Utility

Norwegian Mapping Authority
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1.1 Line network – full model

1.1.1 Application schema

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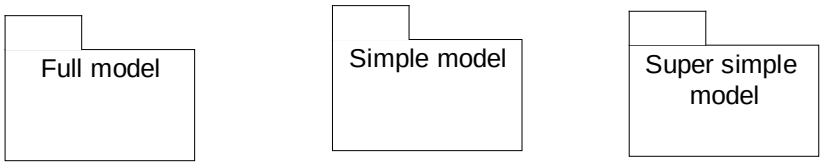
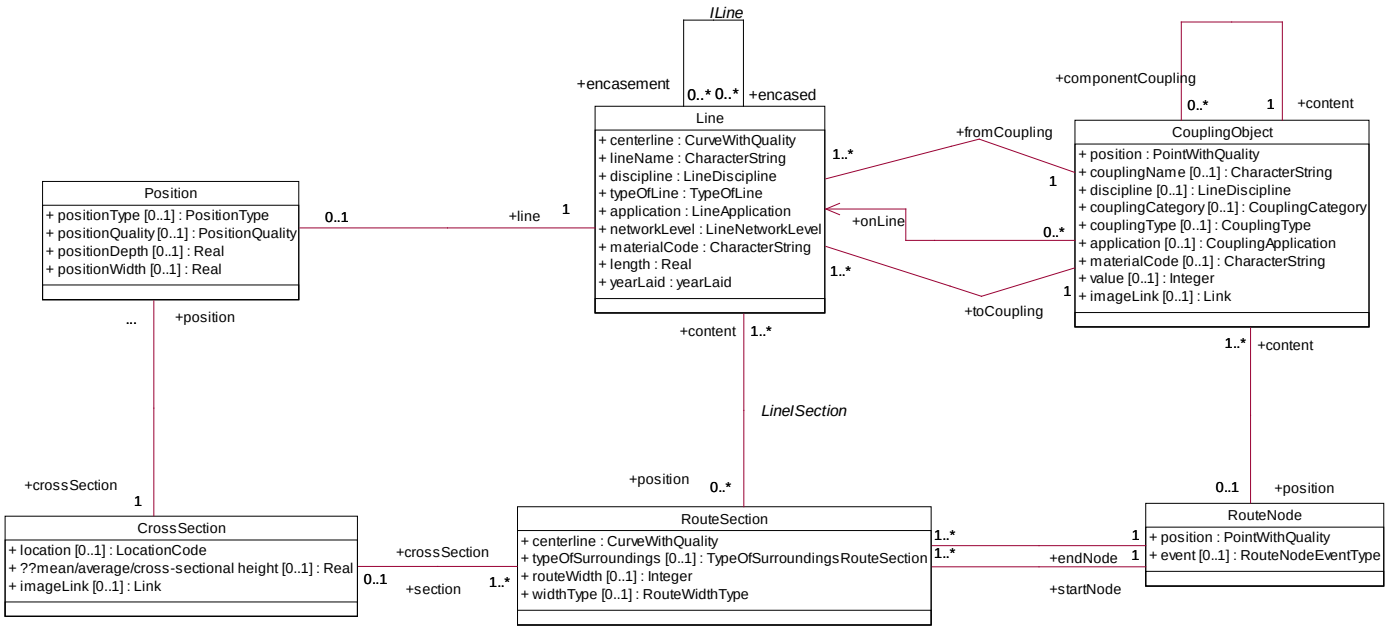
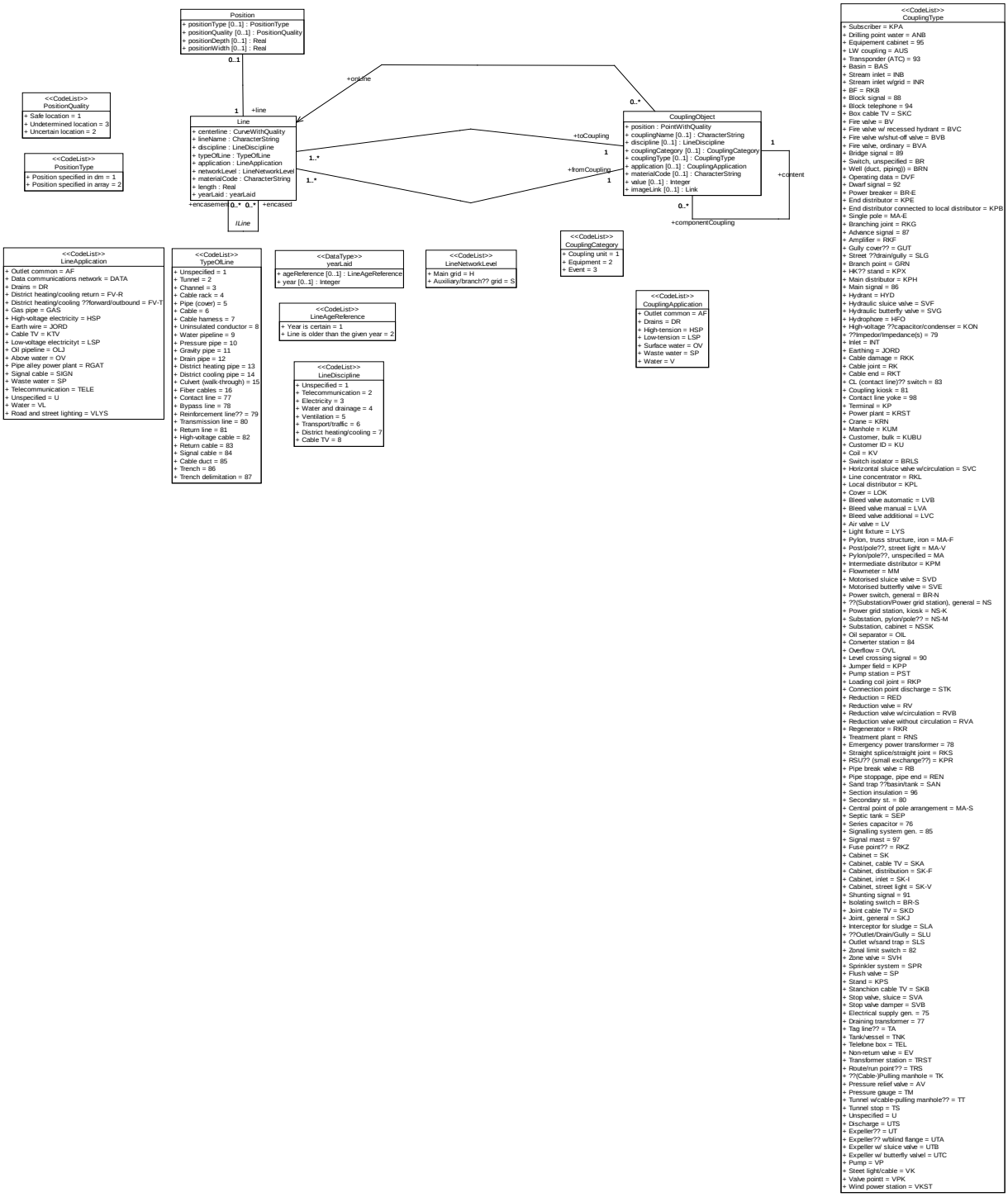


