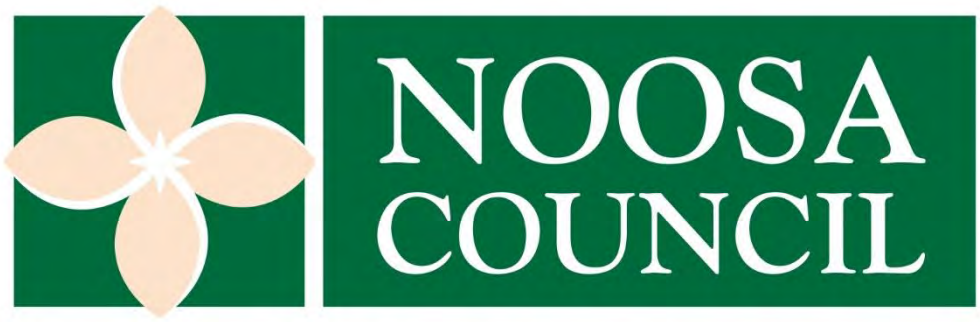

GUIDELINES FOR CREATION AND SUBMISSION OF ADAC XML FILES

ADAC XML Files to be included as an accompaniment to the "As-Constructed" bundle submitted to Council

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Version 1.1 (8th June 2017)

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VERSION NO	DISTRIBUTION	DATE	COMMENTS
1.0	INTERNAL NOOSA COUNCIL STAKEHOLDERS	17/05/2017	DRAFT FOR REVIEW
1.1	EXTERNAL USE	08/06/2017	FINAL

1. PURPOSE

The purpose of this document is to provide guidelines and general assistance with creation and provision of compliant ADAC XML files for Transport, Stormwater and Open Space/ Parks assets. ADAC XML files are required to accompany the usual bundle of "As-Constructed" plans, drawings, schedules and associated information reflecting new civil infrastructure and associated assets.

On completion of physical works and prior to asset handover, "As-Constructed" (also known as "As-Built") information is used to indicate any variations in locations and/or alignments (survey) and other approved changes in assets or construction methods that may have been carried out during operational works as compared to the original approved design. "As-Constructed" drawings are created that accurately reflect these changes, including material types, specifications and other asset-specific information. The digital ADAC XML file is created from this updated "As-Constructed" Plan information.

Please Note: Advice on the overall preparation and presentation of "As-Constructed" drawings and plans, including drawing file formats, styles and necessary content can be found at:

- Noosa Council website page titled "As Constructed Guidelines"; and
- Noosa Council Planning Scheme - Policy 5 (PSP05 Section 6).

2. INTRODUCTION TO ADAC XML

ADAC XML files are a compulsory accompaniment to the "As-Constructed" bundle of information required by council as a part of the handover of Contract Works or donated civil assets and infrastructure.

Compliant ADAC XML files contain a structured and precise digital record of the assets described in the "As-Constructed" plans and other associated engineering documentation. Details include survey-accurate cadastral and boundary references, geometries and relative levels as well as detailed asset records and accompanying attributes.

More specifically, the XML files are used to check the completeness of the "As-Constructed" information provided. The files afford further confirmation of compliance with development approval conditions as well as helping to verify engineering specifications and other design-related requirements.

Depending on the tools[1] (ADAC XML generator) being used to generate the ADAC XML, compliant files are initially created during survey capture and then finalised in conjunction with the creation of the "As-Constructed" drawings (e.g. DWGs). Alternatively the XML files may be generated after the electronic "As-Constructed" drawings have been finalised. It is however essential that the "As-Constructed" drawings and ADAC XML digital files are created using complete and survey-accurate information to identify the assets and the precise locations being represented.

[1] Various software tools (purpose-built ADAC XML generators) are available to capture necessary details and asset attributes required to produce a compliant ADAC XML file. Advice can be sort from providers of most software (CAD) design suites and survey tools.

Please also note that some assets are common to multiple asset classes (e.g. Lighting assets may be related to either Transport or Open Space). In those cases capturing assets under a different asset class to the actual area of use when preparing the ADAC XML file is valid and appropriate.

On receiving the "As-Constructed" bundle, council will undertake a data format and conformance check on the ADAC XML file to confirm the completeness and validity of the details. Please note that if significant anomalies, errors or missing information are identified during these checks, the ADAC XML file(s) may be returned to the provider for correction and resubmission which can potentially delay the progress of asset handover and "On Maintenance" approvals.

