.	Integer

2.3.12 Coaxial cable (RTC_OT_COAX)
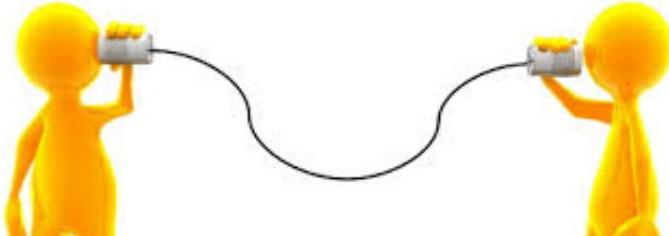
Coaxial cable, a subtype of copper cable, is a copper cable with a variable number of copper coaxial pair conductors used to transmit data by means of electrical signals, especially at radio frequency.

Property		
Name	**Description**	**Data type**
Type of coaxial cable	Indicate the type of coaxial cable	Label
Number of coaxial pair	Indicate the total number of coaxial pairs in the coaxial cable	Integer

2.3.13 Communication interface (RTC_OT_COMITF)
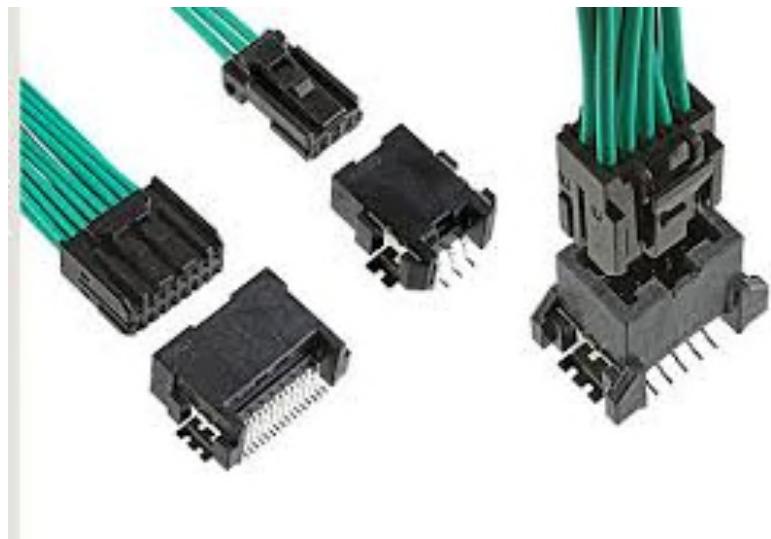
An interface of an active telecom equipment, used for data input or output. It is a subtype of connection interface.

Property		
Name	**Description**	**Data type**
Type of communication interface	Indicate the type of communication interface, can be wired or wireless	Label

2.3.14 Connector (RTC_OT_CON)
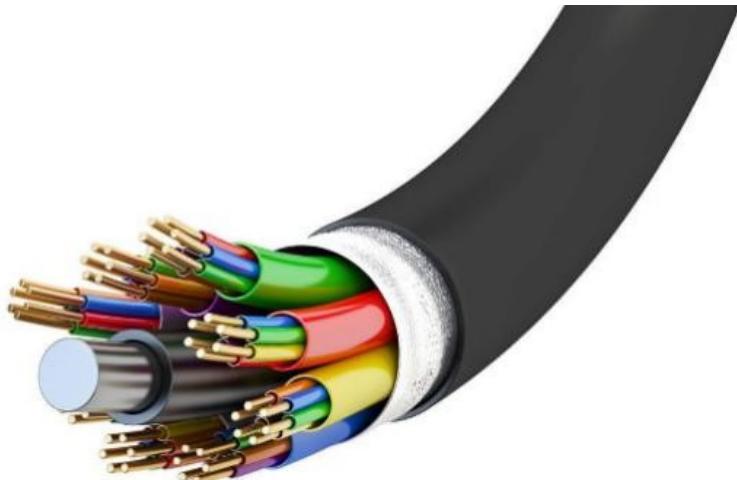
Mechanical connector used to couple two cable endpoints, or to connect a cable endpoint to an equipment port. It is the supertype of telecom connector.

Property		
Name	**Description**	**Data type**
Attenuation of connector	Indicate the Optical or Electrical Attenuation of the mechanical connection brought by the connector (dB).	Sound Power
Type of connector	Indicate whether the connector is a Telecom connector or a Power Supply connector.	Label

2.3.15 Copper cable (RTC_OT_COPCAB)

Copper cable is a subtype of telecom cable, with a variable number of copper coaxial conductors or pair conductors used to transmit data by means of electrical signals.

Property		
Name	**Description**	**Data type**
Type of copper cable	Indicate the type of copper cable.	Enum_CopperCableType
Number of wire pairs	Indicate the number of wire pairs in the copper cable.	Integer

2.3.16 Copper connector (RTC_OT_COPCON)

Mechanical connector used to terminate a wire pair end point so as to allow mechanical connection to another connectorized wire pair end point or to a connectorized telecom equipment port. It can realize electric coupling between two wire pair endpoints.

Property		
Name	**Description**	**Data type**
Type of copper connector	Indicate the type of copper connector.	Label

2.3.17 Copper patch cord (RTC_OT_COPPC)

Copper patch cord, a subtype of copper cable, is a copper cable capped at either end with copper connectors that allow it to be rapidly and conveniently connected to other cable or to distribution panels.

Property		
Name	Description	Data type
Jacket color	Indicate the jacket color of the copper patch cord	Label
Type of patchcord	Indicate the type of copper patch cord	Label
Type of connector A	Indicate the type of A-end connector	Label
Type of connector B	Indicate the type of B-end connector	Label
Color of connector B	Indicates the color B- end of connector	Label
Color of connector A	Indicate the color A- end of connector	Label

2.3.18 Copper symmetric pair cable (RTC_OT_COPSPCAB)

Telecom copper symmetric pair cable, a subtype of copper cable, is a copper cable with a variable number of copper twisted symmetric pair conductors used to transmit data by means of electrical signals.

Property		
Name	Description	Data type
Number of twisted pairs	Total number of twisted wire pairs in the copper pair cable	Integer
Number of untwisted pairs	Total number of untwisted wire pairs in the copper pair cable	Integer

2.3.19 Data transmission unit (RTC_OT_DTU)

Device used to transfer data to on-site control unit, which can be fixed near the rain gauge, snow depth meter, foreign object dual power network sensor or earthquake accelerometer.

The data are amplified and modulated, and then sent to the on-site unit.

Property		
Name	**Description**	**Data type**
Type of data transmission unit	Indicate the type of data transmission unit (outdoor).	Enum_DataTransmissionUnitType
Interface of data transmission unit	Indicate the interface type of data transmission unit (outdoor).	Enum_DataTransmissionUnitInterface
State of data transmission unit	Indicate the working state of data transmission unit (outdoor).	Label

2.3.20 Desktop console (RTC_OT_DCONS)
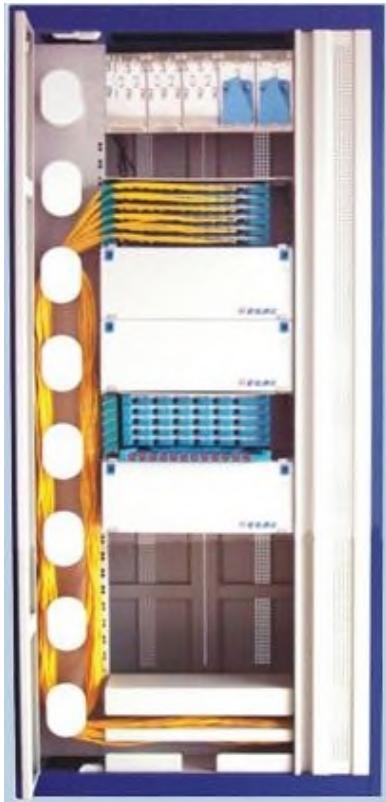
A desktop terminal equipment used by railway dispatching system, mainly realizing dispatching voice communication.

Property		
Name	Description	Data type
User interface of desktop console	Indicate the user interface of the desktop console.	Enum_DesktopConsoleUIType
Type of desktop console	Indicate the type of desktop console.	Label

2.3.21 Distribution frame (RTC_OT_DF)

Distribution frame is used to interconnect and manage wiring between active equipment and subscriber.

Property		
Name	**Description**	**Data type**
Type of distribution frame	Indicate the type of the distribution frame, i.e., ODF, DDF, VDF, NDF, ...	Label
Port capacity	Indicate the cross port capacity of the distribution frame.	Integer

2.3.22 Distribution port (RTC_OT_DPORT)

Port of distribution frame.

Property		
Name	**Description**	**Data type**
Type of distribution port	Indicate the type of distribution port.	Label

2.3.23 Duct (RTC_OT_DUC)

A concrete/metallic/plastic duct that contains tubes and/or cables.

Property		
Name	**Description**	**Data type**
Type of duct	Indicate the type of duct.	Label
Section area	Indicate the section area of the duct.	Area

2.3.24 E-utran node B (RTC_OT_eNB)

An eNB is a logical network component which serves one or more E-UTRAN cells.

It is the hardware connected to the EPC (Evolved Packet Core), more specifically to the MME (Mobility Management Entity), which communicates directly with UEs (User Equipment) in wireless way.

On the basis of the original functions of Node B, eNB added the physical layer, MAC layer, RRC, scheduling, access control, load bearing control, mobility management and wireless resource management of adjacent cells of RNC, providing functions equivalent to the original RLC/MAC/PHY and RRC layer.

Property		
Name	**Description**	**Data type**
Number of managed carriers	Indicate how many carrier frequencies can be managed by the eNodeB.	Integer
Number of antenna	Indicate the number of antennas integrated in the eNodeB.	Integer
Number of interface	Indicate the number of different interfaces of the eNodeB.	Integer
Uplink radio band	Indicate the frequency range, delimited by a lower frequency and an upper frequency, allocated for uplink transmission.	Frequency
Type of interface	Indicate the type of interface of the eNodeB.	Label
Downlink radio band	Indicate the frequency range, delimited by a lower frequency and an upper frequency, allocated for downlink transmission.	Frequency
Type of antenna	Indicate the type of radio antenna integrated in the eNodeB.	Label
Radiated output power per antenna	Indicate the power of radio waves emitted by each antenna of the eNodeB.	Power

2.3.25 Earthquake accelerometer (RTC_OT_EA)

Device used to detect the seismic wave and measure the seismic intensity in case of earthquake.

Property		
Name	Description	Data type
Type of earthquake accelerometer	Indicate the type of Earthquake Accelerometer.	Enum_EarthquakeAccelerometerType
Earthquake accelerometer range	Indicate the measuring range of the Earthquake Accelerometer.	Real
Resolution	Indicate the resolution of the Earthquake Accelerometer.	Real
Margin of error	Indicate the margin of error of the Earthquake Accelerometer.	Ratio
Dynamic range	Indicate the dynamic range of the Earthquake Accelerometer.	Real
Full scale output	Indicate the full scale output of the Earthquake Accelerometer.	Real
Degree of linearity	Indicate the degree of linearity of the Earthquake Accelerometer.	Real
Transverse sensitivity ratio	Indicate the transverse sensitivity ratio of the Earthquake Accelerometer.	Ratio
Root mean square value of noise	Indicate the RMSV of noise of the Earthquake Accelerometer.	Real
Type of data collection	Indicate the type/manner of data collection.	Enum_DataCollectionType
Sampling frequency	Indicate the sampling frequency of the Earthquake Accelerometer.	Frequency
Interface of earthquake accelerometer	Indicate the type of interface of Earthquake Accelerometer.	Enum_InterfaceOfEarthquakeAccelerometer
State of earthquake accelerometer	Indicate the working state of Earthquake Accelerometer.	Label
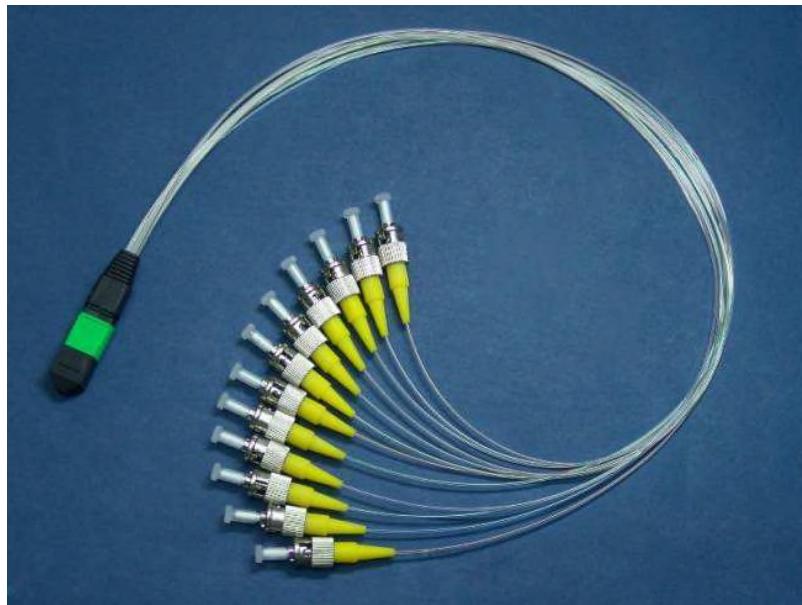
2.3.26 Equipment access zone (RTC_OT_EQAZONE)

Space that allows to access to the equipment. It is defined by the side, top, rear and front access zones.

Property		
Name	Description	Data type
Free distance	Distance that measures the space kept free for an access zone.	Length

2.3.27 Fan out (RTC_OT_FANO)

Provide a safe transition from multi-fiber cable units to individual fibers.

Property		
Name	**Description**	**Data type**
Number of tube	Indicate the number of tubes	Integer
Tube diameter	Indicate the tube diameter	Length (positive, >0)

2.3.28 Feeder (RTC_OT_FED)

Feeder is the radio-frequency transmission line interconnecting an antenna and a transmitter or receiver, it is a subtype of coaxial cable.

Property		
Name	Description	Data type
Type of feeder	Indicate the type of feeder.	Enum_FeederType
Characteristic impedance	Indicate the characteristic impedance of feeder.	Electric Resistance
Propagation speed coefficient	Indicate the propagation speed coefficient of feeder.	Real
Maximum transmission attenuation	Indicate the Maximum transmission attenuation of feeder	Sound Power Level

2.3.29 Fiber (RTC_OT_FIB)

Optical fiber is used in telecommunication systems to transmit data by means of optical signals.

Property		
Name	**Description**	**Data type**
Type of fiber	Indicate the type of the single fiber	Enum_FiberType
Color of fiber	Indicate the color of the single fiber	Enum_FiberColor
Has tight jacket	Indicate whether the fiber has a tight jacket or not	Boolean
Status of assignment	Indicate whether the fiber has been assigned to some specific use.	Boolean
Type of assignment	Indicate the type of assignment, if the fiber has been assigned to some specific use.	Label

2.3.30 Fiber endpoint (RTC_OT_FEP)

The termination point of an optical fiber. Each optical fiber has two termination points.

Property		
Name	**Description**	**Data type**
Is spliced	Indicate whether the fiber end point is spliced to another fiber end point by means of a fusion splice or not.	Boolean
Has connector	Indicate whether the fiber end point is terminated with a connector or not.	Boolean

2.3.31 Fiber tube (RTC_OT_FTU)

A very small radius, semi-rigid hollow plastic tube that houses and protects a certain number of optical fibers. An optical fiber cable may contain many loose fiber tubes.

Property		
Name	**Description**	**Data type**
Color of tube	Indicate the color of the single tube	Enum_TubeColor
Number of tube fiber	Indicate the number of fibers inside the single tube	Integer

2.3.32 Foreign object dual power network sensor (RTC_OT_FOS)

Device which can alarm when foreign objects shock and break the dual power network.

Property		
Name	**Description**	**Data type**
Type of foreign object sensor	Indicate the type of foreign object dual power network sensor.	Enum_ForeignObjectDualPowerNetworkSensorType
Interface of foreign object sensor	Indicate the type of interface of foreign object dual power network sensor.	Enum_FOSInterfaceType
State of foreign object sensor	Indicate the working state of foreign object dual power network sensor.	Label

2.3.33 Front side port (RTC_OT_FSPORT)

The front side port of the distribution frame.
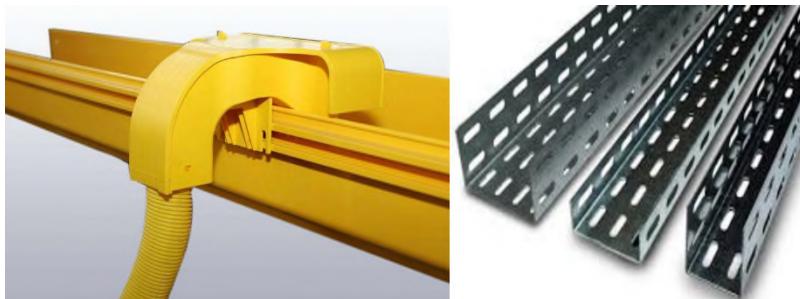
Property		
Name	**Description**	**Data type**
Type of front side port	Indicate the type of front side port.	Label

Number of front side port	Indicate the number of front side ports.	Integer

2.3.34 Gutter (RTC_OT_GUT)

Metallic or plastic support for passing cables.

Property		
Name	**Description**	**Data type**
Type of gutter	Indicate the type of gutter.	Label

2.3.35 IP network equipment (RTC_OT_IPN)

Generic IP network equipment can represent all kind of IP network equipment, which provide IP data transmission channel for telecom subsystems or other subsystems e.g., routers, network switches or firewalls.

Property		
Name	**Description**	**Data type**
Exchange capacity	Indicate the exchange capacity of the IP network equipment.	Real
Packet exchange rate	Indicate the packet exchange rate of the IP network equipment.	Integer
Supported protocol	Indicate the protocols supported by the IP network equipment.	Text
Number of slot	Indicate the number of slot of the IP network equipment.	Integer
Number of occupied slot	Indicate the number of occupied slot of the IP network equipment.	Integer
Type of interface	Indicate the type of interfaces of the IP network equipment.	Label
Number of interface	Indicate the number of different interfaces of the IP network equipment.	Integer
Type of IP network equipment	Indicate the type of the IP network equipment.	Label
Number of cooling fan	Indicate the number of cooling fan in the equipment.	Integer
Type of software	Indicate the type of software responsible for managing the equipment.	Label

2.3.36 Intelligent peripheral (RTC_OT_IP)

Under the control of SCP, IP offers a variety of specialized resources according to the corresponding service logical program. And these resources contain the receiver of DTMF (Dual –Tone Multi-Frequency, signal generator, record notice, etc.

IP provides dedicated resource functions in the intelligent network, allocates, controls and manages various dedicated resources, communicates with other entities in the network, and completes SRF resource functions as well as the maintenance, management and statistics functions of resources.
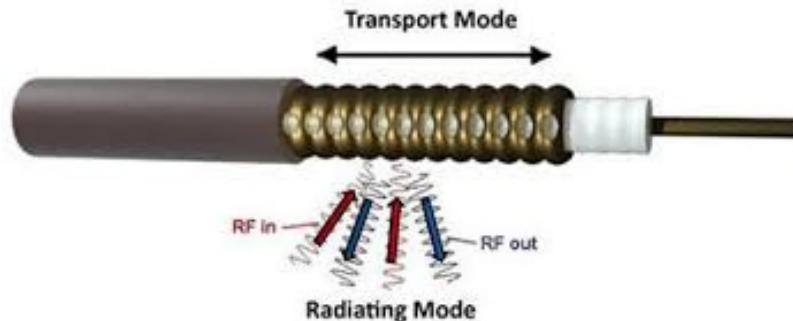
Property		
Name	**Description**	**Data type**
User capacity	Indicate the capacity can be handled by the IP.	Integer

2.3.37 Leaky coaxial cable (RTC_OT_LCX)

Leaky coaxial cable is a coaxial cable whose outer conductor is not completely closed, it is a subtype of coaxial cable.

Part of the electromagnetic energy transmitted along the cable can be radiated or coupled to a wireless transmission system consisting of the outer conductor and the surrounding environment through a slot or gap on the outer conductor or in the opposite direction as mentioned above.

Property		
Name	Description	Data type
Transmission loss	Indicate the transmission loss of the LCX.	Real
Coupling loss	Indicate the coupling loss of the LCX.	Real
Used frequency	Indicate the used frequency of the LCX.	Frequency
Characteristic impedance	Indicate the characteristic impedance of LCX	Electric Resistance

2.3.38 Manhole (RTC_OT_MAH)

Concrete covered opening used to install cable junctions or reserve cable.

