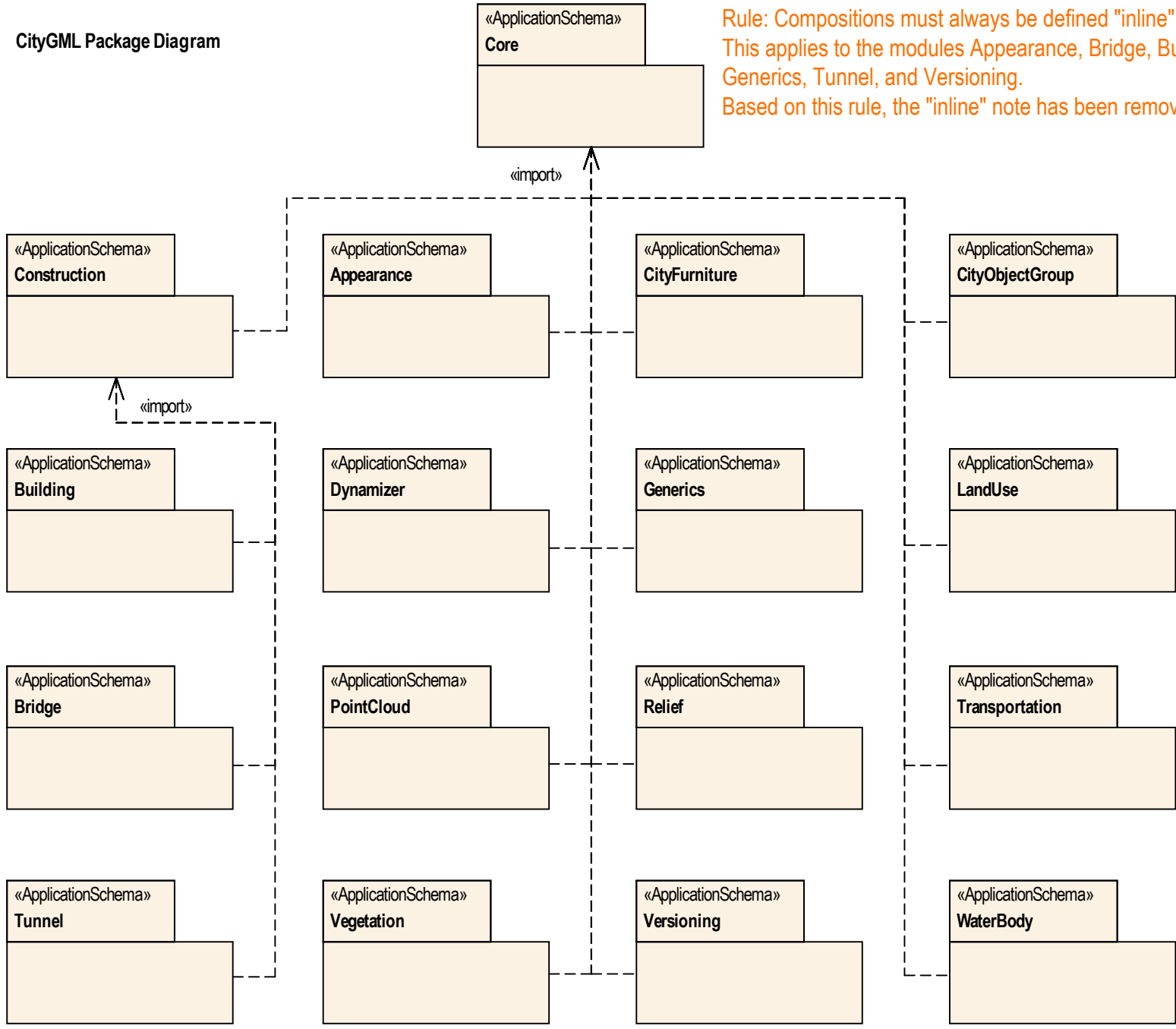
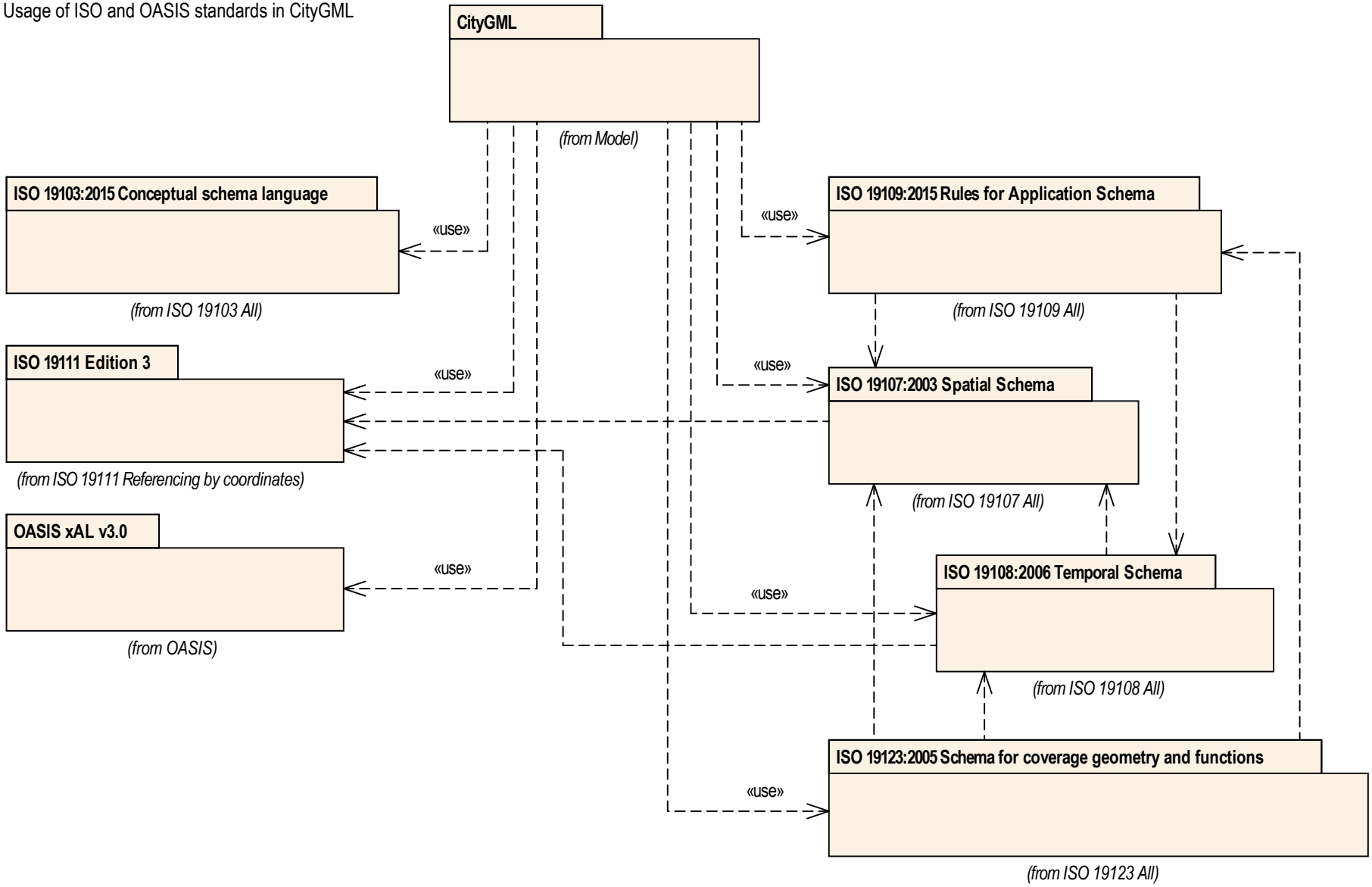
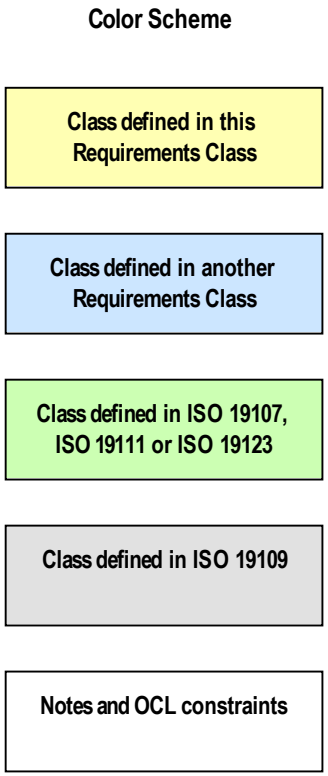
2.6.2021
Rule: Compositions must always be defined "inline".
This applies to the modules Appearance, Bridge, Building, Core, Dynamizer, Generics, Tunnel, and Versioning.
Based on this rule, the "inline" note has been removed in these modules.

CityGML Package Diagram



Usage of ISO and OASIS standards in CityGML




Color Scheme
Class defined in this Requirements Class
Class defined in another Requirements Class
Class defined in ISO 19107, ISO 19111 or ISO 19123
Class defined in ISO 19109
Notes and OCL constraints

8.7.2021: Ok.

«FeatureType»
CityModel
«Property»
+ engineeringCRS: EngineeringCRS [0..1]
+ adeOfCityModel: ADEOfCityModel [0..*]

1 — +cityModelMember «Property» * — inline

«Union»
CityModelMember
«Property»
+ cityObjectMember: AbstractCityObject
+ appearanceMember: AbstractAppearance
+ versionMember: AbstractVersion
+ versionTransitionMember: AbstractVersionTransition
+ featureMember: AbstractFeature

«FeatureType»
AbstractFeatureWithLifespan
«Property»
+ creationDate: DateTime [0..1]
+ terminationDate: DateTime [0..1]
+ validFrom: DateTime [0..1]
+ validTo: DateTime [0..1]
+ adeOfAbstractFeatureWithLifespan: ADEOfAbstractFeatureWithLifespan [0..*]

«FeatureType»
AbstractFeature
«Property»
+ featureID: ID
+ identifier: ScopedName [0..1]
+ name: GenericName [0..*]
+ description: CharacterString [0..1]
+ adeOfAbstractFeature: ADEOfAbstractFeature [0..*]

«FeatureType»
General Feature Model::
AnyFeature

«FeatureType»
AbstractVersion
«Property»
+ adeOfAbstractVersion: ADEOfAbstractVersion [0..*]

«FeatureType»
AbstractVersionTransition
«Property»
+ adeOfAbstractVersionTransition: ADEOfAbstractVersionTransition [0..*]

+appearance «Property» * — «FeatureType» ***AbstractAppearance*** — * +appearance «Property»
«Property»
+ adeOfAbstractAppearance: ADEOfAbstractAppearance [0..*]

