Moreton Bay Regional Council

Asset Design As Constructed (ADAC)

Submission Guidelines

Table of Contents

Version History

Version #	Description	Valid From	Valid To
1.0	New Format Document - ADAC Schema 4.2	10/12/2018	

1 Purpose

The purpose of this document is to provide guidelines and general assistance with respect to the creation and provision of compliant ADAC XML files. ADAC XML files are required to accompany the usual bundle of "As-Constructed" plans, drawings, schedules and associated information reflecting new donated civil infrastructure and associated assets ().

This document applies to all ADAC submissions from 18 February 2019.

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 acceptable drawing file formats, styles, quantities etc. can be found in the Moreton Bay Regional Council Planning Scheme at https://www.moretonbay.qld.gov.au/mbrc-planning-scheme/document/. Refer to *Schedule 6 - Planning scheme policies*. Within this is the *Operational works inspection, maintenance and bonding procedures*.

2 Introduction to ADAC XML

ADAC XML files are a compulsory accompaniment to the "Design" and "As-Constructed" bundles of information required by Council as a part of the construction and handover of nominated works and associated donated civil assets and infrastructure.

Figure 1 - MBRC As-Constructed Bundle Constituents

Compliant ADAC XML files contain a structured and digital record of the assets described in the "Design" and "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 ADAC XML files are used to check the completeness of the "As-Constructed" information provided and tolerances between "Design" and "As Constructed". The files afford further confirmation of compliance with development approval conditions and are used to verify engineering specifications and other design-related requirements. Note: MBRC require all ground services (water, sewer, communications), constructed within MBRC property, to be included in the ADAC XML file. It is a requirement that the 'As Constructed' ADAC XML files submitted be created from a copy of the 'Design' ADAC xml files to allow these tolerance checks to be carried out on like for like assets. Like for like assets must have the same ADAC XML Schema[1] 'Object Id' value which must be unique.

Depending on the tools[2] (ADAC XML generator) being used to generate the ADAC XML, compliant files are initially

[1] ADAC XML Schema refers to the structure and organization of the database system within the software. The ADAC Data Dictionary on the IPWEA website illustrates this structure in an excel format. Appendix A of this document outlines the ADAC XML Schema – Data Dictionary structure and additional MBRC requirements.

[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.

created at the Design phase from design information and input of the responsible engineer. As Constructed ADAC XML files are 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 are created using complete and survey-accurate information to identify the assets and the precise locations being represented. The generation of a pdf file from the ADAC XML, annotated with all asset attributes and certified accordingly, provides a reference for project managers of the ADAC XML file content.
Please also note that some assets are common to multiple asset classes e.g. lighting as street or park lighting. In those cases, capturing assets in a different asset class is valid and appropriate.

On receiving the “As-Constructed” bundle (**Error! Reference source not found.**), 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 processes.

Once the ADAC XML data file(s) are accepted they are then 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 As-Constructed Requirements

3.1 ADAC XML As-Constructed Requirements

The ADAC XML file is to be produced using the **version 4.2 Schema release** and should be “validated” for compliance before being submitted to council. A summary of the ADAC Schema (primary levels), noting asset classes and sub-classes to be addressed by the ADAC capture process, can be found at **Error! Reference source not found.**. This includes additional MBRC requirements. The ADAC Schema and a detailed ADAC Data Dictionary can be found on the ADAC website at: http://www.ipweaq.com/asset-owners

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). All electronic files will need to be accompanied by an appropriate “Document Transmittal Form”.
Once received by Council, the ADAC XML files will go through a compliance test. Failures will need to be corrected and resubmitted until passed. Each version of the ADAC XML file is to be named using the DA number or Council Capital Project Number followed by the suffix ‘ - Submission1, 2, 3 etc.’.

On receipt of the “As-Constructed” bundle of information, data format and conformance checks will be performed on the as-constructed file to confirm the completeness and validity of the details. Should anomalies, errors or missing information be identified during these checks, the as-constructed file(s) may be returned to the provider for correction and resubmission in accordance with applicable conditions, potentially delaying the progress of asset handover.

3.2 Datum Information & Spatial Accuracy

Data contained in the ADAC XML file(s) must reflect the survey details exactly as shown on the “As-Constructed” drawings which must be derived from permanent survey marks (PSMs), with Map Grid of Australia (MGA Zone 56 – GDA 94) co-ordinates and AHD levels to be to fourth order standard as defined by ICSM Standard for the Australian Survey Control Network Special Publication 1 (SP1) Version 2.0 October 2013.

4 Creation of the ADAC XML

In producing compliant ADAC XML files, information on the following asset classes will need to be captured, according to the approved ADAC Schema (refer to software structure and the ADAC Data Dictionary for details). 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, ADAC Schema, ADAC Data Dictionary and available tools and supporting agencies can be found on the ADAC website at: http://www.ipweaq.com/asset-owners

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 details captured and recorded for each particular asset class. The following details 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.
Of particular note, you should be aware that the vertices that make up a polygon feature need to be captured in sequential order around the perimeter when creating the XML. Failure to do so may result in the polygon being captured incorrectly (clipping and 'donuting') (**Error! Reference source not found.** and **Error! Reference source not found.**).

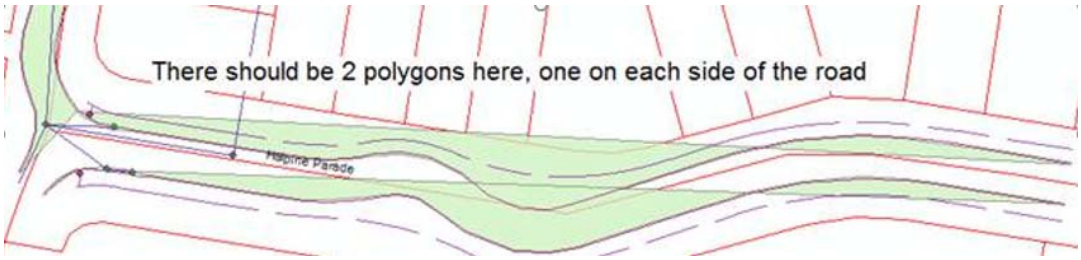

Figure 2 - Vertices not captured in sequential order

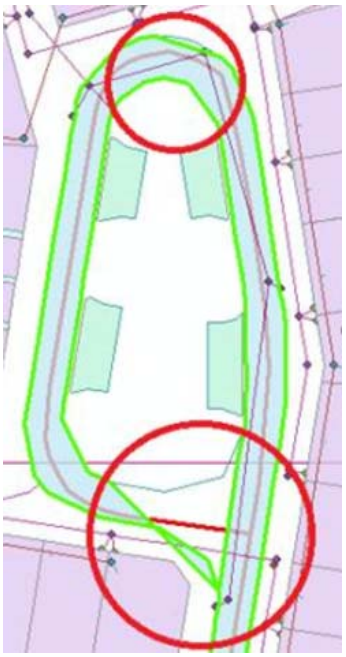

Figure 3 - Vertices not captured in sequential order

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 data dictionary).

5 Asset Capture Guidelines

The following section is intended to provide guidance on the capture of assets within the as-constructed file in a manner which is acceptable to the Moreton Bay Regional Council.

The physical nature of assets will determine where/if assets are captured separately within the as- constructed file. For example, a pathway would be captured as individual and separate features to reflect any changes in physical properties, such as width or material type. Where possible, diagrams and images have been supplied in this document to assist in asset capture. The mandatory attribution specified below includes the minimum information Council requires to enter each asset type into the asset register. While
attributes marked “Non Mandatory” are not required, it is preferable that this information be included (if known).

5.1 Project Attribution

For ADAC XML files, the following attribution is included as header-level information within the schema.

Attribute	Notes
ExportDateTime	*Should be auto-populated from the xml generating software.*
Name	*Should be populated with the Project Name for Capital Works or Development Name and Stage for Development Approvals*
Owner	*This is not required to be provided at the project level, as it is a mandatory attribute for each feature.*
Reciever	*Will be **Moreton Bay Regional Council***
WorksApprovalID	*For developer contributed project, this will be Council’s reference number.* *For Moreton Bay Regional Council Capital works projects, this will be the 6-digit project number (i.e. 123456).*
DrawingNumber	*None*
DrawingRevision	*None*
ConstructionDate	*Must be populated for newly constructed assets*
HorizontalCoordinateSystem	*Must be **MGA56***
HorizontalDatum	*Must be **GDA94**.*
VerticalDatum	*Must be **AHD**.*
IsApproximate	*Must be **False***
OriginMark	*Should be **Nil** as Is Approximate must be False.*
Notes	*None*
DrawingExtents - SouthWest	*The x and y coordinates of the southwest project extent*
DrawingExtents – NorthEast	*The x and y coordinates of the northeast project extent*

Description	*None*
Status	*None*
Software	*None*
Surveyor	*None*
Engineer	*None*

5.2 Global Asset Attribution

The global asset attribution includes attributes which are common to all feature types in the ADAC schema.