Property		
Name	Description	Data type
Depth	Indicate the depth of the manhole.	Length

2.3.39 Master unit (RTC_OT_MU)

A component of a repeater for coupling base station signals.

Property		
Name	Description	Data type
Type of master unit	Indicate the type of master unit.	Enum_MasterUnitType
Transmitted signal	Indicate the type/standard of signal transmitted by the master unit.	Enum_TransmittedSignal
Transmitted frequency	Indicate the transmitted frequency used by the master unit.	Frequency

Transmitted bandwidth	Indicate the transmitted bandwidth of the master unit.	Integer Count Rate
Transmission type	Indicate the data transmission type of the master unit.	Enum_TransmissionType
Maximum number of connected remote unit	Indicate the maximum number of RU which can be connected to the MU.	Integer
Number of interface	Indicate the number of different interfaces of the Master Unit.	Integer
Type of interface	Indicate the type of interfaces of the Master Unit.	Label

2.3.40 Modem (RTC_OT_MOD)

Modem is a device that converts data into a format suitable for a transmission medium which can be copper cables or optical fibers.

Property		
Name	Description	Data type
Type of modem	Indicate the type of the device.	Enum_ModemType
Type of common interface	Indicate the type of common interfaces of the device.	Enum_CommonInterfaceType
Number of common interface	Indicate the number of different common interfaces of the device.	Integer
Type of modem traffic interface	Indicate the type of traffic interfaces of the device.	Enum_ModemTrafficInterfaceType
Number of modem traffic interface	Indicate the number of different traffic interfaces of the device.	Integer

2.3.41 On-site control unit (RTC_OT_OCU)
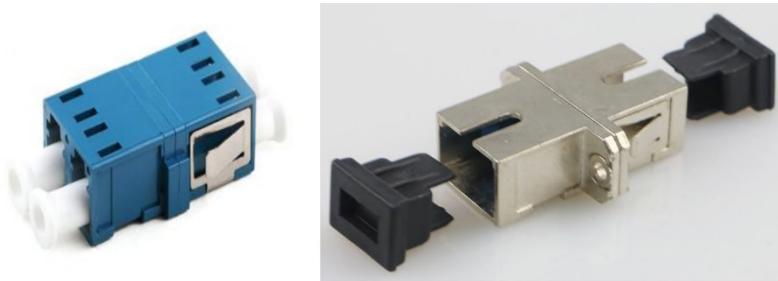
Device used to receive monitoring data from data transmission unit and send the monitoring data to central system, usually located in telecom equipment room.

Property		
Name	Description	Data type
Wind collection	Indicate whether the on-site control unit (indoor) collects wind.	Boolean
Rain collection	Indicate whether the on-site control unit (indoor) collects rain.	Boolean
Snow collection	Indicate whether the on-site control unit (indoor) collects snow depth.	Boolean
Foreign object collection	Indicate whether the on-site control unit (indoor) collects foreign object information.	Boolean
Output	Indicate whether the on-site control unit (indoor) includes output function.	Boolean
Earthquake collection	Indicate whether the on-site control unit (indoor) collects earthquake information.	Boolean
Earthquake alarm	Indicate whether the on-site control unit (indoor) includes earthquake alarm function.	Boolean
Interface of on-site control unit	Indicate the type of interface of on-site control unit (indoor).	Enum_OcuInterfaceType
State of on-site control unit	Indicate the working state of on-site control unit (indoor).	Label

2.3.42 Optical adapter (RTC_OT_OADP)

Optical adapter is used to convert one type of optical port to another type of optical port.

Property		
Name	**Description**	**Data type**
Type of fiber	Indicate the fiber type: single-mode or multi-mode.	Enum_FiberType
Type of connector1	Indicate the type connector 1	Label
Type of connector2	Indicate the type connector 2	Label

2.3.43 Optical fiber cable (RTC_OT_OFC)

Cable containing a variable number of optical fibers.

Property		
Name	**Description**	**Data type**
Fiber cable structure	To distinguish among different structures of optical fiber cable.	Enum_FiberCableStructureType
Number of tubes	Number of tubes containing fibers.	Integer
Number of total fiber	Total number of fibers in the optical fiber cable.	Integer
Number of multimode fiber	Total number of multi-mode fibers in the optical fiber cable.	Integer
Number of singlemode fiber	Total number of single-mode fibers in the optical fiber cable.	Integer

2.3.44 Optical fiber connector (RTC_OT_OFCON)

Mechanical connector used to terminate a fiber end point so as to allow mechanical connection to another connectorized fiber end point or to a connectorized telecom equipment port.

Property		
Name	**Description**	**Data type**
Type of optical fiber connector	Indicate the type of optical fiber connector.	Label

2.3.45 Optical fiber patch cord (RTC_OT_OFPTC)

Optical fiber patch cord, a subtype of optical fiber cable, is an optical fiber cable capped at either end with connectors that allow it to be rapidly and conveniently connected to other cable or to distribution panels.

Property

Name	Description	Data type
Jacket color	Indicate the patch cord jacket color	Label
Color of connector A	Indicate the color of A end of connector	Label
Number of fiber	Indicate the number of fiber in the patch cord (1 or 2)	Integer
Type of connector B	Indicates the type of B-end connector	Label
Type of connector A	Indicate the type of A-end connector	Label
Color of connector B	Indicate the color of B end of connector	Label
Type of fiber	Indicate the fiber type (SM or MM)	Label

2.3.46 Optical network unit (RTC_OT_ONU)

A kind of optical transmission network connection equipment which is installed at user side.

Property		
Name	Description	Data type
Type of optical network unit	Indicate the type of the ONU equipment.	Enum_OpticalNetworkUnitType
Type of interface	Indicate the type of interfaces of the ONU equipment.	Label
Number of interface	Indicate the number of different interfaces of the ONU equipment.	Integer

2.3.47 Optical pigtail (RTC_OT_OPTL)

Optical pigtail, a subtype of optical fiber cable, is a specific hardware connection used for cable termination. On a fiber pigtail, one end of the wire is simply exposed fiber and the other end has a pre-installed connector on it. Fiber pigtails are commonly spliced onto individual strands of a multi-fiber trunk cable.

Property		
Name	**Description**	**Data type**
Type of fiber	Indicate the fiber type.	Enum_FiberType
Jacket color	Indicate the pigtail jacket color.	Label
Type of connector	Indicate the type of connector.	Label

2.3.48 Optical splitter (RTC_OT_OSP)

A passive device used to split the optical signal.

Property		
Name	**Description**	**Data type**
Type of optical splitter	Indicate the type of optical splitter, single mode or multi-mode.	Enum_OpticalSplitterType
Number of branch	Indicate the number of branches can be supported by the optical splitter.	Integer
Type of interface	Indicate the type of interfaces of the optical splitter.	Label
Number of interface	Indicate the number of different interfaces of the optical splitter.	Integer

2.3.49 Pole (RTC_OT_POL)

Metallic or concrete pole used to hold up cables or antennas.

Property		
Name	**Description**	**Data type**
With lightning rod	Indicates whether the pole is equipped with lightning rod	Boolean

2.3.50 Power supply interface (RTC_OT_PSITF)

Power supply interface of a telecom active equipment, using which the equipment can be powered through power supply cables.

Property		
Name	**Description**	**Data type**
Type of power supply interface	Indicate the type of power supply interface.	Label

2.3.51 Power supply port (RTC_OT_PSPORT)

A subtype of power supply interface.

Property		
Name	**Description**	**Data type**
Type of power supply port	Indicate the type of power supply port.	Label

2.3.52 Rack (RTC_OT_RACK)

Metal frame container for equipment.

Property		
Name	**Description**	**Data type**
Number of unit	Indicate the number of vertical units available on the 19" shelf.	Integer
Type of ventilation	Indicate the air circulation mode inside the rack : natural/fan/cooler.	Enum_VentilType
Cable entry	Indicate the cabling position of the rack : top/bottom/both.	Enum_CableEntry

2.3.53 Railway self service identity verification gate (RTC_OT_RSIV)

Railway Self-service Identity Verification Gate:

An equipment for consistency check of tickets, id card and face image. Passengers are allowed or forbid to pass according to the check result.

Property		
Name	**Description**	**Data type**
Number of gate	Indicate the gate number of the railway self service identity verification gate (1 or 2).	Integer
Width of narrow channel	Indicate the width of the wide channel.	Length
Width of wide channel	Indicate the width of the narrow channel.	Length
Passenger throughput	Indicate the throughput of passengers of the railway self service identity verification gate.	Real

2.3.54 Rain gauge (RTC_OT_RG)

Device used to collect and indicate rainfall related information.

Property		
Name	**Description**	**Data type**
Type of rain gauge	Indicate the type of rain gauge.	Enum_RainGaugeType
Rain gauge range	Indicate the measuring range of rain gauge.	Length
Resolution	Indicate the resolution of rain gauge.	Length
Margin of error	Indicate the margin of error of rain gauge.	Ratio
Type of data collection	Indicate the type/manner of data collection of rain gauge.	Enum_DataCollectionType
Sampling frequency	Indicate the sampling frequency of rain gauge.	Frequency
Interface of rain gauge	Indicate the type of interface of rain gauge.	Enum_RainGaugeInterface
State of rain gauge	Indicate the working state of rain gauge.	Label

2.3.55 Rear side port (RTC_OT_RSPORT)

The rear side port of the distribution frame.

Property		
Name	**Description**	**Data type**

Number of rear side port	Indicate the number of rear side ports.	Integer
Type of rear side port	Indicate the type of rear side port.	Label

2.3.56 Recording equipment (RTC_OT_REC)

Records telephone calls between the railway telephony operators. It also provides the function of archiving and immediate replay.

It can support the IP, SIP and RTP protocols.

Property		
Name	**Description**	**Data type**
Number of interface	Indicate the number of different interfaces of the Recording equipment.	Integer
Storage capacity	Indicate the total data storage capacity of the Recording equipment.	Real
Type of interface	Indicate the type of interfaces of the Recording equipment.	Label

2.3.57 Remote radio unit (RTC_OT_RRU)

A component of a distributed base station that converts digital baseband signals into high-frequency (rf) signals and sends high-frequency (rf) signals to the antenna for radiation.

Property		
Name	**Description**	**Data type**
Type of connection	Indicate the connection type of the RRU with BBU.	Enum_RemoteRadioUnitConnectionType
Number of Interface	Indicate the number of different interfaces of the RRU.	Integer
Type of interface	Indicate the type of interfaces of the RRU.	Label
Type of antenna	Indicate the type of radio antenna integrated in the RRU.	Label
Number of carriers	Indicate how many carrier frequencies can be offered by the RRU.	Integer
Number of antenna	Indicate the number of antennas integrated in the RRU.	Integer
Radiated output power per antenna	Indicate the power of radio waves emitted by each antenna of the RRU.	Power
Number of transceiver per antenna	Indicate the number of transceivers per antenna.	Integer
Uplink radio band	Indicate the frequency range, delimited by a lower frequency and an upper frequency, allocated for uplink transmission.	Frequency
Downlink radio band	Indicate the frequency range, delimited by a lower frequency and an upper frequency, allocated for downlink transmission.	Frequency

2.3.58 Remote unit (RTC_OT_RU)
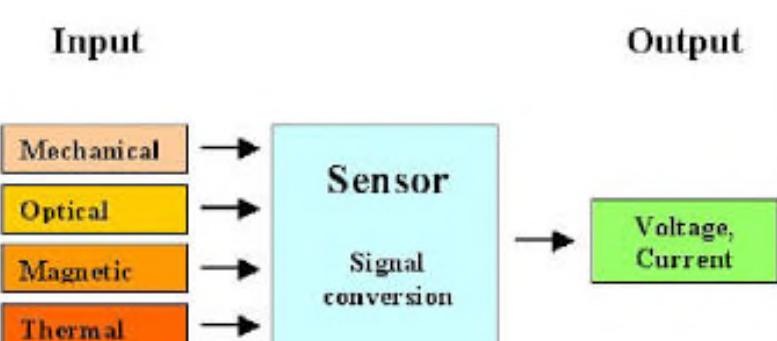
Remote unit is used to amplify a base station signal.

Property		
Name	**Description**	**Data type**
Type of connection	Indicate the connection type of the remote unit with master unit.	Enum_RemoteUnitConnectionType
Number of interface	Indicate the number of different interfaces of the remote unit.	Integer
Type of interface	Indicate the type of interfaces of the remote unit.	Label

2.3.59 Sensor (RTC_OT_SENSOR)

Supertype of all different kinds of sensors, collecting different kinds of information.

Property		
Name	**Description**	**Data type**
Type of sensor	Indicate the type/use of sensor.	Label

2.3.60 Snow depth meter (RTC_OT_SDM)

Device used to measure the depth of snowfall.

Property		
Name	**Description**	**Data type**
Type of snow depth meter	Indicate the type of snow depth meter.	Enum_SnowDepthMeterType
Snow depth meter range	Indicate the measuring range of snow depth meter.	Length
Resolution	Indicate the resolution of snow depth meter.	Length
Margin of error	Indicate the margin of error of snow depth meter.	Ratio
Type of data collection	Indicate the type/manner of data collection of snow depth meter.	Enum_DataCollectionType
Sampling frequency	Indicate the sampling frequency of snow depth meter.	Frequency
Image resolution	Indicate the image resolution of snow depth meter.	Label
Image shooting mode	Indicate the type/manner of image shooting of snow depth meter.	Enum_ImageShootingMode
Interface of snow depth meter	Indicate the type of interface of snow depth meter.	Enum_SnowDepthMeterInterface
State of snow depth meter	Indicate the working state of snow depth meter.	Label

2.3.61 Subrack (RTC_OT_SRAC)

Part of a rack.

Property		
Name	**Description**	**Data type**
Number of unit	Indicate the number of vertical units	Integer
Number of slot	Indicate the number of available horizontal slots.	Integer

2.3.62 Telecom active equipment (RTC_OT_TAEQ)

This class regroups all the telecommunication equipment that must be powered in order to be able to function.

Property		
Name	**Description**	**Data type**
Type of power supply	Indicate what kind of power supply shall be provided to the telecom active equipment, e.g: DC, AC 220V, AC 110V.	Label
Heat dissipation	Indicate the heat dissipation of the telecom active equipment.	Power
Power consumption	Indicate the power consumption of the telecom active equipment.	Power
Rated voltage	The standard voltage under which electrical equipment can stably work over a long period.	Electric Voltage
IK rating	Indicate the protection degree against shocks.	Label
IP rating	Indicate the protection degree vs. rain and dust.	Label
Earthing style	Indicate the earthing style of the telecom active equipment.	Label
Max total power	Indicate the maximum total power of the telecom active equipment.	Power
Type of power supply port	Indicate the type of power supply port of the telecom active equipment.	Label
Number of power supply port	Indicate the number of each type of the power supply port.	Integer

2.3.63 Telecom cable (RTC_OT_TCAB)

Cable containing either fiber or copper wire used to transmit telecom signals, this class is a supertype of optical fiber cable and copper cable.

Property		
Name	**Description**	**Data type**
Type of telecom cable	To distinguish between optical fiber cable or copper cable.	Enum_TelecomCableType

2.3.64 Telecom connector (RTC_OT_TCON)

Mechanical connector used to couple two telecom cable endpoints or to connect a telecom cable endpoint to a telecom equipment port. This class is a supertype of optical fiber connector and copper cable connector.

Property		
Name	**Description**	**Data type**
Type of telecom connector	Indicate whether the telecom connector is a copper connector or a fiber connector.	Label
Is inlet	Indicate whether the connector is inlet or outlet.	Boolean
Number of poles	Indicate the number of poles of the connector.	Integer

2.3.65 Telecom laying infrastructure (RTC_OT_TLAYINF)

This class collects all the objects related to laying infrastructure aimed to support or contain cables.

Property		
Name	**Description**	**Data type**
Burial depth	Indicate the burial depth of the telecom laying infrastructure if it is buried.	Length
Type of laying infrastructure	Indicate the type of telecom laying infrastructure.	Label

2.3.66 Telecom laying infrastructure zone (RTC_OT_TLAYINFZONE)

Space that is reserved for laying telecom cables.

Property		
Name	**Description**	**Data type**
Minimum bending radius	Indicate the minimum bending radius of the route to be respected.	Length
Route	Indicate the path followed by the telecom laying infrastructure.	

2.3.67 Telecom outlet (RTC_OT_TO)

Telecom plug allowing telephone or network access.

Property		
Name	**Description**	**Data type**
Type of telecom outlet	Indicate the type of telecom outlet.	Label

2.3.68 Telephone (RTC_OT_TEL)

A terminal device that realizes bidirectional voice communication by means of electrical signals.

Property		
Name	**Description**	**Data type**
Type of telephone	Indicate the type of telephone	Enum_TelephoneType

2.3.69 Ticket vending machine (RTC_OT_TVM)

A self-service device with functions of choosing ticket, payment and ticket making, etc. With this device, passengers can buy and collect tickets themselves.

Ticket vending machine shall provide a stable, reliable, friendly self-service environment for passengers to purchase or collect tickets conveniently and effectively.

Property		
Name	Description	Data type
Type of ticket vending machine	Indicate the type of ticket vending machine.	Enum_TicketVendingMachine
Payment of ticket vending machine	Indicate the payment method of ticket vending machine.	Enum_TicketVendingMachinePayment
User interface of ticket vending machine	Indicate the mode of the user interface of ticket vending machine.	Enum_TicketVendingMachineUserInterface
Money stuck rate	Indicate the money stuck rate of ticket.	Ratio
Ticket stuck rate	Indicate the stuck rate of ticket.	Ratio
Ticket produce velocity	Indicate the producing velocity of the ticket.	Real
Ticket vending machine change method	Indicate the change method of ticket vending machine.	Label

2.3.70 Tower (RTC_OT_TOW)

Metallic framed structure used to hold antennas or cables.

Property		
Name	**Description**	**Data type**
With lightning rod	Indicate if the tower is equipped with lightning rod.	Boolean
Type of tower	Indicate the type of tower.	Label

2.3.71 Trackside telephony exchange (RTC_OT_TSTEX)
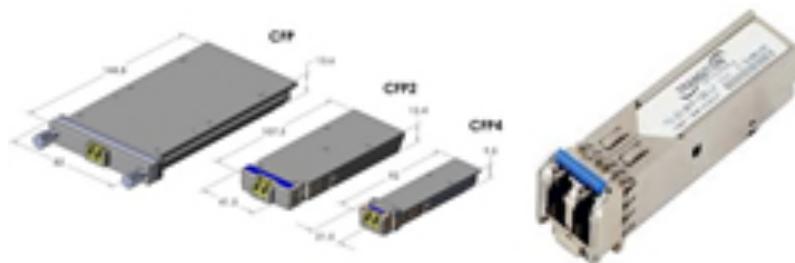
A device that ensures the routing of trackside telephone calls and communications.

Property		
Name	**Description**	**Data type**
User capacity	Indicate the capacity of trackside telephony exchange.	Integer

2.3.72 Transceiver module (RTC_OT_TRMD)

A device that can convert electric signal to optical signal at the sender, and convert optical signal to electric signal at the receiver.

Property		
Name	**Description**	**Data type**
Type of transceiver module	Indicate the type of transceiver module.	Label

2.3.73 Transport equipment (RTC_OT_TRANS)

Generic transport equipment can represent all kind of transport equipment, which provides transmission channel for telecom subsystems or other subsystems.