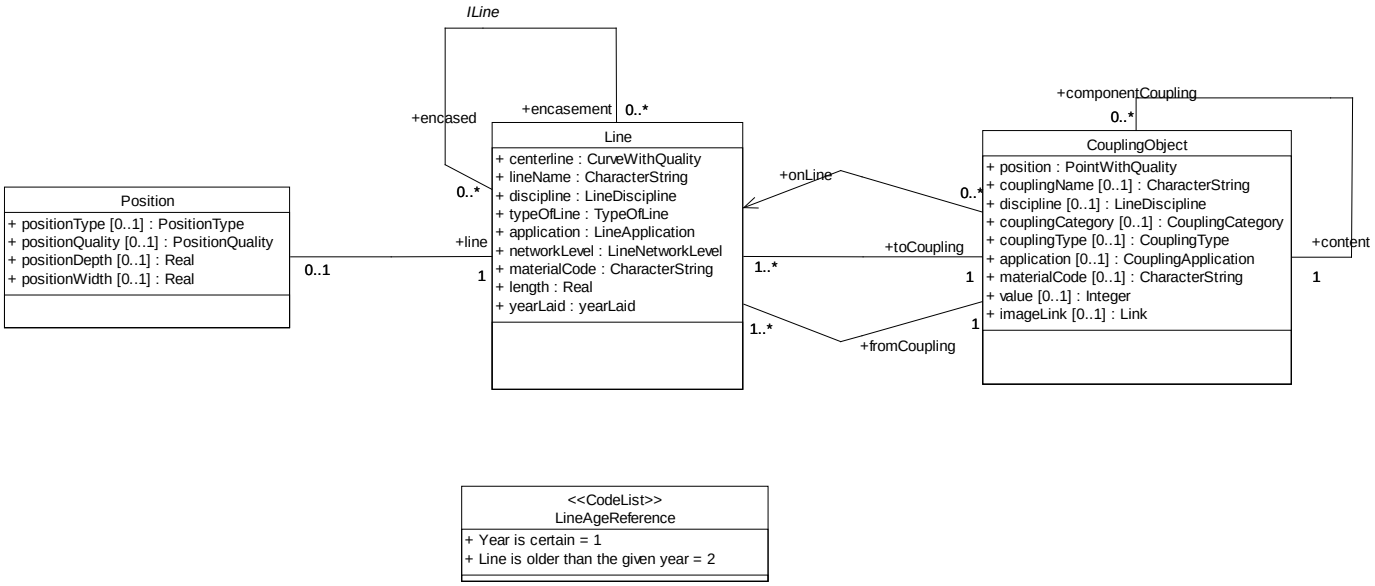
Line full model



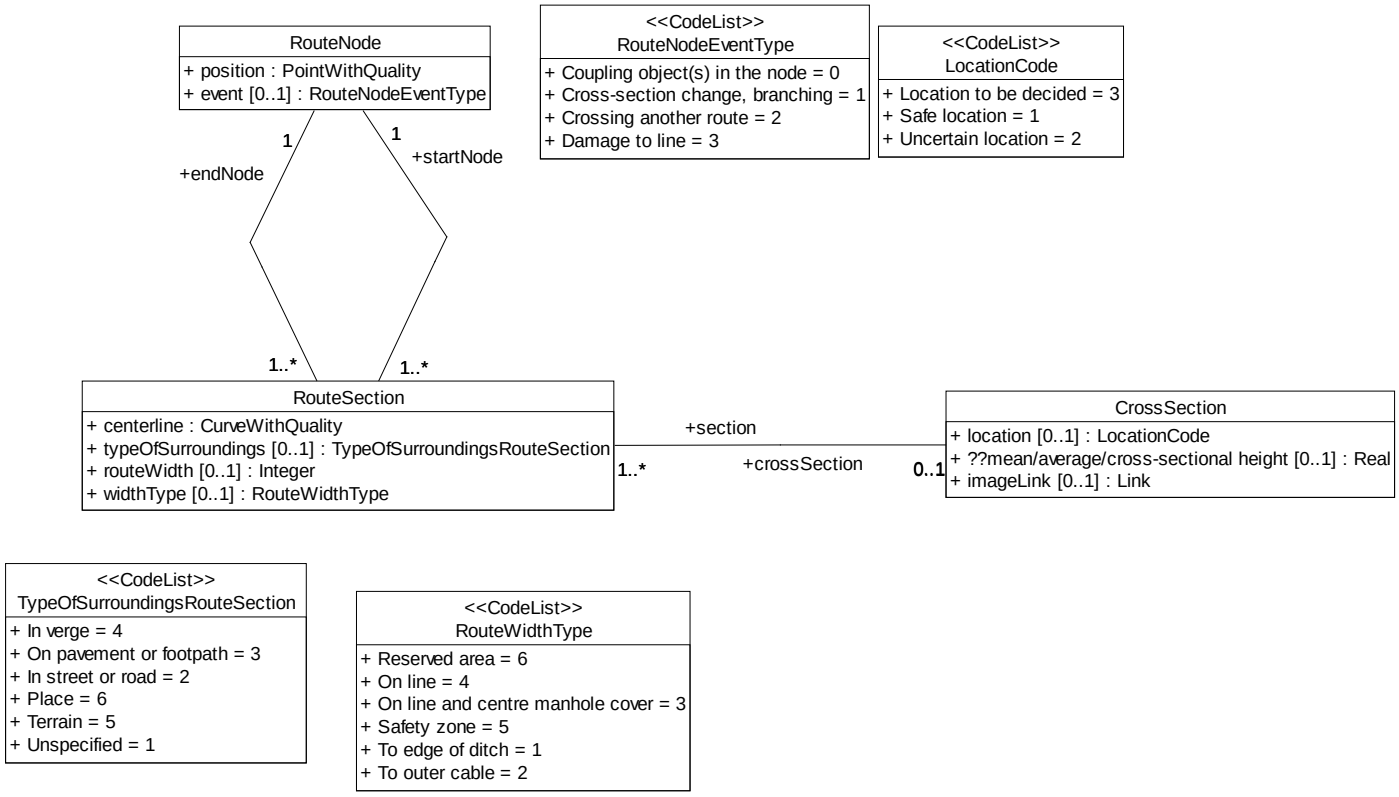
Line network



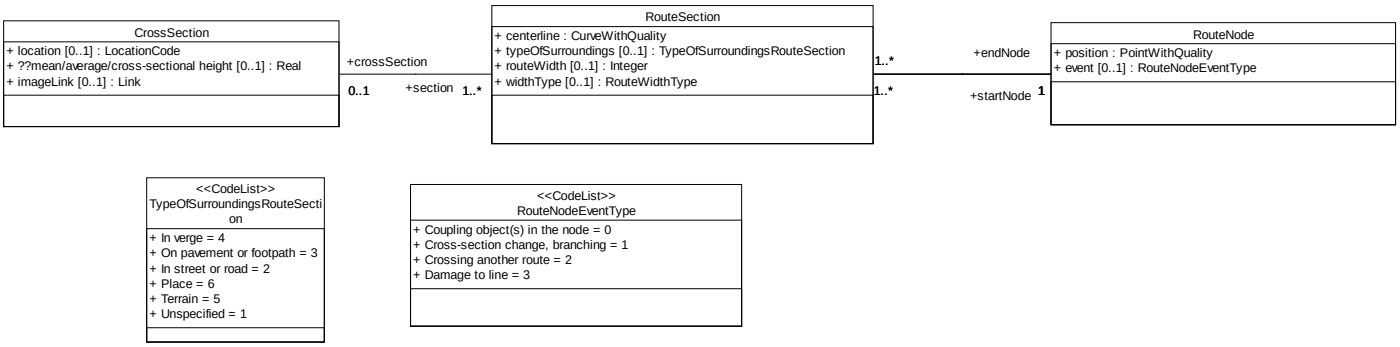
Line network level



Route network



Route network model



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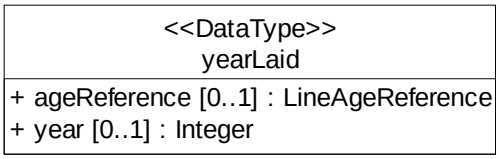
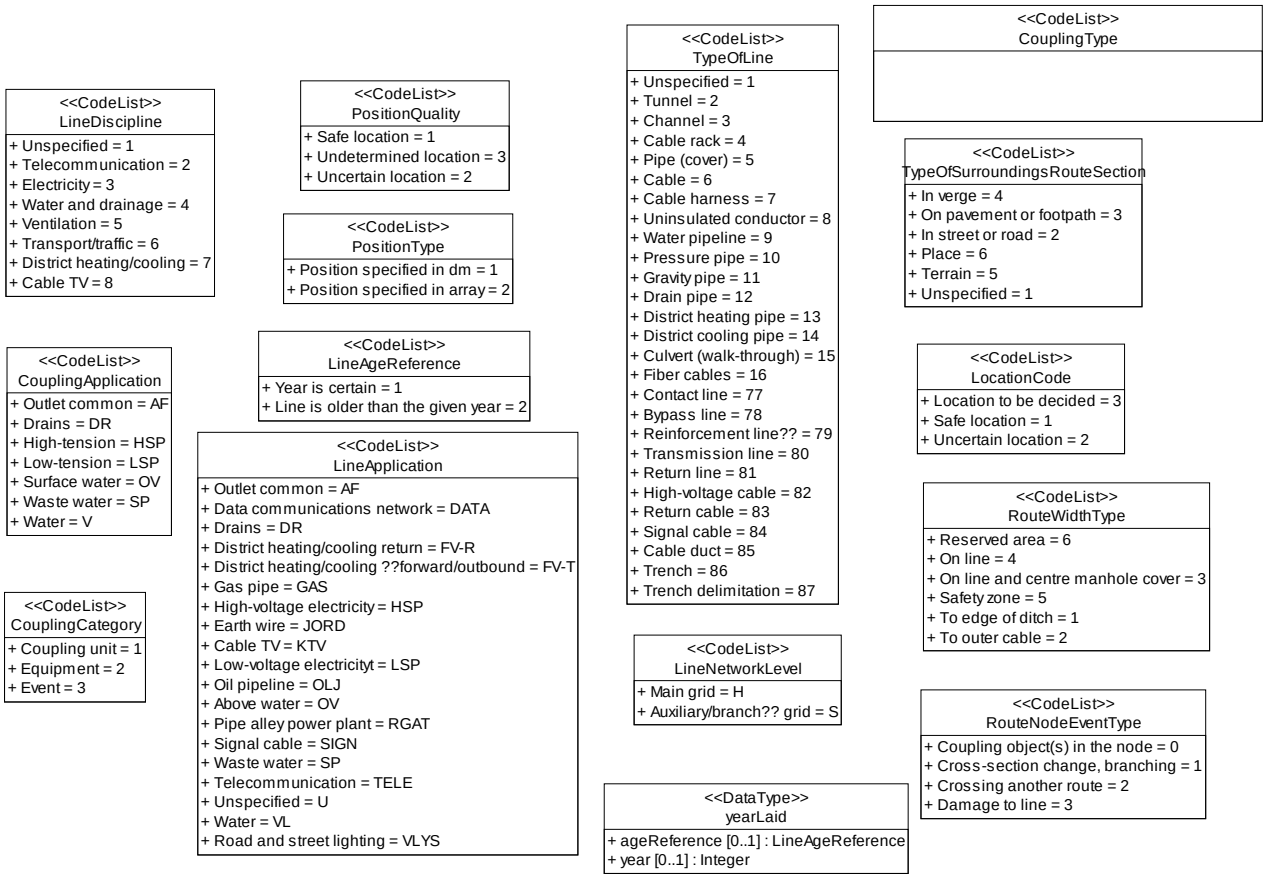


Codelists



1.1.2 Description

1.1.2.1 RouteNode

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class RouteNode	description of the route networkXzXs nodes (connection points). Must have coincident coordinates with the first or last point in the route sections that are connected to the route node				
1.1	position	location where the object exists	1	1	PointWithQuality	
1.2	event	event at node	0	1	RouteNodeEventType	
1.3	Role (unnamed) RouteSection		1	N	RouteSection	
1.4	Role (unnamed) RouteSection		1	N	RouteSection	
1.5	Role content		1	N	CouplingObject	
1.6	Role (unnamed) RouteSection		1	1	RouteSection	

1.1.2.2 RouteSection

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class RouteSection	description of the route network connection lines, if there is a change or an event along the routes, there will be a transition to a new route. Note: the cross-section is the same along the same route section				
2.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	
2.2	typeOfSurroundings	type of surroundings for route section	0	1	TypeOfSurroundingsRouteSection	
2.3	routeWidth	width measured in dm	0	1	Integer	
2.4	widthType	what the width of the route is measured between	0	1	RouteWidthType	

2.5	Role startNode		1	1	RouteNode	
2.6	Role crossSection		0	1	CrossSection	
2.7	Role endNode		1	1	RouteNode	
2.8	Role content		1	N	Line	
2.9	Role (unnamed) RouteNode		1	1	RouteNode	

1.1.2.3 CrossSection

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Class CrossSection	cross-section describes the routeXzXs cross-section. The description applies to the entire cross-section				
3.1	location	cross-section - type	0	1	LocationCode	
3.2	??mean/average/ cross-sectionalheight	the ??mean/average height of the cross-section	0	1	Real	
3.3	imageLink	link to image	0	1	Link	
3.4	Role section		1	N	RouteSection	
3.5	Role position		1	N	Position	

1.1.2.4 CouplingObject

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Class CouplingObject	includes any physical structure or equipment which is related to lines				
4.1	position	location where the object exists	1	1	PointWithQuality	
4.2	couplingName	name of coupling	0	1	CharacterString	
4.3	discipline	description of application area for line	0	1	LineDiscipline	
4.4	couplingCategory	category of coupling	0	1	CouplingCategory	
4.5	couplingType	type of coupling	0	1	CouplingType	
4.6	application	application for coupling	0	1	CouplingApplication	
4.7	materialCode	code for material	0	1	CharacterString	
4.8	value	value	0	1	Integer	
4.9	imageLink	link to image	0	1	Link	
4.1	Role		1	N	Line	

0	(unnamed) Line					
4.1 1	Role position		0	1	RouteNode	
4.1 2	Role content		1	1	CouplingObject	
4.1 3	Role (unnamed) Line		1	N	Line	
4.1 4	Role onLine		1	1	Line	

1.1.2.5 <<DataType>> yearLaid

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
5	Datatype yearLaid	origin of the line				
5.1	ageReference		0	1	LineAgeReference	
5.2	year	number indicating the year - number in the calendar	0	1	Integer	

1.1.2.6 Position

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
6	Class Position	position describes the position of a line within the cross-section				