Mandatory Attribution: The following attribution covered under the Global Types section of ADAC is mandatory for all assets:

Element Name	Mandatory (Y/N)
ObjectId	**Y***
InfrastructureCode	N
Owner	**Y***
DrawingNumber	N
DrawingRevision	N
ConstructionDate	**Y***
Department	N
Surveyor	N
Engineer	N
Status	Y
DataQuality	N
Notes	N
SupportingFiles	N

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

The **ObjectId** element is mandatory as it will be used to as part of Council's data validation process to identify features which are non-compliant / incomplete. There is no naming/numbering convention defined for the ObjectId, except that all features within the file should be uniquely identified.

The **DrawingNumber**, **DrawingRevision**, **ConstructionDate**, **Surveyor** and **Engineer** fields are only required to be populated against individual features where they differ to the information provided at the ADAC project level.

The **Notes** element should be used to record any additional information regarding the asset, or to record attribute information which isn't available within the defined enumerations in the schema. Where Council requires specific information to be recorded in the Notes field for a particular feature type, this has been specified in the relevant sections in this document.

The **Status** is a critical element within the as-constructed information, as it is what Council uses to load new and dispose existing assets into the asset register. It is very important the removal of redundant assets is included in the xml file.

Please note the descriptions for each status below:

Status	Description
Newly Constructed	Newly constructed asset being passed to receiving entity
Existing	Existing asset described as encountered
Designed	Future asset described as a design
Planned	Future asset prior to detailed design
Removed	Previously existing asset described as it was prior to removal
Retired	Pre-existing asset no longer in use, but left in-situ.
Rehabilitated	Existing asset repaired, refitted or refurbished as part of works project.

5.3 Cadastre assets

5.3.1 Cadastral Connection

Asset Capture: Simple linear feature capturing the cadastral connections as deduced from observations and the survey reference mark(s).

Spatial Relationship: Must be coincident to the vertices that define the Cadastre Lot boundary features and relevant PSMs.

Mandatory Attribution: The following attribution is mandatory for *Cadastral Connections*:

Element Name	Mandatory (Y/N)
Bearing	Y
Distance_m	Y

5.3.2 Easement

Asset Capture: Multi-patched area feature representing a new or existing Easement.

Spatial Relationship: May share boundaries with WaterCourseReserve, LotParcels or RoadReserve. Node points between shared boundaries must be coincident i.e. no overlaps or “slivers”.

Mandatory Attribution: The following attribution is mandatory for *Easements*:

Element Name	Mandatory (Y/N)
LotNo	Y
PlanNo	Y

5.3.3 Lot Parcels

Asset Capture: Multi-patched area feature representing the boundary of a titled or proposed Cadastral Lot.

Spatial Relationship: May share boundaries with RoadReserves, WaterCourses or Easements. Node points between shared boundaries must be coincident i.e. no overlaps or “slivers”.

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

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

6 Road Reserve

Asset Capture: Multi-patched area feature representing a gazetted or soon to be gazetted Road reserve boundary.

Spatial Relationship: May share boundaries with WaterCourseReserve, LotParcels, other RoadReserve or Easements. Node points between shared boundaries must be coincident i.e. no overlaps or "slivers".

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

Element Name	Mandatory (Y/N)
Name	Y

6.1.1 Survey Mark

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

Spatial Relationship: May be used in a Cadastral Connection (as in lot parcels, noted above).

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

Element Name	Mandatory (Y/N)
MarkName	Y

6.1.2 Water Course Reserve

Asset Capture: Multi-patched area feature representing the boundary of a Water Course reserve.

Spatial Relationship: May share boundaries with RoadReserves, LotParcels or Easements. Node points between shared boundaries must be coincident i.e. no overlaps or "slivers".

Mandatory Attribution: The following attribution is mandatory for *Water Course Reserves*:

Element Name	Mandatory (Y/N)
Name	Y

6.2 Open Space Assets

6.2.1 Activity Area

General Information: Examples include: Sports Fields, Courts, Playgrounds and Animal Agility Areas.

Asset Capture: Multi-patched area feature representing different activity areas. For playgrounds, this will often align with the soft fall boundaries. For animal agility areas, this will often align with the fencing surrounding the area. For sports fields and courts, this will often align with the marked boundaries of the area, or the edge of the material. Please refer to the dashed yellow line in the example shown below in **Figure 7** representing activity areas for dedicated purposes.

Figure 4

Spatial Relationship: Feature must be totally within the Parent Open Space Activity Area feature.

Mandatory Attribution: The following attribution is mandatory for *Activity Areas*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Activity Areas* is **± 1m.**

6.2.2 Activity Point

General Information: Includes individual pieces of playground, fitness, animal agility or sports equipment.

Asset Capture: Simple point feature representing individual activity assets that typically fall within an Activity Area. Playground modules should be represented as a single feature, located by

its approximate centre point. Please refer to the yellow dots in the example shown in **Figure 7**.

Spatial Relationship: Should typically fall within a defined Activity Area feature.

Mandatory Attribution: The following attribution is mandatory for *Activity Points*:

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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Activity Points* is **± 1m.**

6.2.3 Artwork

General Information: Includes Entry Statements, Memorials, Monuments, Plaques, Sculptures & Statues.

Asset Capture: Simple point feature representing the centre of an asset.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Artwork*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Artwork* is **± 1m.**

6.2.4 Barbeque

General Information: None.

Asset Capture: Simple point feature representing the centre of the barbeque. Any hot water units, taps, lighting or shelters associated with the barbeque should be captured as separate features. The slab the barbeque is installed on is considered part of the asset and does not need to be separately captured.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Barbeques*:

Element Name	Mandatory (Y/N)

EnergySource	Y
Plates	Y
SurroundingMaterial	Y
TopMaterial	Y
Manufacturer	**N***
ModelNumber	**N***

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Barbeques* is **± 1m.**

6.2.5 Barrier Continuous

General Information: Includes fences, bollard runs, guardrails, pedestrian fall protection and gates.

Asset Capture: Complex linear feature (polylines including curves but not bézier curves) representing a barrier type asset. Please refer to the dashed yellow line in the example shown below in **Figure 8**.

When capturing gates, please specify the gate configuration in the **Notes** field. Gate configurations include:

- Single
- Double
- Boom Gate
- Sliding / Roller

Guardrails should be captured under *Barrier Continuous*. When capturing guardrails, the attribution should be populated as follows:

- **Type:** ”Vehicle Barrier”
- **UprightMaterial:** Material of the posts
- **LinkMaterial:** Material of the rail
- **TopMaterial**: None
- **Length:** Length of the railing, including end treatments
- **Height:** Height of the railing
- **Notes:** Include the following:
    - Armour Rail / Steel Wire Rope / Wall
    - Leading & trailing end treatments

Spatial Relationship: None.

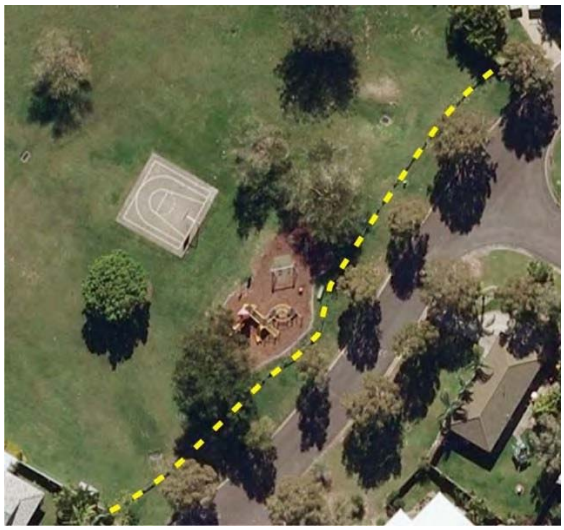

Figure 5

Mandatory Attribution: The following attribution is mandatory for *Barrier Continuous*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Barrier Continuous* is **± 1m.**

6.2.6 Barrier Point

General Information: Includes bollards and locking posts.

Asset Capture: Simple point feature representing the centre of an asset. Road guide posts are not to be captured as Barrier Points (not captured by Moreton Bay Regional Council).

Spatial Relationship: Not applicable.

Mandatory Attribution: Height is not recorded in the ADAC Schema (refer to the ADAC Data Dictionary). To facilitate entry to MBRC systems, please record the height in the ADAC Global Types 'Component Info Infrastructure Code' field in the format 'Height = ##.##m'.

The following attribution is mandatory for *Barrier Points*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Barrier Points* is **± 1m**.

