



Unitywater

Serving you today, investing in tomorrow.

ADAC XML

DATA CAPTURE GUIDELINES

Version 2.1

Last Updated: 02/08/2022

Report Details

Report Writer	Lion Systems in consultation with Strategic Asset Manager
----------------------	---

References	Data Capture Manuals – For Linear Assets Data Dictionaries
-------------------	---

Contents

GLOSSARY	iv
1. Purpose	6
2. Introduction to ADAC XML	6
3. General Requirements	7
4. Datum Information	7
5. Creation of ADAC XML File(s)	7
5.1. Asset Capture Guidelines	8
Project Attribution	8
Global Attribution	9
5.2. Cadastral Information	11
Cadastral Connection	11
Chainage Line	12
Lot Parcel	12
Road Reserve.....	12
Survey Mark	12
Water Course Reserve	13
5.3. Sewerage Assets.....	13
Connection	13
Fitting 15	
Maintenance Hole (Including Inspection Openings at End-of-Line).....	15
Non-Pressure Pipe	17
Pressure Pipe	18
Valve 19	
Break Points for Linear Sewerage Assets – Sewerage Pipes	20
5.4. Supplementary	20
PointFeature / PolylineFeature / PolygonFeature.....	20
5.5. Surface	21
Breakline	21
Contour.....	21
Spot Height.....	21
Profile Line.....	21
5.6. Water Supply Assets	21
Fitting21	
Hydrant.....	22
Maintenance Hole.....	22

Meter	23
Pipe	23
Service Fitting	25
Storage Tank	25
Valve	25
Water Service	26
Break Points for Linear Water Assets – Water Pipes	26

List of Tables

Table 1 - Title	Error! Bookmark not defined.
------------------------------	------------------------------

List of Figures

Figure 1 - Title	26
-------------------------------	----

List of Annexes

List of Enclosures

GLOSSARY

The following terms are used within this document.

Term/Acronym	Definition
ADAC	“Asset Design As Constructed” - The ADAC product is developed and maintained by a consortium of Local Councils and Water Utilities across Australia in conjunction with Institute of Public Works Engineering Australia - Queensland Branch (IPWEAQ). ADAC is used to facilitate the collection and lodgement of detailed information on civil infrastructure and associated assets that are either provided by the private development sector created in conjunction with other major project or upgrade works.
AHD	The Australian Height Datum (1971) is the NGRS normal-orthometric height datum for mainland Australia. The datum sets mean sea level as “zero” elevation. Mean sea level was determined from observations recorded by 30 tide gauges around the coast of the Australian continent for the period 1966 - 1968. Refer to Geoscience Australia website for more information.
As-Con	Short for As Constructed. Compiled information clearly indicating relevant details, locations, levels and alignments (survey) and other approved variations in assets or construction methods that may have been carried out during the operational works as compared to the original approved design.
GDA2020	Geocentric Datum of Australia 2020. Realised by the derived coordinates of the Australian Fiducial Network (AFN) geodetic stations, referenced to the GRS80 ellipsoid and determined with respect to ITRF2014 at epoch 2020.0.
GDA94	Geocentric Datum of Australia 1994. Realised by the derived coordinates of the Australian Fiducial Network (AFN) geodetic stations, referenced to the GRS80 ellipsoid and determined with respect to ITRF92 at epoch 1994.0.
MGA2020	Map Grid of Australia 2020. Universal Transverse Mercator projection of the Geocentric Datum of Australia 2020.

MGA94	Map Grid of Australia 1994. Universal Transverse Mercator projection of the Geocentric Datum of Australia 1994.
UW	Acronym for Unitywater
XML	Extensible Markup Language. Machine and human readable file format.

1. Purpose

The purpose of this document is to provide practical guidelines and general assistance with respect to the survey capture, creation and provision of compliant ADAC XML files for Water and Sewerage assets. ADAC XML files are required to accompany the usual bundle of “As-Constructed” plans, CCTV, reports and schedules reflecting all details of new or upgraded civil infrastructure and associated assets.

On completion of physical works and prior to asset handover, “As-Constructed” (or “As-Built”) information is prepared. “As-Constructed” information clearly indicates relevant details, locations, levels and alignments (survey) and other approved variations in assets or construction methods that may have been carried out during the operational works as compared to the original approved design.

While the clean “As-Constructed” Plans accurately reflect all details including material types, specifications and other asset-specific information, the accompanying ADAC digital file compiles this information in a standardised (XML) format.

2. Introduction to ADAC XML

ADAC XML files are a compulsory accompaniment to the “As-Constructed” bundle of information required by Unitywater as a part of the handover of nominated works and associated civil assets and infrastructure.