6.1	positionType	type of specification of position in cross-section	0	1	PositionType	
6.2	positionQuality	quality of position report	0	1	PositionQuality	
6.3	positionDepth	specification of the position in depth	0	1	Real	
6.4	positionWidth	specification of the positions in width	0	1	Real	
6.5	Role line		1	1	Line	
6.6	Role crossSection		1	1	CrossSection	

1.1.2.7 Line

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
7	Class Line	in the model, the term line has been generalised to mean all types of longitudinal physical objects in the route. Note: this also includes tunnels, ducts, pipes and other objects used as encasing?? structures for other lines				

7.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	
7.2	lineName	name of line	1	1	CharacterString	
7.3	discipline	description of application area for line	1	1	LineDiscipline	
7.4	typeOfLine	specification of the type of line	1	1	TypeOfLine	
7.5	application	application for line	1	1	LineApplication	
7.6	networkLevel	level of line	1	1	LineNetworkLevel	
7.7	materialCode	code for material	1	1	CharacterString	
7.8	length	length in metres	1	1	Real	
7.9	yearLaid	origin of the line	1	1	yearLaid	
7.10	Role toCoupling		1	1	CouplingObject	
7.11	Role fromCoupling		1	1	CouplingObject	
7.12	Role (unnamed) Position		0	1	Position	
7.13	Role (unnamed) CouplingObject		0	N	CouplingObject	
7.14	Role encasement		0	N	Line	
7.15	Role position		0	N	RouteSection	

1.1.2.8 Association RouteSection-RouteNode

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
8	Association RouteSection-RouteNode					
8.1	Role startNode		1	1	RouteNode	
8.2	Role (unnamed) RouteSection		1	N	RouteSection	

1.1.2.9 Association CrossSection-RouteSection

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
9	Association CrossSection-RouteSection					
9.1	Role section		1	N	RouteSection	
9.2	Role crossSection		0	1	CrossSection	

1.1.2.10 Association RouteSection-RouteNode

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
10	Association RouteSection-RouteNode					
10.1	Role endNode		1	1	RouteNode	
10.2	Role (unnamed) RouteSection		1	N	RouteSection	

1.1.2.11 Association Line-CouplingObject

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
11	Association Line-CouplingObject					
11.1	Role toCoupling		1	1	CouplingObject	
11.2	Role (unnamed) Line		1	N	Line	

1.1.2.12 Association CouplingObject-RouteNode

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
12	Association CouplingObject-RouteNode					
12.1	Role position		0	1	RouteNode	
12.2	Role content		1	N	CouplingObject	

1.1.2.13 Association CouplingObject-CouplingObject

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
13	Association CouplingObject-CouplingObject					
13.1	Role componentCoupling		0	N	CouplingObject	
13.2	Role content		1	1	CouplingObject	

1.1.2.14 Association Line-CouplingObject

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrenc	Type	Constraint

				e		
14	Association Line-CouplingObject					
14.1	Role fromCoupling		1	1	CouplingObject	
14.2	Role (unnamed) Line		1	N	Line	

1.1.2.15 Association Position-Line

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
15	Association Position-Line					
15.1	Role line		1	1	Line	
15.2	Role (unnamed) Position		0	1	Position	

1.1.2.16 Association CrossSection-Position

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
16	Association CrossSection-Position					
16.1	Role position		1	N	Position	
16.2	Role crossSection		1	1	CrossSection	