6.2.7 Bicycle Fitting

General Information: None.

Asset Capture: Simple point feature representing the centre of a bicycle fitting. Any slab the bicycle fitting is installed on is considered part of the asset and does not need to be captured separately.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Bicycle Fittings*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Bicycle Fitting* is **± 1m**.

6.2.8 Boating Facility

General Information: None.

Asset Capture: Area feature representing an individual boating facility such as a pontoon, ramp or jetty.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Boating Facilities*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Boating Facilities* is **± 1m**.

6.2.9 Building

General Information: None.

Asset Capture: Area feature (closed polygon) representing the vertical Building footprint for a structure other than a shelter.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Buildings*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Buildings* is **± 1m**.

6.2.10 Electrical Conduit

General Information: None.

Asset Capture: Complex linear feature (polylines including curves but not bézier curves) representing a conduit run.

Spatial Relationship: Conduit shown as a polyline starting and finishing at coincident points with each associated fitting.

Mandatory Attribution: The following attribution is mandatory for *Electrical Conduits*:

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

Diameter_mm	Y
Length_m	Y
Protection	N

Positional Accuracy: The minimum accepted horizontal accuracy for *Electrical Conduits* is **± 1m**.

6.2.11 Electrical Fitting

General Information: Includes Lights, Pits, Poles, Power Outlets and Switchboards.

Asset Capture: Simple point feature representing the centre point of the asset. Council requires all Rate 3 lighting installed to be included in the file. For lights affixed to a pole, a separate Pole feature must also be captured. Bollard lighting does not require a separate Pole feature to be captured.

Spatial Relationship: Must be coincident to Electrical Conduit polylines. Lights with poles will have coincidence geometry.

Mandatory Attribution: The following attribution is mandatory for *Electrical Fittings*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Electrical Fittings* is **± 1m**.

6.2.12 Fixture

General Information: Includes Dog Bag Dispensers, Fish Cleaning Stations, Goal Posts, Planter Boxes, Flag Poles, Scoreboards and Dog Bowls fixed to taps or drink fountains.

Asset Capture: Simple point feature representing the centre of an asset. Dog bag dispensers including a pole do not require the pole to be separately captured. Fish Cleaning Stations include any lighting, taps and slabs associated with it and these do not need to be captured separately.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Fixtures*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Fixtures* is **± 1m**.

6.2.13 Landscape Area

General Information: None.

Asset Capture: Multi-patched area feature representing the “footprint” of a landscaped area. Individual areas are required where the type of Landscaping changes (e.g. garden beds, grass). Only Gardens, Grass and Synthetic Grass are required to be included in the as-constructed data.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Landscape Areas*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Landscape Areas* is **± 1m**.

6.2.14 Open Space Area

General Information: Includes areas such as Parks or Bushlands.

Asset Capture: Multi-patched area feature representing the complete "footprint" of the Open Space area and enclosing relevant Open Space assets. For example, parks will often align with the cadastral *Lot Parcels*, in which case the lot boundaries can be used to represent the Open Space feature. Please refer to the dashed red line in the example shown in **Figure 7**.

Spatial Relationship: Not applicable

Mandatory Attribution: The following attribution is mandatory for *Open Space Areas*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Open Space Areas* is **± 1m.**

6.2.15 Retaining Wall

General Information: None.

Asset Capture: Complex linear feature (polylines including curves but not bézier curves) representing a retaining wall. While recognised as a three dimensional object, the retaining wall is typically captured as a linear course where the wall intersects the ground. **Figure 9** shows the capture location of a new retaining wall (red hatched). Where the retaining wall gradually changes height over its length, the height is to be taken from the highest point of the wall.

Figure 6

Spatial Relationship: Not applicable.

Mandatory Attribution: Currently ADAC does not cater for wall width, so this needs to be provided in the ADAC Global Types 'Component Info Notes' field in the format 'Width: #.##' where #.## is the width in metres to 2 decimal places.

The following attribution is mandatory for *Retaining Walls*:

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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Retaining Walls* is **± 1m.**

6.2.16 Seat

General Information: None.

Asset Capture: Simple point feature representing the centre of a seat. Seating associated with a table are not to be captured separately. Any slab the seat is installed on is considered part of the asset and does not need to be captured separately.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Seats*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Seats* is **± 1m**.

6.2.17 Shelter

General Information: None.

Asset Capture: Simple point feature representing the centre of a shelter. Any lighting, tables, seats or barbeques located underneath the shelter are to be captured as separate assets. Shade sails which share a common pole should be treated as the one feature. Poles associated with shade sails / shelters do not need to be captured separately. Any slab the shelter is installed on is considered part of the asset and details should be provided on its length, width and thickness. The slab information can be provided in the ComponentInfo Notes detail as free text.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Shelters*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Shelters* is **± 1m**.

6.2.18 Sign

General Information: None.

Asset Capture: Simple point feature representing the centre of a sign. Poles associated with the sign do not need to be separately captured.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Signs*:

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

Element Name	Mandatory (Y/N)
Rotation	N
Manufacturer	N
ModelNumber	N

Positional Accuracy: The minimum accepted horizontal accuracy for *Signs* is **± 1m**.

6.2.19 Table

General Information: None.

Asset Capture: Simple point feature representing the centre of a table.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Tables*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Tables* is **± 1m**.

6.2.20 Tree

General Information: None.

Asset Capture: Simple point feature representing the centre of an asset.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Trees*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Trees* is **± 1m**.

6.2.21 Waste Collection Point

General Information: Includes any poles, stands or enclosures associated with a bin.

Asset Capture: Simple point feature representing the centre of the asset.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Waste Collection Points*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Waste Collection Points* is **± 1m**.

6.3 Sewerage Assets

6.3.1 Connections

General Information: None.

Asset Capture: Complex linear feature (polylines including curves but not bézier curves) representing the invert of the property connection. Line direction should be enforced from Inspection Opening to the Non Pressure Pipe/Maintenance Hole due to gravitational flow. The Z coordinate of the alignment is recorded as the invert level of the pipe. Refer to **Figure 11** below for further information on property connections.

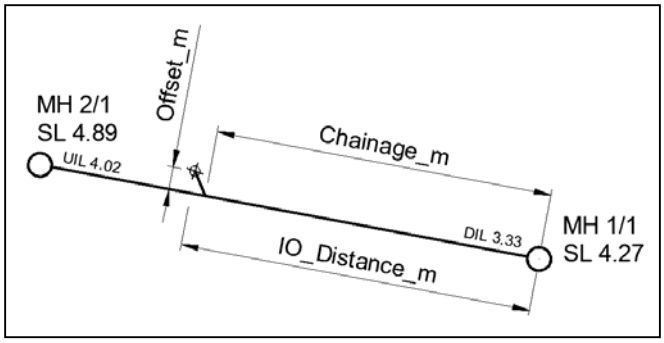

Figure 7

Note: "Unknown", "M_1" and "M_2" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

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 mandatory for *Connections*:

Element Name	Mandatory (Y/N)
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

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

6.3.2 Fittings

General Information: None.

Asset Capture: Single point feature representing the centre point of the fitting. The Structure ID as shown in the design drawings must be recorded in the ObjectId attribute.

For a taper, record the larger diameter in the BodySize_mm attribute and the small diameter in the BranchSize_mm.

Refer to SEQ D&C Code *Asset Information Specification*; Section capture convention such as Pipe breaking and levels for pipe fittings for further information of asset capture requirements.

Website link: http://www.seqcode.com.au/standards/

Note: "Unknown", "M_1" "M_2", "P_1" and "P_2" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

Spatial Relationship: Must be coincident to the pipe asset

Mandatory Attribution: The following attribution is mandatory for *Fittings*:

Element Name	Mandatory (Y/N)
Type	Y
Material	Y
BodySize_mm	Y
BranchSize_mm	N
Rotation	N
Lining	Y
Protection	Y

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

7 Maintenance Hole

General Information: None.

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

Note: "Unknown", "M_1"and "M_2" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

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

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

Element Name	Mandatory (Y/N)
Use	Y
Length_mm	Y *(if rectangular)*
Width_mm	Y *(if rectangular)*
Diameter_mm	Y *(if circular)*
Area_sqm	Y *(if custom)*
SurfaceLevel_m	Y
InvertLevel_m	Y
FloorConstruction	Y
FloorMaterial	Y
WallConstruction	Y
WallMaterial	Y
RoofMaterial	Y
Lining	Y
LidMaterial	Y
DropType	Y
CatchmentPS	N
LineNumber	N
MH_Number	Y
Chainage_m	N
TieDistance_m	N
OffsetDistance_m	N
Rotation	Y

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: Please refer to SEQ

D&C Survey Conventions

Website link: http://www.seqcode.com.au/standards/

7.1.1 Non Pressure Pipes

General Information: None.