The ADAC XML format (schema) is a non-proprietary data specification and file transfer tool written in XML language. The schema is managed by the ADAC Consortium of subscribers principally made up of local authorities and water utilities from across Australia. The schema and associated xml files are used to facilitate the collection and translation of data related to both new and existing infrastructure.

Compliant ADAC XML files contain a structured and precise digital record of the assets described in the clean 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 including material types and approved pavement specifications.

More specifically, the XML files are used to check the completeness of the “As-Constructed” information provided before details are uploaded to Unitywater information systems. The files afford further confirmation of compliance with approval conditions as well as helping to verify specifications and other design-related requirements.

Depending on the tools¹ (ADAC XML generator) being used to produce the ADAC XML output, compliant files may initially be created during survey capture and then finalised in conjunction with the creation of the “As-Constructed” drawings.

Alternatively, the XML files may be generated after the “As-Constructed” CAD drawings have been finalised. It is however essential that the “As-Constructed” drawings and ADAC XML files are created using complete and survey-accurate information to identify both the assets and the precise locations being represented and that the details in the XML file and drawings match exactly.

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 civil engineering design suites (CAD) and survey tools.

On receiving the “As-Constructed” bundle, Unitywater will undertake a data format and conformance check on both the As-Constructed drawings and 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 comparison checks, the As-Constructed drawings and/or the ADAC XML file may be returned to the provider for correction and resubmission which can potentially delay the progress of asset handover and other related approvals.**

Once the ADAC XML data file(s) are accepted by Unitywater they are uploaded to various internal systems and used to assist in the maintenance planning and long-term management of the new infrastructure and other related assets.

3. General Requirements

The ADAC XML file is to be produced using the specified ADAC XML schema release (e.g. ADAC XML Ver 5.x) and should be checked for compliance before being submitted to Unitywater. Details on the preparation of As-Constructed plans and the ADAC capture process can be found on the Unitywater website.

4. Datum Information

Data contained in the ADAC XML file(s) must reflect the survey details exactly and all asset details are to be as shown on the Summary “As-Constructed” Plan(s).

The following shall also apply:

- survey details must be derived from at least two (2) relatively well spaced permanent survey marks (PMs);

Survey details to be derived from “SCIMs” marks and/or newly placed permanent survey marks (PMs) with Map Grid of Australia (MGA) GDA2020 - UTM Zone 56 coordinates for the survey area. All AHD levels to be to fourth (4th) order standard or better as defined by the current ICSM² Standard.

Any ongoing development that commenced prior to July 1 2020 are to continue in MGA56-GDA94 until completed.

5. Creation of ADAC XML File(s)

In producing compliant ADAC XML files, information on the asset classes 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 routinely have these updates incorporated into their various 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.ipweaq.com/adac>

While the ADAC XML files are created from the survey-accurate “As-Constructed” information, particular attention must be given to how Unitywater wishes to have particular details captured and recorded for each particular asset class.

² Intergovernmental Committee on Surveying & Mapping – <http://www.icsm.gov.au>

The following sections 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, a footpath or a pathway would be captured as individual and separate sections (segments) 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).

5.1. Asset Capture Guidelines

In order to capture and record all necessary asset information the following details are intended to provide guidance in the survey and collection of asset information and subsequent creation of a compliant ADAC xml file.

The South East Queensland Design and Construction Code is the primary source of information provided below and is legislated under the Water Distribution Act (2009). All ADAC schema details below relate to the current v5.0.1 schema.

Please refer to the various photos, diagrams and images that are presented under the different sections that are intended to illustrate and guide on the appropriate capture requirements. Details on attribution (mandatory and non-mandatory) are presented in the relevant tables included with each of the asset classes. Guidance on ‘project’ and ‘global’ attribution is included below.

Project Attribution

The following attribution is included within the header-level information and is to be completed in all ADAC xml files submitted:

ATTRIBUTE	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)	NOTES
ExportDateTime	Y		Should be auto populated from the xml generating software
Name	Y		Should be populated with a description of the project (and stage number for subdivisions)
Owner	Y		To be recorded as: UW
Receiver	Y		To be noted as: Unitywater
WorksApprovalID	N	Y	<ul style="list-style-type: none"> ○ Applicable <i>Subdivision Certificate Number</i> (e.g. UWxxx); or ○ Approved <i>Application Number</i>; or ○ <i>Project Number</i>.
DrawingNumber	Y		None