1.1.2.17 Association Line-CouplingObject

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
17	Association Line-CouplingObject					
17.1	Role (unnamed) CouplingObject		0	N	CouplingObject	
17.2	Role onLine		1	1	Line	

1.1.2.18 Association ILine

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
18	Association ILine					
18.1	Role encased		0	N	Line	

18.2	Role encasement		0	N	Line	

1.1.2.19 Association LineISection

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
19	Association LineISection					
19.1	Role position		0	N	RouteSection	
19.2	Role content		1	N	Line	

1.1.2.20 Association RouteSection-RouteNode

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
20	Association RouteSection-RouteNode					
20.1	Role (unnamed) RouteNode		1	1	RouteNode	
20.2	Role (unnamed) RouteSection		1	1	RouteSection	

1.1.2.21

1.1.3 CodeLists

1.1.3.1.1 <<CodeList>> LineDiscipline

Nr	Code name	Definition/Description	Code
1	CodeList LineDiscipline	description of application area for line	
1.1	Unspecified		1
1.2	Telecommunication		2
1.3	Electricity		3
1.4	Water and drainage		4
1.5	Ventilation		5
1.6	Transport/traffic		6
1.7	District heating/cooling		7
1.8	Cable TV		8

1.1.3.1.2 <<CodeList>> TypeOfSurroundingsRouteSection

Nr	Code name	Definition/Description	Code
2	CodeList TypeOfSurroundingsRouteSection	omgivelsestype for traséseksjon	
2.1	In verge		4
2.2	On pavement or footpath		3
2.3	In street or road		2
2.4	Place		6
2.5	Terrain		5
2.6	Unspecified		1

1.1.3.1.3 <<CodeList>> LocationCode

Nr	Code name	Definition/Description	Code
3	CodeList LocationCode		
3.1	Location to be decided		3
3.2	Safe location		1

3.3	Uncertain location		2

1.1.3.1.4 <<CodeList>> RouteWidthType

Nr	Code name	Definition/Description	Code
4	CodeList RouteWidthType	what the width of the route is measured between	
4.1	Reserved area		6
4.2	On line		4
4.3	On line and centre manhole cover		3
4.4	Safety zone		5
4.5	To edge of ditch		1
4.6	To outer cable		2

1.1.3.1.5 <<CodeList>> RouteNodeEventType

Nr	Code name	Definition/Description	Code
5	CodeList RouteNodeEventType		
5.1	Coupling object(s) in the node		0
5.2	Cross-section change, branching		1
5.3	Crossing another route		2
5.4	Damage to line		3

1.1.3.1.6 <<CodeList>> CouplingApplication

Nr	Code name	Definition/Description	Code
6	CodeList CouplingApplication	application for coupling	
6.1	Outlet common		AF
6.2	Drains		DR
6.3	High-tension		HSP
6.4	Low-tension		LSP
6.5	Surface water		OV
6.6	Waste water		SP
6.7	Water		V

1.1.3.1.7 <<CodeList>> CouplingCategory

Nr	Code name	Definition/Description	Code
7	CodeList CouplingCategory	category of coupling	
7.1	Coupling unit		1
7.2	Equipment		2
7.3	Event		3

1.1.3.1.8 <<CodeList>> CouplingType

Nr	Code name	Definition/Description	Code
8	CodeList CouplingType	type of coupling	
8.1	Subscriber		KPA
8.2	Drilling point water		ANB
8.3	Equipement cabinet		95
8.4	LW coupling		AUS
8.5	Transponder (ATC)		93
8.6	Basin		BAS
8.7	Stream inlet		INB
8.8	Stream inlet w/grid		INR
8.9	BF		RKB
8.10	Block signal		88
8.11	Block telephone		94
8.12	Box cable TV		SKC
8.13	Fire valve		BV
8.14	Fire valve w/ recessed hydrant		BVC
8.15	Fire valve w/shut-off valve		BVB
8.16	Fire valve, ordinary		BVA
8.17	Bridge signal		89
8.18	Switch, unspecified		BR
8.19	Well (duct, piping))		BRN
8.20	Operating data		DVF
8.21	Dwarf signal		92
8.22	Power breaker		BR-E

8.23	End distributor		KPE
8.24	End distributor connected to local distributor		KPB
8.25	Single pole		MA-E
8.26	Branching joint		RKG
8.27	Advance signal		87
8.28	Amplifier		RKF
8.29	Gully cover??		GUT
8.30	Street ??drain/gully		SLG
8.31	Branch point		GRN
8.32	HK?? stand		KPX
8.33	Main distributor		KPH
8.34	Main signal		86
8.35	Hydrant		HYD
8.36	Hydraulic sluice valve		SVF
8.37	Hydraulic butterfly valve		SVG
8.38	Hydrophore		HFO
8.39	High-voltage ??capacitor/condenser		KON
8.40	??Impedor/Impedance(s)		79
8.41	Inlet		INT
8.42	Earthing		JORD
8.43	Cable damage		RKK
8.44	Cable joint		RK
8.45	Cable end		RKT
8.46	CL (contact line)?? switch		83
8.47	Coupling kiosk		81
8.48	Contact line yoke		98
8.49	Terminal		KP
8.50	Power plant		KRST
8.51	Crane		KRN
8.52	Manhole		KUM
8.53	Customer, bulk		KUBU
8.54	Customer ID		KU
8.55	Coil		KV
8.56	Switch isolator		BRLS

8.57	Horizontal sluice valve w/circulation		SVC
8.58	Line concentrator		RKL
8.59	Local distributor		KPL
8.60	Cover		LOK
8.61	Bleed valve automatic		LVB
8.62	Bleed valve manual		LVA
8.63	Bleed valve additional		LVC
8.64	Air valve		LV
8.65	Light fixture		LYS
8.66	Pylon, truss structure, iron		MA-F
8.67	Post/pole??, street light		MA-V
8.68	Pylon/pole??, unspecified		MA
8.69	Intermediate distributor		KPM
8.70	Flowmeter		MM
8.71	Motorised sluice valve		SVD
8.72	Motorised butterfly valve		SVE
8.73	Power switch, general		BR-N
8.74	??(Substation/Power grid station), general		NS
8.75	Power grid station, kiosk		NS-K
8.76	Substation, pylon/pole??		NS-M
8.77	Substation, cabinet		NSSK
8.78	Oil separator		OIL
8.79	Converter station		84
8.80	Overflow		OVL
8.81	Level crossing signal		90
8.82	Jumper field		KPP
8.83	Pump station		PST
8.84	Loading coil joint		RKP
8.85	Connection point discharge		STK
8.86	Reduction		RED
8.87	Reduction valve		RV
8.88	Reduction valve w/circulation		RVB
8.89	Reduction valve without circulation		RVA
8.90	Regenerator		RKR

8.91	Treatment plant		RNS
8.92	Emergency power transformer		78
8.93	Straight splice/straight joint		RKS
8.94	RSU?? (small exchange??)		KPR
8.95	Pipe break valve		RB
8.96	Pipe stoppage, pipe end		REN
8.97	Sand trap ??basin/tank		SAN
8.98	Section insulation		96
8.99	Secondary st.		80
8.100	Central point of pole arrangement		MA-S
8.101	Septic tank		SEP
8.102	Series capacitor		76
8.103	Signalling system gen.		85
8.104	Signal mast		97
8.105	Fuse point??		RKZ
8.106	Cabinet		SK
8.107	Cabinet, cable TV		SKA
8.108	Cabinet, distribution		SK-F
8.109	Cabinet, inlet		SK-I
8.110	Cabinet, street light		SK-V
8.111	Shunting signal		91
8.112	Isolating switch		BR-S
8.113	Joint cable TV		SKD
8.114	Joint, general		SKJ
8.115	Interceptor for sludge		SLA
8.116	??Outlet/Drain/Gully		SLU
8.117	Outlet w/sand trap		SLS
8.118	Zonal limit switch		82
8.119	Zone valve		SVH
8.120	Sprinkler system		SPR
8.121	Flush valve		SP
8.122	Stand		KPS
8.123	Stanchion cable TV		SKB
8.124	Stop valve, sluice		SVA
8.125	Stop valve damper		SVB