Property		
Name	**Description**	**Data type**
Type of transport equipment	Indicate the type of transport equipment (SDH, PDH, OADM, other).	Enum_TransportEquipmentType
Type of transport equipment assembly	Indicate the type of transport equipment assembly.	Enum_TransportEquipmentAsseblyType
Number of slot	Indicate the number of slot of the transport equipment.	Integer
Number of occupied slot	Indicate the number of occupied slot of the transport equipment.	Integer
Can upgrade	Indicate whether the transport equipment can be upgraded.	Boolean
Electrical cross capacity	Indicate the electrical cross capacity of the transport equipment.	Label
Number of wave	Indicate the number of waves of the OADM system.	Integer
Rate of single wave	Indicate the transmission rate of a single wave of the OADM system.	Integer Count Rate
System capacity	Indicate the system capacity of the OADM system.	Real
Minimum optical signal to noise ratio	Indicate the minimum OSNR of the OADM system.	Ratio
Chromatic dispersion tolerance	Indicate the CD tolerance of the OADM system.	Real
Polarization mode dispersion tolerance	Indicate the PMD tolerance of the OADM system.	Real
Average power of single channel	Indicate the average power of a single channel of the OADM system.	Power
Maximum power of single channel	Indicate the maximum power of a single channel of the OADM system.	Power
Minimum power of single channel	Indicate the minimum power of a single channel of the OADM system.	Power

2.3.74 Tube (RTC_OT_TUB)
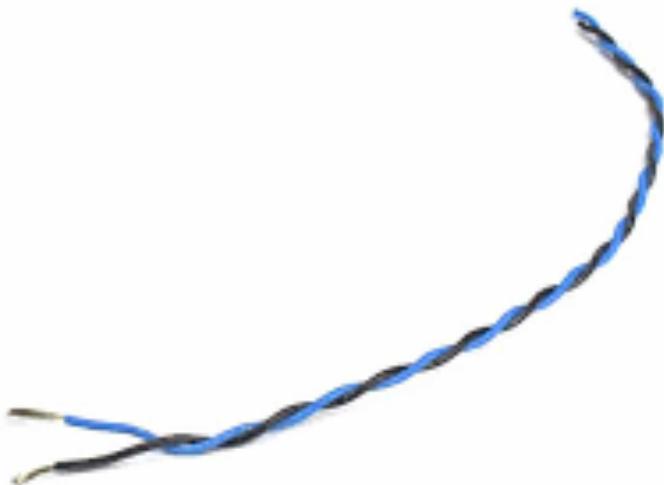
Plastic or metallic tubes that contain cables.

Property		
Name	**Description**	**Data type**
Outer diameter	Indicate the outer diameter of the tube.	Length
Inner diameter	Indicate the inner diameter of the tube.	Length

2.3.75 Wire pair (RTC_OT_WP)

A pair of conductors contained in a copper cable, the pair is always used together to form a circuit to transmit data by means of electric signals.
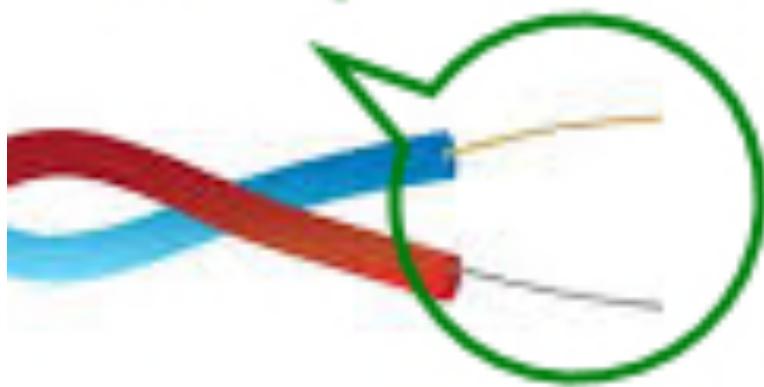
Property		
Name	**Description**	**Data type**
Type of wire pair	Indicate the type of wire pair, i.e., twisted, untwisted or coaxial pair.	Enum_WirePairType
Jacket color	Indicate the color of the insulation jacket of the wire pair.	Label
Sequential number	Indicate the sequential number of the wire pair in the cable.	Integer
Conductor diameter	Conductor diameter (only for twisted and untwisted wire pair).	Length
Core conductor diameter	Core conductor diameter (only for coaxial wire pair).	Length
Shield conductor diameter	Shielded conductor diameter (only for coaxial wire pair).	Length
Characteristic impedance	Indicate the characteristic impedance of the wire pair.	Electric Resistance

2.3.76 Wire pair endpoint (RTC_OT_WPEP)

The termination point of a wire pair. Each wire pair has two termination points.

End point

Property		
Name	**Description**	**Data type**
Has connector	Indicate whether the wire pair end point is terminated with a connector or not.	Boolean
Is joined	Indicate whether the wire pair end point is joined to another wire pair end point by means of a welded junction or not.	Boolean

2.3.77 Wired communication port (RTC_OT_WCPORT)

Port of a telecom active equipment, used for wired connection.

Property		
Name	**Description**	**Data type**
Type of wired communication port	Indicate the type of wired communication port.	Enum_WiredCommunicationPortType

2.4 Energy

2.4.1 AC control panel (REN_OT_EN-10102021)

According to different electrical equipment and different power consumption, the AC power distribution panel generally controls the distribution cabinet by a branch switch consisting of a voltmeter, an ammeter, a switch (or an automatic switch), an insurance, a signal light, and a line.

Property		
Name	**Description**	**Data type**
Type	Type of DCControlPanel	Label
Rated voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text

2.4.2 Actuator (REN_OT_EN-1010203020)

The part of the actuating system to which an external actuating force is applied which used for operating the switches.(IEC 60050-441-15-22)

Property		
Name	**Description**	**Data type**
Type	Type of Actuators	Enum_ActuatorType
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current

Nominal voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text
Switch location / ID	The id of the switch where the equipment is applied	Identifier

2.4.3 Anchoring bar (REN_OT_EN-1010101086)

Used to connect stay from pole to the foundation.

Property		
Name	**Description**	**Data type**
Mechanical tension type	Direction of forces	Enum_MechanicalTensionType

2.4.4 Anti trespassing guard (REN_OT_EN-1010431)

Equipment provided to deter entry to a restricted area, structure or building by an unauthorized person.

Property		
Name	**Description**	**Data type**
Type	e.g. it can be IFC code or just the user define "1, 2, 3…"	Enum_SwitchingPostType

2.4.5 Anti-Fall device (REN_OT_EN-1010426)

Protection against operator falling.

Property		
Name	**Description**	**Data type**
Type	Type of Anti-Fall device	Label

2.4.6 AntiClimbing (REN_OT_EN-1010427)

Protection against climbing.

Property		
Name	**Description**	**Data type**
Type	Type of AntiClimbing	Label

2.4.7 Automaton (REN_OT_EN-10102026)

Self-acting artificial system the behaviour of which is governed either in a stepwise manner by given decision rules or continuously in time by defined relationships, while the output variables of which are created from its input and state variables.(IEC 60050-351-42-32)

Property		
Name	**Description**	**Data type**
Type	Type of the automaton.	Enum_SwitchingPostType

Nominal Voltage / Rated Voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Input signal type	The type of the input signal.	Enum_InputSignalType
Output signal type	The type of the output signal.	Enum_InputSignalType

2.4.8 Autotransformer (REN_OT_EN-101020432)

A transformer in which at least two windings have a common part (IEC 60050-811-26-03; 60050-421-01-11)

Property		
Name	**Description**	**Data type**
Type	Type of Auto-Transformer	Label
Primary Voltage	The nominal voltage at primary side.	Electric Voltage
Secondary Voltage	The nominal voltage at scondary side.	Electric Voltage

2.4.9 Auxiliary electric cabinet (REN_OT_EN-1010207011)

Cabnet for different lowvoltage services (signaling, telecom..)

Property		
Name	**Description**	**Data type**
Type	Type of AuxilaryElectricCabinet	Enum_AuxiliaryElectricCabinetType
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Normina frequency	Frequency of the AC electric power system that the AuxilaryElectricCabinet supplied reaches its optimum operating condition	Frequency
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio (positive, >0)
Function description	To describe the method that the equipment is used for.	Text
Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room	Label

2.4.10 Auxiliary services (REN_OT_EN-10102070)

Provide Energy port for different lowvoltage services (signaling, telecom..)

Property		
Name	**Description**	**Data type**
Type	Type of AuxilaryServices	Enum_AuxiliaryServicesType
Nominal voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage

Switch ID	The id of the switch where the equipment is connected.	Identifier
Nominal Power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Circuit ID	The id of the circuit that connected to the distribution board.	Identifier

2.4.11 Auxiliary transformer (REN_OT_EN-101020433)
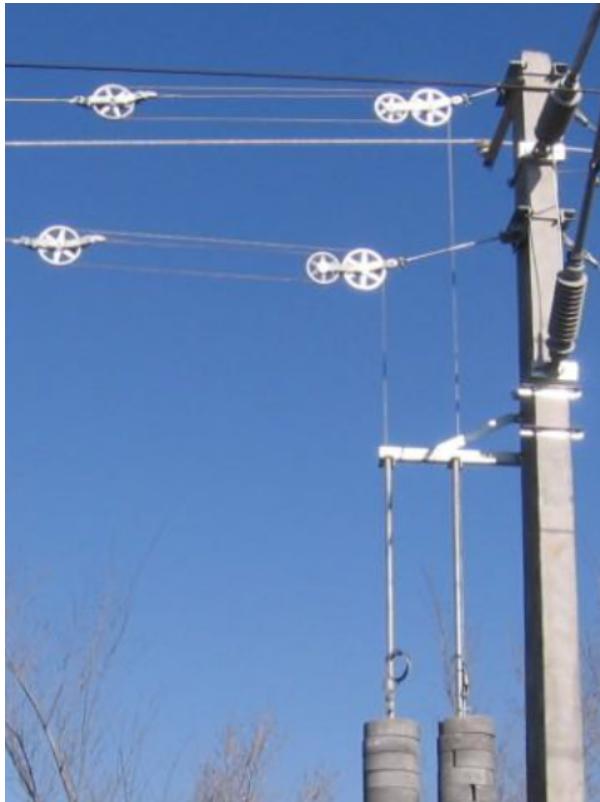
In a substation, a transformer intended to provide supply to the auxiliary equipment (IEC 60050-605-02-46)

Property		
Name	**Description**	**Data type**
Type	Type of Auxilary Transformer	Label
Primary Voltage	The nominal voltage at primary side.	Electric Voltage
Secondary Voltage	The nominal voltage at scondary side.	Electric Voltage

2.4.12 Balance weight tensioner (REN_OT_EN-1010101060)

Automatic tensioner attached to a mast to ensure constant tension in conductors by means of balance weights.(UIC R 791-2006)

Property		
Name	**Description**	**Data type**
a/b value	a value:The distance from the end of the rope to the fixed pulley. b value:The distance from the last tensioner to the ground or the base surface.	Length
Weight type	The type of weight of the tensioning equipement.	Label
Type	Type of Balance weight tensioner	Label

2.4.13 Battery (REN_OT_EN-1010205010)

One or more cells fitted with devices necessary for use, for example case, terminals, marking and protective devices. (IEC 60050-482-01-04)

Property		
Name	**Description**	**Data type**
Capacity	The power capacity that the battery could provide.	Electric Capacitance
encapsulation technology	Code indicating the encapsulation technology which has been applied in an electric, electronic or electromechanical component.	Text
Chargeability type	Code of the chargeability type of a battery.	Enum_BatteryType
Open-circuit voltage	Value as specified by level (miNomax) of the open circuit voltage of a battery.	Electric Voltage
Storage life	Minimum duration of storage at specified ambient temperature at the end of which a cell or battery retains 80% of its original capacity.	Duration

2.4.14 Battery charger (REN_OT_EN-1010207010)

Equipement used to charge the battery, which is storaging electric energy for substation.

Property		
Name	**Description**	**Data type**
Type	Type of BatteryCharger	Enum_BatteryChargerType
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Nominal frequency	Frequency of the AC electric power system that the BatteryCharger supplied reaches its optimum operating condition	Frequency
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio (positive, >0)
Function description	To describe the method that the equipment is used for.	Text
Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room	Label

2.4.15 Bearer Structure (REN_OT_EN-1010101038)

Insure the function of holding registration component in tunnel context.

Property		
Name	**Description**	**Data type**
Type	Type of bearer structure.	Label
Distance to track centre	Distance from the equipment to track centre	Length
Mileage	Mileage of the line where the Bearer Structure locates	Length
Side of line	To indicate which side of the railway line the system / equipment / facility locates.	Label

2.4.16 Bird protection (REN_OT_EN-1010430)

Avoid a sitting down of the birds at electrically critical points of the catenary system.Thus the birds are protected against electrical shocks and disturbances by short circuit are avoided.

Property		
Name	**Description**	**Data type**
Type	Type of Bird protection	Label

2.4.17 Booster transformer (REN_OT_EN-101020431)

A transformer of which one winding is intended to be connected in series with a circuit in order to alter its voltage and the other winding is an energizing winding (IEC 60050-811-26-05, 60050-421-01-12)

Property		
Name	**Description**	**Data type**
Type	Type of Booster Transformer	Label
Primary Voltage	The nominal voltage at primary side.	Electric Voltage
Secondary Voltage	The nominal voltage at scondary side.	Electric Voltage

2.4.18 Boosting cable (REN_OT_EN-10106040)

Cable used to connect between rail and return line.

Property		
Name	**Description**	**Data type**
Type of cable	The type of cable which boosting cable used.	Label
Length	The length of boosting cable.	Length
Connection type	The type of connenction with cable/conductor.	Label

2.4.19 Box type substation (REN_OT_EN-101023)

Pre build substation

Property		
Name	**Description**	**Data type**
High Voltage feed	The primary voltage of the substation.	Electric Voltage

2.4.20 BusBar (REN_OT_EN-10103013)

A low impedance conductor to which several electric circuits can be separately connected.(IEC 60050-605-02-01)

Property		
Name	**Description**	**Data type**

Type	Type of BusBar	Enum_BusBarType
Tensile strength	Measurement of the ability of the busbar to withstand breakage apart under applied force.	Force
Elongation percentage	Measurement of the lengthening ability of the busbar under stress.	Ratio
Breaking load	The force that would break the conductor	Force
Coefficient of linear expansion	Measurement of the amount of growth the busbar experiences.	Length
Young's modulus	Tensile modulus of the wire.	Ratio
DC resistance	The resistance under direct current and 20 centigrade	Electric Resistance
Resistance	The resistance under AC	Electric Resistance
Current-carrying capacity	The max current that the equipment could undertake before the temperature of which is below the nominal value.	Electric Current
Nominal diameter	The diameter of the outside surface of the busbar	Length
Cross sectional area	The cross-section ares of the conductor.	Area
Mass per unit length	Also known as Linear density, linear mass density or linear mass is a measure of mass per unit of length.	Mass Per Length
Physical description Reference	Physical size of the equipemnt. e.g.wighth, length, height, diameter	Text

2.4.21 Cable (REN_OT_EN-10103012)

Assembly consisting of:

– one or more cores,

– their individual covering(s) (if any),

– assembly protection (if any),

– protective covering(s) (if any).

(IEC 60050-461-06-01)

Property		
Name	**Description**	**Data type**
Type	Type of Cable	Enum_CableType
Working temperature	The temperature where the cable takes current.	Mass Per Length
Effective bending radius	The min bending radius that the cable could withstand.	Length
DC resistance	The resistance under direct current and 20 centigrade	Electric Resistance

Resistance	The resistance under AC	Electric Resistance
Current-carrying capacity	The max current that the equipment could undertake before the temperature of which is below the nominal value.	Electric Current
Nominal diameter	The diameter of the outside surface of the cable	Length
Cross sectional area	The cross-section ares of the wire core.	Area
Mass per unit length	Also known as Linear density, linear mass density or linear mass is a measure of mass per unit of length.	Mass Per Length
Conductor material	The conductive material of the equipment.	Label
Insulation material	The material used to insulate	Label
Sheath material	The sheath material of the cable	Label
Metal armoured material	The material of metal armoured (if applied) of the cable	Label

2.4.22 Cable Chamber (REN_OT_EN-10105021)

An opening to a confined space such as a shaft, utility vault, or large vessel, used as an access point for underground cable, allowing inspection, maintenance, and system upgrades. It' also called manhole.

Property		
Name	**Description**	**Data type**
Type	Type of Cable Chamer	Label

2.4.23 Cable Gantry (REN_OT_EN-10105022)

Horizontal cable supports fixed at one end only, spaced at intervals, on which cables rest.(IEC 60050-826-15-10)

Property		
Name	**Description**	**Data type**
Type	Type of Cable Gantry	Label

2.4.24 Cable Sheathing (REN_OT_EN-10105020)

Flexible accessory or a part of a component placed around the cable to minimize flexing of the cable at the point of entry into the component.

Property		
Name	**Description**	**Data type**
Type	Type of Cable Sheathing	Label

2.4.25 Cantilever assembly (REN_OT_EN-1010101040)

Assembly of components attached to the main support structure that supports and registers the overhead contact line.(CENELEC - EN50119)

Support consisting of one or more transverse members projecting from a mast or structure.(IEC 60050-811-33-30/UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of cantilever assemble.	Enum_CantileverAssemblyType
Functional mode	To indicate the purpose that the cantilever assemble is applied for.	Label
Stagger	Lateral displacement of the contact wire to opposite sides of the track centre at successive supports. Note 1 to entry:Stagger avoids localized wear of pantogragh cotact strips.	Integer
Number of track	Track number of railway line.	Identifier
Line condition	Type of the railway line beside the equipment. e.g. straight, outside the curve, inside the curve.	Text
System height	Vertical distance between the main catenary wire and the contact wire measured at a support point.	Length

Assemble description	To describe how the system/equipment/facility is assembled.	Text
Mileage	Mileage of the line where the Cantilever Assemble locates	Length
Side of line	To indicate which side of the railway line the system / equipment / facility locates.	Label

2.4.26 Capacitor (REN_OT_EN-1010205011)

Assembly of one or more capacitor elements assembled in the same housing with lead terminals.

Property		
Name	**Description**	**Data type**
Type	Type of Capacitor	Enum_CapacitorType
Phase number	Number of phase that the equipment operates on.	Integer
Total Capacity [microF]	The capacity of the capacitor	Electric Capacitance
Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room	Label

2.4.27 Catenary system (REN_OT_EN-1010101090)

The longitudinal wire that supports the contact wire, including catenary wire dropper and stich wire.

Property		
Name	**Description**	**Data type**
Type	Type of CatenarySystem	Label

2.4.28 Catenary wire (REN_OT_EN-1010101053)

Longtitudinal wire supporting the grooved contact wires either directly or indirectly.(IEC 60050-811-33-06/UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Stranded type	To identify the method to strand.	Label
Lay ratio	The ratio between lay length and the diameter of the single conductor.	Ratio
Tensile strength before stranded	Measurement of the ability of the single wire un-stranded to withstand breakage apart under applied force.	Force
Tensile strength after stranded	Measurement of the ability of the single wire stranded to withstand breakage apart under applied force.	Force
Elongation percentage	Measurement of the lengthening ability of the wire under stress.	Ratio (positive, >0)

Breaking load	The force that would break catenary wire.	Force
Coefficient of linear expansion	Measurement of the amount of growth the wire experiences.	Real
Young's tangent	Tensile modulus of the wire.	Real
DC resistance	The resistance under direct current and 20 centigrade.	Electric Resistance
Resistance	The resistance under AC.	Electric Resistance
Current-carrying capacity	The max current that the equipment could undertake before the temperature of which is below the nominal value.	Electric Current
Num. of OCL	To indicate the OCL where the equipment is applied.	Integer
Num. of span	To identify the span using the equipment.	Integer
Diameter A(Cross section)	A. diameter of the cross section.	Length
Diameter B(Cross section)	B.diameter of the cross section.	Length
Head width C(Cross section)	C.head width of the cross section.	Length
Groove bottom spacing D(Cross section)	D. distance between the bottom of the groove.	Length
Groove top spacing E(Cross section)	E. distance between the top of the groove.	Real
Head Hight K(Cross section)	K. length of the head of the wire.	Real
Fillet radius R(Cross section)	R. radius of the fillet around the groove.	Real
Upper angle H(Cross section)	H. angle of the upper part of the groove.	Real
Lower angle G(Cross section)	G. angle of the loweer part of the groove.	Real
Mass per unit length	Also known as Linear density, linear mass density or linear mass is a measure of mass per unit of length.	Real
Physical description Reference	Physical size of the equipemnt. e.g.wighth, length, height, diameter.	Real
Type	Type of Catenary wire.	Enum_CatenaryWireType
Mechanical tension	Nominal value of mechanical force of contact wire.	IfcForceMeasure.NEWTON

2.4.29 Combined transformer (REN_OT_EN-101020424)

an instrument transformer consisting of a current and a voltage transformer in the same case (IEC 60050-321-01-03)

Property		
Name	**Description**	**Data type**
Type	Type of Combined transformer	Label
Primary Voltage	The nominal voltage at primary side.	Electric Voltage
Secondary Voltage	The nominal voltage at scondary side.	Electric Voltage

Primary Current	The nominal current at primary side.	Electric Current
Secondary Current	The nominal current at scondary side.	Electric Current

2.4.30 Common protecting facility (REN_OT_EN-1010418)

Basic protection against electric shock.

Property		
Name	**Description**	**Data type**
Type	Type of Common Protecting Facility	Label

2.4.31 Common supplying (REN_OT_EN-10102027)

Power distribution facilities for low-voltage equipements or auxillary equipements.