+dynamizer «Property» * — «FeatureType» ***AbstractDynamizer***
«Property»
+ adeOfAbstractDynamizer: ADEOfAbstractDynamizer [0..*]

«DataType»
QualifiedVolume
«Property»
+ volume: Volume
+ typeOfVolume: QualifiedVolumeTypeValue

«DataType»
QualifiedArea
«Property»
+ area: Area
+ typeOfArea: QualifiedAreaTypeValue

rule on page 1 — «ObjectType» **CityObjectRelation** — inlineOrByReference see issue #20 — * +relatedTo «Property» *
«Property»
+ relationType: RelationTypeValue

inline — inline

«FeatureType»
AbstractCityObject
«Property»
+ relativeToTerrain: RelativeToTerrain [0..1]
+ relativeToWater: RelativeToWater [0..1]
+ adeOfAbstractCityObject: ADEOfAbstractCityObject [0..*]

+generalizesTo «Property» * — * byReference

«DataType»
ExternalReference
«Property»
+ targetResource: URI
+ informationSystem: URI [0..1]
+ relationType: URI [0..1]

1 rule on page 1 * — +externalReference «Property»

+genericAttribute «Property» 0..1 * — «DataType» **AbstractGenericAttribute** — * rule on page 1 0..1 +genericAttribute «Property»

GM_Primitive
«type»
Geometric primitive::
GM_Solid

+lod1Solid «Property» 0..1
+lod2Solid «Property» *
+lod3Solid «Property» *

~~inlineOrByReference~~ * -> 24.6.2021: inline

«FeatureType»
AbstractSpace
«Property»
+ spaceType: SpaceType [0..1]
+ volume: QualifiedVolume [0..*]
+ area: QualifiedArea [0..*]
+ adeOfAbstractSpace: ADEOfAbstractSpace [0..*]

-> 8.7.2021: inlineOrByReference ~~inline~~

-> 8.7.2021: ~~inline~~ inlineOrByReference

+boundary «Property» * — «FeatureType» ***AbstractSpaceBoundary***
«Property»
+ adeOfAbstractSpaceBoundary: ADEOfAbstractSpaceBoundary [0..*]

+lod0MultiSurface «Property»
+lod2MultiSurface «Property» *
+lod3MultiSurface «Property» *

GM_MultiPrimitive
«type»
Geometric aggregates::
GM_MultiSurface
0..1

+lod0MultiSurface «Property» *
+lod1MultiSurface «Property» *
+lod2MultiSurface «Property» *
+lod3MultiSurface «Property» *

«FeatureType»
AbstractThematicSurface
«Property»
+ area: QualifiedArea [0..*]
+ adeOfAbstractThematicSurface: ADEOfAbstractThematicSurface [0..*]

~~inline~~
-> 8.7.2021: inlineOrByReference

«type»
Geometry root::
GM_Object

GM_Primitive
«type»
Geometric primitive::
GM_Point

+relativeGeometry «Property» 0..1
-> 8.7.2021 inlineOrByReference ~~inline~~ 0..1 inlineOrByReference *

+referencePoint «Property» 1 0..1 +lod0Point «Property»

«ObjectType»
ImplicitGeometry
«Property»
+ objectID: ID
+ transformationMatrix: TransformationMatrix4x4
+ mimeType: MimeTypeValue [0..1]
+ libraryObject: URI [0..1]

~~inline~~
-> 8.7.2021: inlineOrByReference

+lod0MultiCurve «Property»
+lod2MultiCurve «Property» *
+lod3MultiCurve «Property» *

GM_MultiPrimitive
«type»
Geometric aggregates::
GM_MultiCurve
0..1

+lod0MultiCurve «Property» *

+lod1TerrainIntersectionCurve «Property»
+lod2TerrainIntersectionCurve «Property» *
+lod3TerrainIntersectionCurve «Property» *

«DataType»
XALAddress
+xalAddress «Property» 1 — rule on page 1

«FeatureType»
AbstractLogicalSpace
«Property»
+ adeOfAbstractLogicalSpace: ADEOfAbstractLogicalSpace [0..*]

«FeatureType»
AbstractPhysicalSpace
-> 8.7.2021: ~~inline~~ inlineOrByReference
«Property»
+ adeOfAbstractPhysicalSpace: ADEOfAbstractPhysicalSpace [0..*]

* inline

«FeatureType»
ClosureSurface
«Property»
+ adeOfClosureSurface: ADEOfClosureSurface [0..*]

GM_MultiPrimitive
«type»
Geometric aggregates::
GM_MultiPoint

+multiPoint «Property» 0..1 * — ~~inline~~
-> 8.7.2021: inlineOrByReference

+pointCloud «Property» 0..1 — +pointCloud «Property» 0..1

+lod1ImplicitRepresentation «Property» inline *
+lod2ImplicitRepresentation «Property» inline *
+lod3ImplicitRepresentation «Property» inline *

«FeatureType»
AbstractOccupiedSpace
«Property»
+ adeOfAbstractOccupiedSpace: ADEOfAbstractOccupiedSpace [0..*]

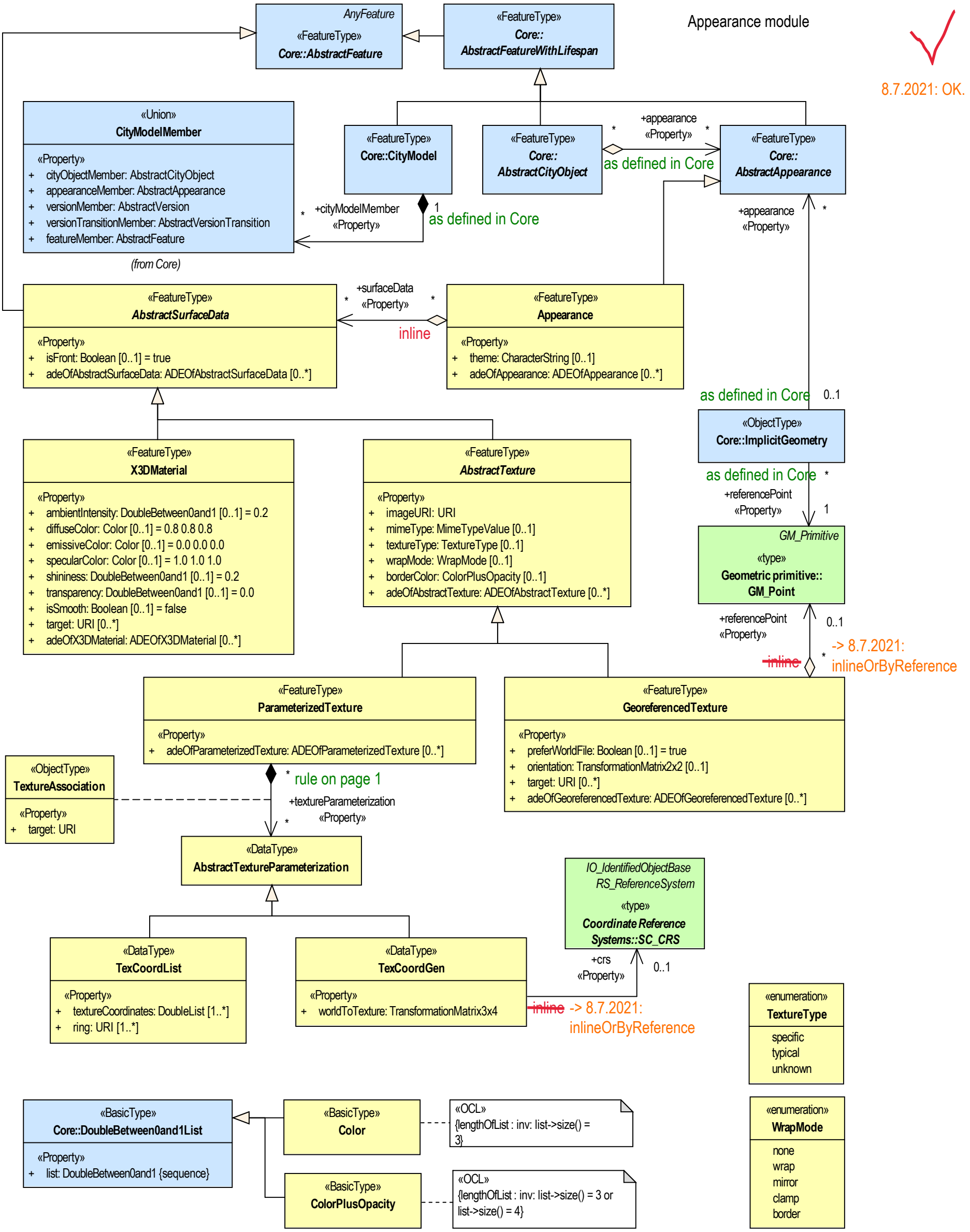
«FeatureType»
AbstractUnoccupiedSpace
«Property»
+ adeOfAbstractUnoccupiedSpace: ADEOfAbstractUnoccupiedSpace [0..*]