8.126	Electrical supply gen.		75
8.127	Draining transformer		77
8.128	Tag line??		TA
8.129	Tank/vessel		TNK
8.130	Telefone box		TEL
8.131	Non-return valve		EV
8.132	Transformer station		TRST
8.133	Route/run point??		TRS
8.134	??(Cable-)Pulling manhole		TK
8.135	Pressure relief valve		AV
8.136	Pressure gauge		TM
8.137	Tunnel w/cable-pulling manhole??		TT
8.138	Tunnel stop		TS
8.139	Unspecified		U
8.140	Discharge		UTS
8.141	Expeller??		UT
8.142	Expeller?? w/blind flange		UTA
8.143	Expeller w/ sluice valve		UTB
8.144	Expeller w/ butterfly valvel		UTC
8.145	Pump		VP
8.146	Steet light/cable		VK
8.147	Valve pointt		VPK
8.148	Wind power station		VKST

1.1.3.1.9 <<CodeList>> LineApplication

Nr	Code name	Definition/Description	Code
9	CodeList LineApplication	application for line	
9.1	Outlet common		AF
9.2	Data communications network		DATA
9.3	Drains		DR
9.4	District heating/cooling return		FV-R
9.5	District heating/cooling ??forward/outbound		FV-T
9.6	Gas pipe		GAS

9.7	High-voltage electricity		HSP
9.8	Earth wire		JORD
9.9	Cable TV		KTV
9.10	Low-voltage electricityt		LSP
9.11	Oil pipeline		OLJ
9.12	Above water		OV
9.13	Pipe alley power plant		RGAT
9.14	Signal cable		SIGN
9.15	Waste water		SP
9.16	Telecommunication		TELE
9.17	Unspecified		U
9.18	Water		VL
9.19	Road and street lighting		VLYS

1.1.3.1.10 <<CodeList>> LineAgeReference

Nr	Code name	Definition/Description	Code
10	CodeList LineAgeReference	reference for age specification on line	
10.1	Year is certain		1
10.2	Line is older than the given year		2

1.1.3.1.11 <<CodeList>> LineNetworkLevel

Nr	Code name	Definition/Description	Code
11	CodeList LineNetworkLevel	level of line network	
11.1	Main grid		H
11.2	Auxiliary/branch?? grid		S

1.1.3.1.12 <<CodeList>> PositionQuality

Nr	Code name	Definition/Description	Code
12	CodeList PositionQuality	description of the quality of the localization	
12.1	Safe location		1
12.2	Undetermined location		3

12.3	Uncertain location		2

1.1.3.1.13 <<CodeList>> PositionType

Nr	Code name	Definition/Description	Code
13	CodeList PositionType	type of specification of position in section	
13.1	Position specified in dm		1
13.2	Position specified in array		2

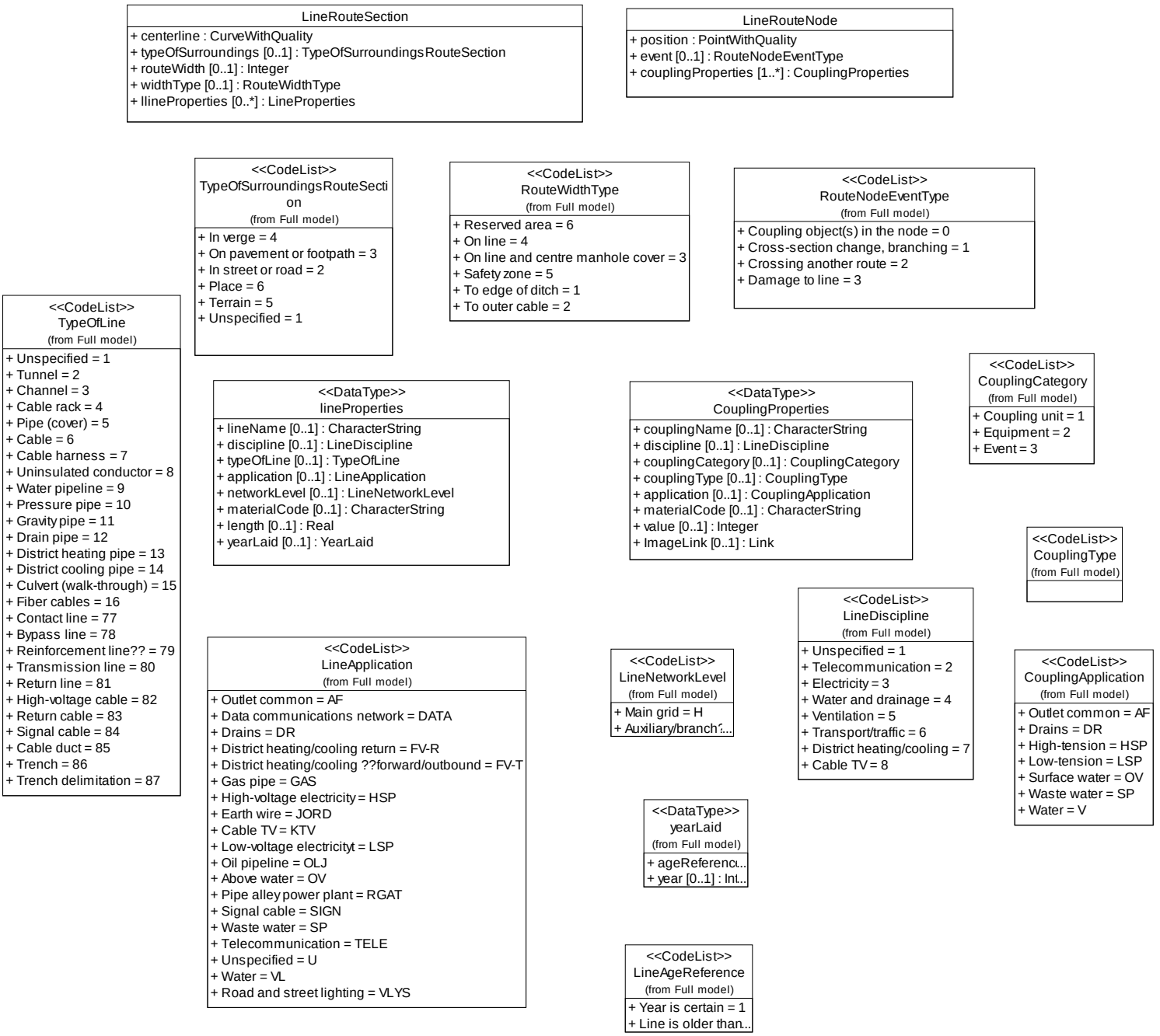
1.1.3.1.14 <<CodeList>> TypeOfLine

Nr	Code name	Definition/Description	Code
14	CodeList TypeOfLine	specification of the type of line	
14.1	Unspecified		1
14.2	Tunnel		2
14.3	Channel		3
14.4	Cable rack		4
14.5	Pipe (cover)		5
14.6	Cable		6
14.7	Cable harness		7
14.8	Uninsulated conductor		8
14.9	Water pipeline		9
14.10	Pressure pipe		10
14.11	Gravity pipe		11
14.12	Drain pipe		12
14.13	District heating pipe		13
14.14	District cooling pipe		14
14.15	Culvert (walk-through)		15
14.16	Fiber cables		16
14.17	Contact line		77
14.18	Bypass line		78
14.19	Reinforcement line??		79
14.20	Transmission line		80
14.21	Return line		81
14.22	High-voltage cable		82

14.23	Return cable		83
14.24	Signal cable		84
14.25	Cable duct		85
14.26	Trench		86
14.27	Trench delimitation		87

1.2 Line network – simple model

1.2.1 Application schema



1.2.2 Description

1.2.2.1 LineRouteSection

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class LineRouteSection	LINE with route section and line properties				
1.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	
1.2	typeOfSurroundings	type of surroundings for the route section	0	1	TypeOfSurroundingsRouteSection	
1.3	routeWidth	width measured in dm	0	1	Integer	
1.4	widthType	what the width of the route is measured between	0	1	RouteWidthType	
1.5	llineProperties	properties of the line	0	N	LineProperties	

1.2.2.2 LineRouteNode

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class LineRouteNode	point with connection object and route node properties				
2.1	position	location where the object exists	1	1	PointWithQuality	
2.2	event	event at node	0	1	RouteNodeEventType	
2.3	couplingProperties	coupling properties	1	N	CouplingProperties	

1.2.2.3 <<DataType>> lineProperties

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Datatype lineProperties	properties of the line				
3.1	lineName	name of line	0	1	CharacterString	
3.2	discipline	description of specific discipline for line	0	1	LineDiscipline	
3.3	typeOfLine	specification of the type of line	0	1	TypeOfLine	
3.4	application	application for line	0	1	LineApplication	
3.5	networkLevel	level of network	0	1	LineNetworkLevel	
3.6	materialCode	code for materials	0	1	CharacterString	
3.7	length	length of line in metres	0	1	Real	