Property		
Name	**Description**	**Data type**
Type	Type of CommonSupplying	Label
Assembly description	To describe how the system / equipment / facility is assembled.	Text
Selective protection	Electrical protection method / sequence of substation.	Text
Material of switches inside	The material of the switches used in the substaion.	Text
Input voltage for line regulation	Range of input voltage for line regulation measurement, at the two ends of which the input voltage is measured	Electric Voltage

2.4.32 Compensator equipment (REN_OT_EN-1010206030)

A device that is used to 'fix' the parameter of electric energy, such as voltage loss, power factor and so on.

Property		
Name	**Description**	**Data type**
Type	Type of CompensatorEquipment	Enum_CompensatorEquipmentType
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Nominal frequency	Frequency of the AC electric power system that the CompensatorEquipment supplied reaches its optimum operating condition	Frequency
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio (positive, >0)

Function description	To describe the method that the equipment is used for.	Text
Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room	Label

2.4.33 Contact wire (REN_OT_EN-1010101052)

Electric conductor of an OCL with which the current collectors make contact. Carries the electricity which is supplied to the train by its pantograph. (IEC 60050-811-33-15/UIC R 791-2006)
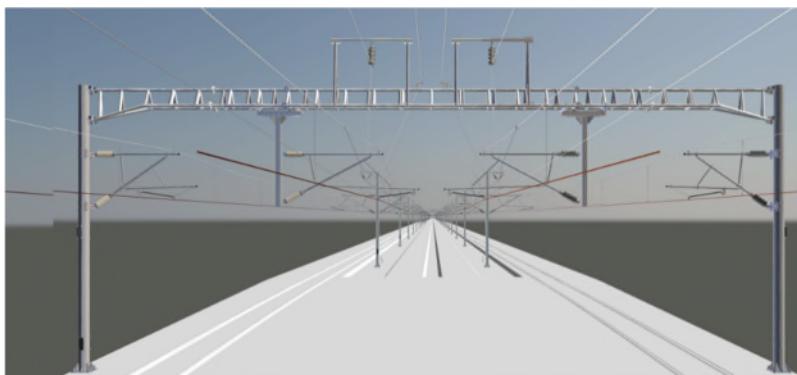
Property		
Name	**Description**	**Data type**
Type	Type of Contact wire.	Label
Nominal cross section	The cross-section ares of the wire core.	Real
Tensile strength	Measurement of the ability of the wire to withstand breakage apart under applied force.	Force
Breaking load	The force that would break contact wire.	Force
Elongation percentage	Measurement of the lengthening ability of the wire under stress.	Ratio
Torsional circle number after fracture	The circle number that the wire could withstand breakage apart under applied force.	Identifier
Coefficient of linear expansion	Measurement of the amount of growth the wire experiences.	Real
Young's modulus	Tensile modulus of the wire.	Real
DC resistance	The resistance under direct current and 20 centigrade.	Electric Resistance
Resistance	The resistance under AC.	Electric Resistance
Current-carrying capacity	The max current that the equipment could undertake before the temperature of which is below the nominal value.	Electric Current
Num. of OCL	To indicate the OCL where the equipment is applied.	Identifier
Num. of span	To identify the span using the equipment.	Identifier
Diameter A(Cross section)	A. diameter of the cross section.	Length
Diameter B(Cross section)	B.diameter of the cross section.	Length
Head width C(Cross section)	C.head width of the cross section.	Length
Groove bottom spacing D(Cross section)	D. distance between the bottom of the groove.	Length
Groove top spacing E(Cross section)	E. distance between the top of the groove.	Length
Head hight K(Cross section)	K. length of the head of the wire.	Length

Fillet radius R(Cross section)	R. radius of the fillet around the groove.	Length
Upper angle H(Cross section)	H. angle of the upper part of the groove.	Length
Lower angle G(Cross section)	G. angle of the loweer part of the groove.	Length
Mass per unit length	Also known as Linear density, linear mass density or linear mass is a measure of mass per unit of length.	Mass Per Length
Mechanical tension	Nominal value of mechanical force of contact wire.	IfcForceMeasure.NEWTON

2.4.34 Cross beam (REN_OT_EN-1010101036)

Rigid cross span structures consist of bending resistant beams which are fixed onto the structures either by hinges or by bending resistant joints.(EN 50119)

Support consisting of a transverse beam and masts situated on either side of tracks.(IEC 60050-811-33-38/UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of Cross Beam.	Label
Number of track	Indicate the number of track which OCS supporting system used to cross.	Integer
Assemble description	To describe how the system / equipment / facility is assembled.	Text
Load bearing capacity	The capacity of soil to support the loads applied to the ground.	Mass
Weight	The force on the object due to gravity.	Mass
Mileage	Mileage of the line where the Cross Beam locates.	Length
Span	The span of the cross beam over the railway track.	Length
Physical description Reference	Physical size of the equipemnt. e.g.wighth, length, height, diameter.	ExternalReference
Camber	In order to offset the deflection generated by the beam under load, the amount of deflection in the direction of deflection reserved during production is reversed.	

2.4.35 Cross bond (REN_OT_EN-10106079)

Electrical connection intended to connect in parallel the conductors of the return circuit.

Property		
Name	**Description**	**Data type**
Type	Type of Cross bond	Enum_CrossBondType

2.4.36 Current transformer (REN_OT_EN-101020421)

An instrument transformer in which the secondary current, in normal conditions of use, is substantially proportional to the primary current and differs in phase from it by an angle which is approximately zero for an appropriate direction of the connections.(IEC 60050-321-02-01)

Property		
Name	**Description**	**Data type**
Type	Type of Current Transformer	Label
Primary current	The nominal current at primary side.	Electric Current
Secondary Current	The nominal current at scondary side.	Electric Current

2.4.37 DC control panel (REN_OT_EN-10102022)

A cabinet that distributes and outputs DC power. The complex power distribution panel also configures the battery pack and monitoring unit.

Property		
Name	**Description**	**Data type**
Type	Type of DCControlPanel	Label
Rated voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage

Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text

2.4.38 Decoupler transformer (REN_OT_EN-101020434)

Phase separation transformer.

Property		
Name	**Description**	**Data type**
Type	Type of Decoupler Transformer	Label
Primary Voltage	The nominal voltage at primary side.	Electric Voltage
Secondary Voltage	The nominal voltage at scondary side.	Electric Voltage
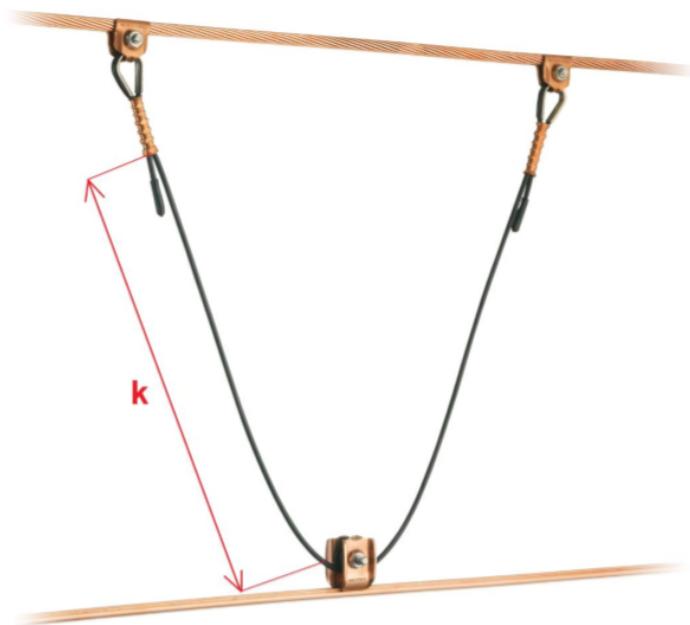
2.4.39 Dropper (REN_OT_EN-1010101057)

Component used to suspend a registration, an auxiliary catenary or a contact wire from a head-span or a longitudinal catenary wire.(IEC 60050-811-33-22/UIC R 791-2006)

可调整体吊弦（模锻）　　　　可调整体吊弦（冲压）

Property		
Name	**Description**	**Data type**
Type	Type of Dropper	Text
Working load	The load that hte dropper takes.	Real
Failure load	The max load that the dropper could undertake before break.	Real
Tensile breaking force	The tensile force that would break stitch wire.	Force
Length	Length of the Dropper	Length
Is Adjustable	To indicate whether the dropper is adjustable or not.	Boolean

Assemble discription	To describe how the system / equipment / facility is assembled.	Text
Is Current-carrying	To indicate whether the current will go through the dropper.	Boolean
Current-carrying capacity	The max current that the equipment could undertake before the temperature of which is below the nominal value.	Electric Current
Num. of OCL	To indicate the OCL where the equipment is applied.	Integer
Num. of span	To identify the span using the equipment	Integer

2.4.40 Earth (REN_OT_EN-10106074)

Part of the Earth which is in electric contact with an earth electrode and the electric potential of which is not necessarily equal to zero.(IEC 60050-195-01-03)

Property		
Name	**Description**	**Data type**
Type	Type of Earth	Label
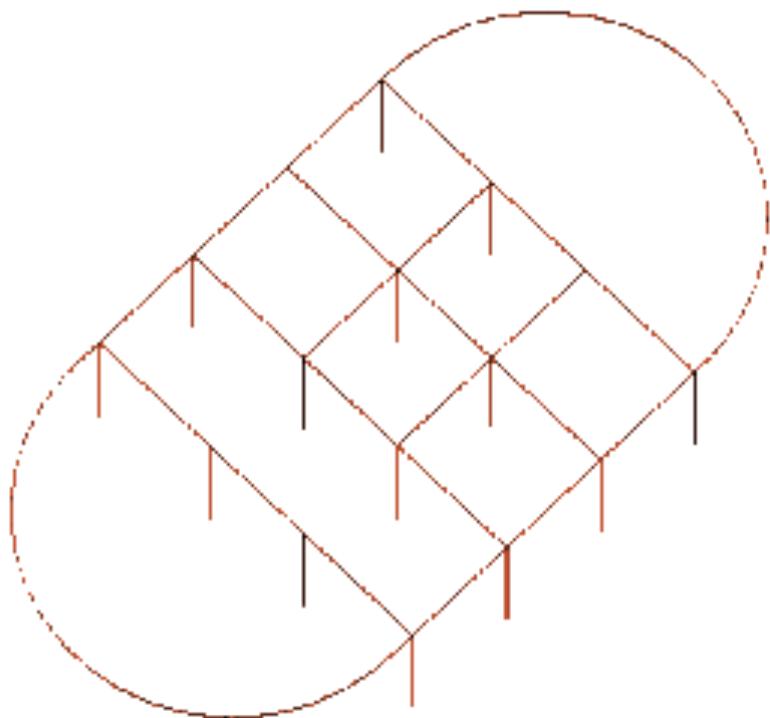
2.4.41 Earth Electrode (REN_OT_EN-10106072)

Conductive part, which may be embedded in a specific conductive medium, e.g. concrete or coke, in electric contact with the Earth.(Grounding rod)(IEC 60050-826-13-05)

Property		
Name	**Description**	**Data type**
Ground resistance	The resisrance through earth electrode to the ground.(might to another earth electrode or leave away)	Electric Resistance
Location in the room / ID of the pole	Location of the electrode set in the room / identity of the pole where the electrode is set.	Identifier

2.4.42 Earth Grid (REN_OT_EN-10106076)

Part of an earthing arrangement comprising only the earth electrodes and their interconnections.(IEC 60050-826-13-06)

Property		
Name	**Description**	**Data type**
Type	Type of Earth Grid	Label

2.4.43 Earthing circuit (REN_OT_EN-10106070)

All conductors which form the intended path for the earthing.

Property		
Name	**Description**	**Data type**
Type	Type of Earthing Circuit	Label
Protection section length	The length of the section where people are protected from the earthing-current	Length
Earth-buried conductor material	The conductive material of the equipment.	Label
Earth wire material	The material of the earth wire	Label
N. earth electrodes	Number of earth electrodes	Integer
N. earth wires	Number of earth wires	Integer
Type of connections to return current circuit	Type of connections to return current circuit from Earthing Circuit	Label
Type of return current circuits	Type of return current circuits from Earthing Circuit	Label
N. tracks	Number of the track in the railway.	Integer
Type of conductors	Type of conductors used in Earthing Circuit	Label
Type of cables	Type of cables from Earthing Circuit	Label

Earth electrodes (N.)	The number of electrode in the earthing circuit.	Integer
Earth electrodes (type)	Type of earth electrodes used.	Label
Fitting type	The fitting which could be fixed on the circuit.	Label
N. voltage limiting devices	Number of voltage limiting devices used.	Integer
Type of voltage limiting devices	Type of voltage limiting devices used in Earthing Circuit	Label
N. cross earth wires	Number of cross earth wire	Integer
Length cross earth wire	Length of cross earth wire	Length
N. insulated anchors	Number of insulated anchors	Integer
N. uninsulated anchors	Number of uninsulated anchors	Integer
Type of insulators for earth wire anchor	Type of insulators for earth wire anchor from Earthing Circuit	Label

2.4.44 Earthing conductor (REN_OT_EN-10106071)

Conductor which provides a conductive path, or part of the conductive path, between a given point in a system or in an installation or in equipment and an earth electrode.

Property		
Name	**Description**	**Data type**
Type	Type of earthing conductor	Label
Ground resistance	The resisrance through earthing conductor to the ground.	Electric Resistance

2.4.45 Earthing terminal (REN_OT_EN-10106073)

Grounding terminal provided on equipment or on a device and intended for the electric connection with the earthing arrangement.

Property		
Name	**Description**	**Data type**
Type	Type of earthing terminal	Label
Ground resistance	The resisrance through eathing terminal to the ground.	Electric Resistance

2.4.46 Electric Gutter (REN_OT_EN-10105019)

Electrical conduit used to protect and route electrical wiring in a building or structure.

Property		
Name	**Description**	**Data type**
Type	Type of Electric Gutter	Label
Lenght	The distance between the ends on a specified point.	Length
Diameter	The diameter of the outside surface.	Length
Height	The shortest distance between the ends on a specified point of measure of the material. Usually differentiated from length and width by measuring from ground or floor and travelling up.	Length

2.4.47 Electric distribution board (REN_OT_EN-1010207012)

Electric distribution board used to dispatch electric power.

Property		
Name	**Description**	**Data type**
Type	Type of the electric distribution board.	Enum_ElectricDistributionBoardType
Feeder line switch type	The type of the switch that applied in the feeder line of the distribution board.	Enum_ElectricDistributionBoardFeederLineSwitchType
Distribution line switch type	The type of the switch that applied in the distribution line of the distribution board.	Enum_ElectricDistributionBoardDistributionLineSwitchType
Nominal Power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04).	Power
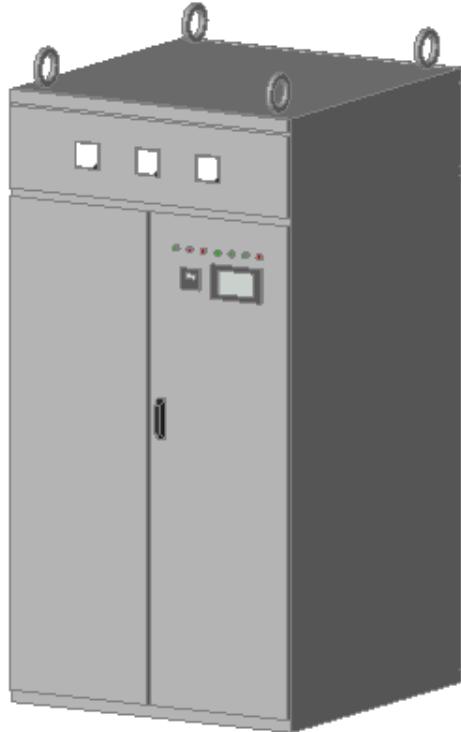
2.4.48 Electric power converter (REN_OT_EN-101020410)

an electrical or electro-mechanical device for converting electric energy from one form to another such as converting between AC and DC; or changing the voltage or frequency; or some combination of these.

Property		
Name	**Description**	**Data type**
Type	Type of ElectricPowerConverter	Enum_ElectricPowerConverter
power	Max power that the equipment could undertake.	Power
Rated voltage of AC side / Primary Rated/Nominal voltage	The voltage at AC side that the equipment could withstand.	Electric Voltage
Rated voltage of DC side / Secondary Rated/Nominal voltage	The voltage at DC side that the equipment could withstand.	Electric Voltage
Phase number	Number of phase that the equipment operates on.	Identifier
Insulated Voltage	The max voltage that the insulation would operate normally	Electric Voltage
Capacitor Type (RFI)	Type of capacitor built inside	Label
Type of cooling	Type of cooling used for ElectricPowerConverter	Label
Weight [kg]	Weight of the equipement	Mass

2.4.49 Electric storage device (REN_OT_EN-10102050)

A Device that stores electric energy.

Property		
Name	**Description**	**Data type**
Type	Type of ElectricStorageDevice.	Label
Rated capacity	The nomnal power capacity of the equipment.	Real
Rated frequency	Frequency of the AC electric power system that the Ripple Control supplied reaches its optimum operating condition	Frequency
Rated voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Insulated Voltage	The max voltage that the insulation would operate normally	Electric Voltage
Number of element	Number of elements built inside.	Integer
Capacity	Power capacity of the equipment	Electric Capacitance
Switch location / ID	The id of the switch where the equipment is applied	Identifier

2.4.50 Electrical conductor (REN_OT_EN-1010101058)

A wire or combination of wires not insulated from one another, suitable for carrying an electric current.(IEC 60050-466-01-15)

Property		
Name	**Description**	**Data type**
Type	Type of Electrical conductor	Label

Working temperature	The temperature where the conductor takes current.	ThermodynamicTemperature
Installation	The method to install the equipment.	Text
Current-carrying capacity	The max current that the equipment could undertake before the temperature of which is below the nominal value.	Electric Current
Assemble description	To describe how the system / equipment / facility is assembled.	Text
Electrical clearance distance	The distance between two conductive parts along a string stretched the shortest way between these conductive parts. (IEV ref 441-17-31)	Length
Num. of OCL	To indicate the OCL where the equipment is applied.	Identifier
Num. of span	To identify the span using the equipment	Identifier

2.4.51 Electrical connector (REN_OT_EN-101030)

Permanent and switched electrical connections are used in the overhead contact line system to provide electrical current transfer.

Property		
Name	**Description**	**Data type**
Type	Type of ElectricalConnector	Enum_ElectricalConnectorType

2.4.52 Elementary sector (REN_OT_EN-1010101025)

Smaller catenary element that can be isolated from the elements supervisors by one or more interruption devices.

Property		
Name	**Description**	**Data type**
Start mileage	Mileage of the line where the ElementarySector starts.	Length
End mileage	Mileage of the line where the ElementarySector ends.	Length
Length	Lenght of the elementary sector.	Length

2.4.53 Emergency switch off (REN_OT_EN-1010203034)

Opening operation of a switching device intended to remove electric power from an electrical installation to avert or alleviate a hazardous situation. (IEC 60050-826-17-03)

Property		
Name	**Description**	**Data type**
Type	Type of EmergencySwitchOff	Label
Rated / Nominal voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Rated / Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Rated frequency	Frequency of the AC electric power system that the Ripple Control supplied reaches its optimum operating condition	Frequency
Phase number	Number of phase that the equipment operates on.	Identifier
Number of poles	Number of poles that the equipment would affect	Integer
Breaking capacity [A]	The current a fuse, circuit breaker, or other electrical apparatus is able to interrupt without being destroyed or causing an electric arc with unacceptable duration.	Real
Transformation Ration		Real
Type of arc extinction	Type of arc extinction used in EmergencySwitchOff	Label
Function module description	To describe the module built in the equipment	Text
Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text
N. of emergency buttons	The number of emergency buttons built in the system	Integer
N. of (HC/HS) relais		Integer
N. of earth fault relais	Number of relais used for preventing earth fault	Integer
N. of (reverse) over current realis	Number of relais used for preventing over current	Integer
Switch location / ID	The id of the switch where the equipment is applied	Identifier

2.4.54 Energy conversion device (REN_OT_EN-10102040)

Electric energy converting device to change the parameter of electrical energy, such as voltage, frequency, and so on.

Property		
Name	**Description**	**Data type**
Type	Type of EnergyConversionDevice	Text

power	Max power that the equipment could undertake	Real
Rated voltage of AC side / Primary Rated/Nominal voltage	The voltage at AC side that the equipment could withstand.	Real
Rated voltage of DC side / Secondary Rated/Nominal voltage	The voltage at DC side that the equipment could withstand.	Real
Phase number	Number of phase that the equipment operates on.	Integer
Insulated Voltage	The max voltage that the insulation would operate normally	Real
Capacitor Type (RFI)	Type of capacitor built inside	Real
Type of cooling	Type of cooling used for EnergyConversionDevice	Text

2.4.55 Environnemental protection (REN_OT_EN-1010428)

Equipement and system dedicated to environment protection.