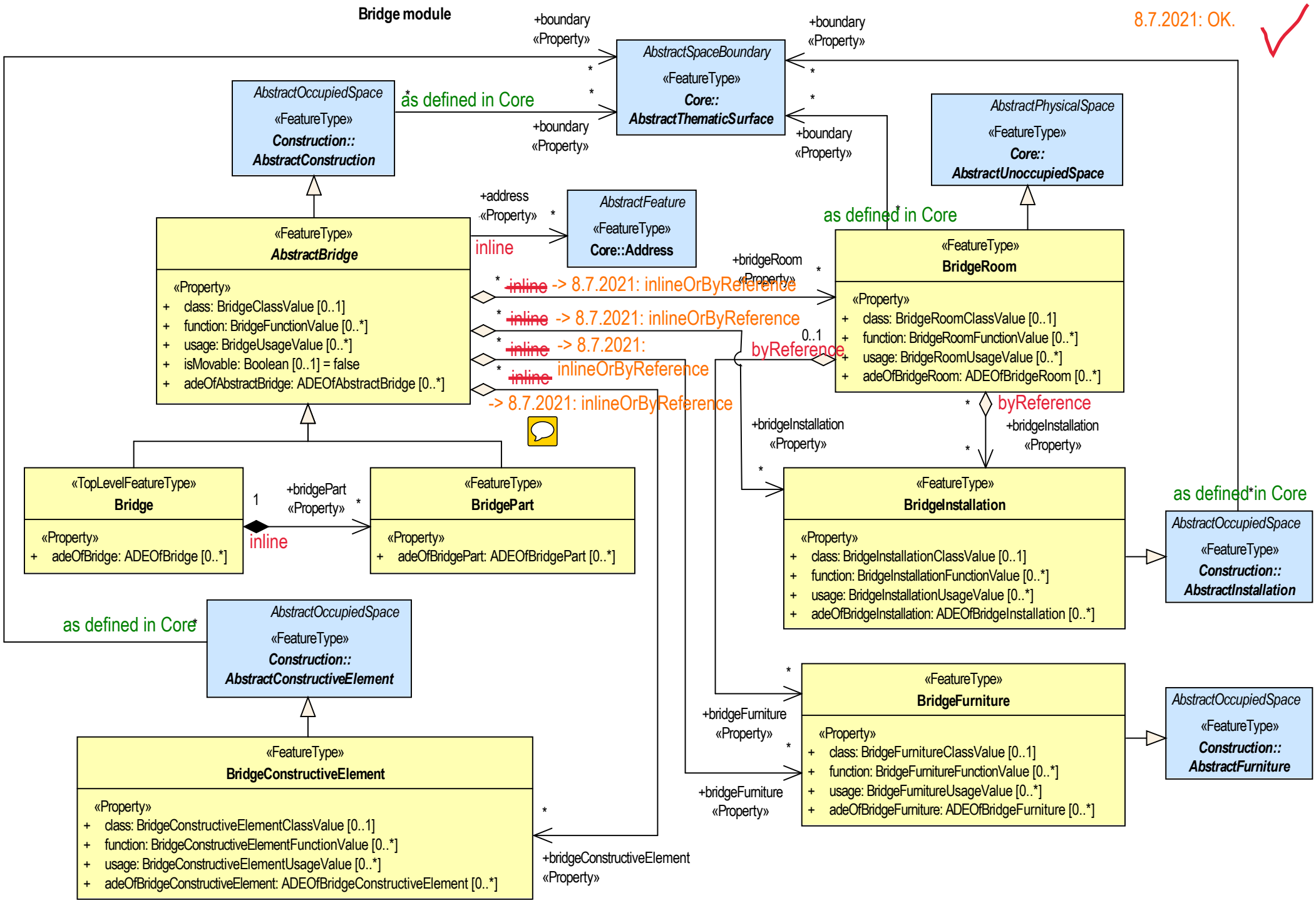
«FeatureType»
AbstractPointCloud
«Property»
+ adeOfAbstractPointCloud: ADEOfAbstractPointCloud [0..*]

«FeatureType»
Address
«Property»
+ adeOfAddress: ADEOfAddress [0..*]

Appearance module

8.7.2021: OK.




Bridge module
8.7.2021: OK.
+boundary
«Property»
*
AbstractSpaceBoundary
«FeatureType»
Core::
AbstractThematicSurface
AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractConstruction
as defined in Core
AbstractPhysicalSpace
«FeatureType»
Core::
AbstractUnoccupiedSpace
+address
«Property»
AbstractFeature
«FeatureType»
Core::Address
inline
«FeatureType»
AbstractBridge
«Property»
+ class: BridgeClassValue [0..1]
+ function: BridgeFunctionValue [0..*]
+ usage: BridgeUsageValue [0..*]
+ isMovable: Boolean [0..1] = false
+ adeOfAbstractBridge: ADEOfAbstractBridge [0..*]
+bridgeRoom
«Property»
~~inline~~ -> 8.7.2021: inlineOrByReference
~~inline~~ -> 8.7.2021: inlineOrByReference
~~inline~~ -> 8.7.2021: inlineOrByReference
~~inline~~ -> 8.7.2021: inlineOrByReference
0..1
byReference
«FeatureType»
BridgeRoom
«Property»
+ class: BridgeRoomClassValue [0..1]
+ function: BridgeRoomFunctionValue [0..*]
+ usage: BridgeRoomUsageValue [0..*]
+ adeOfBridgeRoom: ADEOfBridgeRoom [0..*]
byReference
+bridgeInstallation
«Property»
«TopLevelFeatureType»
Bridge
«Property»
+ adeOfBridge: ADEOfBridge [0..*]
1
+bridgePart
«Property»
inline
«FeatureType»
BridgePart
«Property»
+ adeOfBridgePart: ADEOfBridgePart [0..*]
«FeatureType»
BridgeInstallation
«Property»
+ class: BridgeInstallationClassValue [0..1]
+ function: BridgeInstallationFunctionValue [0..*]
+ usage: BridgeInstallationUsageValue [0..*]
+ adeOfBridgeInstallation: ADEOfBridgeInstallation [0..*]
as defined*in Core
AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractInstallation
as defined in Core
AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractConstructiveElement
«FeatureType»
BridgeFurniture
«Property»
+ class: BridgeFurnitureClassValue [0..1]
+ function: BridgeFurnitureFunctionValue [0..*]
+ usage: BridgeFurnitureUsageValue [0..*]
+ adeOfBridgeFurniture: ADEOfBridgeFurniture [0..*]
+bridgeFurniture
«Property»
+bridgeFurniture
«Property»
AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractFurniture
«FeatureType»
BridgeConstructiveElement
«Property»
+ class: BridgeConstructiveElementClassValue [0..1]
+ function: BridgeConstructiveElementFunctionValue [0..*]
+ usage: BridgeConstructiveElementUsageValue [0..*]
+ adeOfBridgeConstructiveElement: ADEOfBridgeConstructiveElement [0..*]
+bridgeConstructiveElement
«Property»

Building module

8.7.2021: OK.

AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractConstruction

as defined in Core

+boundary
«Property»

AbstractSpaceBoundary
«FeatureType»
Core::
AbstractThematicSurface

AbstractSpace
«FeatureType»
Core::
AbstractLogicalSpace

«FeatureType»
AbstractBuilding

«Property»
+ class: BuildingClassValue [0..1]
+ function: BuildingFunctionValue [0..*]
+ usage: BuildingUsageValue [0..*]
+ roofType: RoofTypeValue [0..1]
+ storeysAboveGround: Integer [0..1]
+ storeysBelowGround: Integer [0..1]
+ storeyHeightsAboveGround: MeasureOrNilReasonList [0..1]
+ storeyHeightsBelowGround: MeasureOrNilReasonList [0..1]
+ adeOfAbstractBuilding: ADEOfAbstractBuilding [0..*]

~~inline~~ -> 24.6.2021: inlineOrByReference
inline
~~inline~~ -> 8.7.2021: inlineOrByReference
~~inline~~ -> 24.6.2021: inlineOrByReference
~~inline~~ -> 8.7.2021:inlineOrByReference
~~inline~~ -> 24.6.2021: inlineOrByReference

+address
«Property»

AbstractFeature
«FeatureType»
Core::Address

+buildingSubdivision
«Property»

«FeatureType»
AbstractBuildingSubdivision

«Property»
+ class: BuildingSubdivisionClassValue [0..1]
+ function: BuildingSubdivisionFunctionValue [0..*]
+ usage: BuildingSubdivisionUsageValue [0..*]
+ elevation: Elevation [0..*]
+ sortKey: Real [0..1]
+ adeOfAbstractBuildingSubdivision: ADEOfAbstractBuildingSubdivision [0..*]

byReference

«TopLevelFeatureType»
Building

«Property»
+ adeOfBuilding: ADEOfBuilding [0..*]

+buildingPart
«Property»
1
inline

«FeatureType»
BuildingPart

«Property»
+ adeOfBuildingPart: ADEOfBuildingPart [0..*]

AbstractPhysicalSpace
«FeatureType»
Core::
AbstractUnoccupiedSpace

+buildingRoom
«Property»

«FeatureType»
BuildingRoom

«Property»
+ class: BuildingRoomClassValue [0..1]
+ function: BuildingRoomFunctionValue [0..*]
+ usage: BuildingRoomUsageValue [0..*]
+ roomHeight: RoomHeight [0..*]
+ adeOfBuildingRoom: ADEOfBuildingRoom [0..*]

inline

«FeatureType»
BuildingUnit

«Property»
+ adeOfBuildingUnit: ADEOfBuildingUnit [0..*]

+buildingUnit
«Property»

«FeatureType»
Storey

«Property»
+ adeOfStorey: ADEOfStorey [0..*]

+storey
«Property»

as defined in Core

AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractConstructiveElement

«FeatureType»
BuildingConstructiveElement

«Property»
+ class: BuildingConstructiveElementClassValue [0..1]
+ function: BuildingConstructiveElementFunctionValue [0..*]
+ usage: BuildingConstructiveElementUsageValue [0..*]
+ adeOfBuildingConstructiveElement: ADEOfBuildingConstructiveElement [0..*]

+buildingConstructiveElement
«Property»

+buildingConstructiveElement
«Property»

byReference

+buildingInstallation
«Property»

«FeatureType»
BuildingInstallation

«Property»
+ class: BuildingInstallationClassValue [0..1]
+ function: BuildingInstallationFunctionValue [0..*]
+ usage: BuildingInstallationUsageValue [0..*]
+ adeOfBuildingInstallation: ADEOfBuildingInstallation [0..*]

AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractInstallation

as defined in Core

+buildingFurniture
«Property»

«FeatureType»
BuildingFurniture

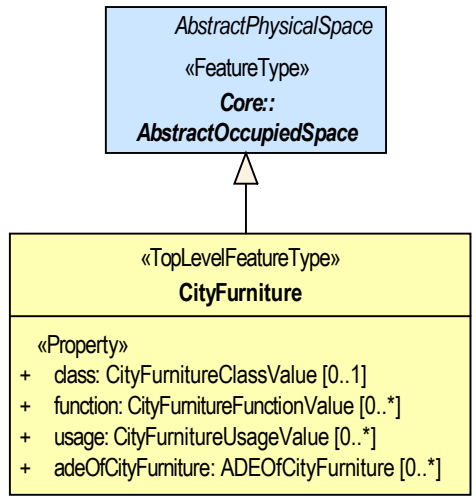
«Property»
+ class: BuildingFurnitureClassValue [0..1]
+ function: BuildingFurnitureFunctionValue [0..*]
+ usage: BuildingFurnitureUsageValue [0..*]
+ adeOfBuildingFurniture: ADEOfBuildingFurniture [0..*]

AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractFurniture

«DataType»
RoomHeight

«Property»
+ highReference: RoomElevationReferenceValue
+ lowReference: RoomElevationReferenceValue
+ status: HeightStatusValue
+ value: Length

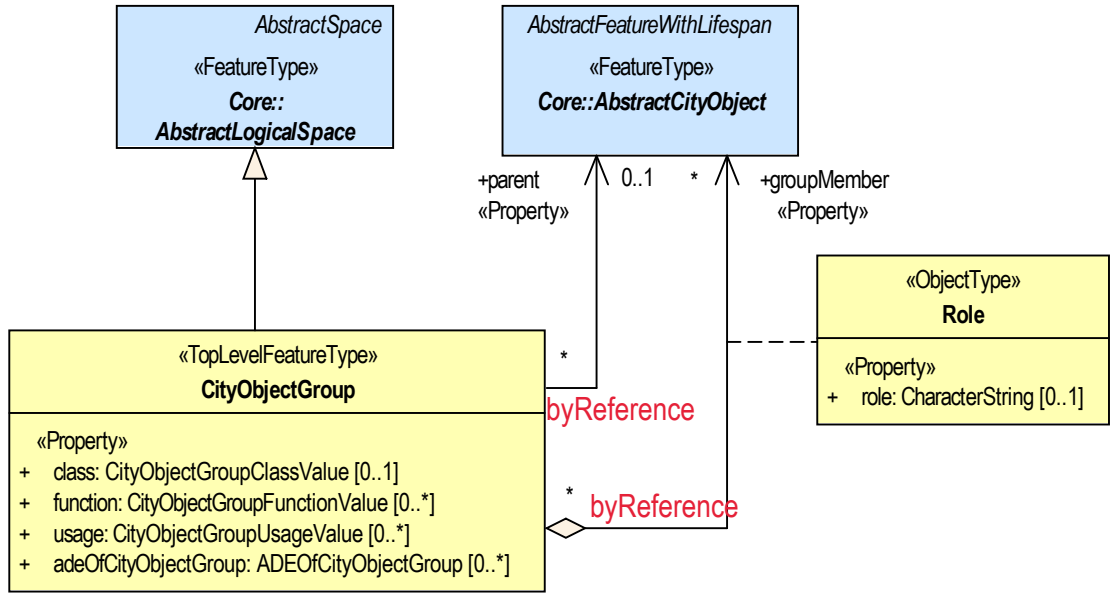
CityFurniture module



2.6.2021: OK.