Asset Capture: Complex linear feature (polylines including curves but not Bezier curves) representing the invert of the pipe asset. Line direction should be enforced from gravity flow or gravity direction.

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. Refer to **Figure 8** 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 are to be captured based on their physical and spatial properties and attributes. For example, if a pipe changes size, material, class, embedment or direction etc. then it must be broken and captured separately. Sewer pipes should not be broken by connections. For further information refer to SEQ D&C Section Envelopers and Conduits and Section Pipe Breaking; Website: http://www.seqcode.com.au/standards/

Where the pipe use is *Overflow*, the point of discharge must be provided in the *Notes* attribute. The following values should be used:

- "STW" - discharge to stormwater system
- "OPEN" - discharge to water course

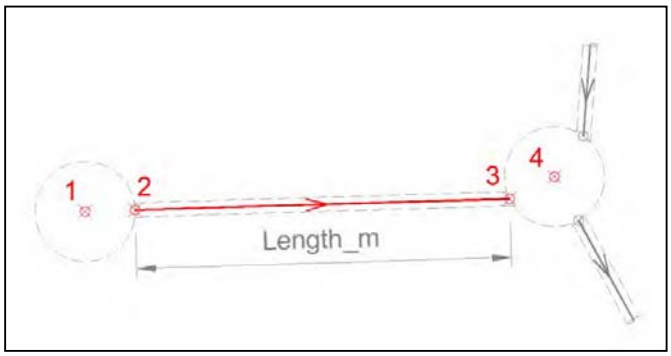

Figure 8

Note: "Unknown", "M_1", "M_2", "L_1", "L_2", "P_1" ,"P_2", "JT_1", "EB_1" and "EB_2" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

Spatial Relationship: Not Applicable

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

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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: Please refer to SEQ D&C Survey Conventions

Website link: http://www.seqcode.com.au/standards/

7.1.2 Pressure Pipes

General Information: None.

Asset Capture: Complex linear feature (polylines including curves but not Bezier curves) representing the invert of the pipe asset. Line direction should be enforced from Pump active asset to Discharge Maintenance Hole due to pumped flow.

Pipes are to be captured based on their physical and spatial properties and attributes. Sewer pipes should not be broken by connections. For further information refer to SEQ D&C Section Pipe Breaking; Website: http://www.seqcode.com.au/standards/

The *Line Number* as shown in the design drawings must be recorded in the *ObjectId* attribute.

Not all combinations of pipe attributes exist, for example a reinforced concrete pipe would not have a concrete protective liner or flanged joints. Particular attention should be given to provide valid pipe-material pipe-class combinations.

The following information is to be provided in the *Notes* field:

- Where applicable, the LDG Standard drawing access structure type should be provided.
- The LDG Standard drawing access structure cover class ("B" or "D") should be provided
- Class PN1 is not available in the ADAC schema, to capture class PN1 you will need to select “other” in the class section and type PN1 in the notes field.

Note: “Unknown”, “M_1”, “M_2”, “P_1” ,“P_2”, “JT_1”, “EB_1” and “EB_2” is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. “Other” is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

Spatial Relationship: Not Applicable

Mandatory Attribution: The following attribution is mandatory for *Pressure Pipes*:

Element Name	Mandatory (Y/N)
Use	Y
Diameter_mm	Y
Material	Y
Class	Y
Lining	**Y***
Protection	**Y***
JointType	Y
Alignment_m	N
AverageDepth_m	**Y***
Embedment	**Y***
RockExcavated	**Y***
Length_m	**Y***

* Additional mandatory requirement for MBRC

Positional Accuracy: Please refer to SEQ D&C Survey Conventions

Website link: http://www.seqcode.com.au/standards/

7.1.3 Valves

General Information: None.

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

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

Mandatory Attribution: The following attribution is mandatory for *Valves*:

Element Name	Mandatory (Y/N)
Use	Y
Type	Y
Diameter_mm	Y
Protection	**Y***
Manufacturer	N
ModelNumber	N
Rotation	N
Lining	**Y***

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: Please refer to SEQ D&C Survey Conventions

Website link: http://www.seqcode.com.au/standards/

7.2 Stormwater

7.2.1 End Structure

General Information: Represents a stormwater headwall / end wall.

Asset Capture: Simple point feature representing the invert of the headwall (refer **Figure 9**). Fences surrounding the end structure should be captured separately as *Barrier Continuous*.

Figure 9

Spatial Relationship: Must be coincident to a stormwater pipe.

Mandatory Attribution: The following attribution is mandatory for *End Structures*:

Element Name	Mandatory within ADAC Schema (Y/N)
Structure ID	Y
StructureLevel_m	Y
EndWall Type	Y (if EndWall exists)
EndWall Construction	Y (if EndWall exists)
WingWall Type	Y (if WingWall exists)
WingWall Construction	Y (if WingWall exists)
Apron Type	Y (if Apron exists)
Apron Construction	Y (if Apron exists)
Grate Type	**Y***
Tide Gate	**Y***
PredominantMaterial	Y
OutletProtectionType	Y
Rotation	N

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *End Structures* is **± 50mm**.
The minimum accepted vertical accuracy for *End Structures* is **± 10mm**.

7.2.2 Fitting

General Information: Represents a stormwater end cap.

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

Spatial Relationship: Must be coincident to the end point a Stormwater pipe feature.

Mandatory Attribution: The following attribution is mandatory for *Fittings*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Fittings* is **± 50mm**.

The minimum accepted vertical accuracy for *Fittings* is **± 10mm**.

7.2.3 GPT Complex

General Information: None.

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

Gross Pollutant Trap (GPT) Complex assets are Commercial or Custom built devices (e.g. Humes Interceptor).

Spatial Relationship: GPT Complex assets must be coincident to pipe features as per Pits/Manhole features.

Mandatory Attribution: The following attribution is mandatory for *GPT Complexes*:

Element Name	Mandatory (Y/N)
Sqid_Id	**Y***
Manufacturer	**Y***
ModelNumber	**Y***
Length_mm	Y *(if rectangular)*
Width_mm	Y *(if rectangular)*
Diameter_mm	Y *(if circular)*
Function1	Y
Function2	N
Function3	N
US_PipeDiameter_mm	N
DS_PipeDiameter_mm	N

Element Name	Mandatory (Y/N)
SurfaceLevel_m	Y
CleanoutLevel_m	Y
Depth_m	**Y***
SumpDepth_m	N
HasFilterMedia	N
HasBasket	N
HasBoards	N
DesignFlow_m3s	Y
MaxContaminantVolume_m3	N
MaxInternalVolume_m3	N
MaintenanceCycle_mnths	N
Rotation	N

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *GPT Complex* is **± 50mm**.

The minimum accepted vertical accuracy for *GPT Complex* is **± 10mm**.

7.2.4 GPT Simple

General Information: None.

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

Gross Pollutant Trap (GPT) Simple assets are “in pit” basket or “end of line” devices.

Spatial Relationship: A GPT Simple asset’s spatial location must correlate with a Pit/Manhole asset as they are housed within those structures and can be removed for maintenance or relocation.

Mandatory Attribution: The following attribution is mandatory for *GPT Simple*:

Element Name	Mandatory (Y/N)
Sqid_Id	**Y***
Construction	Y
Manufacturer	**Y***
ModelNumber	**Y***
TreatmentMeasure	Y
Function1	Y

Element Name	Mandatory (Y/N)
Length_mm	Y
Width_mm	N
MaintenanceCycle_mnths	N
Rotation	N

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *GPT Simple* is **± 50mm**.

The minimum accepted vertical accuracy for *GPT Simple* is **± 10mm**.

7.2.5 Non GPT Simple

General Information: None.

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

Non GPT Simple assets represent basic and minor sand filtration storage.

Spatial Relationship: Non GPT Simple assets must be coincident to pipe features as per Pits/Manhole features.

Mandatory Attribution: The following attribution is mandatory for *Non GPT Simple*:

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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Non GPT Simple* is **± 50mm**.

The minimum accepted vertical accuracy for *Non GPT Simple* is **± 10mm**.

7.2.6 Pipe

General Information: None.

Asset Capture: A simple linear feature representing the invert of the pipe or midpoint of a box asset. Multiple-celled culverts & pipes should always be represented individually; therefore the number of cells attribute should always be “1”. Line direction should be enforced from gravity flow or gravity direction. Pipe features are captured from the intersection of pipe material and chamber wall. Refer to **Figure 10** and **Figure 11.**

Figure 10 represents a single-celled pipe asset where vertices one and four represent the maintenance hole capture and vertices two and three are the intersection of the Pipe material and the chamber wall.

