

As Constructed Requirements and ADAC XML Submission Guidelines

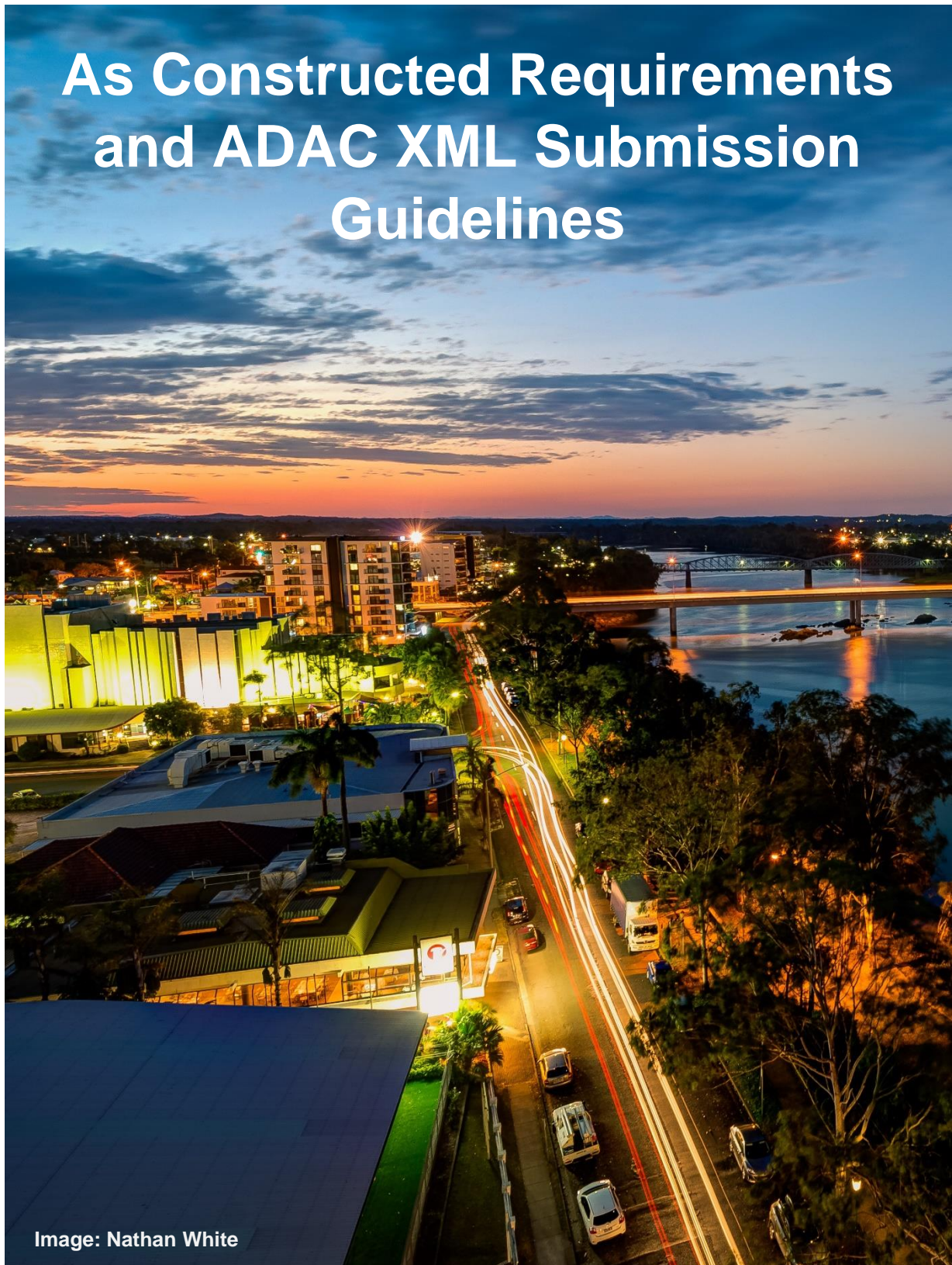


Image: Nathan White

Version No. 2023.1B

P: 07 4932 9000 or 1300 22 55 77

E: enquiries@rrc.qld.gov.au

W: www.rrc.qld.gov.au



[illegible]

Table of Contents

PURPOSE.....	1
SECTION 1: AS CONSTRUCTED INFORMATION REQUIREMENTS.....	2
1.1 As Constructed Submissions.....	2
1.2 Drawing Specifications	2
1.2.1 Drawing Structure Rules	2
1.2.2 Plan Projection & Scale	3
Table 1: Title Block Requirements	3
Table 2: AutoCAD Requirements.....	3
Table 3: Drawn Object Tolerances & DWG Layer Names.....	4
1.3 Survey Requirements	8
1.3.1 General Requirements	8
1.3.2 Required Datum / Projection	8
1.3.3 Acceptable Tolerances	8
1.4 Additional information (when applicable)	8
1.4.1 Maintenance Agreements	8
1.4.2 Buildings & Site Improvements	8
1.4.3 Reservoirs, Water and Sewage Treatment Plants, Sewage and Water Pump stations	8
1.4.4 Artificial Wetland	9
1.4.5 SQID (treatment plants and gross pollutant traps.....	9
1.4.6 Earthworks	9
SECTION 2: ADAC XML SUBMISSION GUIDELINES	10
2.1 Introduction to ADAC XML.....	10
2.2 General Requirements.....	10
2.3 Datum Information	10
2.4 Creating ADAC XML Files	11
2.5 Council's ADAC XML Submission Guidelines	11
2.6 Project Attributes	12
2.7 Global Attributes	13
2.8 Cadastre	14
2.8.1 Connection	14
2.8.2 Chainage Line	14
2.8.3 Easement	14
2.8.4 Lot Parcels	14
2.8.5 Road Reserve	14
2.8.6 Survey Mark	15
2.8.7 Water Course Reserve.....	15
2.9 Open Space Assets	15
2.9.1 Open Space Area.....	15
2.9.2 Activity Area	15
2.9.3 Activity Point.....	15
2.9.4 Artworks	16
2.9.5 Barbeques	16
2.9.6 Barrier Point	16
2.9.7 Barrier Continuous	17
2.9.8 Bicycle Fitting	17
2.9.9 Boating Facility.....	17
2.9.10 Building	17
2.9.11 Edging	18
2.9.12 Electrical Conduit	18
2.9.13 Electrical Fitting.....	18
2.9.14 General Fixture	18
2.9.15 Landscape Area	19
2.9.16 Retaining Walls	19
2.9.17 Seat.....	19
2.9.18 Shelter	20