Property		
Name	**Description**	**Data type**
Type	Type of EnvironnementalProtection	Label

2.4.56 Feeder line (REN_OT_EN-1010101064)

In traction power system, overhead conductors besides overhead contact line include feeder line, reinforcing feeder, return line, positive feeder, protective wire, lightning protective wire, earth wire and so on.

Property		
Name	**Description**	**Data type**
Type	Type of Feeder Line.	Label
Length	Length of the Feeder Line	Length
Conductor type	Type of the conductor / wire used as the feeder line.	Label
Catenary tension force	The tensile force that catenary of feeder line takes.	Force
Start mileage	Mileage of the line where the Feeder Line starts	Length
End mileage	Mileage of the line where the Feeder Line ends	Length
Nominal diameter	The diameter of the outside surface of the feeder line	Length (positive, >0)
Cross sectional area	The cross-section ares of the wire core.	Area
Mass per unit length	Also known as Linear density, linear mass density or linear mass is a measure of mass per unit of length.	Mass Per Length

Physical description Reference	Physical size of the equipemnt. e.g.wigth, length, height, diameter	External Reference
Is located on mast	Indicate if the feeder line is located on mast/pole or landside.	Boolean

2.4.57 Feeder wire (REN_OT_EN-1010101065)

Electrical connection between the contact line and sub-station or the switch station.(IEC 60050-811-36-08/UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of feeder wire.	Label
Mechanical tension	Nominal value of mechanical force of contact wire.	Force
Sectional dimension	A surface or shape that is or would be exposed by making a straight cut through something, especially at right angles to an axis.	

2.4.58 Feeding section (REN_OT_EN-1010101023)

Electric section of the routed fed by individual track feeder circuit-breakers within the area supplied by one or more substation.(IEC 60050-811-36-25)

Property		
Name	**Description**	**Data type**
Length	Length of the Feeding Section.	Length
Start mileage	Mileage of the line where the Feeding Section starts.	Length
End mileage	Mileage of the line where the Feeding Section ends.	Length

2.4.59 Filters (REN_OT_EN-1010206010)

Linear two-port device designed to transmit spectral components of the input quantity according to a specified law, generally in order to pass the components in certain frequency bands and to attenuate those in other bands

(IEC - 151-13-55)

Property		
Name	**Description**	**Data type**
Type	Type of Filters	Enum_FiltersType
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
primary frequency	The nominal frequency at primary side	Frequency

Sencondary frequency	The nominal frequency at scondary side	Frequency
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio (positive, >0)
Function description	To describe the method that the equipment is used for.	Text
Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room	Label

2.4.60 Fuse disconnector (REN_OT_EN-1010203035)

a disconnector in which one or more poles have a fuse in series in a composite unit.(IEC 60050-441-14-15)

Property		
Name	**Description**	**Data type**
Type	Type of Fuse Disconnector	Label
Rated / Nominal voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Rated / Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Rated frequency	Frequency of the AC electric power system that the Ripple Control supplied reaches its optimum operating condition	Frequency
Phase number	Number of phase that the equipment operates on.	Identifier
Number of poles	Number of poles that the equipment would affect	Integer
Breaking capacity [A]	The current a fuse, circuit breaker, or other electrical apparatus is able to interrupt without being destroyed or causing an electric arc with unacceptable duration.	Real
Transformation Ration		Real
Type of arc extinction	Type of arc extinction used in Fuse Disconnector	Label
Function module description	To describe the module built in the equipment	Text
Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text
Switch location / ID	The id of the switch where the equipment is applied	Identifier

2.4.61 Ground Bus (REN_OT_EN-10106075)

Grounding grid consisting of horizontal grounding bodies.

Property		
Name	**Description**	**Data type**

Type	Type of ground bus	Label
Insulation Type	The method used to insulate	Label
Installation	The method to install the equipment.	Text
Working temparature range	The temperature range where the system could operate normally.	ThermodynamicTemperature
Altitude of the line above sea lever	Altitude of the line where the system locates.	Length
Rated Current / Nominal Current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Rated Voltage / Nominal Voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Length	Length of the Ground Bus	Length
Shape discription	To indicate the shape of the ground bus	Label

2.4.62 Ground Module (REN_OT_EN-10106077)

Grounding Composed of nonmetallic minerals with good conductivity and stability.

Property		
Name	**Description**	**Data type**
Type	Type of Ground Module	Label

2.4.63 Guard pile (REN_OT_EN-1010420)

Pile or barrier provided for mechanical protection.

Property		
Name	**Description**	**Data type**
Type	Type of Guard pile	Label

2.4.64 High voltage booster (HVB) (REN_OT_EN-1010206032)

Range extender for increasing the voltage supplied so that the spply distance could be extended.

Property		
Name	**Description**	**Data type**
Type	Type of HighVoltageBooster (HVB)	Enum_HighVoltageBoosterType
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Nominal frequency	Frequency of the AC electric power system that the HighVoltageBooster (HVB) supplied reaches its optimum operating condition	Frequency
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio (positive, >0)
Function description	To describe the method that the equipment is used for.	Text

Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room	Label

2.4.65 Human computer interaction terminal (REN_OT_EN-10102028)

Panel or interface for engineers to control the equipment.

Property		
Name	**Description**	**Data type**
Type	Type of HumanComputerInteractionTeminal	Label
Rated voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text

2.4.66 Hydraulics tensioner (REN_OT_EN-1010101062)

Automatic tensioner attached to a mast to ensure constant tension in conductors by means of Hydraulics.

Property		
Name	**Description**	**Data type**
Type	Type of Hydraulics tensioner	Label

2.4.67 Inductor (REN_OT_EN-1010205012)

Electrical appliances used in circuits or power systems due to their inductance.(IEC 60050-811-26-19)

Property		
Name	**Description**	**Data type**
Type	Type of Inductor	Enum_InductorType
Phase number	Number of phase that the equipment operates on.	Integer
Inductance	The inductance of the inductor	Inductance
Insulation class	The class of insulation.	Label
Connection	The connection of the inductor	Text
Current rate [A]	The nominal current of the inductor per unit	Electric Current

Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room.	Label

2.4.68 Instrument transformer (REN_OT_EN-101020420)

A transformer intended to transmit an information signal to measuring instruments, meters and protective or control devices.(IEC 60050-321-01-01)

Property		
Name	**Description**	**Data type**
Type	Type of Instrument Transformer	Label
PrimaryVoltage	The nominal voltage at primary side	Electric Voltage
SecondaryVoltage	The nominal voltage at primary side	Electric Voltage
PrimaryCurrent	The nominal voltage at primary side	Electric Current
SecondaryCurrent	The nominal voltage at primary side	Electric Current
PrimaryFrequency	The nominal frequency at primary side	Frequency
SecondaryFrequency	The nominal frequency at scondary side	Frequency
Apparent power	The apparent power of the equipment	Power
Accuracy grade	The grade of accuracy	Text
NominalPower / Rated Power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal Voltage / Rated Voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Nominal Current / Rated Current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Phase number	Number of phase that the equipment operates on.	Identifier
Accuracy class	The class of accuracy	Real

2.4.69 Insulated cables (REN_OT_EN-10103014)
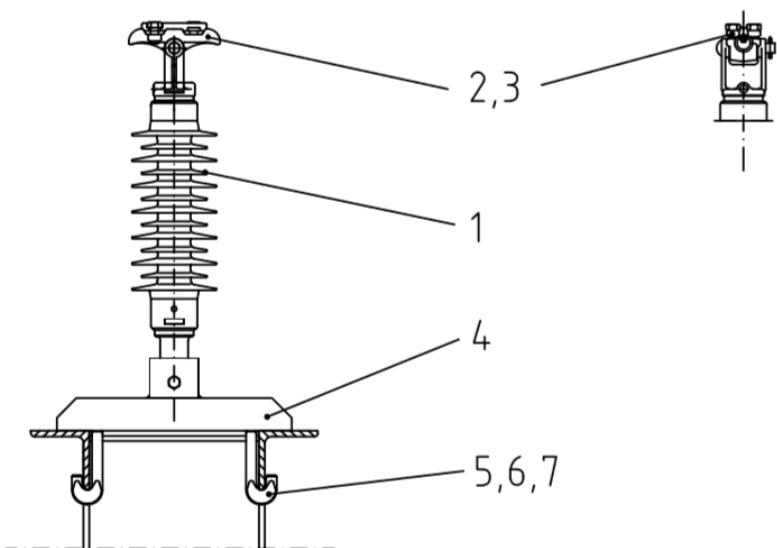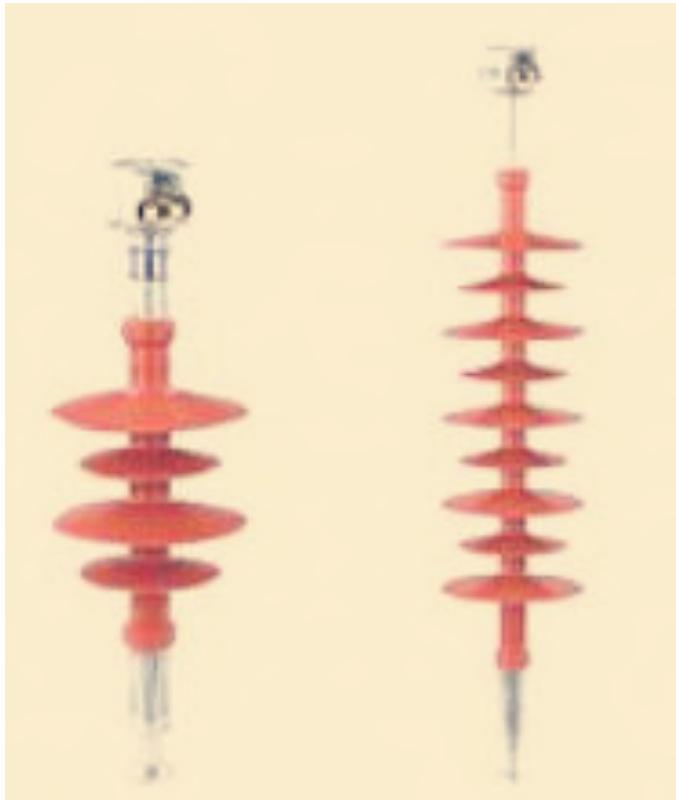
Common insulated cable
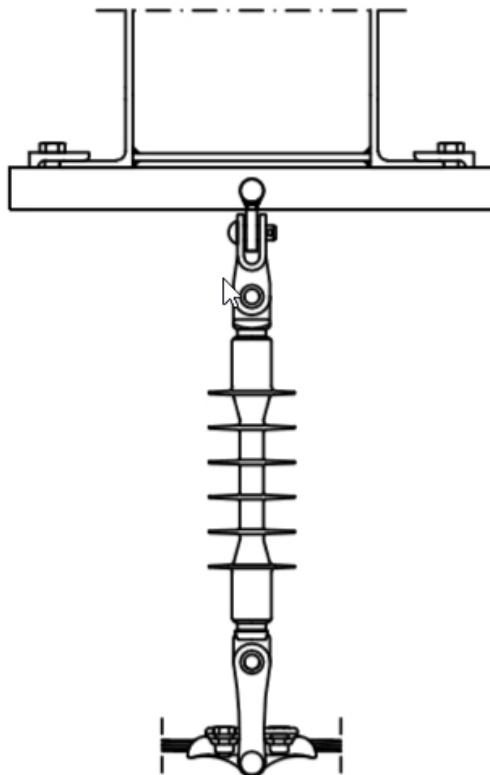
Property		
Name	**Description**	**Data type**
Type	e.g. it can be IFC code or just the user define "1, 2, 3…"	Enum_SwitchingPostType

2.4.70 Insulator (REN_OT_EN-1010101083)

Device intended for electrical insulation and mechanical fixing of equipment or conductors which are subject to electric potential differences.(IEC 60050-471-01-10)

Property

Name	Description	Data type
Insulation Type	The method used to insulate	
Installation	The method to install the equipment.	Text
Working temparature range	The temperature range where the system could operate normally.	ThermodynamicTemperature
Altitude of the line above sea lever	Altitude of the line where the system locates.	Length
Insulated Voltage	The max voltage that the insulation would operate normally	Electric Voltage
Rated Current / Nominal Current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Rated Voltage / Nominal Voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Creepage distance	Shortest distance or the sum of the shortest distances along the surface on an insulator between two conductive parts which normally have the operating voltage between them. (IEV ref 471-01-04)	Length
Lightning impulse withstand voltage(peak)	The peak of lightning impulse that the insulator could withstand.	Electric Voltage
Power frequency withstand voltage	Rms value of sinusoidal power frequency voltage that the insulation of the given equipment can	Electric Voltage

	withstand during tests made under specified conditions and for a specified duration. (IEV ref 614-03-22）	
Fouling resistance voltage	The max voltage that pollution flashover would not happen	Electric Voltage
Mechanical bending strength	The bending force that the indulator could withstand.	Force
Mechanical tensile strength	Measurement of the ability of the insulator to withstand breakage apart under applied force.	Force
Type	Type of insulator	Enum_InsulatorType
Mileage	Mileage of the line where the Insulator locates.	Length

2.4.71 Interlocking device (REN_OT_EN-10102029)

A device which makes the operation of a switching device dependent upon the position or operation of one or more other pieces of equipment. (IEC 60050-441-16-49)

Equipement for interdependent liaison between the control levers or the electric control circuits of different apparatus such as points and signals, which makes it impossible to place them in positions which are unsafe.

Property		
Name	**Description**	**Data type**
Type	Type of InterlockingDevice	Label
Rated voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text

2.4.72 Level crossing protection (REN_OT_EN-1010423)

Equipement dedicated to level crossing protection.

Property		
Name	**Description**	**Data type**

| Type | Type of Level crossing protection | Label |

2.4.73 Lightning arrester (REN_OT_EN-1010415)
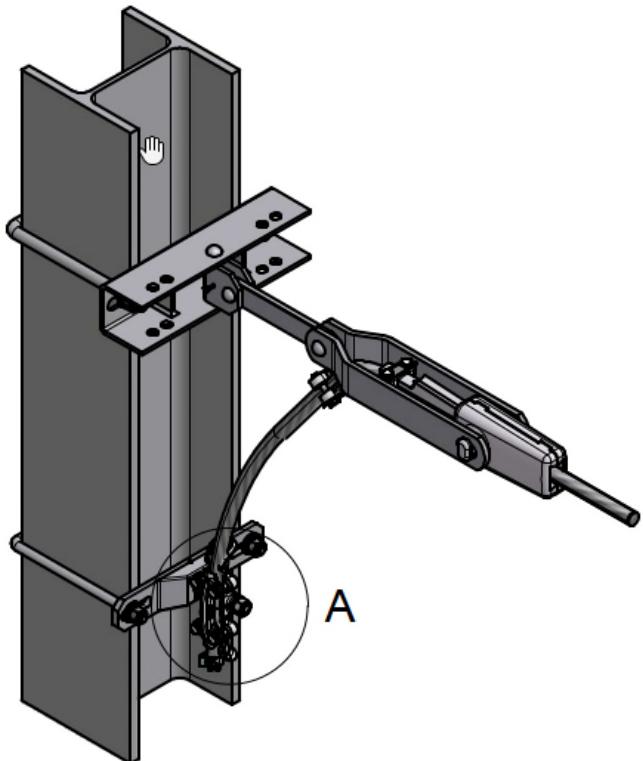
Surge arrestor: Device intended to protect the electrical apparatus from high transient overvoltage and to limit the duration and amplitude of the follow-on current.(UIC R 791-2006)
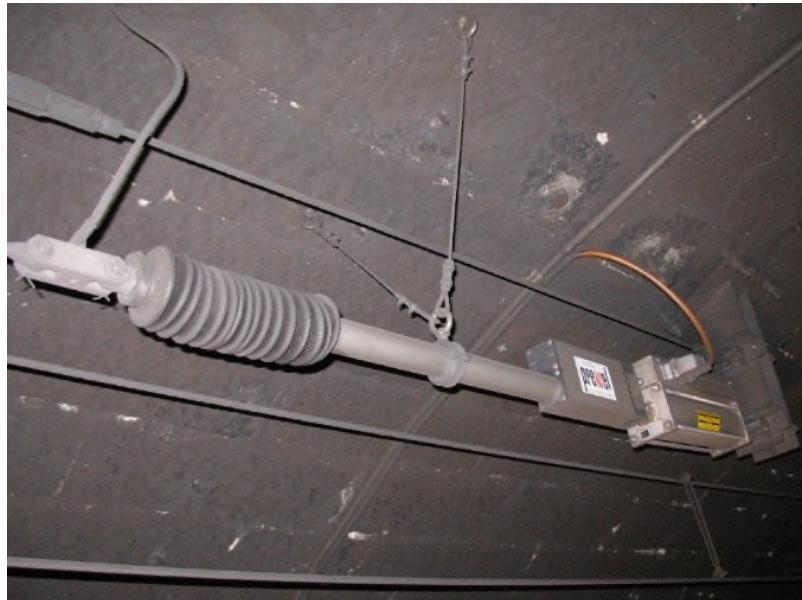
Property		
Name	**Description**	**Data type**
Type	Type of Lightning arrester	Enum_LightingArresterType
Lightning protection distance	The safe distance from the arrester.	Length
Installation height	The height of the top point of the arrester.	Length

2.4.74 Mooring system (REN_OT_EN-1010101085)

Mooring equipement for overheadline.
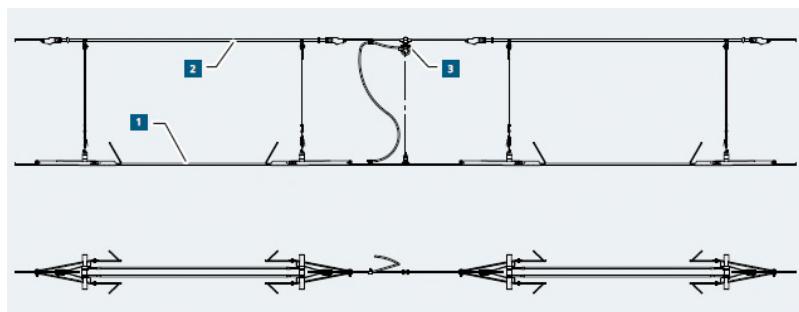
Property		
Name	**Description**	**Data type**

2.4.75 Natural section insulator (REN_OT_EN-1010101072)

Neutral sections are required as phase separations with a neutral gap, when individual feeder sections are connected to different phases of the national electricity supply grid.

Property		
Name	**Description**	**Data type**
Type	Type of Natural Section Insulator	Label

Rated voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Highest operating voltage	The max voltage that the insulator could operate normally.	Electric Voltage
Minimum leakage distance	The min electric current in an unwanted conductive path under normal operating conditions.	Electric Current
Minimum air gap distance		Length
Resistance	The resistance under AC	Electric Resistance
Fouling resistance voltage	The max voltage that pollution flashover would not happen	Electric Voltage
Maximum deflection	Max delection that the insulator could undertake.	Real
Minimum tensile load	The min tensile force that would break the insulator.	Force
Is arc suppression	To indicate whether the natural section insulator has the ability to suppress the arc.	Boolean
Number of wires	The quantity of wires used in the section insulator.	Integer
Number of insulators	The quantity of insulators used in the section insulator.	Integer
Type of insulator	Type of insulator used in/as Natural Section Insulator	Label
Speed up to [km/h]		Linear Velocity
Mileage	Mileage of the line where the Natural Section Insulator locates	Length

2.4.76 Neutral section (REN_OT_EN-1010101022)

Section of a contact line provided with a sectioning at each end to prevent successive electrical sections differing in voltage, phase or frequency being connected together by the passege of current collectors. A length of electrically isolated or non-conducting material incorporated into the contact wire to completely separate electrical sections of OLE. It may take the form of a short insertion in the contact wire or that of an extended overlap.(IEC 60050-811-36-16)

Property		
Name	**Description**	**Data type**
Length	Length of the Neutral Section.	Length
Number of span	Number of span included in the neutral section.	Integer
Start mileage	Mileage of the line where the neutral section start.	Length
End mileage	Mileage of the line where the neutral section end.	Length

2.4.77 Non insulated conductor (REN_OT_EN-10103010)

a wire or combination of wires not insulated from one another, suitable for carrying an electric current.(IEC 60050-466-01-15)

Property		
Name	**Description**	**Data type**
Type	Type of NonInsulatedConductor	Enum_NonInsulatedConductorType
Function description	To describe the method that the equipment is used for.	Text
Installation requirements	Installation requirements that need to be specifically noted in accordance with specifications or standards. For the reason that there is different installation requirements when the device is in different lots, such as subgrade, bridge, tunnel.	Text
The number of cores	Core number of the conductor. (normally for wire)	Integer
Sheathed type	To describe the method / technical parameter of the sheath of the conductor.	Enum_NonInsulatedConductorSheathedType
Rated Current / Nominal Current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Rated voltage / Nominal Voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Insulating Sheath material designation	The material of the insulating sheath of the conductor	Label
Installation position	To indicate where the conductor is installed.	Label
external diameter	The diameter of the external surface of the conductor.	Length
mass per unit length	Also known as Linear density, linear mass density or linear mass is a measure of mass per unit of length.	Mass Per Length
length	Length of the NonInsulatedConductor	Length

2.4.78 OCS Suspension (REN_OT_EN-1010101039)

The group which used to support directly contactline, feeder or earthwire, contains all the parts installed between supports and conductors(including insulators).