Once the ADAC XML data file(s) are accepted by the receiving entity they are uploaded to various internal systems and used to assist in the long-term management of the new donated infrastructure. The detailed asset and location data is also available to external agencies in the future via various digital formats.

3. GENERAL REQUIREMENTS

The ADAC XML file is to be produced using the most recent ADAC XML schema release (e.g. Ver 4.x) and should be "validated" for compliance before being submitted to council. Details on the data schema (primary levels) noting asset classes and sub-classes to be addressed by the ADAC capture process can be found at Appendix A.

The ADAC XML files are to be provided via either electronic transmission or stored on a suitable digital storage device as may be requested (CD/DVD-ROM, USB memory stick).

4. DATUM INFORMATION

Data contained in the ADAC XML file(s) must reflect the survey details EXACTLY AS SHOWN on the accompanying "As-Constructed" drawings which:

- for developments with a total lot number of 30 or less must be derived from at least one (1) permanent survey marks (PSM); and
- for lot numbers greater than 30 in number must be derived from at least two (2) relatively well spaced permanent survey marks (PSMs);

Survey data to be aligned with Map Grid of Australia (MGA Zone 56 – GDA 94) co-ordinates and AHD levels to fourth (4^{th}) order standard or better as defined by the Queensland Department of Natural Resources & Mines.

5. CREATION OF ADAC XML FILE(S)

In producing compliant ADAC XML files, information on applicable asset classes (see below) will need to be captured according to the approved ADAC data schema. Vendors of ADAC XML generators are provided with any updates to the ADAC schema free of charge and should have these updates incorporated into their products for release to customers in a timely manner. Further information on the ADAC process, data schema, available tools and supporting agencies can be found on the ADAC website at: http://www.engicom.com.au/products/adac2/

While the ADAC XML files are created from the survey-accurate "As-Constructed" information, particular attention must be given to how council wishes to have particular aspects captured and recorded for each particular asset class. The following details (below) are provided to assist with the capture of ADAC data when using proprietary ADAC XML generators either during the "As-Con" survey pickup or when capturing the ADAC asset information as a part of the creation of the "As-Con" plans and associated drawings in civil design (software) suites.

The physical nature of assets will determine where/if assets are captured separately within the ADAC XML file. For example, footpath or a pathway would be captured as individual and separate sections to reflect any changes such as width or material type.

Note: It is not within the scope of this document to provide detailed advice on how to operate the various specialist products and tools (ADAC XML generators) used in the creation and provision of the compliant ADAC XML files. Assistance and advice on the use of any particular tool should be sourced from the provider of the product who would necessarily be familiar with general ADAC requirements, processes and the current data model (ADAC XML schema).

When creating a compliant ADAC XML file the following consideration will apply.

Global Asset Attribution

- At *Project Level,* "Owner" Details are Mandatory with the following acceptable values:
  - Council
  - Private
  - State

- At *Project Level,* "Works Approval ID" must be populated (e.g. approved Operational Works Number or DA Approval Number)

- At *Project Level,* "Construction Date" **must** be populated;

- At *Project Level,* "Horizontal Coordinate System" field must be populated with "**MGA56**", with no spaces or other characters included;

- At the individual *Asset Level,* the "Status" field is both critical and mandatory with the following applicable values only:
    - Newly Constructed
    - Existing
    - Designed
    - Planned
    - Removed
    - Retired
    - Rehabilitated

- At the individual *Asset Level*, the "Notes" field should be used to record any additional information regarding the asset, or to record attribute information which isn't available within defined values/enumerations in the schema.

Transport

- **Roadways, including seals and pavement** to be captured from "Lip of Kerb to Lip of Kerb" where Channel exists and "Face of Kerb" where no channel or tray exists as a closed polyline as per "Solid Blue line with Blue shading" example pictured in figures 1 & 2 below. Note: Separate polygons will be required at changes in pavement and/or surfacing.

- **Kerb line** is captured on the nominal kerb line (invert of kerb and channel, face of kerb only) as shown by "Solid Red" line shown in figures 1 and 2 shown below.

- **Sub-soil drains**, where installed, are to be captured at kerb/seal junction as per the "Solid Yellow" examples shown in figures 1 and 2.