2.9.19 Sign	20
2.9.20 Table	20
2.9.21 Tree	21
2.9.22 Waste Collection Point	21
2.10 Sewerage Assets	22
2.10.1 Connection (House Connection)	22
Figure 1: Sewer Connection Location	22
2.10.2 Fitting	23
2.10.3 Maintenance Holes	23
2.10.4 Non Pressure Pipes	24
Figure 2: Non Pressure Pipes	24
2.10.5 Pressure Pipes	25
2.10.6 Valve	25
2.11 Stormwater	26
2.11.1 End Structure	26
Figure 3: End Structure Point Capture	26
2.11.2 Fitting	27
2.11.3 Flow Management Device	27
2.11.4 Gross Pollutant Traps (GPT)	27
2.11.5 Pipe	29
Figure 4: Single Pipe	30
Figure 5: Multi-Cell Culvert	30
Figure 6: Complex Scenario	30
2.11.6 Pit	31
2.11.7 Surface Drain (Including Open Drain)	32
2.11.8 WSUD Area	32
2.12 Supplementary	34
2.12.1 Point Feature / Polyline Feature / Polygon Feature	34
2.13 Transport	34
2.13.1 Bridges	34
2.13.2 Pathway / Road Pathway / Path Structure	35
2.13.3 Pavement / Parking	36
Figure 7: Pavement, Pathway and Pram Ramp	38
2.13.4 Pram Ramp	38
2.13.5 Road Edge	38
2.13.6 Road Island	39
2.13.7 Sub-Soil Drain	39
2.13.8 Flush Point	39
Figure 8: Road Islands	39
2.14 Water Supply Assets	40
2.14.1 Fittings	40
2.14.2 Hydrants	40
2.14.3 Maintenance Holes	40
2.14.4 Meters	41
2.14.5 Pipes	41
2.14.6 Service Fittings	42
2.14.7 Storage Tanks	42
2.14.8 Valves	42
2.14.9 Water Service	43
Figure 9: Water Service and Fittings	43
2.15 Surface	43
2.15.1 Contour	43
2.15.2 Spot Height	44
2.15.3 Break Line	44
2.15.4 Profile Line	44
Table 4: Council Specific Asset Types	44

Purpose

The submission of accurate as constructed information is foundational to the on-going management of infrastructure assets owned by the Rockhampton Regional Council (Council).

This document has been prepared for the purpose of articulating Councils requirements in relation to the preparation and submissions of As Constructed information.

This document is divided into two sections which provide the following:

- Section 1 details the As Constructed information requirements of Council.
- Section 2 provides guidance on creating ADAC (Asset Design As Constructed) XML files for submission to Council.

Section 1: As Constructed Information Requirements

1.1 As Constructed Submissions

Council receives as constructed information from a number of different sources including Developers, and Contractors engaged to deliver capital projects.

Developers - All As Constructed submissions received from Developers must contain the following information

- A Registered Engineer's Certificate & As Constructed Certification document for Operational Works (MCU, ROL, OpWorks), signed by a Registered Professional Engineer of Queensland (RPEQ) and/or Registered Survey and containing an 'As Constructed' stamp that also states the RPEQ number, name of the principal contractor and date. For other Council contract works, a signed BCA Form 16 is required.
- AutoCAD drawings of the As Constructed works that comply with the AutoCAD requirements outlined in Table 3.
- Electronic PDF versions of the above AutoCAD As Constructed layouts containing an 'As Constructed' stamp certified by a Registered Professional Engineer and/or a Registered Surveyor (QLD) and stating their RPEQ number, name of the principal contractor and date.
- A valid ADAC version 4.0, 4.1, 4.2 or 5.0.1 xml file containing all map objects as outlined in Section 2 of this document.
- Electronic PDFs of any newly installed PSMs associated with the Development.
- Submission information must be associated with only one Development Approval).

Subject Heading for As Constructed Lodgement to include the following elements and be submitted to DevelopmentAdvice@rrc.qld.gov.au

- Lodgement of As Constructed Data, Estate Name, Stage, OpWorks/DA no. & Version
- Lodgement of As Constructed Data, Stage Name, Contract Tender, BP no. & Version
- Lodgement of As Constructed Data Addendum, Estate Name, Stage, OpWorks/DA no. & Version

Contractors - All As Constructed submissions received from Contractors engaged in capital project delivery must contain the following information:

- AutoCAD drawings of the As Constructed works that comply with the AutoCAD requirements outlined in Table 3.
- Electronic PDF versions of the above AutoCAD As Constructed layouts containing an 'As Constructed stamp certified by a Registered Professional Engineer and/or Registered Surveyor (QLD) and stating their RPEQ number, name of the principal contractor and date.
- A valid ADAC version 4.0, 4.1, 4.2 or 5.0.1 xml file containing all map objects as outlined in Section 2 of this document.
- Electronic PDFs of any newly installed PSMs associated with the Contract.
- Submission information must be associated with only one Contract.

1.2 Drawing Specifications

1.2.1 Drawing Structure Rules

- All New, Modified, Abandoned and Removed Assets are to be contained within the one CAD file for each Project.
- The Title Block Attribute Data is to appear only in the Layout Views and associated PDFs outlined in Table 1.
- AutoCAD acceptable versions and requirements are listed in Table 2.
- Each Asset type is to be mapped on their separate layers within their Asset Class outlined in Table 3. An AutoCAD Template has also been made available for use by external users.

1.2.2 Plan Projection & Scale

The submitted drawing format is to be set up using the Map Grid of Australia horizontal coordinate system MGA2020 as follows:

- Datum: GDA2020
- Projection: UTM zones (e.g. Zone 56) in Eastings and Northings (metres).

The scale factor used on all drawings shall be 1 unit = 1 metre.