Figure 11 represents an irregular shaped pit with multiple multi-celled pipes entering the pit asset and a large single-celled asset exiting the pit with an outlet through an End Structure.

Pipes are to be captured based on their physical and spatial properties and attributes. For example, if a pipe changes size, material, class, embedment or direction etc. then it must be broken and captured separately.

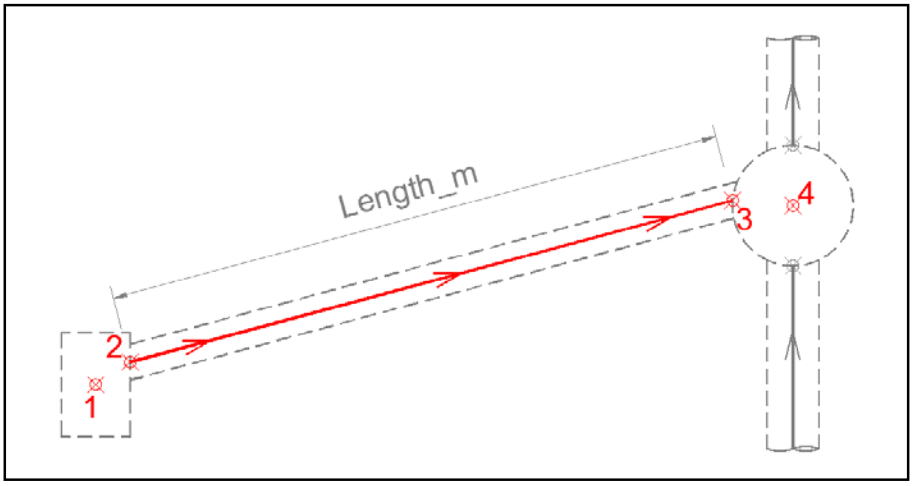

Figure 10

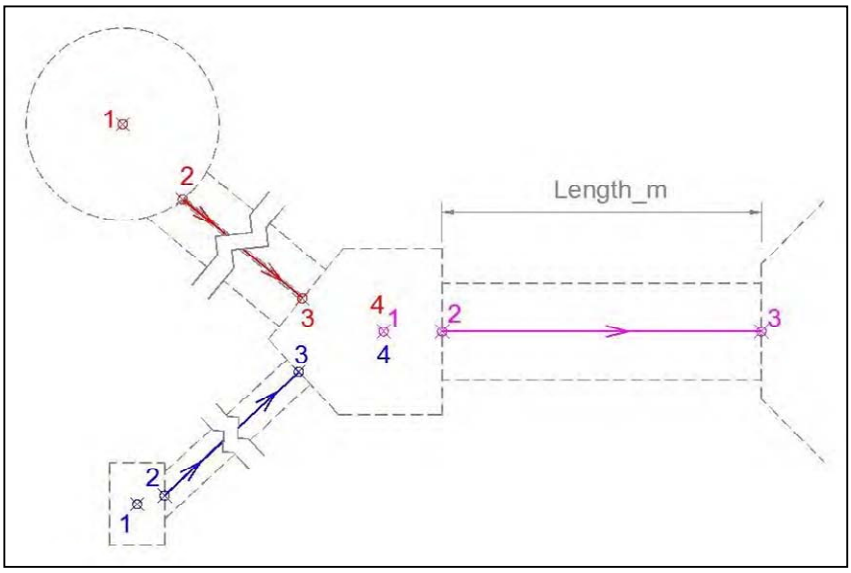

Figure 11

Individual pipes and open drains (refer to Surface Drains) are represented as a single line feature, drawn in the direction of flow, from asset start to asset end - e.g. pipe in to pipe out. The ObjectID is in the format 'ObjectID Upstream Node - ObjectID Downstream Node' - e.g 'G1/1 - G1/2' (**Error! Reference source not found.**).

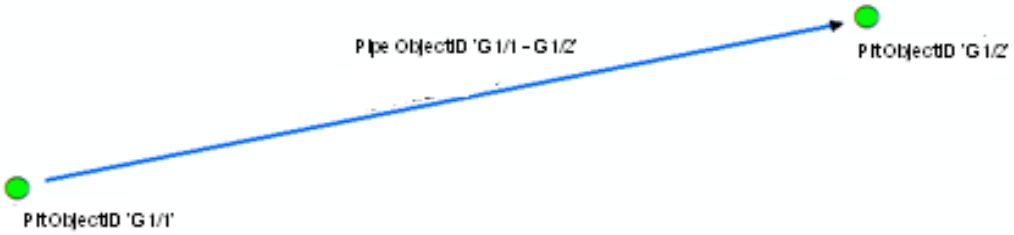

Figure 12

The above shows a Single line, to represent individual pipe or drain, drawn in direction of flow. Individual pipes and open drains should represent actual **pipe extents and not be snapped** to the start and end point pit features (e.g. Inlets, Gullies, Manholes) if not spatially accurate to do so.

Pipes should not be split where another pipe breaks into them (Figure 13). The pipe breaking in should be assigned an End Structure node as per 'Pipes with no terminating structure' below. Structure ID and ObjectID is the same, unique for the field, and prefixed 'Junction' followed by a unique identifier.

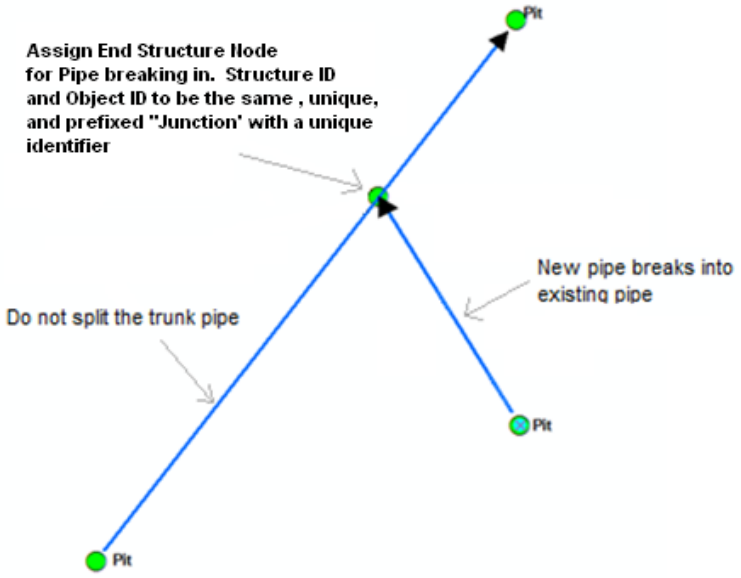

Figure 13

Pipe intersections represented by an end node.

Pipes with no terminating structures (i.e. pipes that are not connected to a network and have no physical End Structures) should have End Structure nodes created with these fields left blank:

- EndWall Construction/Type;
- Wing Wall Construction/Type ; and
- Apron Construction/Type.

The Structure ID and ObjectID should be of the format ‘End1’, End2’, ‘End3’ etc
The End Structure Nodes should snap to the end of the Pipe Polyline (**Error! Reference source not found.**).

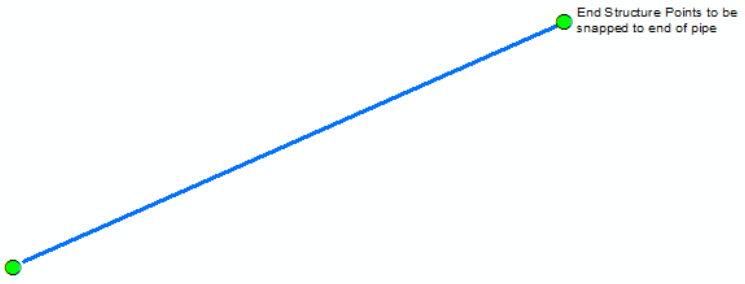

Figure 14

Pipes with no terminating end structures, should snap pipe polyline to end structure node.

The required ADAC field ‘PredominantMaterial’ should be set to a default value of ‘Concrete’ and the required field ‘OutletProtection’Type’ populated accordingly - If there is no Outlet Protection Type, choose ‘Grassed’.

ADAC Global Types ‘Component Info Notes’ field to be denoted ‘NULL’
Junctions at changes in pipe/pipe direction where there is no existing structure are represented as nodes. Please use StormWater Fitting, Fitting Type ‘End Cap’. *ADAC Global Types* ‘Component Info Notes’ field to be denoted ‘NULL’ (**Error! Reference source not found.**).