ATTRIBUTE	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)	NOTES
DrawingRevision	N		None
ConstructionDate	Y		At <i>Project Level</i> , "Construction Date" must be populated with xxxxs date
HorizontalCoordinateSystem	Y		At <i>Project Level</i> , "Horizontal Coordinate System" field must be populated with " MGA56 "
HorizontalDatum	Y		At <i>Project Level</i> , "Horizontal Datum" field must be populated with " GDA94 "
VerticalDatum	Y		At <i>Project Level</i> , "Vertical Datum" field must be populated with " AHD "
IsApproximate	Y		Must be required as "False"
OriginMark	N		Will be "Nil"
Notes	N		None
DrawingExtents-SouthWest	Y		Should never extend beyond: X: 430,700m Y: 6,944,100m
DrawingExtents-NorthEast	Y		Should never extend beyond: X: 534,700m Y: 7,131,700m
Description	Y		None
ProjectStatus	Y		None
Software.Product	Y		Auto-populated from the xml generating software
Software.Version	Y		Auto-populated from the xml generating software
Surveyor.Name	Y		None
Surveyor.DateFinalSurvey	Y		None
Surveyor.DateApproved	Y		None
Engineer.Name	Y		None
Engineer.DateApproved	Y		None

Global Attribution

Global Asset Attribution relates to attributes that are common on all feature types in the ADAC schema.

Mandatory Attribution: The following attributes related to Global Types are to be considered mandatory for all asset types:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
ADACId	Y	
Infrastructure Code	N	
Owner [†]	N	Y
DrawingNumber	N	
DrawingRevision	N	
ConstructionDate	N	Y (if different to Project date)
Department	N	
Surveyor	N	
Engineer	N	
Status [*]	Y	
DataQuality	N	
Notes ^x	N	
SupportingFiles	N	

* At the individual *Asset Level*, the “Status” field is both critical and mandatory with the following applicable values only to be used. Please note the description for each of the permissible “Status” types:

Asset Level Status	Description
Newly Constructed	Newly constructed asset passed to Unitywater
Existing	Existing asset that is recorded as it is current situated
Designed	Future asset that is recorded as it “designed” for the future
Planned	Future asset that is known but prior is to design
Removed	Previously existing asset - described as it was prior to removal
Retired	Pre-existing asset no longer in operation, but, left in-situ. Enumeration also means “Abandoned”.
Rehabilitated	Existing asset that has been refurbished for ongoing use

+ At the individual *Asset Level*, the “Owner” field is both critical and mandatory with the following applicable values only to be used. Please note the difference between the allowable values of Owner at the Asset Level versus the Owner at the Project Level:

Asset Level Owner Value	Description
UW	Unitywater
P	Privately
SEQ	SEQwater
Noosa	Noosa Shire Council
SCC	Sunshine Coast Council
MBRC	Moreton Bay Regional Council
UKN	Unknown

x 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 ADAC xml schema. See individual Asset Types below for details where applicable.

The ADACId is also considered mandatory by Unitywater as it is used to identify assets/features that are considered non-compliant when the xml file is processed. There is no defined naming convention required in creating the ADAC XML other than all features within the file should be uniquely identified by the naming convention chosen.

DataQuality is utilising the AS 5488-2013 “*Classification of Subsurface Utility Information*” standard. Please refer to Table 1 in the SEQ Design and Construction Code Asset Information Specification Section 2.1 for details.

The DataQuality Rating is as follows:

AS5488 Standard Ratings	Tolerance Details
APlus	XY +/-50mm & Z +/-10mm
A	XYZ +/-50mm
B	XY +/-300mm & Z +/-500mm
C	XY +/-300mm & Z N/A
D	XYZ tolerance N/A

5.2. Cadastral Information

Cadastral Connection

This represents an observed and reduced cadastral connection feature. This feature does not relate to lot boundaries, water boundaries or easements which are detailed below.

Chainage Line

Not required to be captured in ADAC format.

Lot Parcel

Asset Capture: Area feature (can be multi-part) representing the boundary of a titled or proposed Cadastral Lot.

Spatial Relationship: May share boundaries with RoadReserves or WaterCourses. Vertices must be coincident with any shared boundaries.

Mandatory Attribution: The following attribution is mandatory for *Lot Parcels*.

Element Name	ADAC Mandatory (Y/N)
LotNo	Y
PlanNo	Y
CancelledLotPlan	N
TitledArea_sqm	Y

Road Reserve

Asset Capture: Multi-patched area feature (can be multi-part) representing a road reserve boundary.

Spatial Relationship: May share boundaries with WaterCourseReserve, LotParcels, or other RoadReserve areas. Vertices must be coincident with any shared boundaries.

Mandatory Attribution: The following attribution is mandatory for *Road Reserves*:

Element Name	ADAC Mandatory (Y/N)
Name	Y

Survey Mark

Asset Capture: Simple point feature representing a Permanent Survey Mark.

Spatial Relationship: May be used in a Cadastral Connection (to lot parcels)

Mandatory Attribution: The following attribution is mandatory for *Survey Marks*.

Element Name	ADAC Mandatory (Y/N)
MarkName	Y

Water Course Reserve

Asset Capture: Area feature representing a boundary of a Water Course reserve.