Table 1: Title Block Requirements

Title Block Attributes for Layout Views	Compulsory
The Project or Development Name.	Yes
Stage Number (if applicable)	Yes
Legal Property Description	Yes
The works approval ID for the development this information represents (D/A number)	Yes
Drawing Number	No
Date the drawing was revised	Yes
As Constructed' Stamp	Yes
Name of Principle Contractor	Yes
Horizontal & Vertical Datum used	Yes
Name & Signature of Registered Professional Engineer	Yes
RPEQ/Reg. Surveyor (QLD) Number & Date	Yes

Table 2: AutoCAD Requirements

General Information:	Requirements:
AutoCAD Version	Version 2000 or later.
Title Block	Provide a title block on each of the layout pages: includes the contract number and revision number; an 'As Constructed' stamp including the name of the principal contractor & RPEQ / Reg. Surveyor (QLD) number and date and the horizontal and vertical datum used.
Survey Station & Reference Points.	Provide the survey station and reference marks xyz values to assist positional accuracy verification.
Dimension Planes	2
Datum/Projection	The Map Grid Australia (MGA2020) Cartesian coordinate system: GDA2020 UTM Zones (generally Zone 56 within Council's region) Eastings and Northings
Drawing Units	Metres
Drawing Precision	6 Decimal places
No. of Annotated Decimal Places	3
Text File Format	ASCII
Polyline map objects	For radial bends (e.g. roads and kerbs in cul-de-sacs) a pickup point is required at every expansion point.
Points Scaling	Relative
Civil 3D points	Convert to AutoCAD points

Table 3: Drawn Object Tolerances & DWG Layer Names

Asset Category	Asset Type	Displayed Location (Plan View)	Positional Accuracy (XY) (90% confidence limit) (\pm x mm)	* Vertical Accuracy (Z) (90% confidence limit) (\pm x mm)	Object Type (Submitted drawing format specification)	DWG Required Layer Name
Transport	Bridge Extent	Segmented showing footprint of whole structure	± 80 mm	NA	Closed Polyline	ROAD_BRIDGE_EXT
	Bridge Deck	Segmented showing footprint of each single deck structure	± 80 mm	NA	Closed Polyline	ROAD_BRIDGE_DECK
	Bridge Super Structure	Segmented showing footprint of each single super structure	± 80 mm	NA	Closed Polyline	ROAD_BRIDGE_SUPS
	Bridge Abutment	Segmented showing footprint of each abutment structure	± 80 mm	NA	Closed Polyline	ROAD_BRIDGE_ABUT
	Bridge Pier	Segmented showing footprint of each pier structure	± 80 mm	NA	Closed Polyline	ROAD_BRIDGE_PIER
	Pathway	Centreline of each Footpath segment, snapped to adjacent centrelines.	± 80 mm	NA	Continuous Polyline	ROAD_PATH_CL
	Road Pathway (Cycle Lanes on road)	Centreline of designated on Road cycle lane.	± 80 mm	NA	Continuous Polyline	ROAD_CYCLE_CL
	Path Structures (Footbridge, Stairs)	Centreline of each Structure, snapped to adjacent centrelines.	± 80 mm	NA	Continuous Polyline	ROAD_PATH_STRUCT
	Road Edge Kerb/ Kerb & Channel/Invert	Lip of Kerb/Kerb and channel or centre of invert; segments must apply to only 1 road; segmented showing consistent construction/attributes and ignoring kerb inlets & driveways.	± 50 mm	± 10 mm	Continuous Polyline	ROAD_KERB
	Pavement - Roads (sealed/unsealed)	Road Sealed - Segmented showing consistent pavement/ surface construction & attribute information incl. separate roundabouts. Road Unsealed - Provide the edge of shoulder/edge of carriageway, segmented showing consistent pavement construction.	± 80 mm	NA	Closed Polyline	ROAD_EB_PAVEMENT
	Parking Areas	Segmented showing consistent pavement/ surface construction & attribute information	± 80 mm	NA	Closed Polyline	ROAD_EB_PARKING
	Pram Ramps	Transition point between Path and Pram Ramp	± 80 mm	NA	Point	ROAD_PRAM_RAMP
	Road Islands - Medians	Edge of Median - not including kerb and channelling/margins/inverts. Where multiple infill types are used, a separate labelled polygon object is required for each infill type.	± 80 mm	NA	Closed Polyline	ROAD_MEDIAN
	Flush Points (Subsoil Cleanouts)	Centre point or Cleanout	± 80 mm	± 10 mm	Point or Block #	ROAD_SS_CLEANOUT
	Sub-Soil Drains	Centreline of each pipe drawn in the direction of flow	± 80 mm	± 10 mm	Continuous Polyline	ROAD_SS_PIPE
	Road Crash Barriers	To be captured in OPEN SPACE as Barriers				
Stormwater	End Structure - Inlets/Outlets	Centre top of structure	± 80 mm	± 10 mm	Point or Block #	SWD_EOL
	Fittings	Centre of fitting	± 80 mm	± 10 mm	Point or Block #	SWD_FITT
	Flow Management Device	Centre top of structure.	± 80 mm	± 10 mm	Continuous Polyline	SWD_FLOWMD
	GPTs (SQIDs)	Centre of device	± 80 mm	± 20 mm	Point or Block #	SWD_GPT
	Pipes Culvert	Centreline of each pipe. Line work to be drawn in the direction of flow.	± 80 mm	± 10 mm	Continuous Polyline	SWD_MAIN
	Pipes Stormwater	Centreline of each pipe. Line work to be drawn in the direction of flow.	± 80 mm	± 10 mm	Continuous Polyline	SWD_MAIN