2.6.2021: OK.

CityObjectGroup module



Construction module

24.6.2021: OK.

«FeatureType»
AbstractConstruction

«Property»
+ conditionOfConstruction: ConditionOfConstructionValue [0..1]
+ dateOfConstruction: Date [0..1]
+ dateOfDemolition: Date [0..1]
+ constructionEvent: ConstructionEvent [0..*]
+ elevation: Elevation [0..*]
+ height: Height [0..*]
+ occupancy: Occupancy [0..*]
+ adeOfAbstractConstruction: ADEOfAbstractConstruction [0..*]

AbstractPhysicalSpace
«FeatureType»
Core::
AbstractOccupiedSpace

«FeatureType»
AbstractConstructiveElement

«Property»
+ isStructuralElement: Boolean [0..1]
+ adeOfAbstractConstructiveElement: ADEOfAbstractConstructiveElement [0..*]

inline
+filling
«Property»

as defined in Core

as defined in Core

«TopLevelFeatureType»
OtherConstruction

«Property»
+ class: OtherConstructionClassValue [0..1]
+ function: OtherConstructionFunctionValue [0..*]
+ usage: OtherConstructionUsageValue [0..*]
+ adeOfOtherConstruction: ADEOfOtherConstruction [0..*]

«FeatureType»
AbstractFillingElement

«Property»
+ adeOfAbstractFillingElement: ADEOfAbstractFillingElement [0..*]

«FeatureType»
Window

«Property»
+ class: WindowClassValue [0..1]
+ function: WindowFunctionValue [0..*]
+ usage: WindowUsageValue [0..*]
+ adeOfWindow: ADEOfWindow [0..*]

as defined in Core

«FeatureType»
AbstractFurniture

«Property»
+ adeOfAbstractFurniture: ADEOfAbstractFurniture [0..*]

«FeatureType»
AbstractInstallation

«Property»
+ relationToConstruction: RelationToConstruction [0..1]
+ adeOfAbstractInstallation: ADEOfAbstractInstallation [0..*]

«FeatureType»
Door

«Property»
+ class: DoorClassValue [0..1]
+ function: DoorFunctionValue [0..*]
+ usage: DoorUsageValue [0..*]
+ adeOfDoor: ADEOfDoor [0..*]

as defined in Core

+boundary
«Property»

+boundary
«Property»

as defined in Core

+boundary
«Property»

«FeatureType»
Core::
ClosureSurface

«TopLevelFeatureType»
Generics::
GenericThematicSurface

AbstractSpaceBoundary
«FeatureType»
Core::
AbstractThematicSurface

inlineOrByReference
+address
«Property»

AbstractFeature
«FeatureType»
Core::Address

+address
«Property»

~~either inline or byReference~~
-> 24.6.2021:
inlineOrByReference

«FeatureType»
AbstractConstructionSurface

«Property»
+ adeOfAbstractConstructionSurface: ADEOfAbstractConstructionSurface [0..*]

+fillingSurface
«Property»

«FeatureType»
AbstractFillingSurface

«Property»
+ adeOfAbstractFillingSurface: ADEOfAbstractFillingSurface [0..*]

inlineOrByReference

«FeatureType»
WallSurface

«Property»
+ adeOfWallSurface: ADEOfWallSurface [0..*]

«FeatureType»
GroundSurface

«Property»
+ adeOfGroundSurface: ADEOfGroundSurface [0..*]

«FeatureType»
InteriorWallSurface

«Property»
+ adeOfInteriorWallSurface: ADEOfInteriorWallSurface [0..*]

«FeatureType»
DoorSurface

«Property»
+ adeOfDoorSurface: ADEOfDoorSurface [0..*]

+boundary
«Property»

«FeatureType»
RoofSurface

«Property»
+ adeOfRoofSurface: ADEOfRoofSurface [0..*]

«FeatureType»
FloorSurface

«Property»
+ adeOfFloorSurface: ADEOfFloorSurface [0..*]

«FeatureType»
OuterFloorSurface

«Property»
+ adeOfOuterFloorSurface: ADEOfOuterFloorSurface [0..*]

«FeatureType»
WindowSurface

«Property»
+ adeOfWindowSurface: ADEOfWindowSurface [0..*]

+boundary
«Property»

«FeatureType»
CeilingSurface

«Property»
+ adeOfCeilingSurface: ADEOfCeilingSurface [0..*]

«FeatureType»
OuterCeilingSurface

«Property»
+ adeOfOuterCeilingSurface: ADEOfOuterCeilingSurface [0..*]

«DataType»
Elevation

«Property»
+ elevationReference: ElevationReferenceValue
+ elevationValue: DirectPosition

«DataType»
Height

«Property»
+ highReference: ElevationReferenceValue
+ lowReference: ElevationReferenceValue
+ status: HeightStatusValue
+ value: Length

«DataType»
ConstructionEvent

«Property»
+ event: EventValue
+ dateOfEvent: Date
+ description: CharacterString [0..1]

«enumeration»
ConditionOfConstructionValue

declined
demolished
functional
projected
ruin
underConstruction

«enumeration»
RelationToConstruction

inside
outside
bothInsideAndOutside

«enumeration»
HeightStatusValue

estimated
measured

«FeatureType»
Core::
AbstractFeatureWithLifespan

AnyFeature
«FeatureType»
Core::AbstractFeature

Dynamizer module

8.7.2021: OK.

«FeatureType»
Core::AbstractCityObject

as defined in Core

+dynamizer
«Property»
*

«FeatureType»
Core::AbstractDynamizer

+sensorLocation
«Property»
byReference
0..1
*

«DataType»
SensorConnection

«Property»
+ connectionType: SensorConnectionTypeValue
+ observationProperty: CharacterString
+ uom: CharacterString [0..1]
+ sensorID: CharacterString [0..1]
+ sensorName: CharacterString [0..1]
+ observationID: CharacterString [0..1]
+ datastreamID: CharacterString [0..1]
+ baseURL: URI [0..1]
+ authType: AuthenticationTypeValue [0..1]
+ mqttServer: CharacterString [0..1]
+ mqttTopic: CharacterString [0..1]
+ linkToObservation: CharacterString [0..1]
+ linkToSensorDescription: CharacterString [0..1]

+sensorConnection
«Property»
0..1
rule on page 1

«FeatureType»
Dynamizer

«Property»
+ attributeRef: CharacterString
+ startTime: TM_Position [0..1]
+ endTime: TM_Position [0..1]
+ adeOfDynamizer: ADEOfDynamizer [0..*]

+dynamicData
«Property»
*
inlineOrByReference
0..1

«FeatureType»
AbstractTimeseries

«Property»
+ firstTimestamp: TM_Position [0..1]
+ lastTimestamp: TM_Position [0..1]
+ adeOfAbstractTimeseries: ADEOfAbstractTimeseries [0..*]

+timeseries
«Property»
0..1
inlineOrByReference

«DataType»
TimeseriesComponent

«Property»
+ repetitions: Integer
+ additionalGap: TM_Duration [0..1]

+component
«Property»
1..*
{ordered}
rule on page 1

«FeatureType»
AbstractAtomicTimeseries

«Property»
+ observationProperty: CharacterString
+ uom: CharacterString [0..1]
+ adeOfAbstractAtomicTimeseries: ADEOfAbstractAtomicTimeseries [0..*]

«FeatureType»
CompositeTimeseries

«Property»
+ adeOfCompositeTimeseries: ADEOfCompositeTimeseries [0..*]

«FeatureType»
TabulatedFileTimeseries

«Property»
+ fileLocation: URI
+ fileType: TabulatedFileTypeValue
+ mimeType: MimeTypeValue [0..1]
+ valueType: TimeseriesTypeValue
+ numberOfHeaderLines: Integer [0..1]
+ fieldSeparator: CharacterString
+ decimalSymbol: Character [0..1]
+ idColumnNo: Integer [0..1]
+ idColumnName: CharacterString [0..1]
+ idValue: CharacterString [0..1]
+ timeColumnNo: Integer [0..1]
+ timeColumnName: CharacterString [0..1]
+ valueColumnNo: Integer [0..1]
+ valueColumnName: CharacterString [0..1]
+ adeOfTabulatedFileTimeseries: ADEOfTabulatedFileTimeseries [0..*]

«OCL»
{columnNumberOrColumnName : inv: (timeColumnNo->notEmpty()
or timeColumnName->notEmpty()) and (valueColumnNo->notEmpty
() or valueColumnName->notEmpty()) and (idValue->notEmpty()
implies idColumnNo->notEmpty() or idColumnName->notEmpty())}

«FeatureType»
StandardFileTimeseries

«Property»
+ fileLocation: URI
+ fileType: StandardFileTypeValue
+ mimeType: MimeTypeValue [0..1]
+ adeOfStandardFileTimeseries: ADEOfStandardFileTimeseries [0..*]

«enumeration»
TimeseriesTypeValue

int
double
string
geometry
uri
bool
implicitGeometry
appearance

«FeatureType»
GenericTimeseries

«Property»
+ valueType: TimeseriesTypeValue
+ adeOfGenericTimeseries: ADEOfGenericTimeseries [0..*]