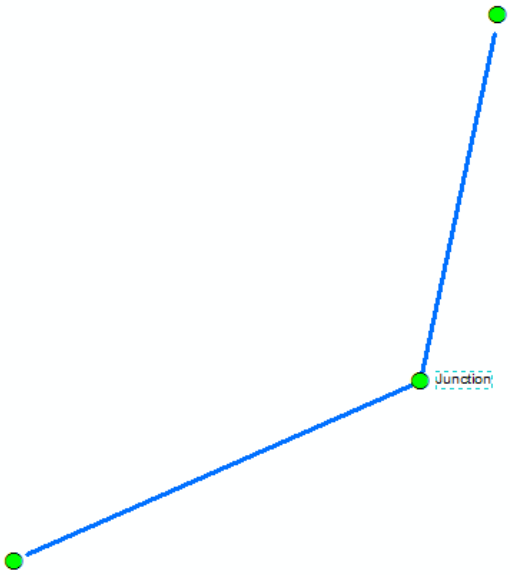

Figure 15

Spatial Relationship: May be coincident to Stormwater point features.

Mandatory Attribution: The following attribution is mandatory for *Pipes*:

Element Name	Mandatory (Y/N)
US_InvertLevel_m	Y
DS_InvertLevel_m	Y
US_SurfaceLevel_m	Y
DS_SurfaceLevel_m	Y
Diameter_mm	Y *(if circular)*
Height_mm	Y *(if box)*
Width_mm	Y *(if box)*
Material	Y
Class	Y *(if circular)*
JointType	Y *(if circular)*
Cells	Y
ConcreteCoverType	Y
Grade	N
Length_mm	**Y***

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Pipes* is **± 50mm**.

The minimum accepted vertical accuracy for *Pipes* is **± 10mm**.

7.2.7 Pit

General Information: None.

Asset Capture: Simple point feature representing the centre of chamber of a pit or manhole. If the asset's Use = "Pit" then the InletType element must be populated. If the Lintel element is not nil, then the InletConfig element must be populated. The InletConfig's Left/Centre/Right is referenced from the road crown looking at the lintel.

The *StructureID* as shown in the design drawing must be provided in the *PitNumber* field.

Refer to the below matrix for common pit types & the attribution required.

Spatial Relationship: Not Applicable.

Mandatory Attribution: The following attribution is mandatory for *Pits*:

Element Name	Mandatory (Y/N)
PitNumber	Y
Use	Y
ChamberConstruction	Y
Length_mm	Y *(if rectangular)*
Width_mm	Y *(if rectangular)*
Diameter_mm	Y *(if circular)*
Radius_mm	Y *(if extended)*
Extension_mm	Y *(if extended)*
LidType	**Y***
SurfaceLevel_m	Y
InvertLevel_m	Y
Depth_m	Y
InletConfig	Y
InletType	Y *(if inlet exists)*
LintelConstruction	Y *(if lintel exists)*
LintelLength_m	Y *(if lintel exists)*
OutletType	Y
FireRetardant	Y
Rotatation	N

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Pits* is **± 50mm**.

The minimum accepted vertical accuracy for *Pits* is **± 10mm**.

7.2.8 Surface Drain

General Information: None.

Asset Capture: Simple linear feature representing the invert of the channel. Surface Drains are to be captured based on their physical and spatial properties and attributes. For example, if a surface changes size, material, shape etc. then it must be broken and captured separately. Figure 19 indicates the capture of a major surface drain as well as a smaller surface drain feeding into it. The main surface drain has been broken into separate features where the main changes of width occur. The smaller surface drain ends at the intersection of the main surface drain's outer edge.

Spatial Relationship: May be coincident to End Structures and WSUD regions/polygons.

Mandatory Attribution: The following attribution is mandatory for *Surface Drains*:

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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Surface Drains* is **± 1m**.

7.2.9 WSUD Area

General Information: None.

Asset Capture: Water Sensitive Urban Design (WSUD) areas such as kerbside bio-filtration beds or purpose built drainage swales should be captured individually as a region/polygon. Individual areas are to be recorded within the ADAC data capture fields defining class type (e.g swale, buffer strip, bio-retention basin). Any associated infrastructure with the WSUD (e.g. vehicle accesses, fences, gates, etc.) should be captured separately. **Figure 16** demonstrates the capture of a WSUD and associated infrastructure, including a Vehicle Access (red polygon) and a gate (blue hatched line).

Figure 16

Spatial Relationship: Not Applicable.

Mandatory Attribution: The following attribution is mandatory for *WSUD Complex Areas*:

Element Name	Mandatory (Y/N)
Sqid_Id	**Y***
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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *WSUD Complex Areas* is **± 1m**.

7.3 Supplementary

Supplementary features are used to record additional asset types or points of reference which isn't otherwise covered under the ADAC schema. The Moreton Bay Regional Council has specified additional asset types required to be supplied in the XML under its *As-Constructed Data Standard.* The details for these asset types have been supplied below.

Element Name	Mandatory (Y/N)
Class	Y
Note	**Y***
Attributes	**Y***

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

7.3.1 CCTV Camera (Point Feature)

General Information: CCTV Security Camera

Asset Capture: Point feature representing the centre of a CCTV Security Camera Asset. No additional attribute information is required to be supplied.

Spatial Relationship: Not applicable

Attribution: The *Class* is to be populated with "**CCTV Camera**". No additional attributes are required.

7.3.2 Fauna Infrastructure (Point Feature)

General Information: Represents artificial fauna habitats such as glider poles, nesting platforms and ground hollows.

Asset Capture: Multi-patched area feature representing the footprint of the artificial fauna habitat. These are to be recorded with a **Class** element of "Artificial Fauna Habitat".

Spatial Relationship: Not applicable.

Attribution: The *Class* is to be populated with "**Fauna Infrastructure**". The following attribution is to be recorded against each feature.

Attribute (valname)	Description	Mandatory (Y/N)	Allowable Values
Element: **TextValue**			
Type	The type of Habitat eg: glider pole and ground hollow	Y	Glider Pole
			Glider Rope
			Ground Hollow
			Log
			Nesting Platform
			Rock
			Concrete
			Fibreglass

Material	The predominant material	Y	Masonry
			Plastic
			Rock
			Steel Galvanised
			Steel Powder Coated
			Timber
			Combination
Pole Mounted	Is the feature mounted to a pole?	N	Yes
			No
Element: **DecimalValue**			
Height	The height of the habitat in metres (2 decimal places).	Y	

Positional Accuracy: The minimum accepted horizontal accuracy for *Artificial Fauna Habitats* is **± 1m**.

7.3.3 Traffic Signal (Point Feature)

General Information: None.

Asset Capture: Point feature representing the Traffic Signal. These are to be recorded with a **Class** element of "Traffic Signal".

Spatial Relationship: Not applicable.

Attribution: The *Class* is to be populated with "**Traffic Signal**". The following attribution is to be recorded against each feature.

Attribute (valname)	**Description**	**Mandatory (Y/N)**	**Allowable Values**
Element: **TextValue**			
Controller Type	The type of Traffic Signal Controller	Y	Aldridge
			ALPHA 16
			ECLIPSE
			PSC
			PSC II
			PSC III
			Relay
Intersection Number	Intersection Number	N	
Pole Type	The type of Pole	Y	Pedestal Base Mounted
			Pedestal In Ground
			Bicycle Friendly
			Mast Arm Combo
			Mast Arm Non Combo
			Joint Use Single Outreach
			Joint Use Double Outreach

			Diving Block

Positional Accuracy: The minimum accepted horizontal accuracy for *Traffic Signal* is **± 1m**.

7.4 Surface

For Developer Contributed files, contour and spot height information is required to be supplied within the as-constructed data, for the purposes of assessing the as-constructed submission.

7.4.1 Contour

Asset Capture: Linear feature capturing a single contour feature.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Contours*:

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

7.4.2 Spot Heights

Asset Capture: Simple point feature representing a single elevation point.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Spot Heights*:

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

7.5 Transport

7.5.1 Flush Point

General Information: None.

Asset Capture: Simple point feature representing the outlet of sub-soil drains into drainage pits/maintenance holes.

Spatial Relationship: Must be coincident to Sub Soil Drain assets.

Mandatory Attribution: The following attribution is mandatory for *Flush Points*:

Element Name	Mandatory (Y/N)
Function	Y

Positional Accuracy: The minimum accepted horizontal accuracy for *Flush Points* is **± 1m**.

7.5.2 Parking

General Information: None.

Asset Capture: Multi-patch region/polygon feature representing the area of Parking. Asset capture is based on physicality therefore separate regions/polygons are required if any part of the pavement profile changes i.e. Surface, Base, Sub-Base, Lower Sub-Base and/or Subgrade.

Spatial Relationship: Must be coincident to other regions representing pavement / parking where there is a common boundary (e.g. no slivers/overlaps).