	Pipes - Jump Ups (House Connections)	Centreline of pipe object with any stub or wye junction on the inter-allotment line when there is no pit/chamber	±80mm	±10 mm	Continuous Polyline	SWD_JU
	Pit	Centre of pit or access chamber	±80mm	±10 mm	Point or Block #	SWD_MH
	Surface Drain - Open Channel/Table Drain	Line work defining the invert of channel and top of batters; for flat bottom channels, include the toes of the batters. Line work to be drawn in the direction of flow. Invert of Table Drain, line work to be drawn in the direction of flow.	±80mm	NA	Continuous Polyline	SWD_OPC
	WSUD Area (Detention/ Retention/ Sediment Basins & Wetlands)	Perimeter of water body (excluding islands).	NA	NA	Closed Polyline (depicting perimeter)	SWD_BAS
Water	Conduit Crossings (water and recycled water)	Centreline of Conduit for water and recycled water (effluent).	±80mm	±20 mm	Continuous Polyline	WAT_COND
	Fittings	Centre of bend/joint	±80mm	±20 mm	Point or Block #	WAT_FITTINGS
	Hydrants	Centre of hydrant	±80mm	±20 mm	Point or Block #	WAT_HYDRANT
	Irrigation Fittings (Sprinkler Head)	Centre of Fitting	±80mm	±20 mm	Point or Block #	WAT_IRRIGATION
	Meters	Centre of meter	±80mm	±20 mm	Point or Block #	WAT_METERS
	Maintenance Holes	Centre of Maintenance Hole.	±80mm	±20 mm	Point or Block #	WAT_MH
	Pipes - Main lines	Node (usually tee) to node (tee or end cap) disregarding FH etc as long as it is the same material/dia. Usually to a tee section or end cap.	±80mm	NA	Continuous Polyline	WAT_MAIN
	Water Service (House Connections)	<i>For single connections-</i> from tapping band on the reticulation line to meter connection only.	±80mm	NA	Continuous Polyline	WAT_HC
		<i>For multiple connections-</i> from tapping band to tee section AND a single separate line from the tee section to the two meter connection points.				
	Pumping Stations	Centre of pump station.	±80mm	±20 mm	Point or Block #	WAT_PS
	Reservoirs	Centre of reservoir.	±80mm	NA	Point or Block #	WAT_RES
	Storage Tank	Centre of tank.	±80mm	NA	Point or Block #	WAT_TANK
	Service Fitting (Tap, Drinking Fountain)	Centre of Fitting	±80mm	NA	Point or Block #	WAT_SERVICE_FITT
	Valves	Centre of valve	±80mm	±20 mm	Point or Block #	WAT_VALVES
Sewer	Connection - Jump Ups (Property Service)	Centre of line from the Inspection Opening to Main line junction. Line work to be drawn in the direction of flow.	±80mm	NA	Continuous Polyline	SEW_JU
	Fittings - Bends/Joints	Centre of bend/joint	±80mm	±20 mm	Point or Block #	SEW_FITTINGS
	Maintenance Holes	Centre of Manhole/Access Chamber.	±80mm	±10 mm	Point or Block #	SEW_MH
	Non Pressure Pipes - Gravity Mains	Centre of Access Chamber to centre of Access Chamber. Line work to be drawn in the direction of flow.	±80mm	±20 mm	Continuous Polyline	SEW_MAIN

	Pressure Pipes - Rising Mains	Centre of Access Chamber to centre of Access Chamber. Line drawn in the direction of flow.	±80mm	±20 mm	Continuous Polyline	SEW_RMAIN
	Pumping Stations	Centre of wet well.	±80mm	±10 mm	Point or Block #	SEW_PS
	Valves	Centre of valve	±80mm	±20 mm	Point or Block #	SEW_VALVES
Effluent	Fittings - Bends/Joints	Centre of joint	±80mm	±20 mm	Point or Block #	EFF_FITTINGS
	Meters	Centre of meter	±80mm	±20 mm	Point or Block #	EFF_METER
	Non Pressure Pipes - Gravity Mains	Centre of Access Chamber to centre of Access Chamber. Line work to be drawn in the direction of flow.	±80mm	±20 mm	Continuous Polyline	EFF_MAIN
	Pressure Pipes - Rising Mains	Centre of Access Chamber to centre of Access Chamber. Line drawn in the direction of flow.	±80mm	±20 mm	Continuous Polyline	EFF_RMAIN
	Valves	Centre of valve	±80mm	±20 mm	Point or Block #	EFF_VALVE
	Structures	Centre of Structure	±80mm	NA	Point or Block #	EFF_STRUCTURE
Open Space	Open Space Areas	The boundary area for park with this stage of the development.	NA	NA	Closed Polyline (perimeter of the Open space area).	OSPACE_AREA
	Activity Areas	The boundary area for playground within the park area.	NA	NA	Closed Polyline (perimeter of the Playground/Activity area).	OSPACE_ACTIVITY_AREA
	Activity Point (Play Equipment)	Centre of object	±100mm	NA	Point (centre of the object)	OSPACE_EQUIP
	Artworks	Centre of structure	±100mm	NA	Point (centre of the object)	OSPACE_ART
	BBQs	Centre of structure	±100mm	NA	Point (centre of the object)	OSPACE_BBQ
	Barrier Points	Centre of Bollard	±80mm	NA	Point or Block #	OSPACE_BARRIERS
	Barrier Continuous	Centreline of fence or row of bollards	±80mm	NA	Continuous Polyline	OSPACE_FENCE
	Bicycle Fitting	Centre of structure	±100mm	NA	Point (centre of the object)	OSPACE_BIKE
	Boating Facility	The boundary of the boat ramp, jetty, pontoon	NA	NA	Closed Polyline (perimeter of the boat ramp).	OSPACE_BOAT
	Buildings	Perimeter of building.	NA	NA	Closed Polyline (perimeter of the Building).	OSPACE_STRUCT_POLY
	Edging	Lip of edging	±100mm	NA	Continuous Polyline	OSPACE_EDGE
	Electrical Conduit	Centre of conduit run	±80mm	±10 mm	Continuous Polyline	OSPACE_ELEC_COND
	Electrical Fitting	Centre of pole footings. (also used for Street Lights)	±80mm	NA	Point or Block #	OSPACE_ELEC_FITT
	General Fixture (Fitting)	Centre of fitting	±100mm	NA	Point (centre of the object)	OSPACE_FITT
	Landscape Areas	The boundary area for Landscaped area.	NA	NA	Closed Polyline (perimeter of the Landscape area).	OSPACE_LANDSCAPE
	Retaining Walls	Line representing the ground surface level at the point of incline: from the start and end of the wall and any change in direction.	±80mm	NA	Continuous Polyline	OSPACE_RETWALL
	Seat	Centre of structure	±100mm	NA	Point (centre of the object)	OSPACE_SEAT