«OCL»
{dataTypeOfValue : inv:
if valueType = TimeseriesTypeValue::int then
TimeValuePair->forAll(c | c.intValue->size()=1)
else if valueType = TimeseriesTypeValue::double then
TimeValuePair->forAll(c | c.doubleValue->size()=1)
else if valueType = TimeseriesTypeValue::string then
TimeValuePair->forAll(c | c.stringValue->size()=1)
else if valueType = TimeseriesTypeValue::geometry then
TimeValuePair->forAll(c | c.geometryValue->size()=1)
else if valueType = TimeseriesTypeValue::uri then
TimeValuePair->forAll(c | c.uriValue->size()=1)
else if valueType = TimeseriesTypeValue::bool then
TimeValuePair->forAll(c | c.boolValue->size()=1)
else if valueType = TimeseriesTypeValue::implicitGeometry
then
TimeValuePair->forAll(c | c.implicitGeometryValue->size()=1)
else TimeValuePair->forAll(c | c.appearanceValue->size()=1)
endif endif endif endif endif endif endif}

rule on page 1

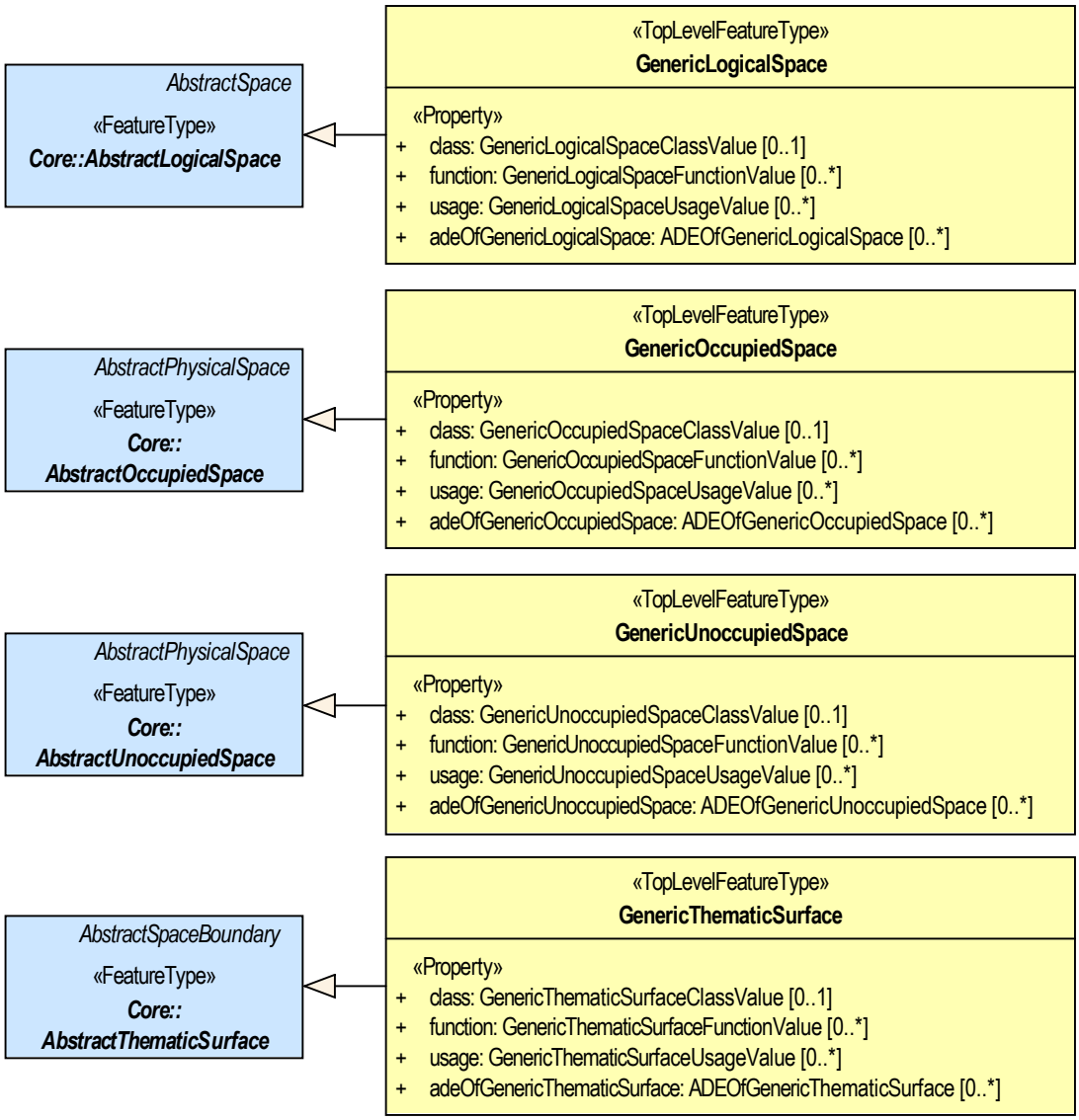
+timeValuePair
«Property»
1..*

«DataType»
TimeValuePair

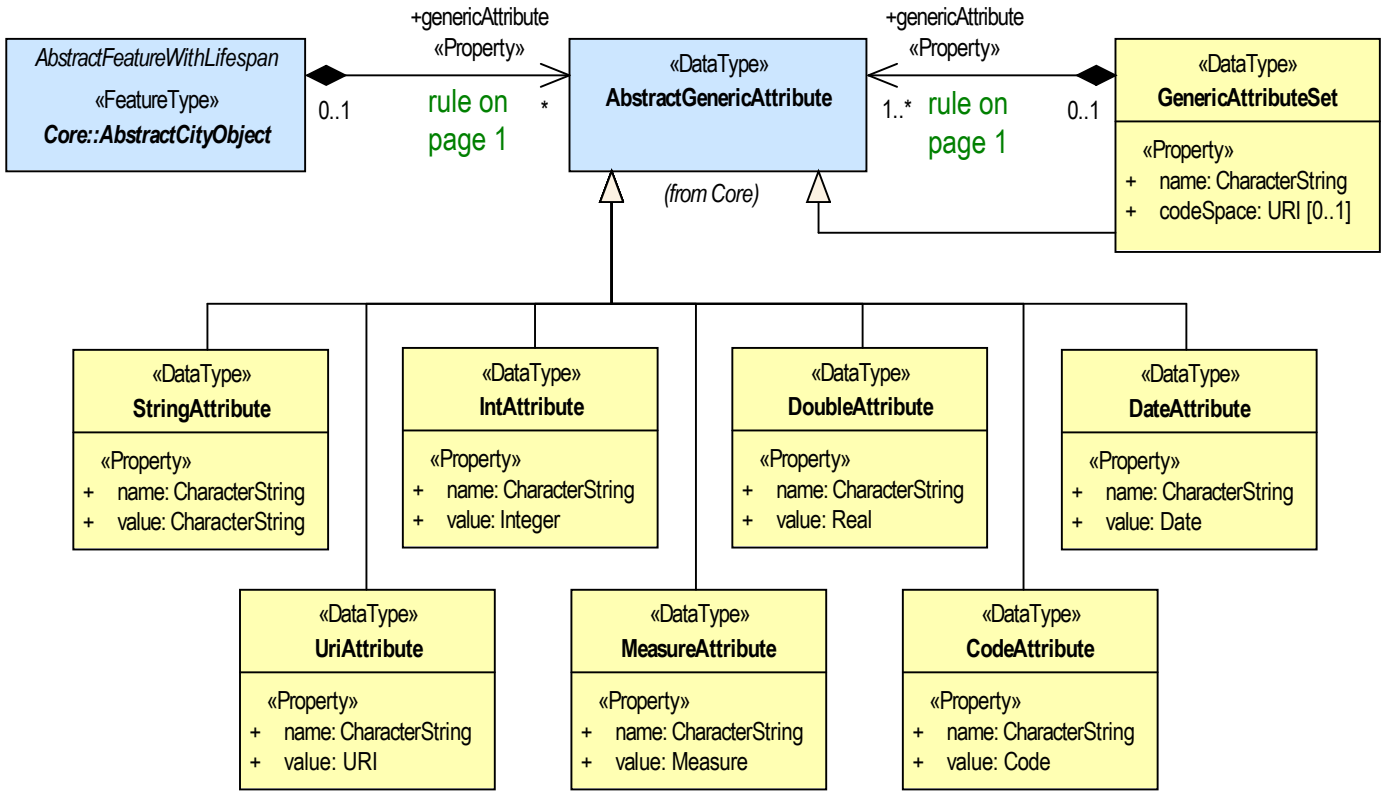
«Property»
+ timestamp: TM_Position
+ intValue: Integer [0..1]
+ doubleValue: Real [0..1]
+ stringValue: CharacterString [0..1]
+ geometryValue: GM_Object [0..1]
+ uriValue: URI [0..1]
+ boolValue: Boolean [0..1]
+ implicitGeometryValue: ImplicitGeometry [0..1]
+ appearanceValue: AbstractAppearance [0..1]

«OCL»
{singleValue : inv: intValue->size() + doubleValue->size() +
stringValue->size() + geometryValue->size() + uriValue->size()
+ boolValue->size() + implicitGeometryValue->size() +
appearanceValue->size() = 1}

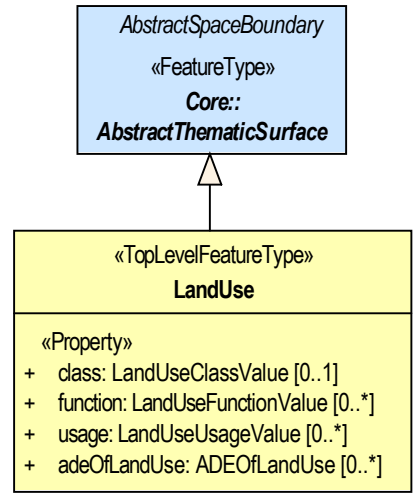
Generics module



8.7.2021: OK.