- **Road islands** are captured as closed polyline/object from back of kerb. Individual sub-sections of traffic islands to be identified by different material types (i.e. paving, concrete, grassed) as per "Solid Green" line in figure 1.

- **Bus Shelters** to be captured as supplementary polygon feature representing the "footprint" of the structure with the "Class" field populated as "Bus Shelter" in the corresponding ADAC record.

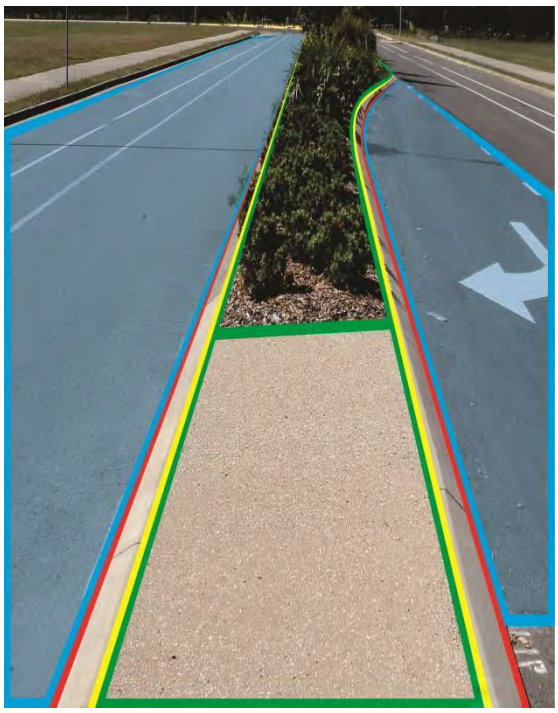

Figure 1

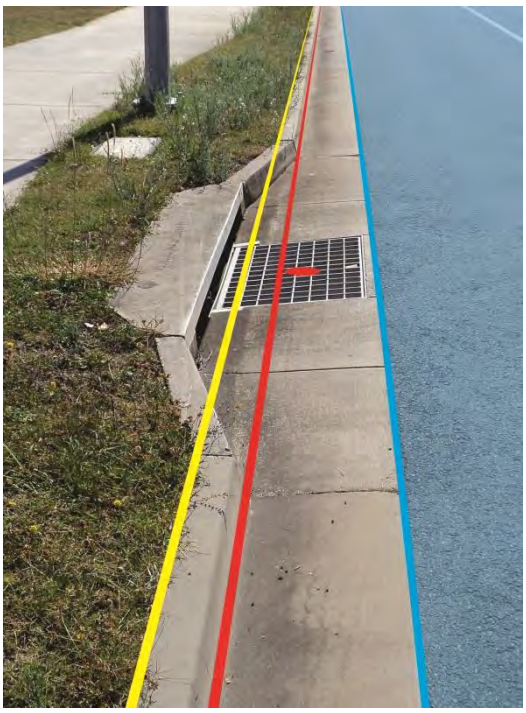

Figure 2

- **Bridge Pavements/Seals** to be defined under the pavements feature class and shown as a closed polyline/object from abutment to abutment as per figure 3 below. At this time the ADAC data model does not cater for the capture of specific engineering data and "Notes" field is to be used to record relevant summary details on bridge deck and structure etc.

Figure 3

- **Guard Rails, Retaining Walls and Fences** on the roadside or in road reserve areas are to be captured within the Open Space – BarriersContinuous table.
  Note: Where fences, barriers or retaining walls continue into Open Space/Park areas the capture is to be broken at the boundary line.

- **Pathways** to be captured as a Complex linear feature (read: polylines including curves but not Bezier curves) representing the centre longitudinal axis of a pathway. Please refer to the "Solid Red" line in figure 4 below.

  Note: Where a roadside footpath/pathway adjoins an Open Space/Park region the pathway capture is to be broken at the boundary line.

- **Pram Ramps** are to be indicated by a Point Feature, shown as the "Green Cross" in Figure 4 below.