	Shelters	Centre of structure	±100mm	NA	Point (centre of the object)	OSPACE_STRUCT_POINT
	Signs	Centre of Sign - depicting a single support or the centre between multiple supports. (Also used for Street Signs)	±100mm	NA	Point (centre of the object)	OSPACE_SIGN
	Table	Centre of structure	±100mm	NA	Point (centre of the object)	OSPACE_TABLE
	Tree	Centre of Tree	±100mm	NA	Point (centre of the object)	OSPACE_TREE
	Waste Collection Points	Centre of bin	±100mm	NA	Point (centre of the object)	OSPACE_BINS
Development	Development Boundary	The extent of Development: to include all new, modified, removed & abandoned infrastructure.	NA	NA	Closed Polyline (based on the perimeter of the Cadastre)	DEV_BDY
	Stage Boundary	Define the Stage boundary	NA	NA	Closed Polyline (depicting extent)	STAGE_BDY
Cadastre	Lot Parcels	The lot boundaries associated with this stage of the development.	NA	NA	Closed Polyline (perimeter of the Cadastre/proposed cadastre).	CAD_LOT_PARCELS
	Easements	The easements associated with this stage of the development.	NA	NA	Closed Polyline (perimeter of the Easement/proposed Easement).	CAD_EASEMENTS
	Connections	The connection between Survey Mark/s and Cadastre for this stage of the development	NA	NA	Continuous Polyline	CAD_CONNECTIONS
Survey	Survey Marks	Survey point for existing & installed PSMs and Reference Stations (AHD71 & GDA2020 UTM Zones).	±80mm	±10mm	Point or Block # & copy of new PSM Form 6s.	SURV_MARKS
Surface	Spot Heights	Refer 1.4.6	±80mm	±20 mm	Point	SUR_SPOT_HEIGHTS
	Contours	Refer 1.4.6	±80mm	±20 mm	Continuous Polyline	SUR_CONTOURS
Supplementary	Various	Used for Assets not covered by other layers Supplementary Layers can also be used for Council Specific Information.	±80mm	±10 mm	Various	*_SUPP_*

Where objects are provided as Blocks in AutoCAD, the 'Insertion Point' for the block MUST be the objects attribute data collection point; i.e. for a manhole the insertion point would be the centre of the access chamber. All entities that comprise a block must be on the same layer as the AutoCAD insertion Layer.

* Accuracies stated are relative and related to Permanent Survey Marks (PSMs) used for the survey control. Council now requests the map objects and coordinates of the control points and PSMs used during the survey to assist staff with the assessment of the positional accuracy.

1.3 Survey Requirements

1.3.1 General Requirements

Council will conduct random site audits to confirm that submitted data conforms to requirements, including positional accuracies and tolerances, and the submission of all required objects and attributes.

1.3.2 Required Datum / Projection

The required datum for 'As Constructed' surveys is:

- Horizontal Control Surveys GDA2020
- Vertical Control Surveys AHD71

1.3.3 Acceptable Tolerances

Specific survey tolerances and requirements for the submission of As Constructed information are set out in Table 3. This is not to be confused with the construction tolerances and requirements specified in the Capricorn Municipal Development Guideline, (CMDG), Australia & New Zealand Standards (AS/NZ Standards) and any other relevant policies / standards listed in the Decision Notice.

1.4 Additional information (when applicable)

1.4.1 Maintenance Agreements

Copies of all Maintenance Agreements that were a requirement of any related Council approval process for infrastructure that is to be Council owned but maintained by another party OR that is owned by another party but Council maintained.

1.4.2 Buildings & Site Improvements

Generally for Council site-related building and maintenance works e.g. buildings, shade structures, play grounds, monuments, communications, and air conditioning units:

Architectural: Electronic copies of PDF and AutoCAD drawings for the built structures including: structural drawings, site layout, soil reports, footings, energy efficiency, building classification and compliance certificates, structural calculations, construction standards and specifications.

Services: Electronic copies of PDF and AutoCAD drawings for the built structure services including electrical, mechanical, hydraulic, plumbing, gas, drainage, water reticulation and fire; provided in layers that clearly identify the principal contractor; contract number, revision number of the document.

Operation & Maintenance Manual (including asset/equipment register): Two hard copies, and one electronic copy for the installed assets, including the relevant warranty periods, models and serial numbers.

Maintenance Planning & Consumables: Electronic copy detailing painting, finishes, floor covering schedules (eg. product colour code/descriptions).

Note: The above information should cover details of all assets that were incorporated in the relevant building approval processes.

1.4.3 Reservoirs, Water and Sewage Treatment Plants, Sewage and Water Pump stations

Operation & Maintenance Manual (including asset/equipment registers): Two hard copies and one electronic copy for the installed assets.

Services: Electronic copies of PDF and AutoCAD drawings of all civil, mechanical/electrical works. The layers must clearly identify the principal contractor; contract number and revision number of the document.

Note: Either the technical drawings or the manuals should outline individual civil, mechanical or electrical component details including brands, model and serial numbers, where the information has not already been provided in the attribute details of ADAC xml file. Asset equipment registers must state the make, model and company purchased from.

1.4.4 Artificial Wetland

Electronic copies of PDF and AutoCAD design drawings of the artificial wetlands.

1.4.5 SQID (treatment plants and gross pollutant traps

Electronic copies of PDF and AutoCAD design drawings of the SQIDs.

1.4.6 Earthworks

For any developments that involved ground surface cutting and/or filling, the As Constructed submission must include the SPOT heights and any Digital Elevation Models and/or line work in digital AutoCAD format over the affected allotments.

Section 2: ADAC XML Submission Guidelines

2.1 Introduction to ADAC XML

ADAC XML files are a compulsory accompaniment to the As Constructed bundle of information required by the Council and form a necessary part of the final approval and handover of infrastructure assets donated to Council, or delivered via capital works.

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

Depending on the tools¹ (XML generator) being used to generate the ADAC XML, compliant files are initially created during survey capture and then finalised in conjunction with the creation of the As Constructed drawings (e.g. DWGs). Alternatively the XML files may be generated after the electronic As Constructed drawings have been finalised. It is essential that the As Constructed drawings are created using complete and survey-accurate information to correctly identify the assets and the precise locations being represented in the ADAC XML file.

Vendors of ADAC XML generators are routinely provided with updates to the ADAC schema free of charge, and take steps to have these updates incorporated into their products for release to customers in a timely manner. Further information on the ADAC process, data schema, available tools and supporting agencies can be found on the ADAC website which is <https://www.ipwea-qnt.com/adac>

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

2.2 General Requirements

The ADAC XML file shall be produced using the most recent ADAC XML schema release (e.g. Version 5.0.1) and should be “validated” for compliance before being submitted to Council.