Mandatory Attribution: The following attribution is mandatory for *Parking*:

Element Name	Mandatory (Y/N)
Name	Y
NoOfCarparks	N
OnOffStreet	Y
SurfaceType	Y
SurfaceThickness_mm	Y
SurfaceArea_sqm	**Y***

Element Name	Mandatory (Y/N)
PavementType	Y
BaseLayerType	Y
BaseLayerDepth_mm	Y
BaseStabilisation	**Y*** *(if Base stabilised)*
SubBaseLayerType	Y (*if SubBase exists)*
SubBaseLayerDepth_mm	Y (*if SubBase exists)*
SubBaseStabilisation	**Y*** (*if SubBase stabilised)*
LowerSubBaseLayerType	Y (*if Lower SubBase exists)*
LowerSubBaseLayerDepth_mm	Y (*if Lower SubBase exists)*
LowerSubBaseStabilisation	**Y*** (*if Lower SubBase stabilised)*
PavementGeoTextile	N
SubgradeCBR	Y
SubgradeStabilisation	N

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Parking* is **± 1m**.

7.5.3 Path Structure

General Information: None.

Asset Capture: Complex linear feature (polylines including curves but not Bezier curves) representing the centre longitudinal axis of a path structure. Path Structures include boardwalks, footbridges, stairs, ramps & underpasses.

When capturing stairs, the number of treads should be recorded in the **Notes** field.

Spatial Relationship: Changes in surface types or widths must be represented as separate features.

Mandatory Attribution: The following attribution is mandatory for *Path Structures*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Path Structures* is **± 1m**.

7.5.4 Pathway

General Information: None.

Asset Capture: Complex linear feature (polylines including curves but not Bezier curves) representing the centre longitudinal axis of a pathway. Changes in surface types or widths must be represented as separate features.

Figure 17

Figure 18

Spatial Relationship: **Figure 17** and **Figure 18** are examples of the capture of a pathway (blue hatched line) and its relationship with pram ramps (red point).

Mandatory Attribution: The following attribution is mandatory for *Pathways*:

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Pathways* is **± 1m**.

7.5.5 Pavement

General Information: None.

Asset Capture: Multi-patch region/polygon feature representing the area of Pavement. Asset capture is based on physicality therefore separate regions/polygons are required if any part of the pavement profile changes i.e. Surface, Base, Sub-Base, Lower Sub-Base and/or Subgrade. **Figure 19** demonstrates the capture locations of a Pavement. The blue line represents the capture location where kerb exists (back of kerb), the yellow line represents where no kerb exists (edge of seal) and the red line represents where separate pavement areas are recorded for each road.

The following information is to be provided in the Notes field:

Pavement GeoTextile location

Figure 19

Spatial Relationship: Must be coincident to other regions representing pavement / parking where there is a common boundary- no slivers/overlaps.

Mandatory Attribution: The following attribution is mandatory for *Pavements*:

Element Name	Mandatory (Y/N)
Name	Y
SurfaceType	Y
SurfaceThickness_mm	Y
SurfaceNomWidth_m	Y
PavementType	Y
BaseLayerType	Y
BaseLayerDepth_mm	Y
BaseStabilisation	**Y*** *(if Base stabilised)*
SubBaseLayerType	Y (*if SubBase exists)*
SubBaseLayerDepth_mm	Y (*if SubBase exists)*
SubBaseStabilisation	**Y*** (*if SubBase stabilised)*
LowerSubBaseLayerType	Y (*if Lower SubBase exists)*
LowerSubBaseLayerDepth_mm	Y (*if Lower SubBase exists)*
LowerSubBaseStabilisation	**Y*** (*if Lower SubBase stabilised)*
PavementGeoTextile	N
SubgradeCBR	Y
SubgradeStabilisation	N

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Pavements* is **± 1m**.

7.5.6 Pram Ramp

General Information: None.

Asset Capture: Simple point feature representing a pram ramp. Typically captured in the centre of Pram Ramp where it transitions to a Kerb/Road. Refer to Figure 17 and Figure 18 for the capture of Pram Ramps. The pram ramp (which is highlighted by the red polygon) is captured based on the red point.

Spatial Relationship: May be coincident with a Road Edge feature.

Mandatory Attribution: The following attribution is mandatory for *Pram Ramps*:

Element Name	Mandatory (Y/N)
Rotation	N

Positional Accuracy: The minimum accepted horizontal accuracy for *Pram Ramps* is **± 1m**.

7.5.7 Road Edge

General Information: None.

Asset Capture: Complex linear feature (polylines including curves but not bézier curves) representing the top (back) of kerb. In case of inverts, edge of concrete furthest from road centreline. Refer to the blue line in **Figure 19** for capture location. Kerb around Road Islands are to be represented as a Road Edge feature.

Spatial Relationship: Must be coincident to other polylines representing road edge where there is a common boundary between kerb types / material change i.e. no slivers and/or overlaps.

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

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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Road Edge* is **± 1m**.

7.5.8 Road Island

General Information: None.

Asset Capture: Multi-patch region/polygon feature representing the area of Island/LATM bounded by the back of Kerb features. Asset capture is based on physicality therefore separate regions/polygons are required if the Type of Island or Infill changes.
Refer to **Figure 20** for an example of asset capture. Kerb around Road Islands are to be represented as a Road Edge feature.

Figure 20

Spatial Relationship: Must be coincident to other regions representing road islands where there is a common boundary i.e. no slivers and/or overlaps. Must be coincident to any kerb (Road Edge) surrounding the Road Island.

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

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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Road Islands* is **± 1m**.

7.5.9 Road Pathway

General Information: None.

Asset Capture: Complex linear feature (polylines including curves but not Bezier curves) representing the centre longitudinal axis of a road pathway (on-road cycleway).

Spatial Relationship: Not applicable

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

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

Positional Accuracy: The minimum accepted horizontal accuracy for *Road Pathways* is **± 1m**.

7.5.10 Sub Soil Drain

General Information: None.

Asset Capture: Simple Linear feature (i.e. straight lines) representing the Invert of a circular sub- soil drain pipe asset. Pipes are typically broken where the Use and/or Type of drain changes.

Spatial Relationship: Must be coincident to Flush Points.

Mandatory Attribution: The following attribution is mandatory for *Sub Soil Drains*:

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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: The minimum accepted horizontal accuracy for *Sub Soil Drains* is **± 1m**.

7.6 Water Supply Assets

7.6.1 Fittings

General Information: Please refer to SEQ D&C for detailed capture conventions
Website link: http://www.seqcode.com.au/standards/

Asset Capture: Single point feature representing the centre point of the fitting. Please refer to the yellow circles in **Figure 21** below for representations of a Tee and Tapping Band. For a taper, record the larger diameter in the BodySize_mm attribute and the smaller diameter in the BranchSize_mm

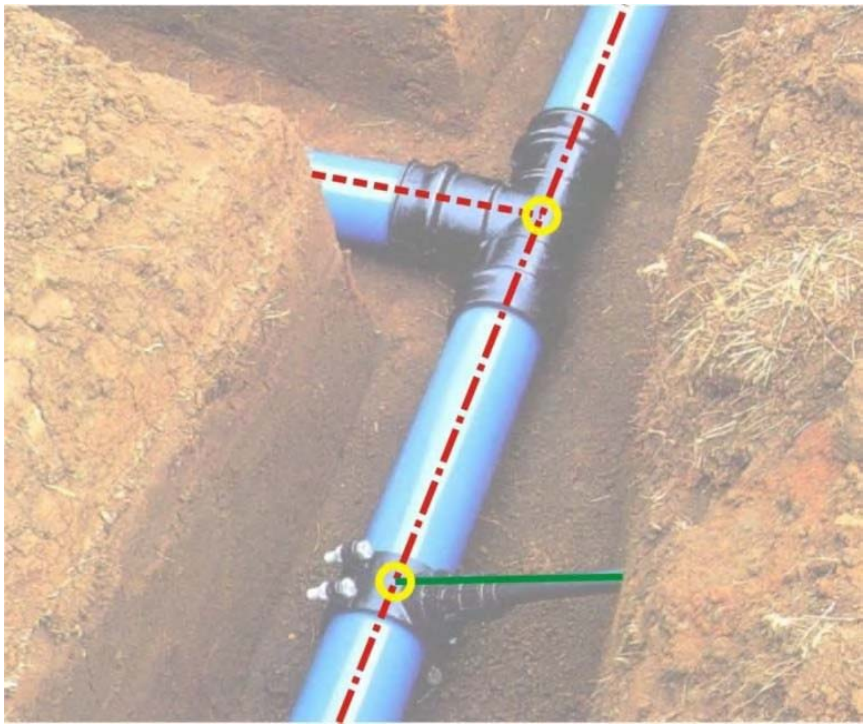

Figure 21

Note: "Unknown", "M_1", "M_2", "P_1" and "P_2" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

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

Mandatory Attribution: The following attribution is mandatory for *Fittings*:

Element Name	Mandatory (Y/N)
Type	Y
Material	Y
Lining	**Y***
Protection	**Y***
BodySize_mm	Y
BranchSize_mm	N
Rotation	N
WaterQuality	Y

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

7.6.2 Hydrants

General Information: Please refer to SEQ D&C for detailed capture conventions
Website link: http://www.seqcode.com.au/standards/

Asset Capture: Single point feature representing the centre of the vertical hydrant branch.