3.8	yearLaid	origin of the line	0	1	YearLaid	

1.2.2.4 <<DataType>> CouplingProperties

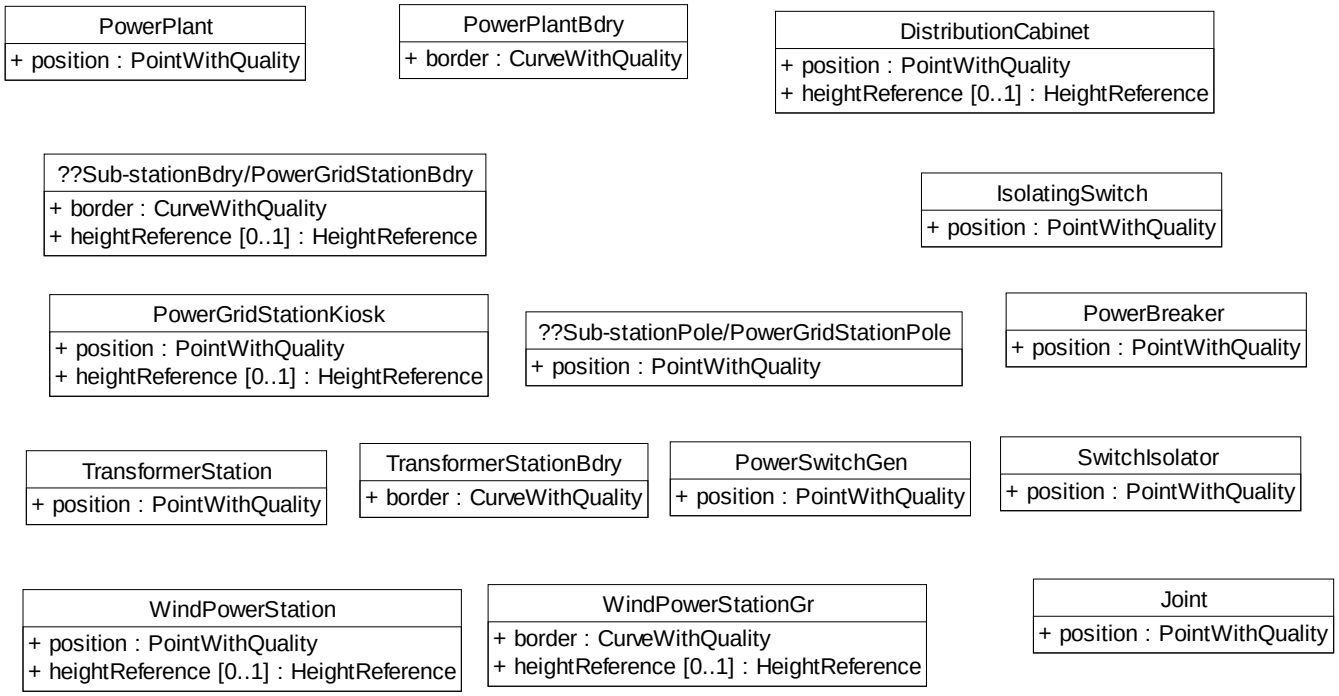
No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Datatype CouplingProperties	properties for coupling				
4.1	couplingName	name of coupling	0	1	CharacterString	
4.2	discipline	description of specific discipline for line	0	1	LineDiscipline	
4.3	couplingCategory	category of coupling	0	1	CouplingCategory	
4.4	couplingType	type of coupling	0	1	CouplingType	
4.5	application	application for coupling	0	1	CouplingApplication	
4.6	materialCode	code for materials	0	1	CharacterString	
4.7	value	value	0	1	Integer	
4.8	ImageLink	link to image	0	1	Link	