Council is conscience of the potential limitations 3rd Party ADAC XML generators may have based on their version and therefore will except older ADAC XML schema versions; 4.0, 4.1 & 4.2 where necessary.

2.3 Datum Information

Data contained in the ADAC XML file(s) must reflect the survey details of the assets **exactly** as found in the real world and as accurately reflected in the As Constructed drawings. Unless otherwise specified, survey details must be derived from permanent survey marks (PSMs), where available, with Map Grid of Australia (MGA – GDA 2020) co-ordinates and the relevant UTM Zone for the survey area. All AHD levels to be to fourth order standard as defined by ICSM² Standard for the Australian Survey Control Network Special Publication 1 (SP1) Version 2.0 October 2013.

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 on the choice and application of the products available can be sort from providers of most software design suites and survey tools.

² Intergovernmental Committee on Surveying & Mapping - www.icsm.gov.au

2.4 Creating ADAC XML Files

To create compliant ADAC XML files, information on the following asset classes/features will need to be captured, where relevant, in accordance with the approved ADAC data schema:

- Cadastre
- Open Space
- Water
- Sewer
- Stormwater
- Supplementary
- Surface
- Transport

It should be noted that some asset types are common to multiple asset classes (e.g. lighting fixtures designed and used for the purposes of either street or park lighting). In such cases, recording assets in a different asset class to the actual service class (Open Space vs Transport) is valid and appropriate when generating the ADAC XML file. This example would see street light fittings added to the ADAC XML file under the asset class of Open Space.

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

2.5 Council's ADAC XML Submission Guidelines

While the ADAC XML files are created from the survey-accurate As Constructed information, Council's has specific data submission requirements which are detailed in Sections 2.6 to 2.15 of this document. The detail provided in these sections is intended to assist with the capture of ADAC data when using proprietary ADAC XML generators either during the As Constructed or As Built survey pickup or when capturing the ADAC asset information as a part of the creation of the As Constructed plans and associated drawings in civil design (software) suites.

The following sections outline the complete list of asset types in all asset classes within the current ADAC schema Version 5.0.1. The **ADAC/Council Required** column indicates in red the mandatory ADAC fields and in black those additional fields which are mandatory for Council.

It should be noted that certain assets require fields to be populated based on their configuration i.e. Stormwater Pits if rectangular length and width is required only and if circular diameter is required only.

On receipt of the As Constructed bundle of information, Council will undertake data format and conformance checks on the ADAC XML file to confirm the completeness and validity of the details. Should significant anomalies, errors or missing information be identified during these checks, the ADAC XML file(s) may be returned for correction and re-submission prior to Council acceptance.

Once accepted by Council, ADAC XML data file(s) are uploaded to various internal information systems where the data is foundational to the on-going management of the assets. The detailed asset and location data may also be made available in the future to external agencies via digital formats.

2.6 Project Attributes

The following attribute data is included within the header information and is required to be included in all ADAC XML files submitted to Council.

ADAC Element	Attribute Description/Sub Attribute	ADAC/RRC Required
ExportDateTime	<i>Should be auto-populated from the XML generating software.</i>	Y
Name	<i>The project or development name and stage.</i>	Y
Owner	<i>Are assets for the whole project owned by Council or another entity.</i>	Y
Receiver	<i>Populated with "Rockhampton Regional Council"</i>	Y
WorksApprovalID	<i>Development Application Number or Project Number</i>	Y
DrawingNumber	<i>The Council drawing number of the as constructed plans. This may not be known at the time of compilation.</i>	Y
DrawingRevision	<i>Date the drawing was revised. ISO 8601 is the accepted format.</i>	Y
ConstructionDate	<i>The accepted date of construction for the whole project. Usually the project completion date. ISO 8601 is the accepted format. Date may be used to calculate remaining life in an asset management system.</i>	Y
CoordinateSystem	<i>Records the particulars of the horizontal and vertical coordinate systems for the whole project.</i>	
	HorizontalCoordinateSystem (MGA56 or MGA2020)	Y
	HorizontalDatum (GDA94 or GDA2020)	Y
	VerticalDatum (AHD)	Y
	IsApproximate ("false")	Y
	OriginMark	Y
	Notes	N
DrawingExtents	<i>The rectangular coordinate envelope enclosing the project area</i>	
	SouthWest	Y
	NorthEast	Y
Description	<i>Populated with "As Constructed Submission"</i>	Y
ProjectStatus	<i>The reason for the ADAC file creation. This is not the same as Asset_status, which is at the asset level Submission Status is usually related to the development assessment process or to data transfer between entities or systems</i>	Y
Software	<i>Details of the software product used to create the ADAC data set. Should be auto-populated from the XML generating software</i>	
	Product	Y
	Version	Y
Surveyor	<i>Structure containing information from the certifying surveyor.</i>	
	SurveyorName	Y
	DateFinalSurvey	Y
	DateApproved	Y
Engineer	<i>Structure containing information from the certifying engineer.</i>	
	EngineerName	Y
	DateApproved	Y

2.7 Global Attributes

These are attributes common to all feature types in the ADAC schema. The following table lists Councils mandatory fields for each asset

Attribute	ADAC/RRC Required
ADACId	Y
InfrastructureCode	N
Owner	Y
DrawingNumber	N
DrawingRevision	N
ConstructionDate	N
Department	N
Surveyor	N
Engineer	N
Status	Y
DataQuality	N
Notes	N
SupportingFiles	N

ADACId Must be populated and unique to each individual asset.

Owner Each asset must have an owner allocated i.e.

- Council
- Private
- TMR

Status Must be populated for each asset.

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

Notes: This field can be utilised for an asset type description where ADAC does not have a suitable enumeration, these may be assets appearing in the Capricorn Municipal Design Guidelines (CMDG) and/or unique to Rockhampton Regional Council.

2.8 Cadastre

2.8.1 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.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Connection	Bearing	<i>The bearing in decimal degrees clockwise from North in the coordinate system of this project.</i>	Y
	Distance_m	<i>The distance in metres on the coordinate system of this project.</i>	Y

2.8.2 Chainage Line

Asset Capture: **Not required by RRC**

2.8.3 Easement

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

Spatial Relationship: May share boundaries with Water Course Reserve, Lot Parcels or Road Reserve. Node points between shared boundaries must be coincident i.e. no overlaps or "slivers".