The following information is to be provided in the Notes field:

- BodySize_mm.

Note: "Unknown" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

Spatial Relationship: Must be coincident to a pipe asset.

Mandatory Attribution: The following attribution is mandatory for *Hydrants*:

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

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

7.6.3 Maintenance Holes

General Information: Please refer to SEQ D&C for detailed capture conventions
Website link: http://www.seqcode.com.au/standards/

Asset Capture: Single point feature representing the centre of the chamber. The Structure ID as shown in the design drawings must be recorded in the ObjectId attribute.

The invert level of the maintenance structure can be located by holding the target on the floor of the maintenance hole and measuring the level; this is not the same level as invert level of the ingoing and outgoing pipes. Surface level is taken as the top level of the lid or, of the roof where there is no lid, or the wall where there is no roof. Where the diameter/width/length vary over the depth of the structure, take the largest.

Note: "Unknown", "M_1" and "M_2" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

Spatial Relationship: Not applicable.

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

Element Name	Mandatory (Y/N)
Use	Y
Length_mm	Y *(if rectangular)*
Width_mm	Y *(if rectangular)*
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

* Additional mandatory requirement for MBRC

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

7.6.4 Meters

General Information: None.

Asset Capture: Single point feature located at the centre point of the domestic meter itself. The definition for the Offset Side element is *the offset from the left or the right side boundary when looking from the road.*

Note: "Unknown" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Meters*:

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

* Additional mandatory requirement for MBRC

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

7.6.5 Pipes

General Information: Please refer to SEQ D&C for detailed capture conventions Website link: http://www.seqcode.com.au/standards/

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. Water pipes should not be broken by connections. For further information refer to SEQ D&C section Envelopers and Conduits and Pipe Breaking;
Website link: http://www.seqcode.com.au/standards/

Not all combinations of pipe attributes exist, for example an ABS pipe would not have a protective liner or spigot-socket joints. Particular attention should be given to provide valid pipe-material pipe-class combinations.

The following information is to be provided in the *Notes* field:

- Class type SDR7.4, SDR9, SDR11, SDR13.5,SDR17 and SDR21 is not available in the ADAC scheme, to capture class select “other” in the class section and class type in the notes field.

Note: “Unknown”, “M_1”, “M_2”, “P_1” ,“P_2”, “JT_1”, “EB_1” and “EB_2” is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. “Other” is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

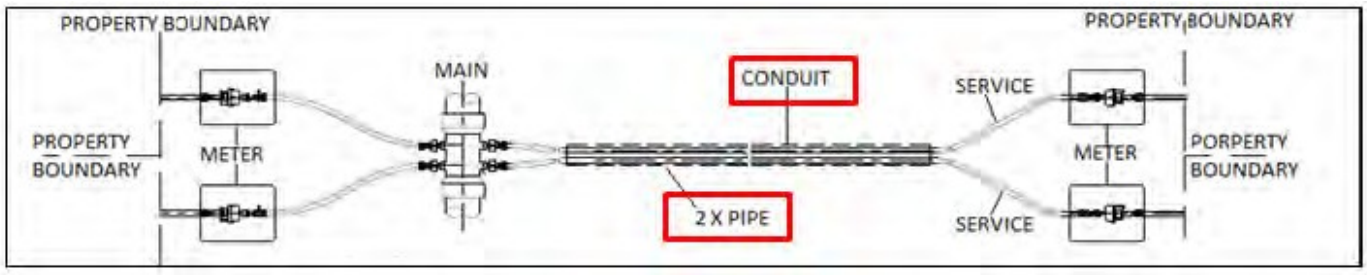

Figure 22

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Pipes*:

Element Name	Mandatory (Y/N)
Use	Y
Alignment_m	N
Diameter_mm	Y
Material	Y
Class	**Y***
Lining	**Y***
Protection	**Y***
JointType	**Y***
AverageDepth_m	**Y***
Embedment	**Y***
Length_m	**Y***
WaterQuality	Y

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Note: Protection and Joint Type is not mandatory for Conduits

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

7.6.6 Service Fittings

General Information: Please refer to SEQ D&C for detailed capture conventions
Website link: http://www.seqcode.com.au/standards/

Asset Capture: Single point feature representing the centre point of the fitting. Please refer to the yellow circles in figure 23 below (Section 7.6.8 Valves) for representations of a Tee and Tapping Band.

Note: "Unknown" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

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

Mandatory Attribution: The following attribution is mandatory for *Service Fittings*:

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

Element Name	Mandatory (Y/N)
WaterSaver	Y
AutoShutOff	Y
Rotation	N
WaterQuality	Y

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

7.6.7 Storage Tanks

General Information: Please refer to SEQ D&C for detailed capture conventions
Website link: http://www.seqcode.com.au/standards/

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

Note: "Unknown" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

Spatial Relationship: Not applicable.

Mandatory Attribution: The following attribution is mandatory for *Storage Tanks*:

Element Name	Mandatory (Y/N)
Material	Y
Source	Y
Manufacturer	N
ModelNumber	N
Volume_m3	Y
Rotation	N

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

7.6.8 Valves

General Information: Please refer to SEQ D&C for detailed capture conventions
Website link: http://www.seqcode.com.au/standards/

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

Figure 23 is an image of a Tee and Tapping Band (yellow circles) connected to reticulation mains (redlines) and a service pipe (green line).

Figure 23

Note: "Unknown" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

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

Mandatory Attribution: The following attribution is mandatory for *Valves*:

Element Name	Mandatory (Y/N)
Use	Y
Type	Y
Diameter_mm	Y
Manufacturer	N
ModelNumber	N
Rotation	N
WaterQuality	Y

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/

7.6.9 Water Services

General Information: Please refer to SEQ D&C for detailed capture conventions
Website link: http://www.seqcode.com.au/standards/

Asset Capture: Simple linear feature (i.e. straight lines) representing the invert of a water supply domestic service. Where the Water Service does not align with the side property boundary, offsets from the side property boundary must be provided. These can be supplied in the *Dimensions* feature within the ADAC schema. Service pipes of greater than 65 mm diameter should be input separately as the constituent water pipe, fitting and valve feature. Diameter mm 20, 25, 38 or 50 for copper and 25, 32, 40, 63 for PE (external diameter).

Note: Water Service connections must not break at the water main.

The following information is to be provided in the *Notes* field:

- The lot numbers being serviced by the Water Service feature are to be recorded in the *Notes* field.

Note: "Unknown" is not an acceptable value as specified in the SEQ D&C Code (Section use of generic values) for submissions of as-constructed records. "Other" is to be used only where a material is genuinely something other than the materials that the schema currently provides. The material must be recorded in the Notes field.

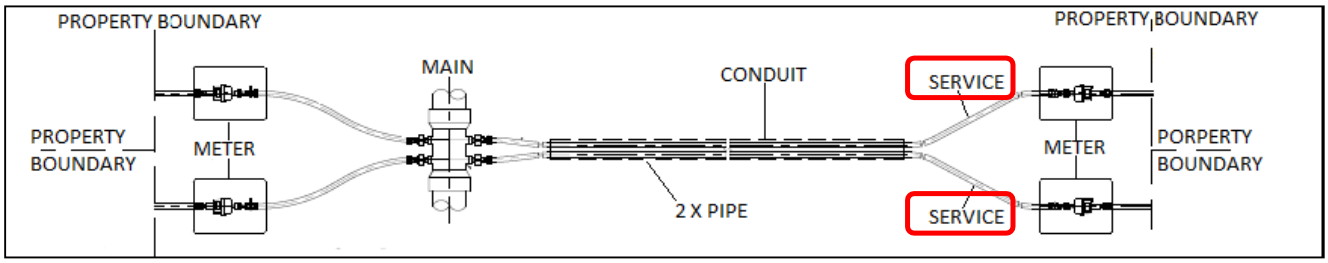

Figure 24

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

Mandatory Attribution: The following attribution is mandatory for *Water Services*:

Element Name	Mandatory (Y/N)
Diameter	Y
Material	Y
Class	**Y***
Protection	**Y***
Termination	**Y***
Water Quality	Y
Length_m	**Y***

* Additional mandatory requirement for MBRC where marked with an Asterix and bold

Positional Accuracy: Please refer to SEQ D&C Survey Conventions
Website link: http://www.seqcode.com.au/standards/