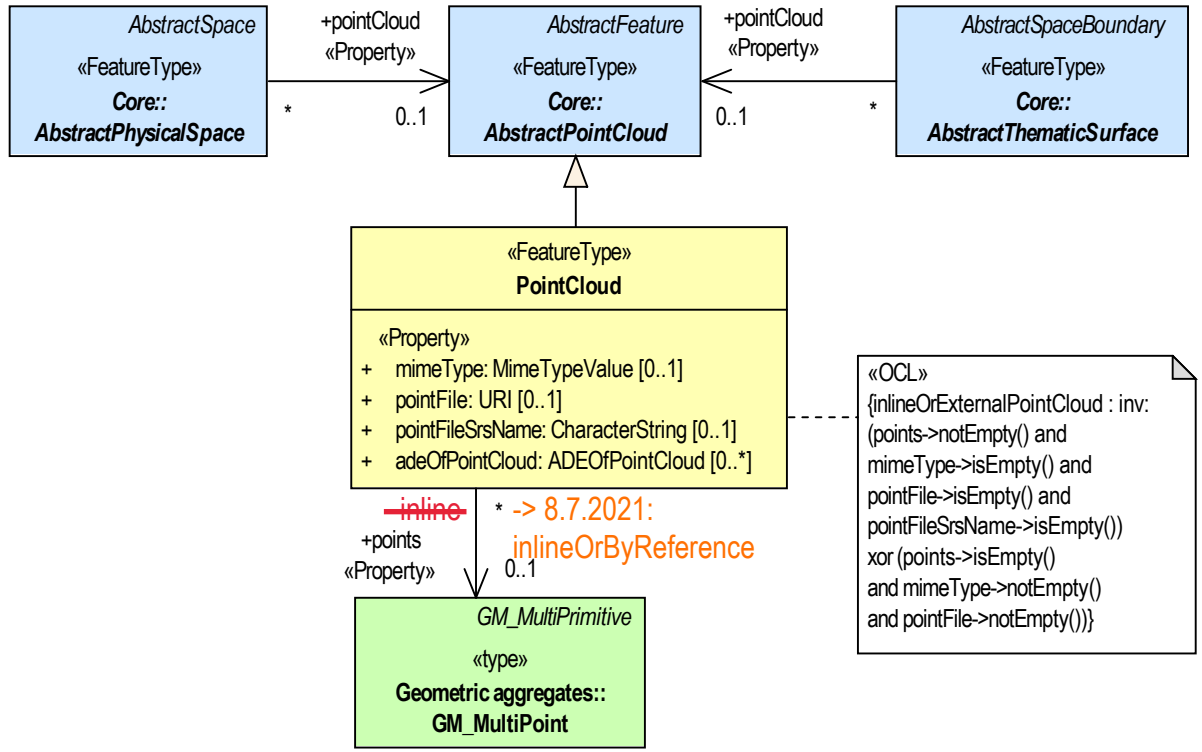


LandUse module

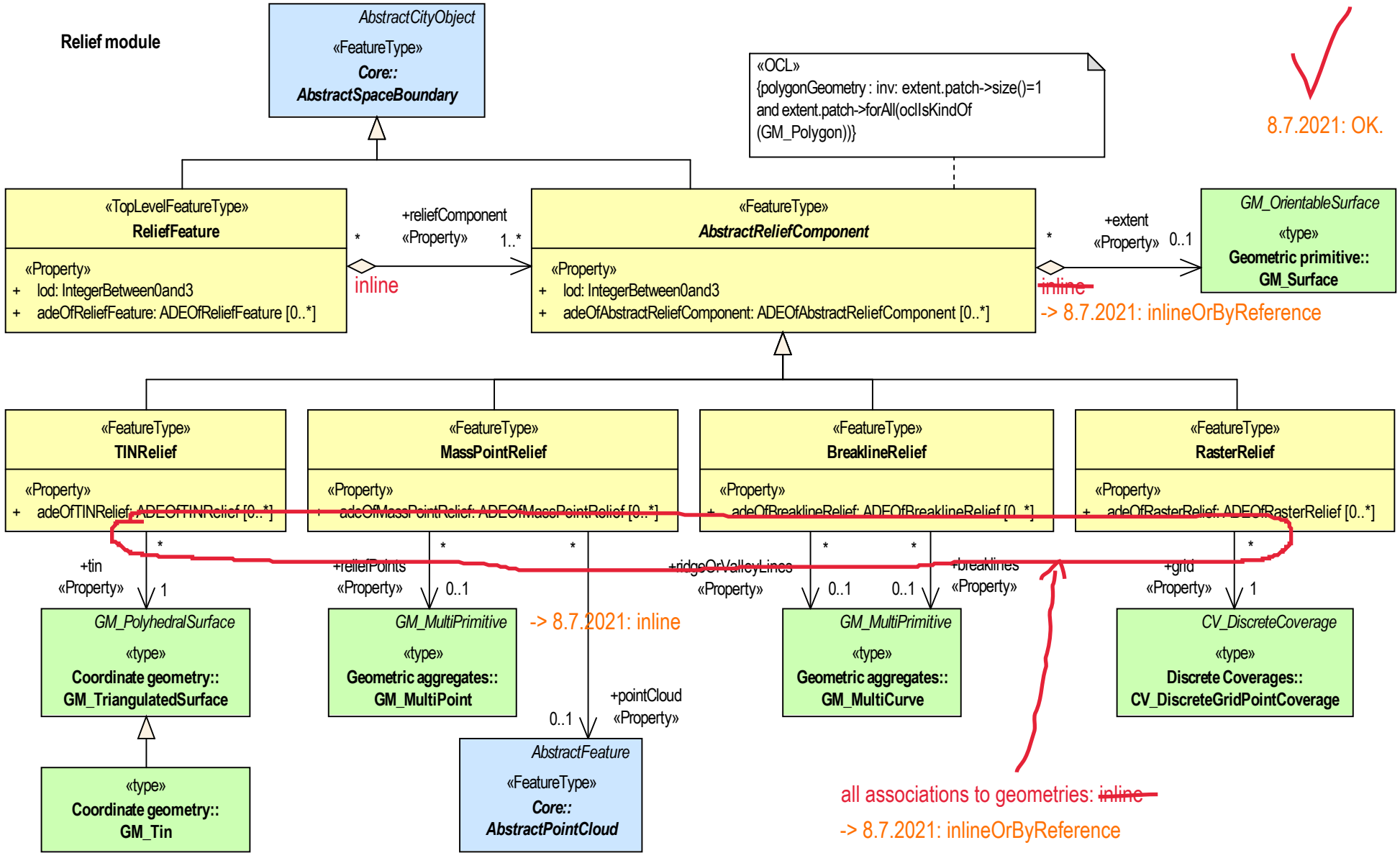


2.6.2021: OK.

PointCloud module



8.7.2021: OK.


Relief module
AbstractCityObject
«FeatureType»
Core::
AbstractSpaceBoundary
«OCL»
{polygonGeometry : inv: extent.patch->size()=1
and extent.patch->forAll(oclIsKindOf
(GM_Polygon))}
8.7.2021: OK.
«TopLevelFeatureType»
ReliefFeature
«Property»
+ lod: IntegerBetween0and3
+ adeOfReliefFeature: ADEOfReliefFeature [0..*]
+reliefComponent
«Property»
* 1..*
inline
«FeatureType»
AbstractReliefComponent
«Property»
+ lod: IntegerBetween0and3
+ adeOfAbstractReliefComponent: ADEOfAbstractReliefComponent [0..*]
+extent
«Property»
* 0..1
inline
-> 8.7.2021: inlineOrByReference
GM_OrientableSurface
«type»
Geometric primitive::
GM_Surface
«FeatureType»
TINRelief
«Property»
+ adeOfTINRelief: ADEOfTINRelief [0..*]
«FeatureType»
MassPointRelief
«Property»
+ adeOfMassPointRelief: ADEOfMassPointRelief [0..*]
«FeatureType»
BreaklineRelief
«Property»
+ adeOfBreaklineRelief: ADEOfBreaklineRelief [0..*]
«FeatureType»
RasterRelief
«Property»
+ adeOfRasterRelief: ADEOfRasterRelief [0..*]
+tin
«Property»
* 1
+reliefPoints
«Property»
* 0..1
-> 8.7.2021: inline
+ridgeOrValleyLines
«Property»
* 0..1
+breaklines
«Property»
* 0..1
+grid
«Property»
* 1
GM_PolyhedralSurface
«type»
Coordinate geometry::
GM_TriangulatedSurface
GM_MultiPrimitive
«type»
Geometric aggregates::
GM_MultiPoint
GM_MultiPrimitive
«type»
Geometric aggregates::
GM_MultiCurve
CV_DiscreteCoverage
«type»
Discrete Coverages::
CV_DiscreteGridPointCoverage
+pointCloud
«Property»
0..1
«type»
Coordinate geometry::
GM_Tin
AbstractFeature
«FeatureType»
Core::
AbstractPointCloud
all associations to geometries: inline
-> 8.7.2021: inlineOrByReference

8.7.2021: OK.

AbstractPhysicalSpace
«FeatureType»
Core::
AbstractUnoccupiedSpace

«FeatureType»
ClearanceSpace
«Property»
+ class: ClearanceSpaceClassValue [0..*]
+ adeOfClearanceSpace: ADEOfClearanceSpace [0..*]

«FeatureType»
AuxiliaryTrafficSpace
«Property»
+ class: AuxiliaryTrafficSpaceClassValue [0..1]
+ function: AuxiliaryTrafficSpaceFunctionValue [0..*]
+ usage: AuxiliaryTrafficSpaceUsageValue [0..*]
+ granularity: GranularityValue
+ adeOfAuxiliaryTrafficSpace: ADEOfAuxiliaryTrafficSpace [0..*]

+clearanceSpace «Property»
* inline

+auxiliaryTrafficSpace «Property»
-> 8.7.2021: inlineOrByReference
*~~inline~~

«FeatureType»
TrafficSpace
«Property»
+ class: TrafficSpaceClassValue [0..1]
+ function: TrafficSpaceFunctionValue [0..*]
+ usage: TrafficSpaceUsageValue [0..*]
+ granularity: GranularityValue
+ trafficDirection: TrafficDirectionValue [0..1]
+ occupancy: Occupancy [0..*]
+ adeOfTrafficSpace: ADEOfTrafficSpace [0..*]

+trafficSpace «Property»
-> 8.7.2021: ~~inline~~ inlineOrByReference

«FeatureType»
AbstractTransportationSpace
«Property»
+ trafficDirection: TrafficDirectionValue [0..1]
+ occupancy: Occupancy [0..*]
+ adeOfAbstractTransportationSpace: ADEOfAbstractTransportationSpace [0..*]

as defined in Core
+boundary «Property»

«FeatureType»
AuxiliaryTrafficArea
«Property»
+ class: AuxiliaryTrafficAreaClassValue [0..1]
+ function: AuxiliaryTrafficAreaFunctionValue [0..*]
+ usage: AuxiliaryTrafficAreaUsageValue [0..*]
+ surfaceMaterial: SurfaceMaterialValue [0..1]
+ adeOfAuxiliaryTrafficArea: ADEOfAuxiliaryTrafficArea [0..*]

+predecessor «Property»
+successor «Property»
byReference byReference

inlineOrByReference
inlineOrByReference

as defined in Core
+boundary «Property»

+marking «Property»

«FeatureType»
TrafficArea
«Property»
+ class: TrafficAreaClassValue [0..1]
+ function: TrafficAreaFunctionValue [0..*]
+ usage: TrafficAreaUsageValue [0..*]
+ surfaceMaterial: SurfaceMaterialValue [0..1]
+ adeOfTrafficArea: ADEOfTrafficArea [0..*]