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Easement	LotNo	<i>The lot number as described on the originating survey plan</i>	Y
	PlanNo	<i>The plan number of the originating survey plan.</i>	Y

2.8.4 Lot Parcels

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

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Lot	LotNo	<i>The lot number as described on the originating survey plan</i>	Y
	PlanNo	<i>The plan number of the originating survey plan.</i>	Y
	CancelledLotPlan	<i>The lot on plan cancelled by this boundary if applicable.</i>	N
	TitledArea_sqm	<i>The area in square metres enclosed by the boundary, as described by the survey plan.</i>	Y

2.8.5 Road Reserve

Asset Capture: **Not required by RRC**

2.8.6 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).

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
SurveyMark	MarkName	<i>The name by which the survey mark may be uniquely identified from control records.</i>	Y

2.8.7 Water Course Reserve

Asset Capture: **Not required by RRC**

2.9 Open Space Assets

2.9.1 Open Space Area

Asset Capture: Multi-patched area feature representing the “footprint” of the Open Space area and enclosing all relevant Open Space assets. Please refer to the green line in the example shown in figure 1.
Spatial Relationship: Not applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
OpenSpaceArea	Name	<i>The official name or description of the Open Space area (e.g.: Smith St Park, Stockland Park Sporting complex)</i>	Y
	Type	<i>The type of Open Space area e.g.: Recreational, Bushland, Sporting Complex</i>	Y

2.9.2 Activity Area

Asset Capture: Multi-patched area feature representing different activity area's within the parent area feature. Please refer to the dashed yellow line in the example shown in figure 1 representing activity areas for dedicated purposes.
Spatial Relationship: Feature must be totally within the Parent Open Space Activity Area feature.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
ActivityArea	Use	<i>The type of use for the Activity Site e.g.: Animal, Fitness, Play, Sport</i>	Y
	Type	<i>The type of Activity Site. e.g.: Sports Field, Cycling Facility</i>	Y
	Material	<i>The material type of Undersurfacing e.g.: Bark, Rubber, Grassed</i>	Y
	Thickness_mm	<i>Thickness of material in millimetres.</i>	Y

2.9.3 Activity Point

Asset Capture: Simple point feature representing each individual activity asset. Units should be set as 1. Please refer to the yellow triangles in the example shown in figure 1.
Spatial Relationship: Not applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
ActivityPoint	Use	<i>The activity use category</i>	Y
	Type	<i>The activity item type</i>	Y
	Material	<i>The material type of Activity Item e.g.: Timber, Aluminium</i>	Y
	Theme	<i>The theme of the Activity item. e.g.: Kangaroo, Boat, Fort, Car</i>	Y
	Units	<i>The number of units present e.g.: 1, 2, 3</i>	Y
	Manufacturer	<i>The Manufacturer of the unit</i>	Y
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	Y

2.9.4 Artworks

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

Spatial Relationship: Not Applicable

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Artwork	Type	<i>The type of Artwork e.g.: Sculpture, Statue</i>	Y
	Material	<i>The material type of Artwork e.g.: Timber, Aluminium</i>	Y

2.9.5 Barbeques

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

Spatial Relationship: These Open Space assets to be totally within the Open Space Area feature.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Barbeque	EnergySource	<i>The Source of energy for the BBQ. i.e.: Mains, Bottled, Solar</i>	Y
	Plates	<i>The number of plates fitted in the BBQ structure.</i>	Y
	SurroundingMaterial	<i>The material type of the surround structure i.e.: brick, steel and Timber</i>	Y
	TopMaterial	<i>The material type of the top structure i.e.: Tiled, marble, steel</i>	Y
	Manufacturer	<i>The Manufacturer of the unit</i>	Y
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	Y

2.9.6 Barrier Point

Asset Capture: Simple point feature representing the centre of an asset. Please refer to black dot in figure 1.

Spatial Relationship: Not Applicable

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
BarrierPoint	Type	<i>The type of Barrier Point eg: Bollard, Locking Post</i>	Y
	UprightMaterial	<i>The material type of Barrier Uprights eg: Timber, Aluminium</i>	Y

2.9.7 Barrier Continuous

Asset Capture: Complex linear feature (read: polylines including curves but not bézier curves) representing a barrier type asset e.g. fences, bollards, guardrails, pedestrian fall protection. It is recommended, but not mandatory, that each vertex represents an upright, particularly for bollard runs. This allows the geometry to be exploited to identify the individual features if necessary. Please refer to the dashed x red line in the example shown in figure 1.

Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
BarrierContinuous	Type	<i>The type of Barrier e.g.: Safety Fencing, Bollard Run, Gate</i>	Y
	UprightMaterial	<i>The material type of Barrier Uprights e.g.: Timber, Aluminium</i>	Y
	LinkMaterial	<i>The material type of Barrier Link Material e.g.: None, Chain, Wire</i>	Y
	TopMaterial	<i>The material type of Barrier Topping Material e.g.: None, Chain, Barbed Wire</i>	Y
	Length_m	<i>The lineal length of the barrier in metres</i>	Y
	Height_m	<i>The height of the barrier in metres</i>	Y
	UprightNumber	<i>Total number of uprights in the run. For fencing, this will be the number of posts. For a bollard run, it will be the number of bollards.</i>	Y

2.9.8 Bicycle Fitting

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

Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
BicycleFitting	Type	<i>The type of Bicycle fitting e.g.: Bicycle Rack, Banana Rail</i>	Y
	Material	<i>The material type of Bicycle fitting e.g.: Timber, Aluminium</i>	Y
	Manufacturer	<i>The Manufacturer of the unit</i>	Y
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	Y

2.9.9 Boating Facility

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

Spatial Relationship: Not applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
BoatingFacility	Type	<i>The type of Boating Facility e.g.: Jetty, Pier</i>	Y
	Material	<i>The material type of Boating Facility e.g.: Timber, Aluminium</i>	Y

2.9.10 Building

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

Spatial Relationship: Not applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Building	Type	<i>The type of Building e.g.: Grandstand, Bandstand</i>	Y
	Material	<i>The material type of Building e.g.: Timber, Brick</i>	Y

2.9.11 Edging

Asset Capture: Complex linear feature (read: polylines including curves but not bézier curves) representing the edging of an Activity Area or Landscaped Area.