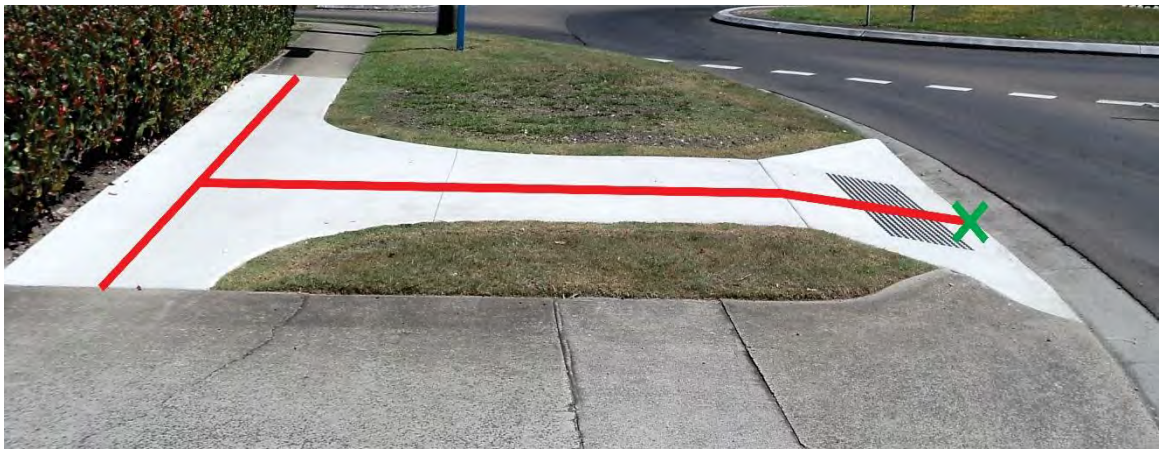

Figure 4

Stormwater/Drainage

- **Field inlets and gullies** to be represented as "point" located at the "centre of grate" where coincident with "centre of chamber" (see previous figure 2 noted in Transport section above with Red Spot at location in centre of grate).

- **Stormwater manholes** to be represented as a "point" noting centre of chamber (not centre of lid)

- **End structures (headwalls and end-walls)** are represented as a "point feature" at the outlet of the pipe/culvert as per the example shown at figure 5 below. Point to be located at top of the structure (at the point of the red arrow).

Figure 5

- **Pipes and concrete-lined open drains** to be represented as a single line feature. The pipe network is to be represented as a Dis-Connected Network with a length value of Material Length as per Figure 6 below. Pits and Manholes are to be recorded as points at centre of chamber as noted above.

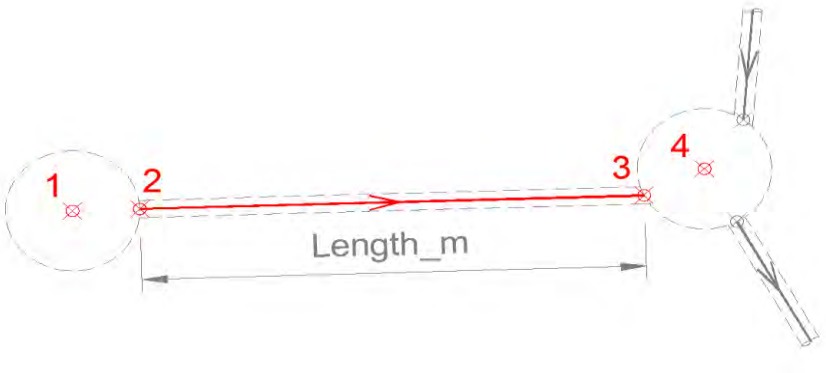

Figure 6

- **For multi-cell culverts/pipes**, to be one ADAC record where of similar configuration with the number of individual cells/pipes is to be recorded in the "cells" field of the table structure.

- **Stormwater quality improvement devices (SQIDs)** known as Gross Pollutant Traps (GPTs) fall into and are captured in three primary categories:

  - GPT Complex such as Commercial or Custom built device (e.g. Humes Intercepter)
  - GPT Simple such as an "in pit" basket or "end of line" device (must have a corresponding "pit" or "end structure" point feature).
  - GPT Non-Simple which represent basic and minor sand filtration storage

  All GPT devices are recognised as a point features and described accordingly within ADAC data capture fields.

- **Water sensitive urban design areas (WSUDs)** such as kerbside bio-filtration beds or purpose built drainage swales should be captured individually as a closed polyline. Individual areas are to be recorded within the ADAC data capture fields defining class type within the ADAC data capture fields (e.g swale, buffer strip, bio-retention basin).

Open Space Assets

- **Open space functional area** (i.e. Open Space "footprint") to be captured as closed polyline/object within the ADAC "Open Space – Open Space Area" table structure as represented by the dashed red line in figure 7 below.