1.3 Line network – Super simple model

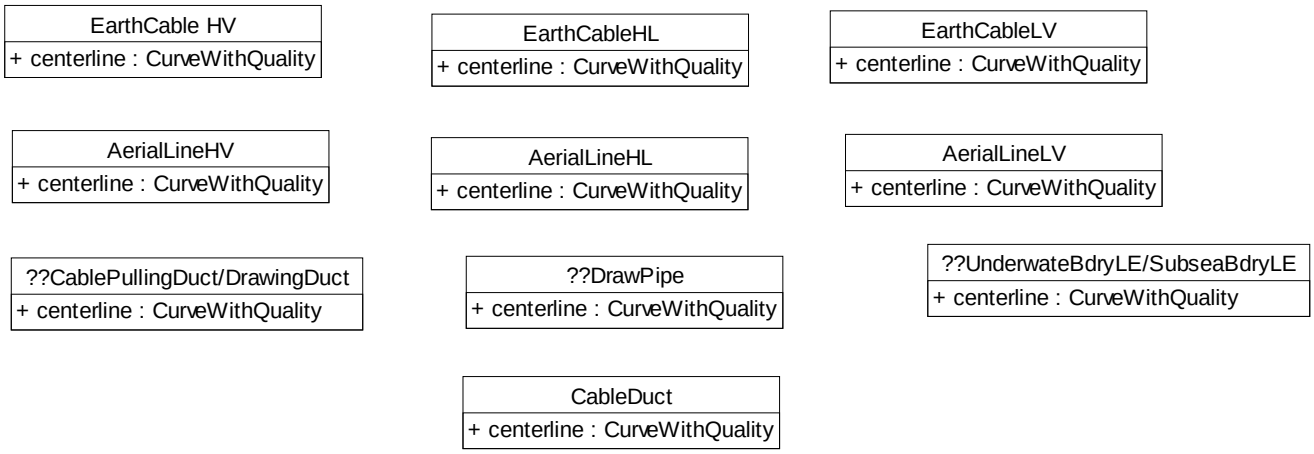
1.3.1 Application schema

DistrictHeating

EL-Coupling objects

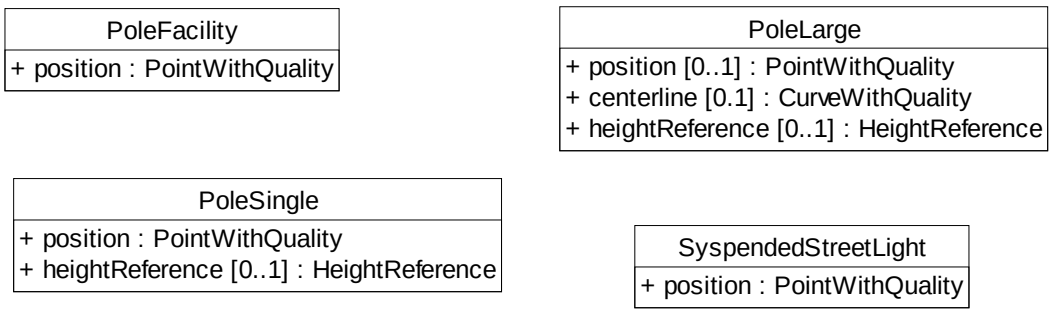


EL-Routes

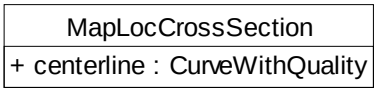


EL-Tele other

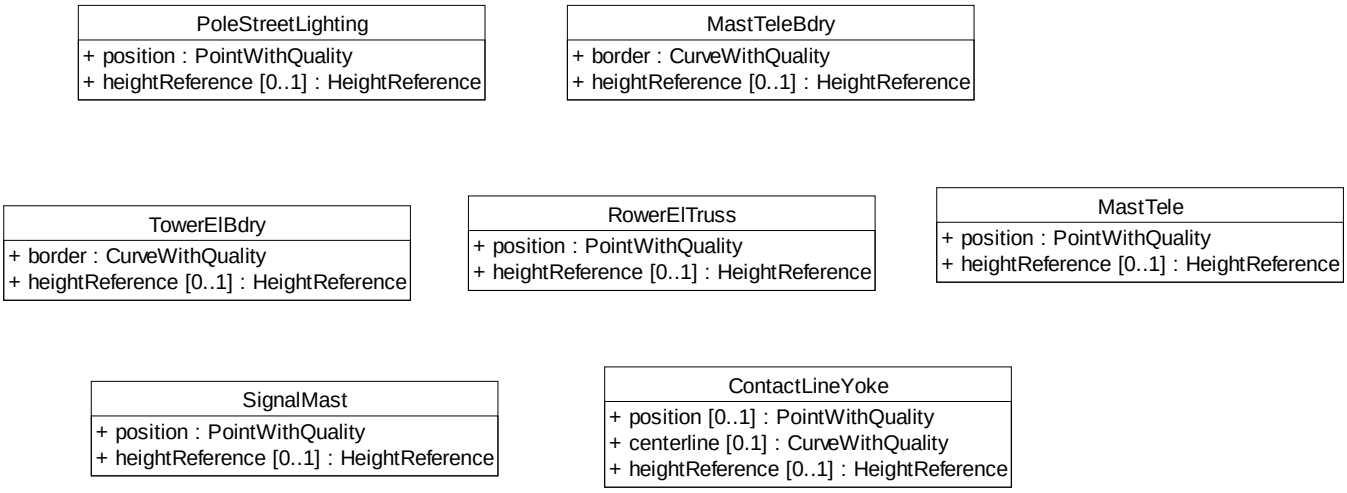
EL-Tele poles



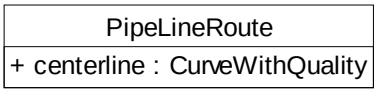
Map location



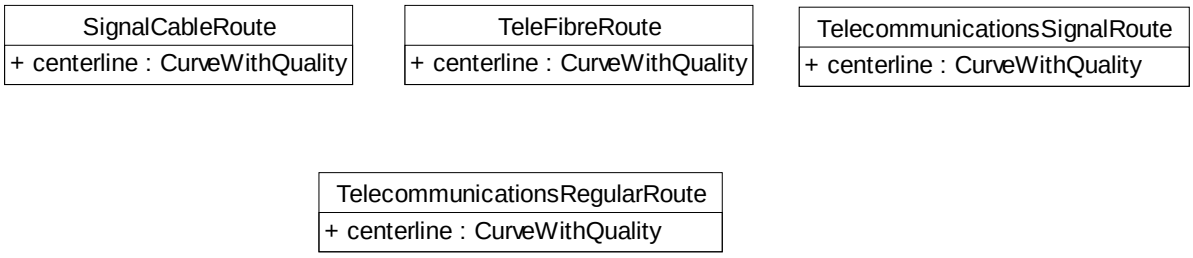
Masts



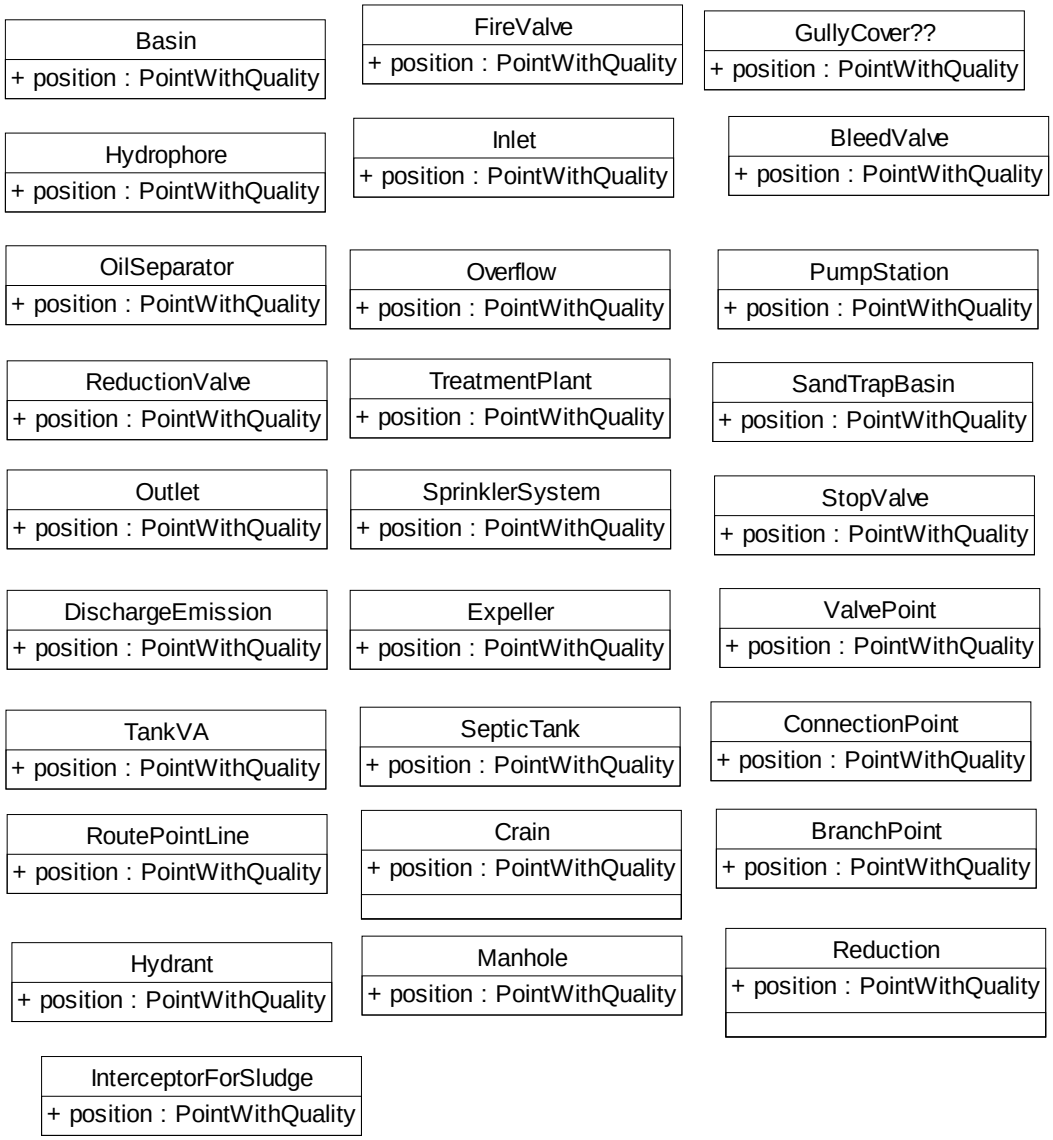
Pipeline route



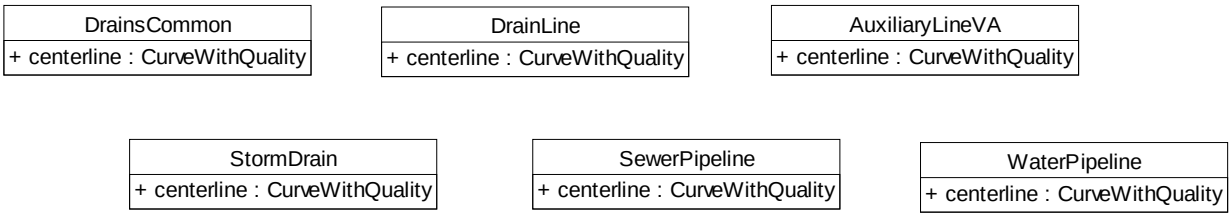
Tele-Route



VA-Coupling objects



VA-Routes



Description

1.3.1.1 DistrictCoolingLine

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class DistrictCoolingLine					
1.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.2 DistrictHeatingLine

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class DistrictHeatingLine					
2.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.3 PowerBreaker

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class PowerBreaker					
1.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.4 DistributionCabinet

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class DistributionCabinet	distribution cabinet for electricity or telecommunications. Note: may be used if ..KOPLING * 3 * SK-F (KOPLING := coupling)				
2.1	position	location where the object exists	1	1	PointWithQuality	
2.2	heightReference	koordinatregistering utført på topp eller bunn av et objekt	0	1	HeightReference	

1.3.1.5 PowerPlant

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Class PowerPlant					

3.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.6 SwitchIsolator

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Class SwitchIsolator					
4.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.7 PowerSwitchGen

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
5	Class PowerSwitchGen					
5.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.8 PowerGridStationKiosk

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
6	Class PowerGridStationKiosk	small building containing transformer for distribution of electricity. Note: May be used if ..KOPLING * 3 * NS-K (KOPLING := coupling)				
6.1	position	location where the object exists	1	1	PointWithQuality	
6.2	heightReference	coordinate registration carried out at the top or bottom of an object	0	1	HeightReference	

1.3.1.9 ??Sub-stationPole/PowerGridStationPole

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
7	Class ??Sub-stationPole/PowerGridStationPole	transformer for distribution of electricity, suspended from pole. Note: may be used if ..KOPLING * 3 * NS-M (KOPLING := coupling)				
7.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.10 IsolatingSwitch