«FeatureType»
Marking
«Property»
+ class: MarkingClassValue [0..1]
+ adeOfMarking: ADEOfMarking [0..*]

«TopLevelFeatureType»
Track
«Property»
+ class: TrackClassValue [0..1]
+ function: TrackFunctionValue [0..*]
+ usage: TrackUsageValue [0..*]
+ adeOfTrack: ADEOfTrack [0..*]

inline
+section «Property»

«FeatureType»
Section
«Property»
+ class: SectionClassValue [0..1]
+ adeOfSection: ADEOfSection [0..*]

«FeatureType»
Intersection
«Property»
+ class: IntersectionClassValue [0..1]
+ adeOfIntersection: ADEOfIntersection [0..*]

+intersection «Property»
inlineOrByReference

«TopLevelFeatureType»
Road
«Property»
+ class: RoadClassValue [0..1]
+ function: RoadFunctionValue [0..*]
+ usage: RoadUsageValue [0..*]
+ adeOfRoad: ADEOfRoad [0..*]

«TopLevelFeatureType»
Waterway
«Property»
+ class: WaterwayClassValue [0..1]
+ function: WaterwayFunctionValue [0..*]
+ usage: WaterwayUsageValue [0..*]
+ adeOfWaterway: ADEOfWaterway [0..*]

«TopLevelFeatureType»
Square
«Property»
+ class: SquareClassValue [0..1]
+ function: SquareFunctionValue [0..*]
+ usage: SquareUsageValue [0..*]
+ adeOfSquare: ADEOfSquare [0..*]

«TopLevelFeatureType»
Railway
«Property»
+ class: RailwayClassValue [0..1]
+ function: RailwayFunctionValue [0..*]
+ usage: RailwayUsageValue [0..*]
+ adeOfRailway: ADEOfRailway [0..*]

AbstractSpaceBoundary
«FeatureType»
Core::
AbstractThematicSurface

«FeatureType»
Core::
ClosureSurface

«FeatureType»
HoleSurface
«Property»
+ adeOfHoleSurface: ADEOfHoleSurface [0..*]

+boundary «Property»
as defined in Core

«FeatureType»
Hole
«Property»
+ class: HoleClassValue [0..1]
+ adeOfHole: ADEOfHole [0..*]

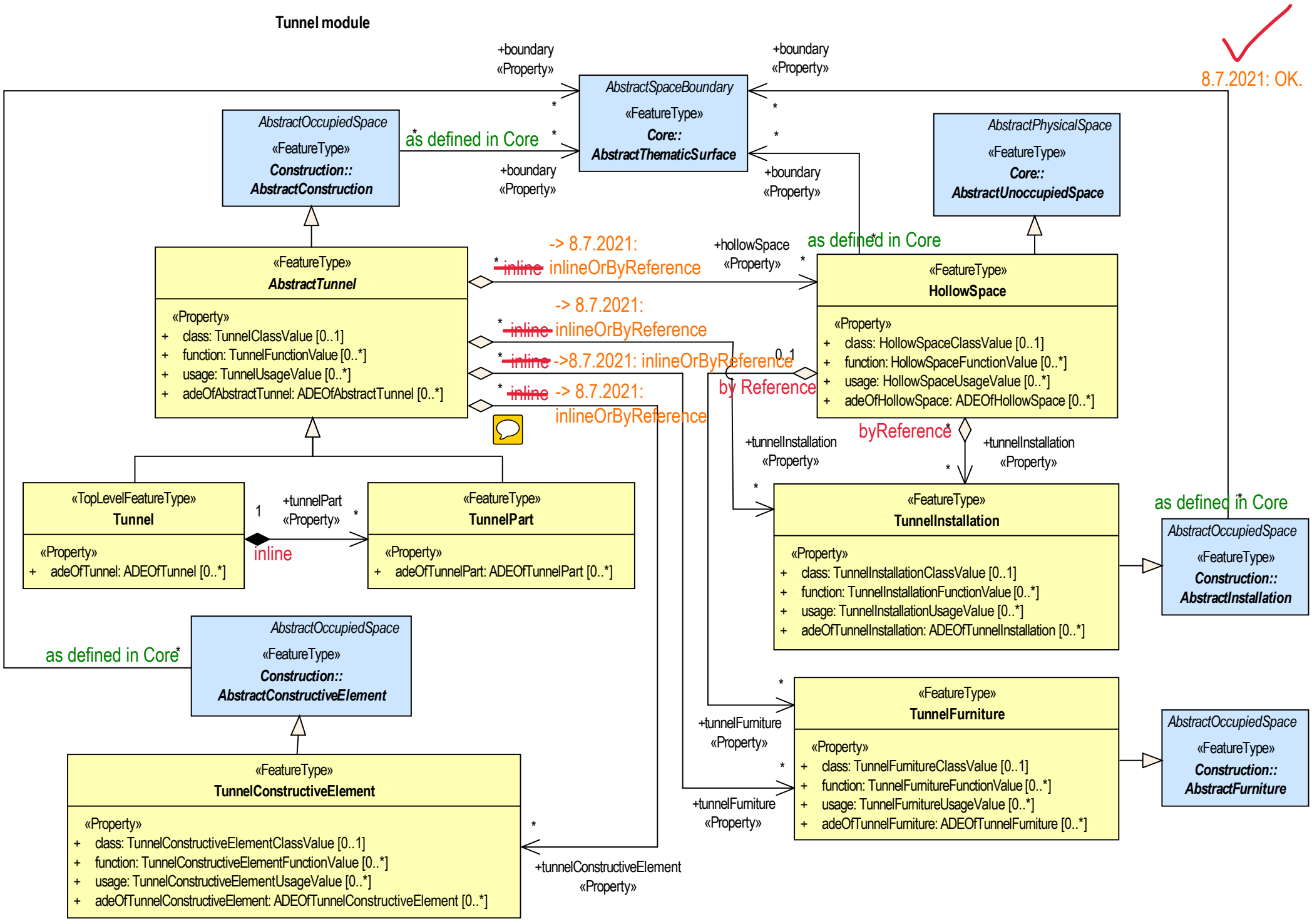
+hole «Property»

«enumeration»
GranularityValue
lane
way

«enumeration»
TrafficDirectionValue
forwards
backwards
both

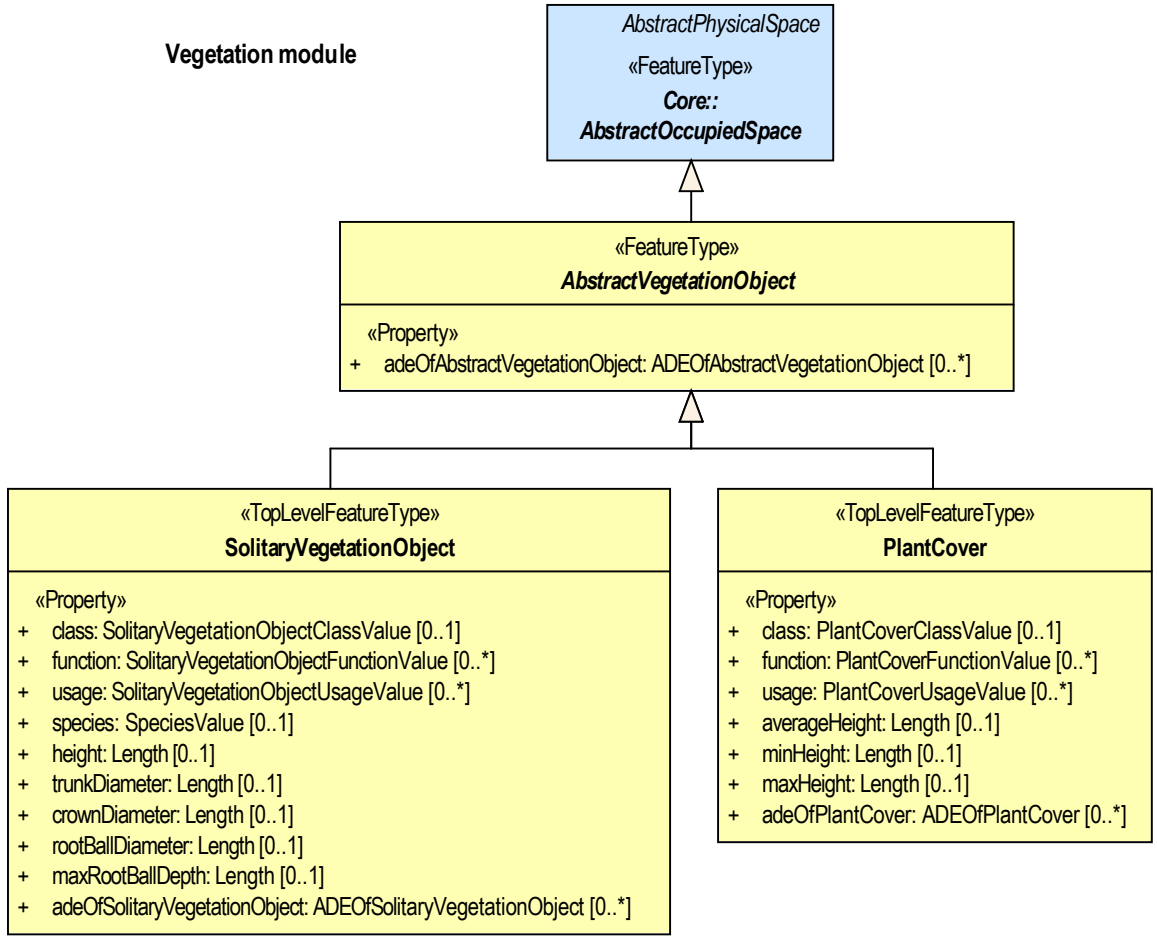
«DataType»
Occupancy
«Property»
+ numberOfOccupants: Integer
+ interval: IntervalValue [0..1]
+ occupantType: OccupantTypeValue [0..1]