Spatial Relationship: May share boundaries with RoadReserves and LotParcels. Vertices must be coincident with any shared boundaries.

Mandatory Attribution:

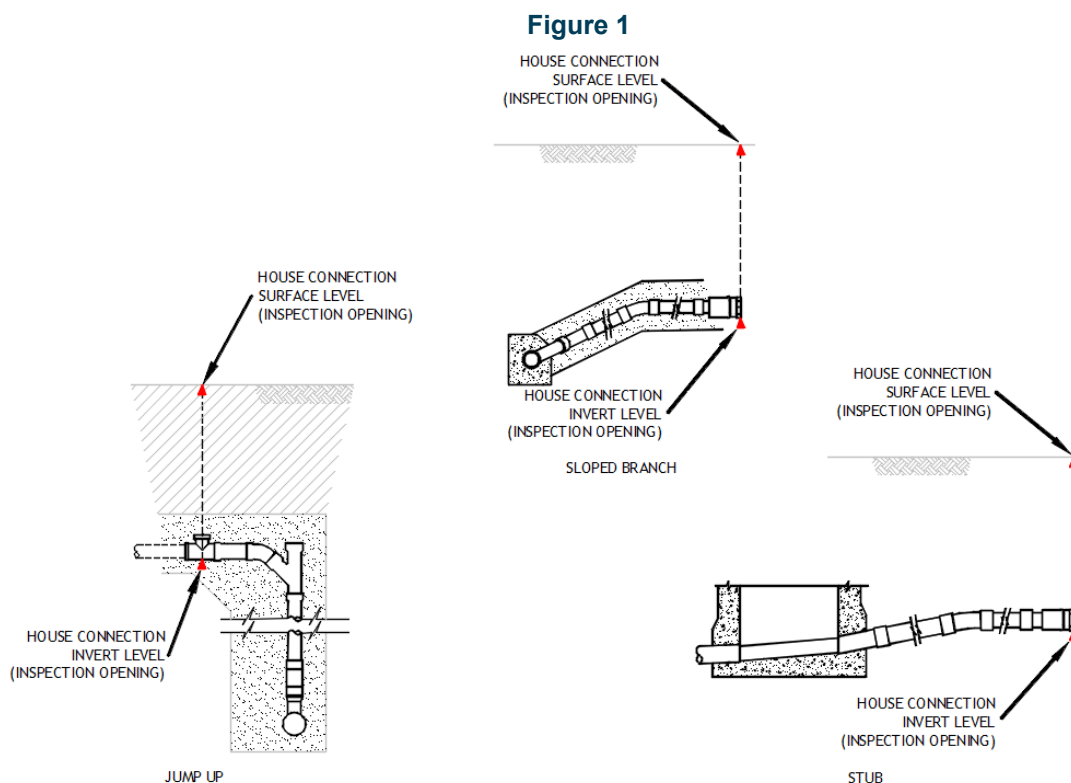
Element Name	ADAC Mandatory (Y/N)
Name	Y

5.3. Sewerage Assets

Connection

Asset Capture: Complex linear feature (Polyline not including Curves read: Straight line segments) representing the invert of the pipe asset. Enforced line direction from Inspection Opening to the Non-Pressure Pipe/Maintenance Hole due to gravitational flow. Please refer to **Figure 1 below** for examples of a “Jump Up”, “Sloped Branch” and “Stub” Connection.

Spatial Relationship: Gravity downstream end point of the linear feature must be coincident to anywhere on a Non-Pressure pipe linear feature or the point feature of a Maintenance Hole if the asset is a “Stub” connection.



Mandatory Attribution: The following attribution is applicable to house connections.

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
SurfaceLevel_m	Y	
InvertLevel_m	Y	
Use	Y	
Diameter_mm	Y	
Material *	Y	
Class *	Y	
Length_m	Y	
Type	Y	
Chainage_m	Y	
Offset_m	Y	
LineNumber	N	
DSMHID	N	
IO_Distance_m	Y	
SO_Nearest_m	Y	
SO_Other_m	Y	
Sediment_Trap	Y	

* Generic Enumerations e.g. "M_1", "M_2" etc and "Unknown" are not acceptable. "Other" is only acceptable if the enumeration isn't available in the allowable values with the actual enumeration populated in the Notes element.