Property		
Name	**Description**	**Data type**
Type	Type of OCS suspension.	Label
Mileage	Mileage of the line where the OCS suspension locates.	Length
Track number	Track number of railway.	Identifier
Contact wire height	Distance from the top of the rail to the lower face of the contact wire, measured perpendicular to the track.	Length

Stagger	Lateral displacement of the contact wire to opposite sides of the track centre at successive supports. (IEV ref 811-33-21)	Real

2.4.79 OCS fastening (REN_OT_EN-1010101086-1)

Fastening device that mechanically joins or affixes two or more objects together for OCS equipement.

Property		
Name	**Description**	**Data type**
Type	Type of OCSFastening	Label
Mechanical parameters	The mechanical performance of the equipment.	
Electrical parameters	The electrical performance of the equipment.	
Manufacturing technology	The method / technology used to produce the equipment.	

2.4.80 OCS fitting (REN_OT_EN-1010101073)

Clamps and fittings provide the mechanical and structural connection of components and provide electrical connections in contact line systems and within cross-span structures.They have to withstand both operating currents and short-circuit current loadsin the energised part of the overhead contact line system.In addition to the mechanical stresses,short-circuit current loads occur in the passive part of the overhead contact line system,at rigid and flexible terminations and also in cross-span equipment.

Property		
Name	**Description**	**Data type**
Type	Type of OCS Fitting.	Label
Mechanical parameters	The mechanical performance of the equipment.	Text
Electrical parameters	The electrical performance of the equipment.	Text
Anti-corrosion type	The method to prevent corrosion.	Label
Manufacturing technology	The method / technology used to produce the equipment.	Text
Installation location	The mileage where the equipment / system / facility starts	Length

2.4.81 OCS foundation (REN_OT_EN-1010101031)

Construction, usually of concrete or steel, completely or partly buried in the ground on which the support is mounted. The foundation must provide stability to all loads borne by the support.(UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of OCSFoundation.	Enum_OCSFoundationType
Elevation value	Can refer to either the relative distance above sea level or above ground level.	Length
Bearing capacity	The load (kN) that the foundation could withstand.	Force
Is reinforcement	To indicate whether the OCS foundation is reinforced or not.	Boolean
Distance to track centre	Distance from centre of foundation to track centre.	Length
Mileage	Mileage of the line where the OCSFoundation locates.	Length
Side of line	To indicate which side of the railway line the system/equipment/facility locates.	Label

2.4.82 OCS supporting elements (REN_OT_EN-1010101032)

Parts which support the conductors and the associated insulators of an OCL.(UIC R 791-2006/IEC 60050-811-33-19)

Property		
Name	**Description**	**Data type**
Type	Type of OCS supporting elements.	Label
Load bearing capacity	The capacity of soil to support the loads applied to the ground.	Force
Distance to track center	Distance from side of pole to track centre.	Length

2.4.83 OCS supporting system (REN_OT_EN-1010101030)

Include foundation, supporting elements and suspension.

Property		
Name	**Description**	**Data type**
Type of supporting system	Type of foundatin in the OCS supporting system.	PENum_SupportingSystemType

Number of cantilever	Indicate the number of cantilever in the OCS supporting system.	Integer
Number of tracks	Number of track associated to the supporting system.	Label

2.4.84 Oil retention tray (REN_OT_EN-1010429)

Retention tray for environnemental protection against oil.

Property		
Name	**Description**	**Data type**
Type	Type of OilRetention Tray	Label
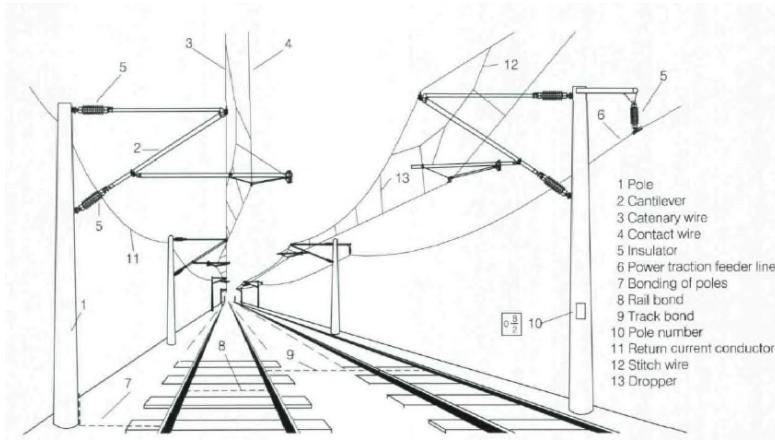
2.4.85 Overhead contact line (REN_OT_EN-1010101051)

Contact line placed above the upper limit of the vehicle gauge and supplying vehicles with electrical energy through pantographs.(UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of overhead contact line.	Label
Tension length	Length of overhead contact line between two teminating points.	Length
stagger	Lateral displacement of the contact wire to opposite sides of the track centre at successive supports. Note 1 to entry:Stagger avoids localized wear of pantogragh cotact strips.	
Contact wire height	Distance from the top of the rail to the lower face of the contact wire, measured perpendicular to the track.	Length
System height	Vertical distance between the main catenary wire and the contact wire measured at a support point.	Length
Range of contact pressure	The range of pressure force between pantograph and contact line.(min and max)	Force
Contact wire uplift	Vertical upward movement of the contact wire due to the force produced from the pantograph.	
Gradient min	The minimum slope or a degree of slope in a railway.	Ratio
Gradient max	The maximum slope or a degree of slope in a railway.	Ratio
Electrical clearance	The recommended air clearances (static/dynamic) between earth and the live parts of the overhead contact line system.	
Contact wire tension force	The tensile force that contact wire takes.	Force

2.4.86 Overhead contact line system (REN_OT_EN-10101010)

Contact line above the upper limit of the train using an overhead contact line to supply current for use by traction units.

1 Pole
2 Cantilever
3 Catenary wire
4 Contact wire
5 Insulator
6 Power traction feeder line
7 Bonding of poles
8 Rail bond
9 Track bond
10 Pole number
11 Return current conductor
12 Stitch wire
13 Dropper

Property		
Name	**Description**	**Data type**
Type of OCS	Indicate the type of OCS.	Enum_OverheadContactLineType
Pantograph type	Indicate the type of pantograph.	Label
Contact wire type	Indicate the type of contact wire used in the overhead contact line system.	Label
Contact wire tension force	The tensile force that contact wire takes.	Force
Catenary wire type	Indicate the type of Catenary wire.	Label
Catenary wire tension force	The tensile force that catenary wire takes.	Force
Stitch wire provided	Indicate whether the stitch wire is used in the overhead contact line system or not.	Boolean
Stitch wire provided tension force	The tensile force that stitch wire takes.	Force
Stitch wire provided length	The length of stitch wire.	Length (positive, >0)
Dropper type	Indicate the type of dropper.	Enum_DropperType
Tension length	Length of overhead contact line between two teminating points.	Length
Span length	The length of span in overhead contact line system.	Length
Number of overlapping spans	Number of overlapping spans in overhead contact line system.	Integer
Stagger	Lateral displacement of the contact wire to opposite sides of the track centre at successive supports. Note 1 to entry:Stagger avoids localized wear of pantogragh cotact strips.	Real
Contact wire height	Distance from the top of the rail to the lower face of the contact wire, measured perpendicular to the track.	Length
System height	Vertical distance between the main catenary wire and the contact wire measured at a support point.	Length
Pole gauge(standard/minimum)	Distance from track side of pole to track centre.	Length
Contact pressure(min/max)	The pressure between pantograph and contact line.	Electric Voltage

Contact wire uplift	Vertical upward movement of the contact wire due to the force produced from the pantograph.	Length
Gradient min	The minimum slope or a degree of slope in a railway.	Ratio
Gradient max	The maximum slope or a degree of slope in a railway.	Ratio
Electrical clearance(static/dynamic)	The recommended air clearances between earth and the live parts of the overhead contact line system	Real
Running speed	Linear speed of the vehicle (IEV ref 811-13-02).	Linear Velocity
Position of the line(e-exclusively, i-inclusively)	A-town(i) - B-town(e).	Label
Start mileage	Mileage of the line where the railway starts.	Length
End mileage	Mileage of the line where the railway ends.	Length
Line grade	Level/grade of the railway. (e.g. high speed)	Label
Line length	Length of the railway.	Length
Number of tracks	Track number of railway.	Label
Minimum track curve radio	The minimum radius of curve within a section of or whole railway line.	Length (positive, >0)

2.4.87 Overhead line (REN_OT_EN-101014)

An electric line whose conductors are supported above ground, generally by means of insulators and appropriate supports.(IEC 60050-466-01-02)

Note – Certain overhead lines may also be constructed with insulated conductors.

Property		
Name	**Description**	**Data type**
Type		Label

2.4.88 Pole (REN_OT_EN-1010101034)

Vertical support in solid wood, concrete or steel, or of steel lattice construction, with one end planted in the ground at the side of the track, either directly or through a separate base or foundation(IEC 60050-811-33-20)

A main vertical support construction with one end embedded in the ground adjacent to the track,tensioning and registion of the OCL.(UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type of pole	Type of pole.	Enum_PoleType
Heigh	Indicate the height of pole.	Length
Conicity	The ratio of the diameter of the bottom surface of the cone to the height of the pole.	Ratio
Weight	The force on the object due to gravity.	Mass
Load bearing capacity	The capacity of soil to support the loads applied to the ground.	Force
Bending	The behavior of a structural element subjected to a lateral load(vertical/horizontal).	Force
Torsion	The torque perpendicular to the axis of the pole that the pole could withstand.	Force

2.4.89 Power control system (REN_OT_EN-10102010)

Control the entire network and manage protection control and auxiliaries services of traction power system.

Property		
Name	**Description**	**Data type**
Type	Type of PowerControlSystem	Label
Assembly description	To describe how the system / equipment / facility is assembled.	Text
equipments ID undercontrol	The identity of the equipement controlled by the power control system	Identifier
Location in control center	The location of the power control system in control center	Real

Nominal voltage	The optimum voltage for the electrical appliance to a long work.	IfcElectricVoltageMeasure.VOLT

2.4.90 Power supply system (REN_OT_EN-101020)

To supply electric traction system from high voltage.

Property		
Name	**Description**	**Data type**
Type	Type of power supply system.	Enum_TractionPostType

2.4.91 Power transformer (REN_OT_EN-101020430)

A static piece of apparatus with two or more windings which, by electromagnetic induction, transforms a system of alternating voltage and current into another system of voltage and current usually of different values and at the same frequency for the purpose of transmitting electrical power (IEC 60050-811-26-01)

Property		
Name	**Description**	**Data type**
Type	Type of Power Transformer	Label
Primary voltage	The nominal voltage at primary side	Electric Voltage
Secondary voltage	The nominal voltage at scondary side	Electric Voltage
Primary current	The nominal current at primary side	Electric Current
Secondary current	The nominal current at scondary side	Electric Current
Primary frequency	The nominal frequency at primary side	Frequency
Secondary frequency	The nominal frequency at primary side	Frequency
Apparent power	The apparent power of the equipment	Power
Phase number	Number of phase that the equipment operates on.	Identifier
Connection type	Type of the connection	Label
Load loss	The load loss produced	Ratio
Short circuit voltage	The voltage when the transformer is under short circuit	Electric Voltage
No-load loss	The active power absorbed when a given voltage at rated frequency is applied to the terminals of one of the windings, the other winding(s) being open-circuited	Ratio
Insulated Voltage	The max voltage that the insulation would operate normally	Electric Voltage
Primary Power	The nominal power at primary side	Power
Secondary Power	The nominal power at secondary side	Power
Number of primary winding	The number of winding at the primary side	Integer

Number of secondary winding	The number of winding at the secondary side	Integer
Type of cooling	Type of cooling used for Power Transformer	Label
Number of voltage ratio		Electric Voltage
Insulation value	The insulation value of the power transformer	Real
Total weight [kg]	Weight of the equipement	Mass
Oil weight [kg]	The oil weight of the transformer	Mass
Removable part weight [kg]	The weight of additional part of the transformer	Mass
Fire risk	The fire risk of the transformer	Text
Noise measurements	To indicate the noise level of the tranformer.	Sound Power Level
Fire prevention document date	The valid date for the document.	Date
Number of primary winding		Integer
Number of secondary winding		Integer

2.4.92 Profile gate (REN_OT_EN-1010419)

Profile gate.

Property		
Name	**Description**	**Data type**
Type	Type of Profile gate	Label

2.4.93 Protection element (REN_OT_EN-101040)

Protection against electric shock for people and equipments.

Property		
Name	**Description**	**Data type**

2.4.94 Protective barrier (REN_OT_EN-1010421)

Part providing protection against direct contact from any usual direction of access.(IEC 60050-195-06-15)

Property		
Name	**Description**	**Data type**
Type	Type of Protective barrier	Label

2.4.95 Protective boarding (REN_OT_EN-1010424)

Non-conducting barrier to protect persons from coming into direct contact with the live conductor rail.

Property		
Name	**Description**	**Data type**
Type	Type of Protective boarding	Label

2.4.96 Protective canope (REN_OT_EN-1010422)

Conductive screen used to separate an electric circuit and/or conductors from hazardous-live-parts.

Property		
Name	**Description**	**Data type**
Type	Type of Protective canope	Label

2.4.97 Protective obstacle (REN_OT_EN-1010425)

Part preventing unintentional direct contact, but not preventing direct contact by deliberate action.(IEC 60050-195-06-16)

Property		
Name	**Description**	**Data type**
Type		Label

2.4.98 Rail joint bond (REN_OT_EN-10106050)

Conductor ensuring the electrical continuity of rails at a joint.(UIC R 791-2006/IEC 60050-811-35-07)

Property		
Name	**Description**	**Data type**
Type	Type of Rail joint bond	Text

2.4.99 Regulating devices (REN_OT_EN-10102060)

A device that is used to reguate electric energy.

Property		
Name	**Description**	**Data type**
Type	Type of RegulatingDevices	Enum_RegulatingDeviceType
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio (positive, >0)
Function description	To describe the method that the equipment is used for.	Text
Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room	Label

2.4.100 Return busbar (REN_OT_EN-10106060)

Busbar in return current circuit.

Property		
Name	**Description**	**Data type**
Type	Type of ReturnBusbar	Text

2.4.101   Return cable (REN_OT_EN-10106030)

Insulated return conductor forming part of the return circuit and connecting the rest of the return circuit of the sub-station.(UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of Return cable	Label
Number of cores	The number of cores in cable.	Integer
Overall diameter	The overall diameter of a cable.	
Rated voltage	The voltage that a device is designed to handle.	Electric Voltage
Rated temperature	The range of allowed temerature that a device is certified to handle. The upper bound of this value is the maximum.	ThermodynamicTemperature
Screen diameter	The diameter of the screen around a cable or bus segment (if present).	Length
Has protective earth	Indicates whether the electrical device has a protective earth connection (=TRUE) or not (= FALSE).	Boolean
Maximum operating temperature	The maximum short circuit temperature at which a cable or bus is certified to operate.	ThermodynamicTemperature
Maximum short circuit temperature	The maximum temperature at which a cable or bus is certified to operate.	ThermodynamicTemperature
Halogen proof	Produces small amount of smoke and irritating Deaerator/Gas.	Boolean
Function reliable	Cable maintain given properties/functions over a given (tested) time and conditions. According to IEC standard.	Boolean

2.4.102   Return circuit (REN_OT_EN-10106010)

The electric circuit comprising the running rails or a return current rail, their electrical connections and the return cables to the sub-station.(UIC R 791-2006)

All conductors which form the intended path for the traction return current and the current under fault conditions

Note 1 to entry: The conductors can be for example:

-running rails;

-return conductor rails;

-return conductors;

-return cables.(IEC 60050-811-35-01)

Property		
Name	**Description**	**Data type**
Type	Type of Return circuit	Label

Number of conductors	Denotes the number of grounded connectors in a circuit.	Integer
Wire Type	Denotes the function or material of the wire.	Label
Wire Size	Designator that denotes the size of the diameter of the wire; not the length.	Label

2.4.103   Return conductor (REN_OT_EN-10106020)
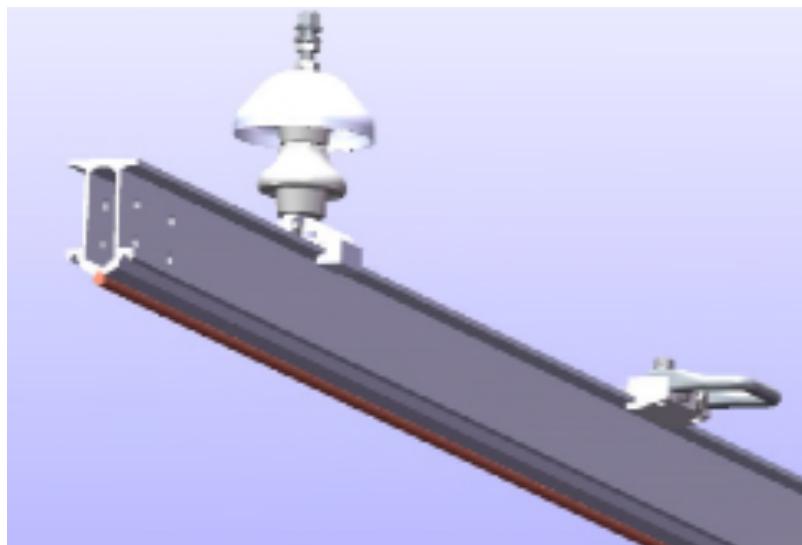
Conductor paralleling the track return and connected to the running rails at periodic intercals.(IEC 60050-811-35-13)

Property		
Name	**Description**	**Data type**
Type	Type of Return conductor	Label
Cross sectional	Cross section area of conductor.	Area
Shape	Indication of the shape of the conductor.	Label
Function	Type of function for which the conductor is intended.	Label

2.4.104   Rigid support (REN_OT_EN-1010101043)

Method of attaching an overhead contact line rigidly to its supports.(IEC 60050-811-33-32/UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of rigid support.	Label
Stagger	Lateral displacement of the contact wire to opposite sides of the track centre at successive supports. Note 1 to entry:Stagger avoids localized wear of pantogragh cotact strips.	Real
Assemble description	To describe how the system/equipment/facility is assembled.	Text
Distance to track centre	Distance from the equipment to track centre.	Length
Mileage	Mileage of the line where the rigid support locates.	Length
Side of line	To indicate which side of the railway line the system/equipment/facility locates.	Label
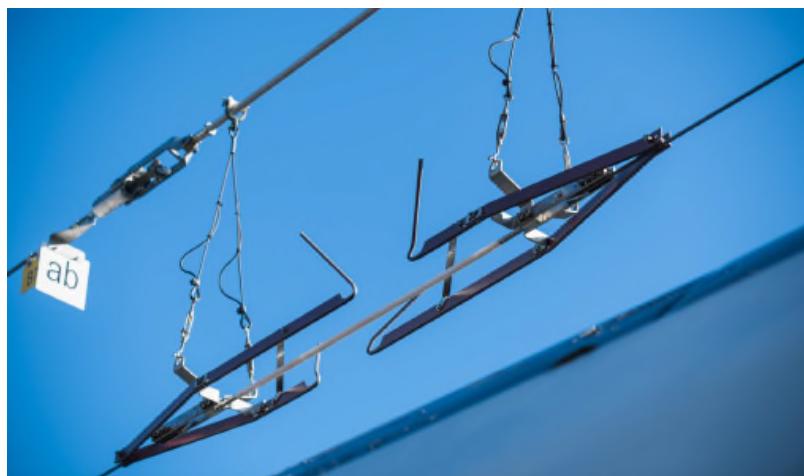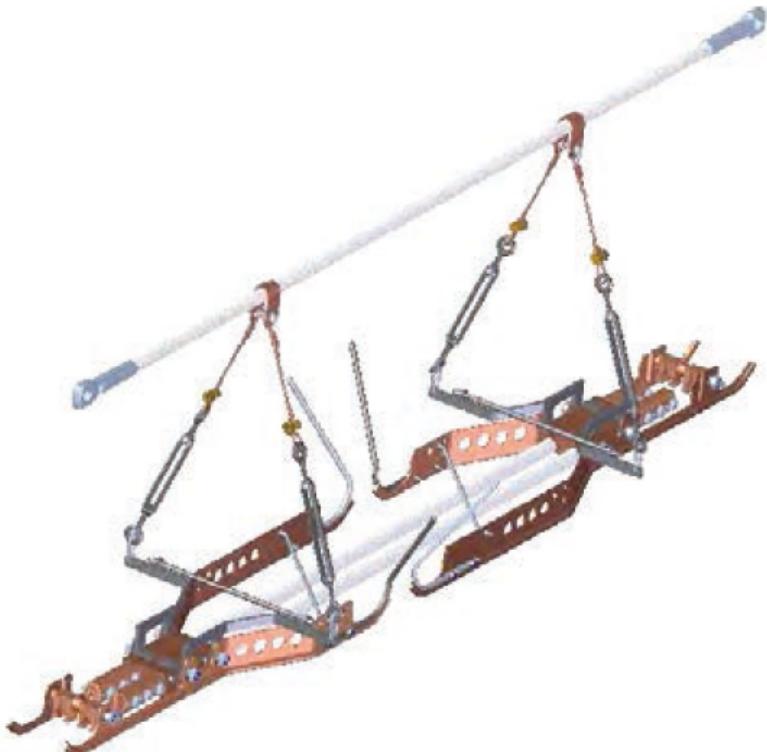
2.4.105 Ripple control (REN_OT_EN-1010206020)

The remote control of a switch by electrical impulses.