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint

8	Class IsolatingSwitch					
8.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.11 Joint

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
9	Class Joint					
9.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.12 TransformerStation

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
10	Class TransformerStation					
10.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.13 WindPowerStation

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
11	Class WindPowerStation	power plant which utilises the windXzXs energy to produce electric power. Note: may be used if ..KOPLING * 3 * VKST (KOPLING := coupling)				
11.1	position	location where the object exists	1	1	PointWithQuality	
11.2	heightReference	koordinatregistering utført på topp eller bunn av et objekt	0	1	HeightReference	

1.3.1.14 PowerPlantBdry

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
12	Class PowerPlantBdry					
12.1	border	course following the transition between different real world phenomena	1	1	CurveWithQuality	

1.3.1.15 ??Sub-stationBdry/PowerGridStationBdry

No	Name/	Description	Obligation/	Maximum	Type	Constraint

	Role name		Condition	Occurrence		
13	Class ??Sub-stationBdry/PowerGridStationBdry	small building containing transformer for distribution of electricity				
13.1	border	course following the transition between different real world phenomena	1	1	CurveWithQuality	
13.2	heightReference	coordinate registration carried out at the top or bottom of an object	0	1	HeightReference	

1.3.1.16 TransformerStationBdry

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
14	Class TransformerStationBdry					
14.1	border	course following the transition between different real world phenomena	1	1	CurveWithQuality	

1.3.1.17 WindPowerStationGr

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
15	Class WindPowerStationGr	power plant which utilizes the windXzXs energy to produce electric power				
15.1	border	course following the transition between different real world phenomena	1	1	CurveWithQuality	
15.2	heightReference	koordinatregistering utført på topp eller bunn av et objekt	0	1	HeightReference	

1.3.1.18 EarthCable HV

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class EarthCable HV					
1.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.19 EarthCableHL

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint

2	Class EarthCableHL					
2.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.20 EarthCableLV

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Class EarthCableLV					
3.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.21 AerialLineHV

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Class AerialLineHV					
4.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.22 AerialLineLV

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
5	Class AerialLineLV					
5.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.23 AerialLineHL

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
6	Class AerialLineHL					
6.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.24 ??CablePullingDuct/DrawingDuct

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
7	Class ??CablePullingDuct/DrawingDuct					
7.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.25 ??DrawPipe

No	Name/	Description	Obligation/	Maximum	Type	Constraint

	Role name		Condition	Occurrence		
8	Class ??DrawPipe					
8.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.26 ??UnderwateBdryLE/SubseaBdryLE

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
9	Class ??UnderwateBdryLE/SubseaBdryLE					
9.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.27 CableDuct

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
10	Class CableDuct					
10.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.28 Marker

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class Marker					
1.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.29 Probe

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class Probe					
2.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.30 TimberPilePlate

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Class TimberPilePlate	timber pile with emblem plate				
3.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.31 UIron

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Class UIron					
4.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.32 PoleFacility

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class PoleFacility					
1.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.33 PoleSingle

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class PoleSingle					
2.1	position	location where the object exists	1	1	PointWithQuality	
2.2	heightReference	coordinate registration carried out at the top or bottom of an object	0	1	HeightReference	

1.3.1.34 PoleLarge

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Class PoleLarge					
3.1	position	location where the object exists	0	1	PointWithQuality	
3.2	centerline	course followed by the central part of the Object	0	1	CurveWithQuality	
3.3	heightReference	coordinate registration carried out at the top or bottom of an object	0	1	HeightReference	

1.3.1.35 SyspendedStreetLight

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Class SyspendedStreetLight					
4.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.36 MapLocCrossSection

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class MapLocCrossSection	Merknad: Frittstående linje				
	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.37 RowerElTruss

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class RowerElTruss					
1.1	position	location where the object exists	1	1	PointWithQuality	
1.2	heightReference		0	1	HeightReference	

1.3.1.38 TowerElBdry

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class TowerElBdry					
2.1	border	course following the transition between different real world phenomena	1	1	CurveWithQuality	
2.2	heightReference		0	1	HeightReference	

1.3.1.39 MastTele

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Class MastTele					
3.1	position	location where the object exists	1	1	PointWithQuality	
3.2	heightReference		0	1	HeightReference	

1.3.1.40 MastTeleBdry

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Class MastTeleBdry					
4.1	border	course following the transition between	1	1	CurveWithQuality	

		different real world phenomena				
4.2	heightReference		0	1	HeightReference	

1.3.1.41 PoleStreetLighting

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
5	Class PoleStreetLighting					
5.1	position	location where the object exists	1	1	PointWithQuality	
5.2	heightReference		0	1	HeightReference	

1.3.1.42 SignalMast

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
6	Class SignalMast					
6.1	position	location where the object exists	1	1	PointWithQuality	
6.2	heightReference	coordinate registration carried out at the top or bottom of an object	0	1	HeightReference	

1.3.1.43 ContactLineYoke

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
7	Class ContactLineYoke					
7.1	position	location where the object exists	0	1	PointWithQuality	
7.2	centerline	course followed by the central part of the Object	0	1	CurveWithQuality	
7.3	heightReference		0	1	HeightReference	

1.3.1.44 PipeLineRoute

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class PipeLineRoute					
	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.45 TeleFibreRoute

No	Name/	Description	Obligation/	Maximum	Type	Constraint

	Role name		Condition	Occurrence		
1	Class TeleFibreRoute					
1.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.46 TelecommunicationsSignalRoute

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class TelecommunicationsSignalRoute					
2.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.47 TelecommunicationsRegularRoute

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Class TelecommunicationsRegularRoute					
3.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.48 SignalCableRoute

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Class SignalCableRoute					
4.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.49 Hydrant

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class Hydrant					
1.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.50 Manhole

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class Manhole					
2.1	position	location where the object	1	1	PointWithQuali	

		exists			ty	

1.3.1.51 Outlet

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Class Outlet					
3.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.52 Basin

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Class Basin					
4.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.53 FireValve

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
5	Class FireValve					
5.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.54 GullyCover??

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
6	Class GullyCover??					
6.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.55 BranchPoint

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
7	Class BranchPoint					
7.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.56 Hydrophore

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
8	Class Hydrophore					

8.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.57 Inlet

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
9	Class Inlet					
9.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.58 OilSeparator

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
10	Class OilSeparator					
10.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.59 Overflow

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
11	Class Overflow					
11.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.60 PumpStation

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
12	Class PumpStation					
12.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.61 ConnectionPoint

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
13	Class ConnectionPoint					
13.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.62 TreatmentPlant

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
14	Class					

	TreatmentPlant					
14.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.63 SepticTank

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
15	Class SepticTank					
15.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.64 SandTrapBasin

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
16	Class SandTrapBasin					
16.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.65 InterceptorForSludge

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
17	Class InterceptorForSludge					
17.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.66 TankVA

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
18	Class TankVA					
18.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.67 RoutePointLine

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
19	Class RoutePointLine					
19.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.68 ReductionValve

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrenc	Type	Constraint

				e		
20	Class ReductionValve					
20.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.69 SprinklerSystem

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
21	Class SprinklerSystem					
21.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.70 StopValve

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
22	Class StopValve					
22.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.71 DischargeEmission

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
23	Class DischargeEmission	indicates quantity and type of discharge/emission from a source				
23.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.72 Expeller

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
24	Class Expeller					
24.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.73 ValvePoint

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
25	Class ValvePoint					
25.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.74 BleedValve

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
26	Class BleedValve					
26.1	position	location where the object exists	1	1	PointWithQuality	

1.3.1.75 Crain

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
27	Class Crain					
27.1	position		1	1	PointWithQuality	

1.3.1.76 Reduction

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
28	Class Reduction					
28.1	position		1	1	PointWithQuality	

1.3.1.77 DrainsCommon

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
1	Class DrainsCommon					
1.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.78 DrainLine

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
2	Class DrainLine					
2.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.79 AuxiliaryLineVA

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
3	Class AuxiliaryLineVA					
3.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.80 StormDrain

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
4	Class StormDrain					
4.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.81 SewerPipeline

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
5	Class SewerPipeline					
5.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	

1.3.1.82 WaterPipeline

No	Name/ Role name	Description	Obligation/ Condition	Maximum Occurrence	Type	Constraint
6	Class WaterPipeline					
6.1	centerline	course followed by the central part of the object	1	1	CurveWithQuality	