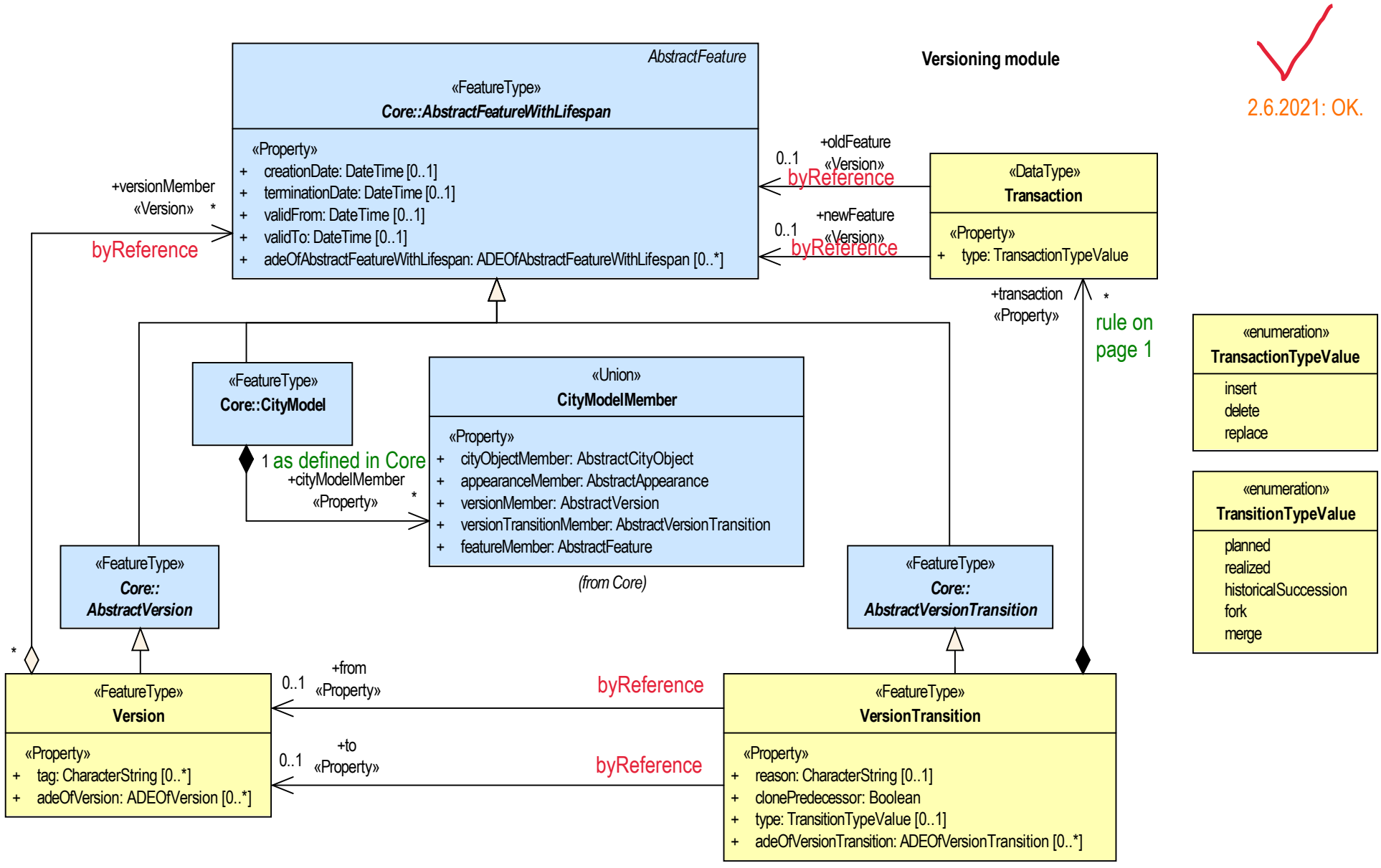
(from Core)

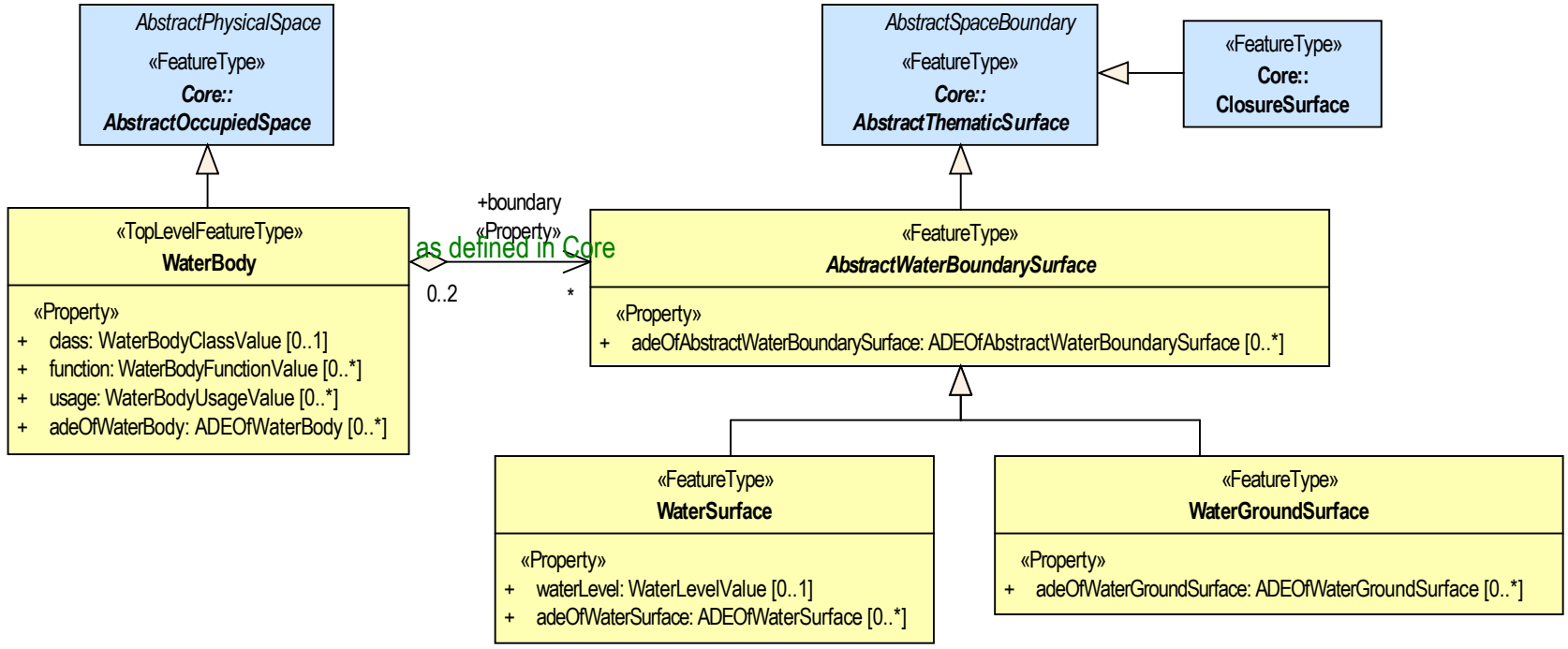

Tunnel module
8.7.2021: OK.
+boundary
«Property»
*
AbstractSpaceBoundary
«FeatureType»
Core::
AbstractThematicSurface
AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractConstruction
as defined in Core
AbstractPhysicalSpace
«FeatureType»
Core::
AbstractUnoccupiedSpace
«FeatureType»
AbstractTunnel
«Property»
+ class: TunnelClassValue [0..1]
+ function: TunnelFunctionValue [0..*]
+ usage: TunnelUsageValue [0..*]
+ adeOfAbstractTunnel: ADEOfAbstractTunnel [0..*]
-> 8.7.2021:
inline inlineOrByReference
+hollowSpace
«Property»
«FeatureType»
HollowSpace
«Property»
+ class: HollowSpaceClassValue [0..1]
+ function: HollowSpaceFunctionValue [0..*]
+ usage: HollowSpaceUsageValue [0..*]
+ adeOfHollowSpace: ADEOfHollowSpace [0..*]
->8.7.2021: inlineOrByReference
by Reference
0..1
byReference
+tunnelInstallation
«Property»
«TopLevelFeatureType»
Tunnel
«Property»
+ adeOfTunnel: ADEOfTunnel [0..*]
1
+tunnelPart
«Property»
inline
«FeatureType»
TunnelPart
«Property»
+ adeOfTunnelPart: ADEOfTunnelPart [0..*]
«FeatureType»
TunnelInstallation
«Property»
+ class: TunnelInstallationClassValue [0..1]
+ function: TunnelInstallationFunctionValue [0..*]
+ usage: TunnelInstallationUsageValue [0..*]
+ adeOfTunnelInstallation: ADEOfTunnelInstallation [0..*]
AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractInstallation
AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractConstructiveElement
«FeatureType»
TunnelConstructiveElement
«Property»
+ class: TunnelConstructiveElementClassValue [0..1]
+ function: TunnelConstructiveElementFunctionValue [0..*]
+ usage: TunnelConstructiveElementUsageValue [0..*]
+ adeOfTunnelConstructiveElement: ADEOfTunnelConstructiveElement [0..*]
+tunnelConstructiveElement
«Property»
+tunnelFurniture
«Property»
«FeatureType»
TunnelFurniture
«Property»
+ class: TunnelFurnitureClassValue [0..1]
+ function: TunnelFurnitureFunctionValue [0..*]
+ usage: TunnelFurnitureUsageValue [0..*]
+ adeOfTunnelFurniture: ADEOfTunnelFurniture [0..*]
AbstractOccupiedSpace
«FeatureType»
Construction::
AbstractFurniture

2.6.2021: OK.

Vegetation module




Versioning module
2.6.2021: OK.
AbstractFeature
«FeatureType»
Core::AbstractFeatureWithLifespan
«Property»
+ creationDate: DateTime [0..1]
+ terminationDate: DateTime [0..1]
+ validFrom: DateTime [0..1]
+ validTo: DateTime [0..1]
+ adeOfAbstractFeatureWithLifespan: ADEOfAbstractFeatureWithLifespan [0..*]
+versionMember
«Version»
*
byReference
0..1
+oldFeature
«Version»
byReference
0..1
+newFeature
«Version»
byReference
«DataType»
Transaction
«Property»
+ type: TransactionTypeValue
+transaction
«Property»
*
rule on page 1
«enumeration»
TransactionTypeValue
insert
delete
replace
«enumeration»
TransitionTypeValue
planned
realized
historicalSuccession
fork
merge
«FeatureType»
Core::CityModel
1 as defined in Core
+cityModelMember
«Property»
*
«Union»
CityModelMember
«Property»
+ cityObjectMember: AbstractCityObject
+ appearanceMember: AbstractAppearance
+ versionMember: AbstractVersion
+ versionTransitionMember: AbstractVersionTransition
+ featureMember: AbstractFeature
(from Core)
«FeatureType»
Core::
AbstractVersion
«FeatureType»
Core::
AbstractVersionTransition
*
«FeatureType»
Version
«Property»
+ tag: CharacterString [0..*]
+ adeOfVersion: ADEOfVersion [0..*]
0..1
+from
«Property»
byReference
0..1
+to
«Property»
byReference
«FeatureType»
VersionTransition
«Property»
+ reason: CharacterString [0..1]
+ clonePredecessor: Boolean
+ type: TransitionTypeValue [0..1]
+ adeOfVersionTransition: ADEOfVersionTransition [0..*]

8.7.2021: OK.

WaterBody module