Property		
Name	**Description**	**Data type**
Type	Type of Ripple Control	Enum_RippleControlType
Function module description	To describe the module built in the equipment.	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Nominal frequency	Frequency of the AC electric power system that the Ripple Control supplied reaches its optimum operating condition	Frequency
Control pulse current	The current of the control pulse for controlling the ripple control	Electric Current
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio (positive, >0)
Function description	To describe the method that the equipment is used for.	Text
Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room	Label

2.4.106 Section insulator (REN_OT_EN-1010101071)

Sectioning point formed by insulators inserted in a continuous run of a contact line, with skids or similar devices to maintain continuous electrical contact with the current collector.(IEC 60050-811-36-15)

Property		
Name	**Description**	**Data type**
Type	Type of Section insulator	Label
Rated voltage	The optimum voltage at which electrical appliances operate for long periods of time.	Electric Voltage
Highest operating voltage	The max voltage that the insulator could operate normally.	Electric Voltage
Minimum leakage distance	The min electric current in an unwanted conductive path under normal operating conditions.	Length
Minimum air gap distance	The minimum distance which ensure air insulation.	Length
Resistance	The resistance under AC	Electric Resistance

Fouling resistance voltage	The max voltage that pollution flashover would not happen	Electric Voltage
Maximum deflection	Max delection that the insulator could undertake.	Real
Minimum tensile load	The min tensile force that would break the insulator.	Real
Is arc suppression	To indicate whether the section insulator has the ability to suppress the arc.	Boolean
N. wires	The quantity of wires used in the section insulator.	Integer
N. insulators	The quantity of insulators used in the section insulator.	Integer
Type of insulator	Type of insulator used in/as Section insulator	Label
Speed up to [km/h]		Linear Velocity
Mileage	Mileage of the line where the Section insulator locates	Length

2.4.107 Sectioning device (REN_OT_EN-1010101070)

The division of the contact line into electrical sections, each of which may be isolated from the adjacent sections e.g. by means of a switch.(UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of Sectioning device	Label

2.4.108 Sector (REN_OT_EN-1010101026)

A section of supply zone which can be energized by closing a feeder circuit breaker at the substation.

Property		
Name	**Description**	**Data type**
Start mileage	Mileage of the line where the Sector starts.	Length
End mileage	Mileage of the line where the Sector ends.	Length

2.4.109 Sign and signal (REN_OT_EN-10105015)

Authorised sign that conveys, to vehicular and pedestrian traffic, a prohibition, restriction, requirement or warning, or information.

Property		
Name	**Description**	**Data type**
Type	Type of Sign and signal	Enum_SignAndSignalType

2.4.110 Solid conductor (REN_OT_EN-10103014-1)

A conductor consisting of a single wire.(IEC 60050-466-10-01)
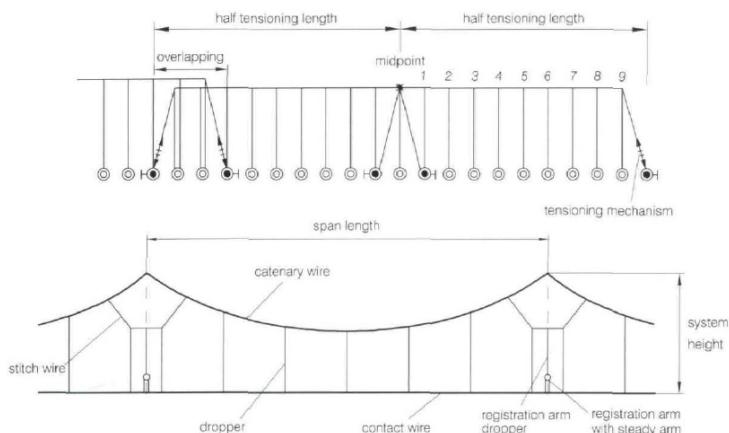
Property		
Name	**Description**	**Data type**
Type	Type of Solid conductor	Enum_SolidConductorType

Tensile strength	Measurement of the ability of the conductor to withstand breakage apart under applied force.	Force
Elongation percentage	Measurement of the lengthening ability of the conductor under stress.	Ratio
Breaking load	The force that would break the conductor	Force
Coefficient of linear expansion	Measurement of the amount of growth the conductor experiences.	Ratio
Young's modulus	Tensile modulus of the wire.	Ratio
DC resistance	The resistance under direct current and 20 centigrade.	Electric Resistance
Resistance	The resistance under alternating current.	Electric Resistance
Current-carrying capacity	The max current that the equipment could undertake before the temperature of which is below the nominal value.	Electric Current

2.4.111 Span (REN_OT_EN-1010101020)

1.Overhead contact line from one support or suspension point to the next.(IEC 60050-811-33-40)<OCL>

2.The part of a line between two consecutive points of support of a conductor.(IEC 60050-466-03-01)<OHL>

Property		
Name	**Description**	**Data type**
Span length	The length of span.	Length
Sag	The vertical distance between the wire and virtual line connecting cantilever at each end of the span.	Length
Max sag value	The maximum vertical distance between the wire and virtual line connecting cantilever at each end of the span.	Length

Encumbrance	Distance between catenary wire and the contact wire	Length
Contact wire heigh	Heigh of the contact wire at the suspension	Length
Min heigh contact wire	Min heigh of contact wire.	Length
Max span length	Max length of span.	Length
Min span length	Min length of span.	Length
Upstream span length	Length of span locates at the upstream side of railway line.	Length
Downstream span length	Length of span locates at the downstream side of railway line.	Length
Contact wire slope	An angle formed by the slope of contact wire.	Real
Upslope gradient	An increase inclined part of the railway; a slope.	Real
Downslope gradient	An decrease inclined part of the railway; a slope.	Real
Suspension heigh gradient	An inclined part of overhead line suspension in the railway; a slope.	Real
Type	Type of span	Enum_SpanType
Start mileage	Mileage of the line where the Span starts.	Length
End mileage	Mileage of the line where the Span end.	Length
Start pole number	Start pole number identifier	
End pole number	End pole number identifier	

2.4.112   Spark gap (REN_OT_EN-1010412)

Device used to connect a circuit to earth in the event of a fault in live circuits.(UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of Spark gap	Enum_SparkGapType
Breakdown voltage tolerance	Nominal value of the tolerance of the dc breakdown voltage of a spark gap.	Electric Voltage
Capacitance	Maximum value of the capacitance between the electrodes of a spark gap at specified frequency and temperature.	Electric Capacitance
Insulation resistance	Minimum resistance between one terminal or several terminals connected together and the case or enclosure of a component at specified voltage	Electric Resistance
Power dissipation	Permissible power which may be dissipated continuously, at specified conditions.	Power
Current rms	Maximum rms current of an electric-electronic or electromechanical component at specified ambient temperature.	Electric Current

2.4.113   Spring tensioner (REN_OT_EN-1010101061)

Automatic tensioner attached to a mast to ensure constant tension in conductors or in cross-span registration cables by means of springs.(UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of Spring tensioner	Label
Rated tension	The tension force that the tensioning equipment under normal work.	Force
Working range(stroke)	The working range of the tensioning equipment under normal work.	
Weight	The force on the object due to gravity.	Force

2.4.114 Start and stop equipment (REN_OT_EN-1010203033)
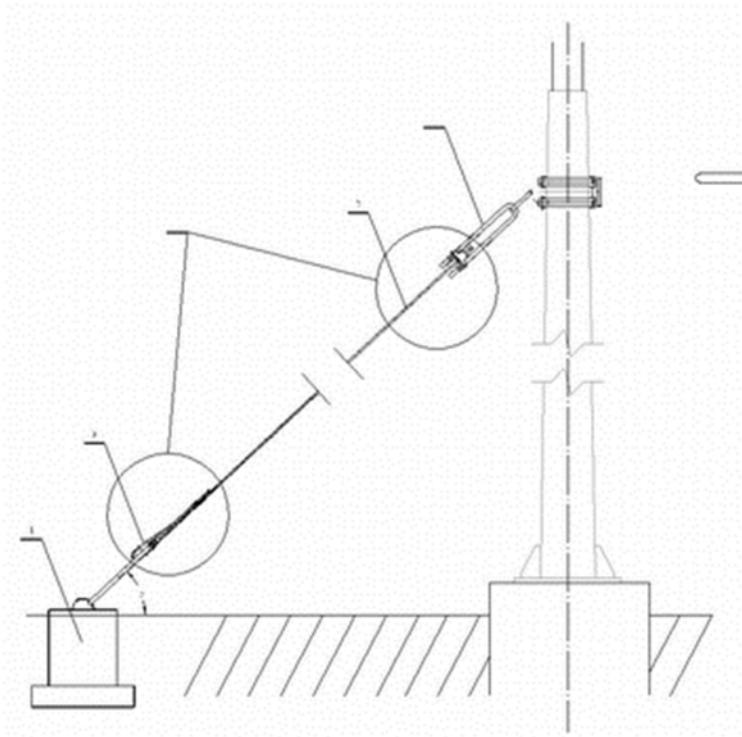
Switch for alternatively closing and opening one or more electric circuits.(IEC 60050-151-12-23)
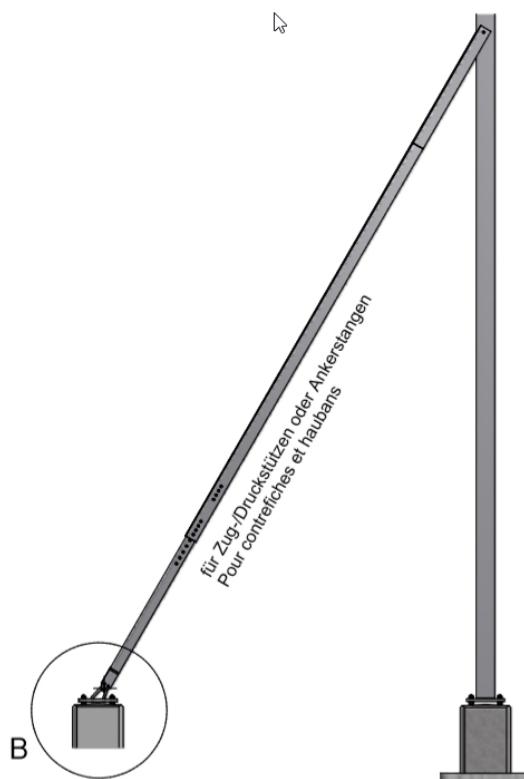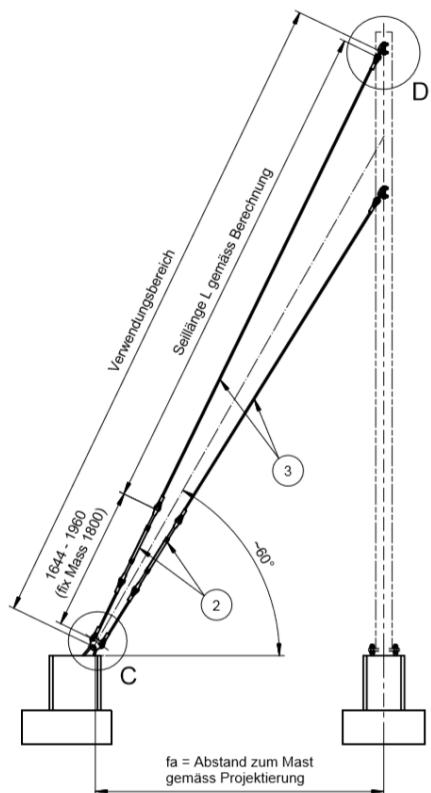
Property		
Name	**Description**	**Data type**
Type	Type of StartAndStop Equipment	Label
Function description	To describe the method that the equipment is used for.	Text
Button number	Number of button used in the equipement panel.	Integer
Equipment location / ID	The id of the equipment / facility where the equipment is applied.	Identifier
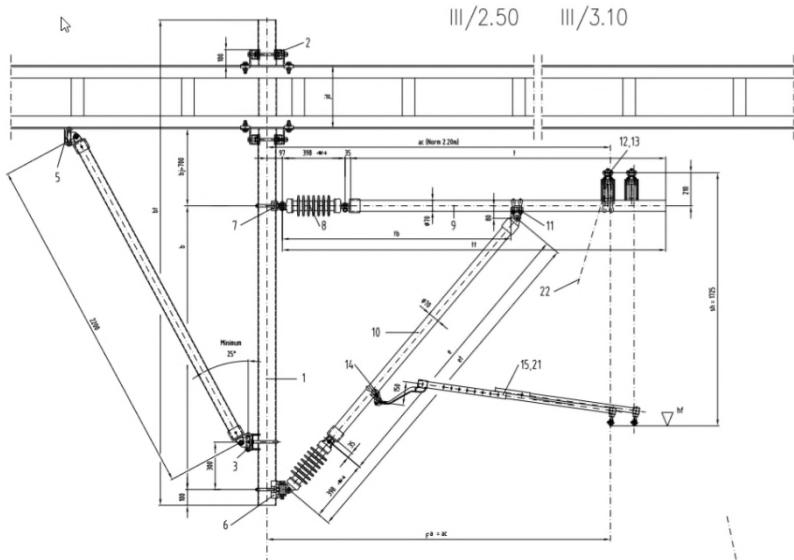
2.4.115 Stay (REN_OT_EN-1010101033)

Rod, wire or cable, with a tensioner, to anchor a mast or a cantilever(IEC 60050-811-33-47/UIC R 791-2006)(tie, guy)

Verwendungsbereich

Seillänge L gemäss Berechnung

3

1644 - 1960
(fix Mass 1800)

2

~60°

D

C

fa = Abstand zum Mast
gemäss Projektierung

für Zug-/Druckstützen oder Ankerstangen
Pour contrefiches et haubans

B

Property		
Name	**Description**	**Data type**
Type	Type of Stay.	Enum_StayType
Assemble description	To describe how the system / equipment / facility is assembled.	Text
Mileage value	Mileage of the line where the stay locates.	Length
Length	Length of the Stay.	Length
Installation angle	Angle between stay and ground.	Plane Angle
Installation height	Height of the point where stay is linked to.	Length
Physical description Reference	Physical size of the equipemnt. e.g.wighth, length, height, diameter.	ExternalReference

2.4.116 Stitch wire (REN_OT_EN-1010101056)

The auxiliary wire used in stitched suspension.(IEC 60050-811-33-18/UIC R 791-2006)

Property		
Name	**Description**	**Data type**
Type	Type of Stitch wire	Label
Length	Length of the Stitch wire	Length

|		
Tensile force	The tensile force that stitch wire takes.	Force
Breaking load	The force that would break stitch wire.	Force
Sliding load		Force
Assemble description	To describe how the system / equipment / facility is assembled.	Text
Num. of OCL	To indicate the OCL where the equipment is applied.	Identifier
Num. of span	To identify the span using the equipment	Identifier

2.4.117 Stranded conductor (REN_OT_EN-10103011)
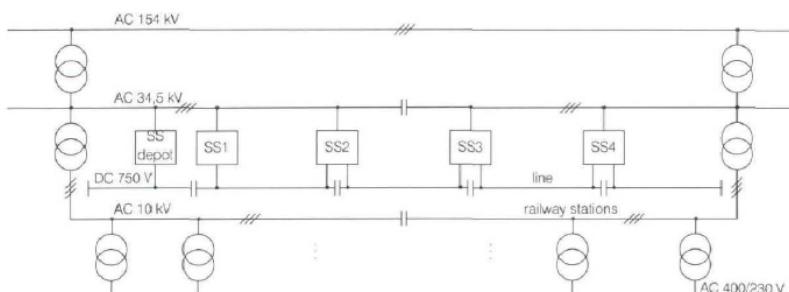
A conductor consisting of a number of individual uninsulated wires laid up together in alternating left- and right-hand helical layers.(IEC 60050-466-10-03)

Property		
Name	**Description**	**Data type**
Type	Type of Stranded conductor	Enum_StrandedConductorType
Stranded type	To identify the method to strand.	Enum_StrandedConductorStrandedType
Lay ratio	The ratio between lay length and the diameter of the single conductor.	Ratio
Tensile strength before stranded	Measurement of the ability of the conductor un-stranded to withstand breakage apart under applied force.	Length
Tensile strength after stranded	Measurement of the ability of the conductor stranded to withstand breakage apart under applied force.	Length
Elongation percentage	Measurement of the lengthening ability of the conductor under stress.	Ratio
Breaking load	The force that would break the conductor	Force
Coefficient of linear expansion	Measurement of the amount of growth the conductor experiences.	Ratio
Young's modulus	Tensile modulus of the wire.	Force
DC resistance	The resistance under direct current and 20 centigrade	Electric Resistance
Resistance	The resistance under AC	Electric Resistance
Current-carrying capacity	The max current that the equipment could undertake before the temperature of which is below the nominal value.	Electric Current
Nominal diameter	The diameter of the outside surface of the conductor	Length
Stranded structure	The structure of the stand method.	Real
Cross sectional area	The cross-section ares of the conductor.	Area

Mass per unit length	Also known as Linear density, linear mass density or linear mass is a measure of mass per unit of length.	Mass Per Length
Physical description Reference	Physical size of the equipemnt. e.g.wighth, length, height, diameter	Text

2.4.118 Substation (REN_OT_EN-101021)

Substation the main function of which is to supply an electric traction system.(IEC 60050-811-36-02)

Property		
Name	**Description**	**Data type**
Type	Type of Substation	Enum_SubstationType
High Voltage feed	The primary voltage of the substation.	Electric Voltage
Reserve power supply	The extra power that the substation could take.	Power
Master Station ID	The Identity of the master station.	Identifier
Number of rectifier group	The quantity of rectifier group built in substation.	Integer
Number of supply feeders	Number of power supplies that feeds the substaton.	Integer
Orientation of HV site	The orientation of the high voltage facilities / feed in the substation.	Label
Place for mobile substation	During construction or maintainance, the susbstation might be without power supply / power off, thus the mobile substation might be used as the power source for construction or maintainance, which needs space to be installed.	Boolean
Rectifier group power [kW]	The nominal power of rectifier group.	Power
Selective protection	Electrical protection method / sequence of substation.	Text
HV section outside	To indicate if the high voltage components are built outside or not.	Boolean
Nominal voltage protection (first value) [kV]	The max current that the switches at the primary side of the substation could withstand without breaking the circuit under nominal primary voltage.	Electric Voltage
Nominal voltage protection (second value) [kV]	The max current that the switches at the secondary side of the substation could withstand without breaking the circuit under nominal secondary voltage.	Electric Voltage
Assembly description	To describe how the system / equipment / facility is assembled.	Text