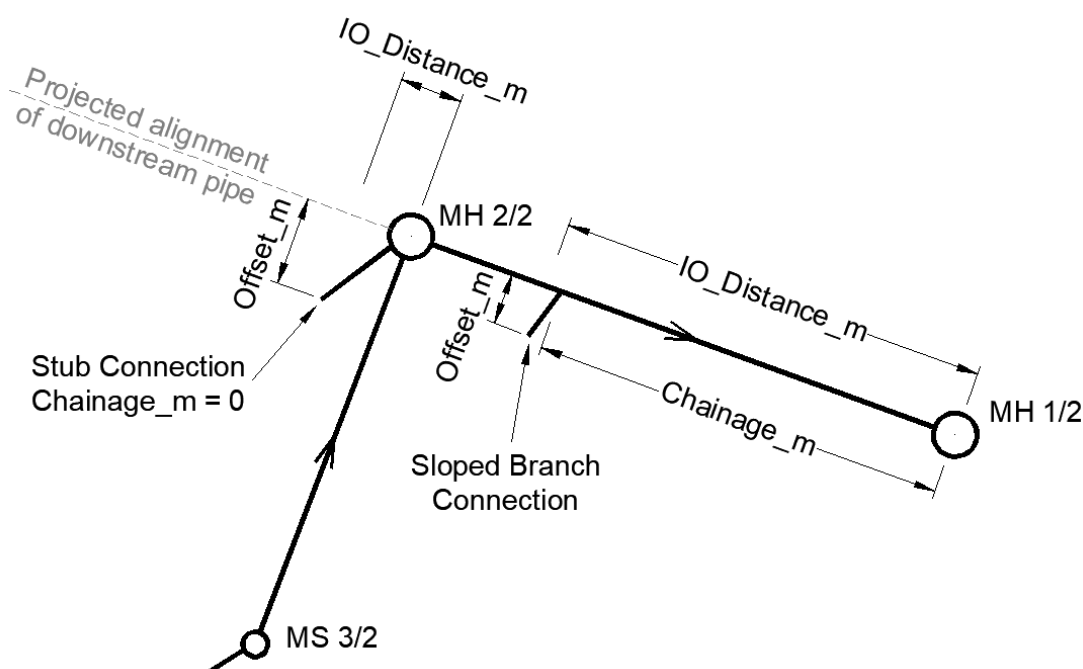


Figure 2 – Highlights dimensional attribution details for House Connections.

Fitting

Asset Capture: Single point feature representing the centre point of the fitting.

Spatial Relationship: Must be coincident to the end of pipe assets or a pipe asset anywhere along its length.

Mandatory Attribution:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
Type	Y	
Material *	Y	
Lining *	N	Y
Protection *	N	Y
BodySize_mm	Y	
BranchSize_mm	N	Y (If Type = Taper, Tee or Wye)
Rotation	N	

* Generic Enumerations e.g. "M_1", "M_2" etc and "Unknown" are not acceptable. "Other" is only acceptable if the enumeration isn't available in the allowable values with the actual enumeration populated in the Notes element.

Maintenance Hole (Including Inspection Openings at End-of-Line)

Asset Capture: Single point feature located at the centre of chamber on the top/lid surface. Note: Capturing centre of lid is appropriate only when the lid is centred over the chamber.

Please Note: Manufacturer and Model Number are to be included in the Notes element.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for Maintenance Holes:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
Use	Y	
ChamberSize.Rectangular.Length_mm	Y (if rectangular)	
ChamberSize.Rectangular.Width_mm	Y (if rectangular)	
ChamberSize.Circular.Diameter_mm	Y (if circular)	
ChamberSize.Custom.Area_sqm	Y (if custom)	
SurfaceLevel_m	Y	
InvertLevel_m	Y	
FloorConstruction	Y	
FloorMaterial *	Y	
WallConstruction	Y	
WallMaterial *	Y	
RoofMaterial *	Y	
Lining *	N	Y
LidMaterial *	Y	
DropType	Y	
CatchmentPS	N	
LineNumber	N	
MH_Number	Y	
Chainage_m	N	
TieDistance_m	N	
OffsetDistance_m	N	
Rotation	Y	

* Generic Enumerations e.g. "M_1", "M_2" etc and "Unknown" are not acceptable. "Other" is only acceptable if the enumeration isn't available in the allowable values with the actual enumeration populated in the Notes element.

Non-Pressure Pipe

Asset Capture: Complex linear feature (read: polylines with no curves only straight-line segments) representing the invert of the pipe asset. Enforced line direction from Gravity Upstream (read: higher AHD level) to Gravity Downstream (read: lower AHD level) due to gravitation flow in each individual pipe.