- **Activity areas** are to be captured as a closed polyline/object within the "Open Space – Activity Area" table structure as represented by the dashed yellow line in figure 7 (e.g. playground softfall, recreational space, hardstand play area, landscaped areas).

- **Pathway assets** within parks captured as per normal Transport requirements using ADAC "Transport – Pathways" table structure (represented by blue solid line as in figure 7 below). Note: Pathways within parks that adjoin a roadside footpath are to be broken at the park boundaries.

- **Water assets within open space areas** captured as per typical Water Supply standards (i.e. hydrants, valves, fittings and meters as point features. Pipes as line features).

- **Shelters** (e.g. rigid or sail covers) shown as a single point at the centroid of the building footprint as per figure 7.

- **Significant buildings** (e.g. sheds, rotundas, band stands or toilet blocks) to be represented as a closed polyline/object representing the footprint of the structure(s).

- **Individual parks improvements** (i.e. assets such as barbeques, seats, tables, play equipment) to be captured as a point feature and recorded by type within the ADAC data capture tables.

Lighting (Metered Street/Park)

- **Lighting** to be captured within the Open Space – Electrical Fitting table structure where.

- **Switchboards** are also captured within the Open Space – Electrical Fitting table structure where Type = Switch Board/Meter Box.

Surface Features

- **Contours** are represented as polylines representing all major and minor contour lines with real elevations.

- **Spot Heights** are represented as point features for all spot heights according to Town Planning requirements, including real elevations.

Typical example of Open Space ADAC data capture shown below in figure 7.

Figure 7

APPENDIX A - ADAC DATA SCHEMA

The following hierarchy identifies the individual assets and characteristics available to be captured and categorised by asset service class nominating attributes and "mandatory status".

Global Attribution at Asset Level

Element Name	ADAC Mandatory (Y/N)	NSC Mandatory (Y/N)
ObjectId	N	Y
InfrastructureCode	N	
Owner	N	
DrawingNumber	N	
DrawingRevision	N	
ConstructionDate	N	
Department	N	
SurveyorName	N	
SurveyorDateFinalSurvey	N	
SurveyorDateApproved	N	
EngineerName	N	
EngineerDateApproved	N	
Status	Y	
DataQuality	N	
Notes	N	
SupportingFile	N	

Supplementary Object Model

Note: These features only contain the Object_Id element from the Global elements.

SupplementaryPoint / SupplementaryPolyline / SupplementaryPolygon

Element Name	Mandatory (Y/N)
Class	Y
Note	N
Attribute()TextValue	N
Attribute()IntegerValue	N
Attribute()DecimalValue	N
Attribute()DateValue	N
Attribute()TimeValue	N
Attribute()DateTimeValue	N

Surface Object Model

Note: These features only contain the Object_Id element from the Global elements.

Contour / SpotHeight

Element Name	Mandatory (Y/N)
Status	Y
Elevation_m	Y

Transport Object Model

FlushPoint

Element Name	Mandatory (Y/N)
Function	Y

Parking

Element Name	Mandatory (Y/N)
Name	Y
NoOfCarparks	N
OnOffStreet	Y
SurfaceType	Y (if Surface exists)
SurfaceThickness_mm	Y (if Surface exists)
SurfaceArea_sqm	N
PavementType	Y
BaseLayerType	Y (If BaseLayer exists)
BaseLayerDepth_mm	Y (If BaseLayer exists)
BaseStabilisation	N
SubBaseLayerType	Y (If SubBaseLayer exists)
SubBaseLayerDepth_mm	Y (If SubBaseLayer exists)
SubBaseStabilisation	N
LowerSubBaseLayerType	Y (If LowerSubBaseLayer exists)
LowerSubBaseLayerDepth_mm	Y (If LowerSubBaseLayer exists)
LowerSubBaseStabilisation	N
PavementGeoTextile	N
SubgradeCBR	Y
SubgradeStabilisation	N

PathStructure

Element Name	Mandatory (Y/N)
Use	Y
Structure	Y
SurfaceMaterial	Y
SubStructureMaterial	Y
Width_m	Y

Pathway

Element Name	Mandatory (Y/N)
Use	Y
Structure	Y
SurfaceMaterial	Y
Width_m	Y
Depth_mm	Y