Total area [sqm]	The area that the substation covers.	Area
Area of the high voltage part [sqm]	The area that the high voltage part of the substation takes.	Area
Width	Width of the substation.	Length (positive, >0)
material of switches inside	The material of the switches used in the substaion.	Label
material of transformer inside	The material of the transformer used in the substaion.	Label
Length	Length of the substation.	Length (positive, >0)
Height	Height of the substation.	Length (positive, >0)
Line Number	The code number of the railway line where the substation applied.	Label
Line name	The name of the railway line where the substaion applied.	Label
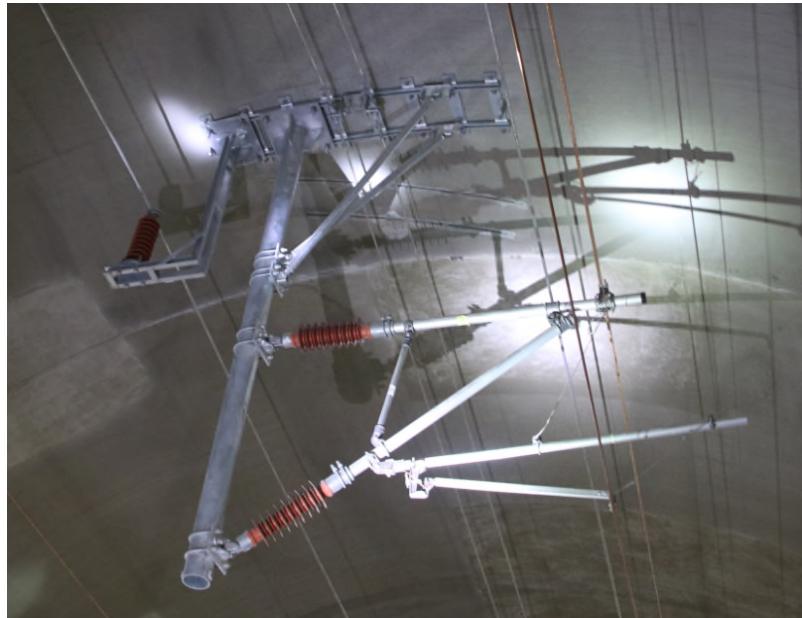
2.4.119   Substation control equipment (REN_OT_EN-10102020)

Equipement used to control operational equipment at a distance using the transmission of information by telecommunication techniques. (IEC 60050-371-01-01)

Property		
Name	**Description**	**Data type**
Type	Type of SubstationControlEquipment	Label
Nominal voltage	The optimum voltage for the electrical appliance to a long work.	IfcElectricVoltageMeasure.VOLT
Equipments ID undercontrol	The identity of the equipment controlled by the system.	Identifier
Location in control center	The location of the system in control center	Real

2.4.120   Suffix post (REN_OT_EN-1010101035)
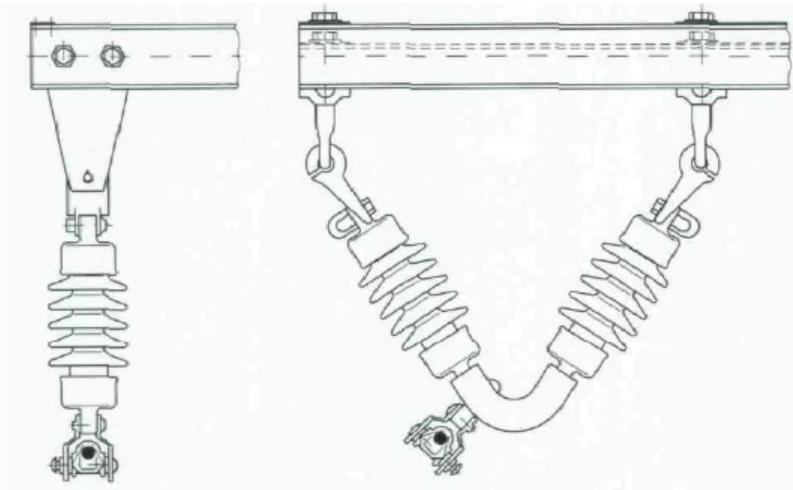
Insure the function of holding registration component in specific condition like tunel or under-bridge.

| Property		
Name	**Description**	**Data type**
Line condition	Type of the railway line beside the equipment. e.g. straight, outside the curve, inside the curve.	Label
Track curve radio	The radius of curve of the railway line beside the equipment.	Length
Load bearing capacity	The capacity of soil to support the loads applied to the ground.	Force
Bending	The vertical/horizontal bending moment that the pole could withstand.	Force
Torsion	The torque perpendicular to the axis of the pole that the pole could withstand.	Force
Wind speed for structural design	The max wind speed that the pole could withstand.	Linear Velocity
Distance to track center	Distance from side of suffix post to track centre.	Length
Mileage value	Mileage of the line where the Suffix post locates.	Length
Side of line	To indicate which side of the railway line the system / equipment / facility locates.	Label
Type	Type of suffix post.	Label

2.4.121 Support bracket (REN_OT_EN-1010101042)

A device designed to carry, through insulators(or no), a set of conductors of overhead line.

Property		
Name	Description	Data type

Type	Type of Support bracket.	Label
Assemble discription	To describe how the system / equipment / facility is assembled.	Text
Line condition	Type of the railway line beside the equipment. e.g. straight, outside the curve, inside the curve.	Text
Track curve radio	The radius of curve of the railway line beside the equipment.	Length
Is insulated	To indicate whether the support bracket is insulated or not.	Boolean
Mileage	Mileage of the line where the Support bracket locates.	Length
Side of line	To indicate which side of the railway line the system / equipment / facility locates.	Label

2.4.122   Switch (REN_OT_EN-1010203024)

Switch for alternatively closing and opening one or more electric circuits (IEC

60050-151-12-23)

Property		
Name	**Description**	**Data type**
Type	Type of Switch	Enum_SwitchType
Rated frequency	Frequency of the AC electric power system that the Ripple Control supplied reaches its optimum operating condition	Frequency
Phase number	Number of phase that the equipment operates on.	Identifier
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text
Switch location / ID	The id of the switch where the equipment is applied	Identifier

2.4.123 Switch cabinet (REN_OT_EN-1010203010)

In addition to the incoming and outgoing lines, the switchgear is completely enclosed by a grounded metal casing.

Switch cabinets/switchgear contain sensitive electrical, electronic and mechanical components to perform control, drive, power supply and safety functions. As a rule, these components are of high quality.

Switch cabinets consist of the cabinet housing and door and the interior components (e.g. mounting plates), which generally take the form of drawer units or are mounted on a panel.

Property		
Name	**Description**	**Data type**
Type	Type of the switch cabinet.	Enum_SwitchingPostType
Drawer number	Number of drawer applied in the cabinet.	Integer
Drawer size description	To describe the size of the drawer of the cabinet.	ExternalReference
Switch rated current	The rated current of the switch disconnector built in the cabinet.	Electric Current

2.4.124 Technical Building (REN_OT_EN-10105010)

Building on track side dedicated to railways operation.

Property		
Name	**Description**	**Data type**
Type	Type of Technical Building	Label

2.4.125 Telecom cabinet (REN_OT_EN-10102025)

Cabinet contaning the telecommunication equipment.

| Property		
Name	**Description**	**Data type**
Type	Type of TelecomCabinet	Label
Rated voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text
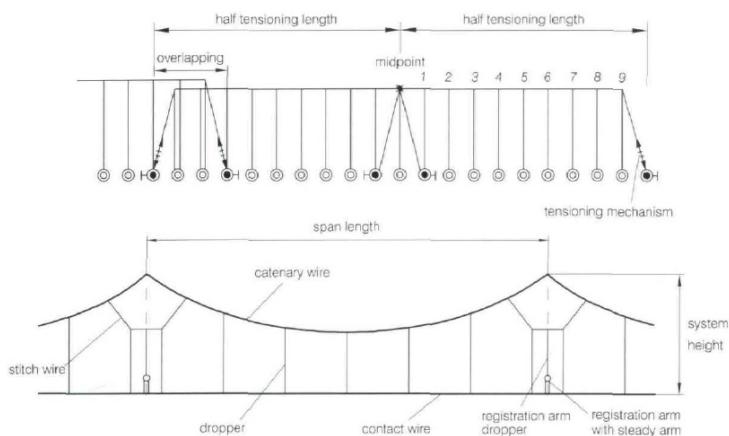
2.4.126 Telecommand (REN_OT_EN-10102023)

A system sending command to control and monitor the switches and circuit breakers or systems not directly connected (e.g. via wires) within the traction power system remotly.

Property		
Name	**Description**	**Data type**
Type of tower		Label
Presence of diagnostic		Boolean
Number CPU	The number of CPU core	Integer
Number diagnostic and maintenance workstation	Number of workstation used for diagnostic and maintenance.	Integer
Number traffic and electrical traction workstation	Number of workstation used for traffic and electrical traction.	Integer
Automatic authorization exchange device		Boolean
Type of telecontrol system	Type of telecontrol system used for Telecommand	Label
Type of subsystem	Type of subsystem used for Telecommand	Label
VDU printer		

2.4.127 Tensioning section (REN_OT_EN-1010101010)

Length of the overhead contact line between two terminating points.(IEC 60050-811-33-61)

Property		
Name	**Description**	**Data type**
Length of OCL	Distance between two terminals of the ocs.	Length
Side of line	To indicate which side of the railway line the system / equipment / facility locates.	Label
Number of tensionning Equipements	The quantity of tensionning equipment included in the tensioning section.	Integer

Start mileage	Mileage of the line where the Tensioning Section starts.	Length
End mileage	Mileage of the line where the Tensioning Section ends.	Length
Start pole number	Star pole number identifier	
End pole number	End pole number identifier	

2.4.128 Traction post (REN_OT_EN-101022)

Power Supply system

Property		
Name	**Description**	**Data type**
Type	Type of traction post.	Enum_TractionPostType
Total area	The area that the traction post covers.	Area
Assembly description	To describe how the system / equipment / facility is assembled.	Text
Line Number	The code number of the railway line where the substation applied.	Label

2.4.129 Traction power system (REN_OT_EN-1010)

Railway electrical distribution network used to provide energy for rolling stock. (IEC 60050-811-36-21/CENELEC - EN 50122-1)
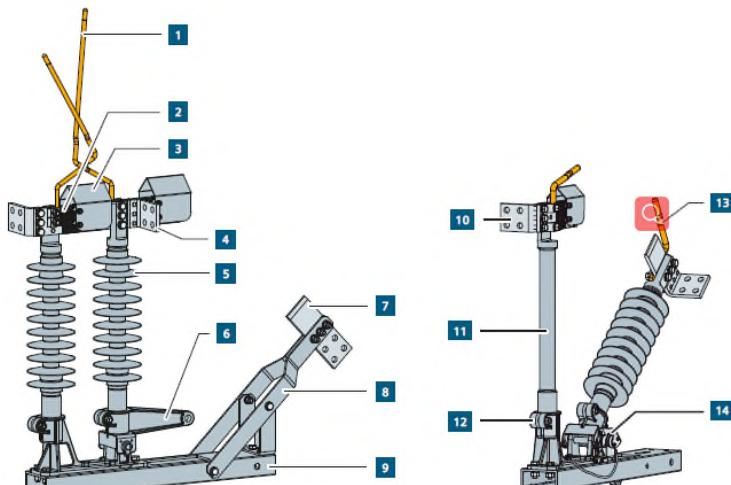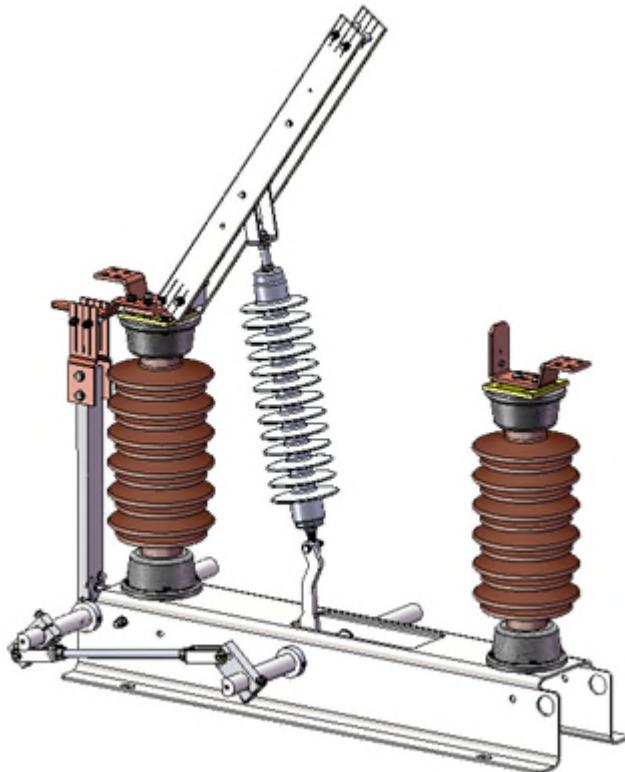
Note 1 to entry: The system includes

• contact line systems,

• return circuit of electric traction systems,

• running rails of non-electric traction systems, which are in the vicinity of, and conductively connected to the running rails of an electric traction system,

• electrical installations, which are supplied from contact lines either directly or via a transformer,

• electrical installations in substations, which are utilized solely for distribution of power directly to the contact line,

• electrical installations of switching stations. (IEC 62128-1:2013, 3.4.1)

Property		
Name	**Description**	**Data type**
Power supply mode	Work mode of traction power system.	Enum_PowerSupplyMode
Nominal voltage	The optimum voltage for the electrical appliance.	IfcElectricVoltageMeasure.kV
Frequency	Frequency of the ac electric power system that the ripple control supplied reaches its optimum operating condition.	IfcFrequencyMeasure.HERTZ
Electrification type	Indicate the type of railway-electrification.	Enum_ElectrificaitonType

2.4.130   Traction switching equipement (REN_OT_EN-10102030)

Switching equipement used for traction power, which is usually composed by switch(s), cabinet (might be), instrument tranformer (might be), and other auxillary equipements.

1	Arcing horn	5	Silicone composite	9	Baseplate	14	Drehwinkelsensor SIL1
2	Main contact set		insulator	10	Connection piece	*	only for disconnector with
3	Protective cover	6	Swivel socket	11	Support tube		earth contact
4	Contact spring for eart-	7	Contact blade for earthing*	12	Socket	**	only for earthing switch
	hing*	8	Earthing contact support*	13	Pre-arcing horn**		with pre-arcing horns
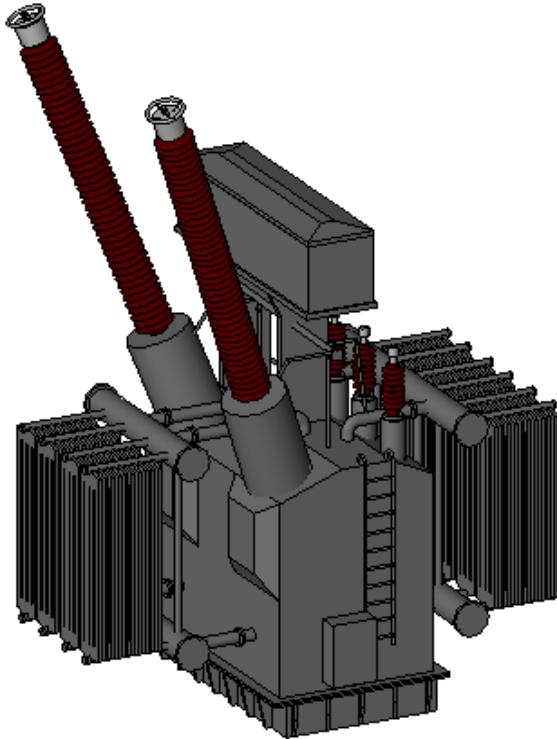
| Property		
Name	**Description**	**Data type**
Type	Type of TractionSwitching Equipement	Label

Rated voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Environment temperature	The temperature around.	ThermodynamicTemperature
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio
Function description	To describe the method that the equipment is used for.	Text
Assembly information	To describe how the system / equipment / facility is assembled.	Text
Cabinet material	The maretial of the cabinet	MaterialDefinition
Conductor material	The conductive material of the equipment.	MaterialDefinition

2.4.131 Traction transformer (REN_OT_EN-101020435)

A stationary device with two or more windings, in order to transmit electrical energy, converts the AC voltage and current of one system to the AC voltage and current of another system at the same frequency by electromagnetic induction.(GB 1094, IEC 60076)

electric energy converter without moving parts that changes voltages and currents associated with electric energy without change of frequency.(IEC 60050)

Property		
Name	**Description**	**Data type**
Type	Type of TractionTransformer.	Label
Primary Voltage	The nominal voltage at primary side.	Electric Voltage
Secondary Voltage	The nominal voltage at scondary side.	Electric Voltage

2.4.132 Unbalancing compensator (REN_OT_EN-1010206031)

A device that is used to correct voltage umbalance in the system.

Property		
Name	**Description**	**Data type**
Type	Type of UnbalancingCompensator	Enum_UnbalancingCompensatorType
Function module description	To describe the module built in the equipment	Text
Nominal power	A conventional value of apparent power determining a value of the rated current that may be carried with rated voltage applied, under specified conditions. (IEV ref 421-04-04)	Power
Nominal current	Value of current in accordance with which the relevant performance of a transformer operated meter is fixed (IEV ref 314-07-02)	Electric Current
Nominal voltage	Suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system. (IEV ref 482-03-31)	Electric Voltage
Nominal frequency	Frequency of the AC electric power system that the UnbalancingCompensator supplied reaches its optimum operating condition	Frequency
Air Relative Humidity	Measurement of the ratio of water vapor in the air.	Ratio (positive, >0)
Function description	To describe the method that the equipment is used for.	Text

Switch location / ID	The id of the switch where the equipment is applied	Identifier
Location in equipment room	Location of the equipment in the room	Label

2.4.133 Underground facility (REN_OT_EN-10105018)

Cables and other facilieits needed to connect OCS to substation and to low voltage services.

Property		
Name	**Description**	**Data type**
Type	Type of UndergroundFacilities	Label

2.4.134 Unitary control element (REN_OT_EN-10102024)

A unitary control element combines a number of control components into a single product, such as a thermostat or humidistat.

A unitary control element provides a housing for an aggregation of control or electrical distribution elements that, in combination, perform a singular (unitary) purpose. Each item in the aggregation may have its own geometric representation and location. (IFC4)

Property		
Name	**Description**	**Data type**
Type	Type of UnitaryControlElement	Label
Nominal Voltage / Rated Voltage	The optimum voltage for the electrical appliance to a long work.	Electric Voltage
Function description	To describe the method that the equipment is used for.	Text
equipments ID undercontrol	The identity of the equipement controlled by the power control system	Identifier

2.4.135 Varistor (REN_OT_EN-1010410)

Resistor the resistance of which is strongly varying with the applied voltage.(IEC 60050-151-13-23)

Property		
Name	**Description**	**Data type**
Type	Type of Varistor	Enum_VaristorType
Characteristic function	The characteristic function to show the relationship between varistor current and voltage.	Text

2.4.136 Voltage limiter (REN_OT_EN-1010413)

Over voltage protection facilities.

Property		
Name	**Description**	**Data type**
Type	Type of Voltage limiter	Label
Breakdown voltage tolerance	Nominal value of the tolerance of the dc breakdown voltage of a spark gap.	Electric Voltage

Insulation resistance	Minimum resistance between one terminal or several terminals connected together and the case or enclosure of a component at specified voltage	Electric Resistance

2.4.137 Voltage transformer (REN_OT_EN-101020422)

An instrument transformer in which the secondary voltage, in normal conditions of use, is substantially proportional to the primary voltage and differs in phase from it by an angle which is approximately zero for an appropriate direction of the connections.(IEC 60050-321-03-01)

Property		
Name	**Description**	**Data type**
Type	Type of Voltage Transformer	Label
Primary Voltage	The nominal voltage at primary side.	Electric Voltage
Secondary Voltage	The nominal voltage at scondary side.	Electric Voltage

2.4.138   Voltmetric relay (REN_OT_EN-101020423)

A relay device used to observe the voltage level and disconnect the circuit from the supply if any variations are occurs from the standard range.

Property		
Name	**Description**	**Data type**
Type	Type of VoltmetricRelay	Label
Trigger voltage	The voltage that the relay would disconnect the circuit.	Electric Voltage

2.4.139   Structure earth (REN_OT_EN-10106078)

Construction made of metallic parts or construction including interconnected metallic structural parts, which can be used as an earth electrode.

Property		
Name	**Description**	**Data type**
Type	Type of structure earth	Label