The gravity upstream and downstream ends of an individual pipe are captured at the intersection between the pipe material and the wall of the chamber. Please refer to **Figure 3 below** for a detailed diagram. Points 2 and 3 represent the intersection of pipe material and chamber wall whereas points 1 and 4 represent the Maintenance Holes capture. Pipes to be captured based on their physical and spatial properties and attributes. For example, if a pipe changes size, material or class. Sewer pipes are NOT to be broken at connections.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for Non-Pressure Pipes:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
LineNumber	N	Y
Use	Y	
Diameter_mm	Y	
Material *	Y	
Class *	Y	
Lining *	N	Y
Protection *	Y	
JointType *	Y	
US_InvertLevel_m	Y	
DS_InvertLevel_m	Y	
US_SurfaceLevel_m	Y	
DS_SurfaceLevel_m	Y	
Alignment_m	N	
Depth_m	Y	
Embedment *	Y	
RockExcavated	N	Y
PipeGrade	N	
Length_m	N	

* Generic Enumerations e.g. "M_1", "M_2" etc and "Unknown" are not acceptable. "Other" is only acceptable if the enumeration isn't available in the allowable values with the actual enumeration populated in the Notes element.

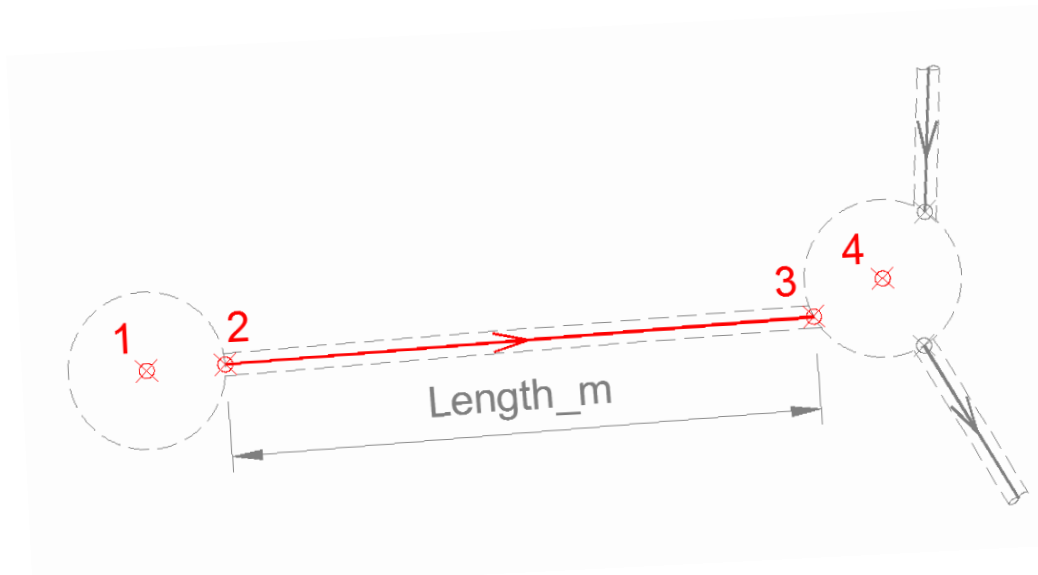


Figure 3

Pressure Pipe

Asset Capture:

Complex linear feature (read: polylines with no curves only straight line segments) representing the invert of the pipe asset. Enforced line direction from Pump active asset to Discharge Maintenance Hole due to pumped flow. Pipes to be captured based on their physical and spatial properties and attributes. For example, if a pipe changes size, material or class then it must be broken and captured separately.

Spatial Relationship:

Must be coincident to Pressure pipe point features in the pumped sewerage network.

Mandatory Attribution:

The following attribution is mandatory for Pressure Pipes:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
Use	Y	
Diameter_mm	Y	
Material *	Y	
Class *	Y	
Lining *	N	Y
Protection *	N	Y
JointType *	Y	
Alignment_m	N	
Depth_m	N	Y

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
Embedment *	N	Y
RockExcavated	N	Y
Length_m	N	

* Generic Enumerations e.g. "M_1", "M_2" etc and "Unknown" are not acceptable. "Other" is only acceptable if the enumeration isn't available in the allowable values with the actual enumeration populated in the Notes element.

Valve

Asset Capture: Single point feature representing the centre of a valve body, typically the spindle.

Asset Capture: The relationship between Use and Type is as per the below table.

ADAC.Use	ADAC.Type
Non-Return	Generic Rubber Gate Swing Check
Service Stop Scour Diversion Zone Boundary Flow Control	Gate Butterfly Knife Gate Eccentric Plug Globe Ball Generic Penstock
Pressure Control	Overflow Pressure Release Vacuum Release
Gas Release	Air Valve
Other	Special

Spatial Relationship: Must be coincident anywhere along its length or at the end of Pressure Pipe assets.

Mandatory Attribution:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
Use	Y	
Type	Y	
Diameter_mm	Y	

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
Lining *	N	Y
Protection *	N	Y
Manufacturer	N	
ModelNumber	N	
Rotation	N	

* Generic Enumerations e.g. “M_1”, “M_2” etc and “Unknown” are not acceptable. “Other” is only acceptable if the enumeration isn’t available in the allowable values with the actual enumeration populated in the Notes element.