Pavement

Element Name	Mandatory (Y/N)
Name	Y
SurfaceType	Y (if Surface exists)
SurfaceThickness_mm	N
SurfaceNomWidth_m	Y (if Surface exists)
PavementType	Y
BaseLayerType	Y (If BaseLayer exists)
BaseLayerDepth_mm	Y (If BaseLayer exists)
BaseStabilisation	N
SubBaseLayerType	Y (If SubBaseLayer exists)
SubBaseLayerDepth_mm	Y (If SubBaseLayer exists)
SubBaseStabilisation	N
LowerSubBaseLayerType	Y (If LowerSubBaseLayer exists)
LowerSubBaseLayerDepth_mm	Y (If LowerSubBaseLayer exists)
LowerSubBaseStabilisation	N
PavementGeoTextile	N
SubgradeCBR	Y
SubgradeStabilisation	N

PramRamp

Element Name	Mandatory (Y/N)
Rotation	N

RoadEdge

Element Name	Mandatory (Y/N)
Type	Y
Length_m	N
PavementExtension_mm	Y

RoadIsland

Element Name	Mandatory (Y/N)
Type	Y
Area_sqm	N
InfillType	Y

RoadPathway

Element Name	Mandatory (Y/N)
Use	Y
Structure	Y
SurfaceMaterial	Y
Width_m	Y

SubSoilDrain

Element Name	Mandatory (Y/N)
Use	Y
Type	Y
Length_m	N

Stormwater Object Model

EndStructure

Element Name	Mandatory (Y/N)
StructureID	Y
StructureLevel_m	Y
EndWallType	Y (if EndWall exists)
EndWallConstruction	Y (if EndWall exists)
WingWallType	Y (if WingWall exists)
WingWallConstruction	Y (if WingWall exists)
ApronType	Y (if Apron exists)
ApronConstruction	Y (if Apron exists)
GrateType	N
TideGate	N
PredominantMaterial	Y
OutletProtectionType	N
Rotation	N

Fitting

Element Name	Mandatory (Y/N)
FittingType	Y
Rotation	N

GPTComplex

Element Name	Mandatory (Y/N)
Sqid_Id	N
Manufacturer	Y (if Commerical)
ModelNumber	Y (if Commerical)
Length_mm	Y (Rectangular only)
Width_mm	Y (Rectangular only)
Diameter_mm	Y (Circular only)
Function1	Y
Function2	N
Function3	N
US_PipeDiameter_mm	N
DS_PipeDiameter_mm	N
SurfaceLevel_m	Y
US_InvertLevel_m	Y
DS_InvertLevel_m	Y
CleanoutLevel_m	Y
Depth_m	N
SumpDepth_m	N
HasFilterMedia	N
HasBasket	N
HasBoards	N
DesignFlow_m3s	Y
MaxContaminantVolume_m3	N
MaxInternalVolume_m3	N
MaintenanceCycle_mnths	N
Rotation	N

GPTSimple

Element Name	Mandatory (Y/N)
Sqid_Id	N
Construction	Y
Manufacturer	N
ModelNumber	N
TreatmentMeasure	Y
Function1	Y
Length_mm	Y
Width_mm	N
MaintenanceCycle_mnths	N
Rotation	N

NonGPTSimple

Element Name	Mandatory (Y/N)
Sqid_Id	N
Construction	Y
Manufacturer	N
ModelNumber	N
TreatmentMeasure	Y
Function1	Y
Function2	N
Function3	N
Length_mm	Y
Width_mm	N
MaintenanceCycle_mnths	N
Rotation	N

Pipe

Element Name	Mandatory (Y/N)
US_InvertLevel_m	Y
DS_InvertLevel_m	Y
US_SurfaceLevel_m	Y
DS_SurfaceLevel_m	Y
Diameter_mm	Y (Circular only)
Height_mm	Y (Rectangular only)
Width_mm	Y (Rectangular only)
Material	Y
Class	Y
JointType	Y (Circular only)
Cells	Y
ConcreteCoverType	Y
Grade	N
Length_m	N

Pit

Element Name	Mandatory (Y/N)
PitNumber	Y
Use	Y
ChamberConstruction	Y
Length_mm	Y (Rectangular only)
Width_mm	Y (Rectangular only)
Diameter_mm	Y (Circular only)
Radius_mm	Y (Extended only)
Extension_mm	Y (Extended only)
LidType	N
SurfaceLevel_m	Y
InvertLevel_m	Y
Depth_m	Y
InletConfig	Y (if Inlet exists)
InletType	Y (if Inlet exists)
LintelConstruction	Y (if Lintel exists)
LintelLength_m	Y (if Lintel exists)
OutletType	Y
FireRetardant	Y
Rotation	N

SurfaceDrain

Element Name	Mandatory (Y/N)
Type	Y
Shape	Y
LiningMaterial	Y
LinedWidth_m	Y
BatterMaterial	N
BatterWidth_m	N
US_InvertLevel_m	Y
DS_InvertLevel_m	Y
AverageGrade	N
Length_m	N

WSUDArea

Element Name	Mandatory (Y/N)
Sqid_Id	N
TreatmentMeasure	Y
Function1	Y
Function2	N
Function3	N
PondingArea_m2	N
PondingDepth_m	N
FilterArea_m2	N
FilterDepth_m	N
TransitionDepth_m	N
DrainageDepth_m	N
MacrophyteZoneArea_m2	N
MacrophyteZoneDepth_m	N
CoarseSedimentArea_m2	N
SedimentVolume_m3	N
MinSurfaceLevel_m	N
PermanentPondLevel_m	N
OutletLevel_m	N
DesignFlow_m3s	N
HasSpillway	Y
MaintenanceCycle_mnths	N

OpenSpace Object Model

ActivityArea

Element Name	Mandatory (Y/N)
Use	Y
Type	Y
UnderSurfaceMaterial	Y
EdgeType	Y

ActivityPoint

Element Name	Mandatory (Y/N)
Use	Y
Type	Y
Material	Y
Theme	N
Units	N
Manufacturer	N
ModelNumber	N

Artwork / Boating Facility / Building

Element Name	Mandatory (Y/N)
Type	Y
Material	Y

BarrierContinuous

Element Name	Mandatory (Y/N)
Type	Y
UprightMaterial	Y
LinkMaterial	Y
TopMaterial	Y
Length_m	Y
Height_m	Y
UprightNumber	Y

BarrierPoint

Element Name	Mandatory (Y/N)
Type	Y
UprightMaterial	Y

BBQ

Element Name	Mandatory (Y/N)
EnergySource	Y
Plates	Y
SurroundingMaterial	Y
TopMaterial	Y
Manufacturer	N
ModelNumber	N

BicycleFitting / Fixture / WasteCollectionPoint

Element Name	Mandatory (Y/N)
Type	Y
Material	Y
Manufacturer	N
ModelNumber	N

ElectricalConduit

Element Name	Mandatory (Y/N)
Type	Y
Material	Y
Diameter_mm	Y
Length_m	Y
Protection	N

ElectricalFitting

Element Name	Mandatory (Y/N)
Type	Y
Base	Y
Material	Y
EnergySource	Y
Manufacturer	N
ModelNumber	N

LandscapeArea

Element Name	Mandatory (Y/N)
Type	Y
EdgeMaterial	Y
RootBarrier	Y

OpenSpaceArea

Element Name	Mandatory (Y/N)
Name	Y
Type	Y

RetainingWall

Element Name	Mandatory (Y/N)
Use	Y
Material	Y
Construction	Y
Length_m	Y
Height_m	Y

Seat

Element Name	Mandatory (Y/N)
SeatType	Y
Places	Y
Material	Y
Manufacturer	N
ModelNumber	N

Shelter

Element Name	Mandatory (Y/N)
Type	Y
ConstructionType	Y
FloorMaterial	Y
WallMaterial	Y
RoofMaterial	Y
Manufacturer	N
ModelNumber	N

Sign

Element Name	Mandatory (Y/N)
Type	Y
Material	Y
Manufacturer	N
ModelNumber	N
Structure	Y
SignText	N
Rotation	N

Table

Element Name	Mandatory (Y/N)
Type	Y
SeatType	Y (if seating exists)
Places	Y (if seating exists)
Material	Y
Manufacturer	N
ModelNumber	N

Tree

Element Name	Mandatory (Y/N)
Species	Y
Genus	Y
RootBarrier	Y
Grate	Y

Surface Object Model

Note: These features only contain the Object_Id element from the Global elements.

Contours

Element Name	Mandatory (Y/N)
Status	Y
Elevation_m	Y

Spot Heights

Element Name	Mandatory (Y/N)
Status	Y
Elevation_m	Y