Break Points for Linear Sewerage Assets – Sewerage Pipes

The following details identify where “breaks” are to be made and pipe lengths to be recorded as individual records during ADAC XML file creation.

Sewer Pipe lengths are to be broken or terminated under the following circumstances:

- Changes in Pipe Size;
- Changes in Pipe Material;
- Changes in Pipe Class;

And at the following fittings, devices and structures:

- Sewer Maintenance Holes (all features)
- Fittings (all features except Bends on Pressure Pipes)
- Valves (all features)

5.4. Supplementary

PointFeature / PolylineFeature / PolygonFeature

Asset Capture: Simple Point, Complex Polyline or Multi-patch Area feature (depending on the feature type) representing objects or assets that add clarity or context to the strict ADAC features.

Mandatory Attribution:

Element Name	ADAC 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

5.5. Surface

Breakline

Not required to be captured in ADAC format.

Contour

Not required to be captured in ADAC format.

Spot Height

Not required to be captured in ADAC format.

Profile Line

Not required to be captured in ADAC format.

5.6. Water Supply Assets

Fitting

Asset Capture: Single point feature representing the centre point of the fitting. Please refer to the yellow circles in **Figure 4 (below)** for representations of a “Tee” and “Tapping Band”.

Spatial Relationship: Must be coincident to a pipe asset in the water reticulation network.

Mandatory Attribution:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
Type	Y	
Material *	Y	
Lining *	N	Y
Protection *	N	Y
BodySize_mm	Y	
BranchSize_mm	N	Y (If Type = Cross Connection, Ready Tap, Taper, Tapping Band, Tee or Wye)
Rotation	N	
WaterQuality	Y	

* Generic Enumerations e.g. “M_1”, “M_2” etc and “Unknown” are not acceptable. “Other” is only acceptable if the enumeration isn’t available in the allowable values with the actual enumeration populated in the Notes element.

Hydrant

Asset Capture: Single point feature representing the centre of the vertical hydrant branch. Note: Hydrant Diameter refers to the riser pipe diameter in millimetres not the connecting reticulation pipe size.

Spatial Relationship: Must be coincident to a pipe asset.

Mandatory Attribution:

Element Name	ADAC Mandatory (Y/N)
Use	Y
Diameter_mm	Y
Rotation	N
WaterQuality	Y

Maintenance Hole

Asset Capture: Single point feature located on the centre of the chamber/structure.

Spatial Relationship: No connectivity is enforced due to the size and shape of the object.

Mandatory Attribution:

Element Name	ADAC Mandatory (Y/N)
Use	Y
ChamberSize.Rectangular.Length_mm	Y (if rectangular)
ChamberSize.Rectangular.Width_mm	Y (if rectangular)
ChamberSize.Circular.Diameter_mm	Y (if circular)
SurfaceLevel_m	Y
InvertLevel_m	Y
FloorConstruction	Y
FloorMaterial *	Y
WallConstruction	Y
WallMaterial *	Y
RoofMaterial *	Y
LidMaterial *	Y
Rotation	N

* Generic Enumerations e.g. "M_1", "M_2" etc and "Unknown" are not acceptable. "Other" is only acceptable if the enumeration isn't available in the allowable values with the actual enumeration populated in the Notes element.

Meter

Asset Capture: Single point feature located at the centre point of the meter itself.

Please note: The definition for the OffsetSide element is *“the offset from the left or the right side boundary when looking from the road.”*

Note: In-line Flow Meters are also to be captured in the schema here as Type = “Magflow”.

Spatial Relationship: Domestic Meters must be coincident to a water service pipe or water pipe with a Use of “Fire Service”, “Service” or “Fire Service Thru Meter”. Flow Meters must be coincident to a water pipe only.

Mandatory Attribution:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
SerialNumber	Y	
Type	Y	
Diameter_mm	Y	
Dials	N	
Manufacturer	N	
ModelNumber	N	Y
InitialReading	N	
PrivateBooster	Y	
OffsetSide	Y	
Offset_m	Y	
InstallationDate	Y	
LotNo	Y	
PlanNo	Y	
Rotation	N	
WaterQuality	Y	

Pipe

Asset Capture: Simple Linear feature (i.e. straight lines) representing the Invert of a circular pipe asset. Pipe segments are to be captured based on the pipe attributes. If any physical element of a pipe changes (e.g. size, material, class etc.) then the pipe asset must be broken and captured separately. Please refer to the red and green polylines in **Figure 4 below**. The red lines represent reticulation pipes whereas the green line represents a service pipe. Pipes are not to be broken at WaterServices.

Note: Service pipes less than and equal to 63mm in diameter are to be captured as WaterService, not Pipe.

Spatial Relationship:

Pipes must be coincident to water valves and fittings that participate in a flow network.

Mandatory Attribution:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
Use	Y	
WaterQuality	Y	
Alignment_m	N	
Diameter_mm	Y	
Material *	Y	
Class *	N	Y
Lining *	N	Y
Protection *	N	Y
JointType *	N	Y
Depth_m	N	
Embedment *	N	Y
Length_m	N	

* Generic Enumerations e.g. "M_1", "M_2" etc and "Unknown" are not acceptable. "Other" is only acceptable if the enumeration isn't available in the allowable values with the actual enumeration populated in the Notes element.

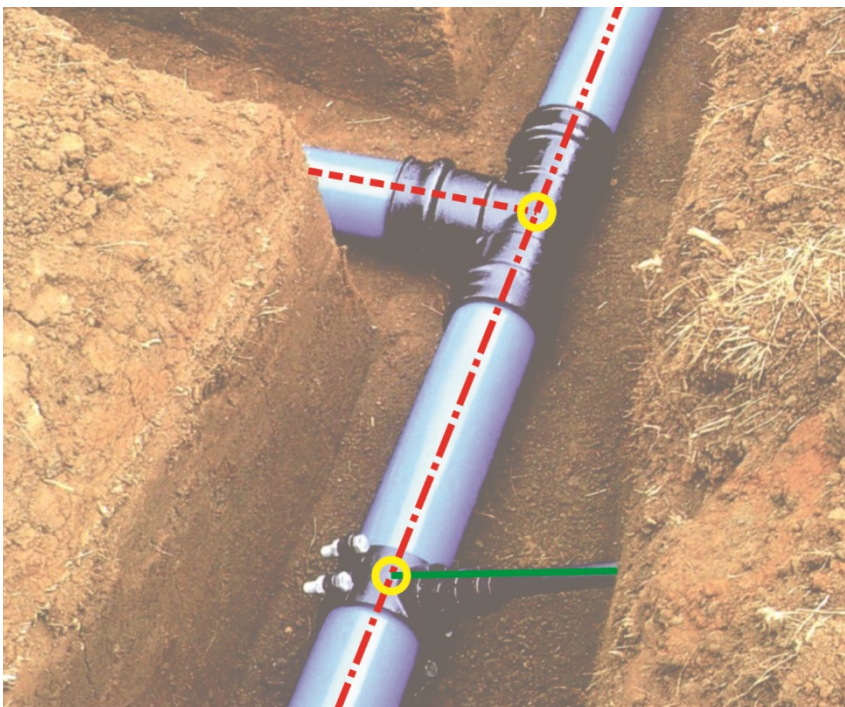


Figure 4

Service Fitting

Not required to be captured in ADAC format.

Storage Tank

Not required to be captured in ADAC format.

Valve

Asset Capture: Single point feature representing the centre of a valve body, typically the spindle.

Data Capture: The relationship between Use and Type is as per the following table.

ADAC.Use	ADAC.Type
Non-Return	Generic NR Rubber Gate Swing Check Wafer RPZ
Service Stop Scour Diversion Zone Boundary Flow Control	Gate Butterfly Knife Gate Eccentric Plug Globe Ball Valve Vee Ported Ball Control
Pressure Control	Overflow Pressure Relief Pressure Sustaining Altitude Valve Vacuum Release
Gas Release	Air Valve
Other	Special

Spatial Relationship: Must be coincident to a Water Pipe asset.

Mandatory Attribution:

Element Name	ADAC Mandatory (Y/N)
Use	Y
Type	Y
Diameter_mm	Y
Manufacturer	N

Element Name	ADAC Mandatory (Y/N)
ModelNumber	N
Rotation	N
WaterQuality	Y

Water Service

Asset Capture:

Simple Linear feature (i.e. straight lines) representing the invert of a circular pipe asset as per the solid green line in **Figure 4 above**. Only Service pipes less than and equal to 63mm are to be captured here. Larger sized Service pipes are to be captured in Water pipe with a Use of "Service".

Spatial Relationship:

Water Services must be coincident to a water pipe, valve or fitting that participate in a flow network.

Mandatory Attribution:

Element Name	ADAC Mandatory (Y/N)	UW Mandatory (Yes?)
Diameter_mm	Y	
Material	Y	
Class	N	Y
Protection	N	Y
Termination	N	Y
WaterQuality	Y	
Length_m	N	

Break Points for Linear Water Assets – Water Pipes

Water Pipe lengths are to be broken or terminated where there are:

- Changes in Pipe Size;
- Changes in Pipe Material;
- Changes in Pipe Class;
- At all Valves and Hydrants;
- At the following fittings:
 - Dead Plates, Dead Ends (all Types);
 - Connectors, Cross Connections, Connector Thrusts;
 - Dismantling Joints, Gibaults, Tapers;
 - Wyes, Tees; and
 - Booster Pumps