Spatial Relationship: No Applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Edging	Material	<i>The material type of edging</i>	Y
	Length_mm	<i>Length of material in millimetres.</i>	Y
	Width_mm	<i>Width of material in millimetres.</i>	Y

2.9.12 Electrical Conduit

Asset Capture: Complex linear feature (read: 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.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
ElectricalConduit	Type	<i>The conduit type eg: Medium Duty, Heavy Duty</i>	Y
	Material	<i>The conduit material type</i>	Y
	Diameter_mm	<i>The conduit diameter</i>	Y
	Length_m	<i>The lineal length of the barrier in metres</i>	Y
	Protection	<i>The type of conduit protection used e.g.: Concrete encased, rubber mat, tape only</i>	Y

2.9.13 Electrical Fitting

Asset Capture: Simple point feature representing the centre point of an electrical fitting such as lighting, switch board or power outlet.

Spatial Relationship: Must be coincident to Electrical Conduit polylines.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
ElectricalFitting	Type	<i>The type of Electrical Component e.g.: Light, Switch Board, Power Outlet</i>	Y
	Base	<i>The type of base (e.g.: Fixed or Slip)</i>	Y
	Material	<i>The material type of the component e.g.: Aluminium, Steel</i>	Y
	EnergySource	<i>The type of Power Source e.g.; Mains, Solar</i>	Y
	Manufacturer	<i>The Manufacturer of the unit</i>	Y
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	Y

2.9.14 General Fixture

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

Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
GeneralFixture	Type	<i>The type of Fixture e.g.: Dog bag dispensers, Fish cleaning station</i>	Y
	Material	<i>The material type of Fixture e.g.: Timber, Aluminium</i>	Y
	Manufacturer	<i>The Manufacturer of the unit</i>	Y
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	Y

2.9.15 Landscape Area

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, enclosed shrubs, physical protection around mature trees etc.).

Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
LandscapeArea	Type	<i>The type of Garden/L'scape Area e.g.: Garden, Grass, Rem Vegetation</i>	Y
	RootBarrier	<i>Does Root Barrier exist - Yes or No</i>	Y
	Irrigated	<i>Is Landscaped Area irrigated?</i>	Y

2.9.16 Retaining Walls

Asset Capture: Complex linear feature (read: 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.

Spatial Relationship: Not applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
RetainingWall	Use	<i>Context of use for this wall. i.e. Terrestrial or Marine</i>	Y
	Material	<i>The material/type of Retaining Wall eg: Rock, Conc. Block, Conc. Crib</i>	Y
	Construction	<i>Construction principle of this wall (eg: Gravity, Piled, Cantilever)</i>	Y
	Length_m	<i>The lineal length of the wall in metres</i>	Y
	Height_m	<i>The height (or average height) of the wall in metres</i>	Y

2.9.17 Seat

Asset Capture: Simple point feature representing the centre of an asset. Please refer to the blue hexagons in the example shown in figure 1.

Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Seat	SeatType	<i>The configuration of the seating.</i>	Y
	Places	<i>The number of individuals the seating is designed for. This attribute may be used to help determine the capacity of a recreational facility.</i>	Y
	Material	<i>The primary material type of Seat eg: Timber, Aluminium</i>	Y
	Manufacturer	<i>The Manufacturer of the unit</i>	Y
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	Y

2.9.18 Shelter

Asset Capture: Simple point feature representing the centre of an asset. Please refer to purple square in figure 1.

Spatial Relationship: Not Applicable.

Note: Shelter Polygon is able to be captured in ADAC 5.0.1, RRC does not require or accept Shelters captured as polygons.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Shelter	Type	The type of structure e.g.: Sail, Rigid	Y
	ConstructionType	The type of shelter constructed e.g.: Prefab or Built insitu	Y
	FloorMaterial	The material type of the Floor e.g.: Concrete, Timber	Y
	WallMaterial	The material type of the Walls e.g.: Timber/cladding, Reinforced Block	Y
	RoofMaterial	The material type of the Roof e.g.: Steel Sheeting, Masonary tiles	Y
	Manufacturer	The Manufacturer of the unit	Y
	ModelNumber	The standard code, model number or part number for the unit	Y

2.9.19 Sign

Asset Capture: Simple point feature representing the centre of an asset, can be used for Open Space Signs or Road Signs.

Spatial Relationship: Not Applicable

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Sign	Type	The type of Sign e.g.: Regulatory, Naming, Information The purpose of a sign. Applied to individual sign blades as blades may have different purposes in a compound sign.	Y
	Material	The material type of sign e.g.: Timber, Steel/Aluminium, Carved stone	Y
	Manufacturer	The Manufacturer of the unit	Y
	ModelNumber	The standard code, model number or part number for the unit	Y
	Structure	The type of structure this sign blade is fixed to.	Y
	SignText	Sign Text	Y
	Rotation	Rotation angle (cartesian - anti-clockwise 0 degrees = East) May be used to denote direction of facing.	N

2.9.20 Table

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

Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description/Sub Attribute	ADAC/RRC Required
Table	Type	The type of Unit eg: Table, Bench or counter.	Y
	Seating	Seating details. Element should be nil if no seating is present.	
		SeatType	Y
		Places	Y
	Material	The material type of Table/Seat e.g.: Timber, Aluminium	Y
	Manufacturer	The Manufacturer of the unit	Y
	ModelNumber	The standard code, model number or part number for the unit	Y

2.9.21 Tree

Asset Capture: Simple point feature representing the centre of an asset.
 Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Tree	Species	<i>The Tree Species</i>	Y
	Genus	<i>The Tree Genus</i>	Y
	RootBarrier	<i>Does Root Barrier exist - Yes or No</i>	Y
	Grate	<i>Does Tree Grate exist - Yes or No</i>	Y

2.9.22 Waste Collection Point

Asset Capture: Simple point feature representing the centre of an asset. Please refer to the pink dot in the example shown in figure 1.
 Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
WasteCollectionPoint	Type	<i>The type of Bin/Waste collection point e.g.: Std Litter Bin, Wheelie Bin Enclosure</i>	Y
	Material	<i>The material type of Bin/Waste collection point e.g.: Aluminium, Steel</i>	Y
	Manufacturer	<i>The Manufacturer of the unit</i>	Y
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	Y

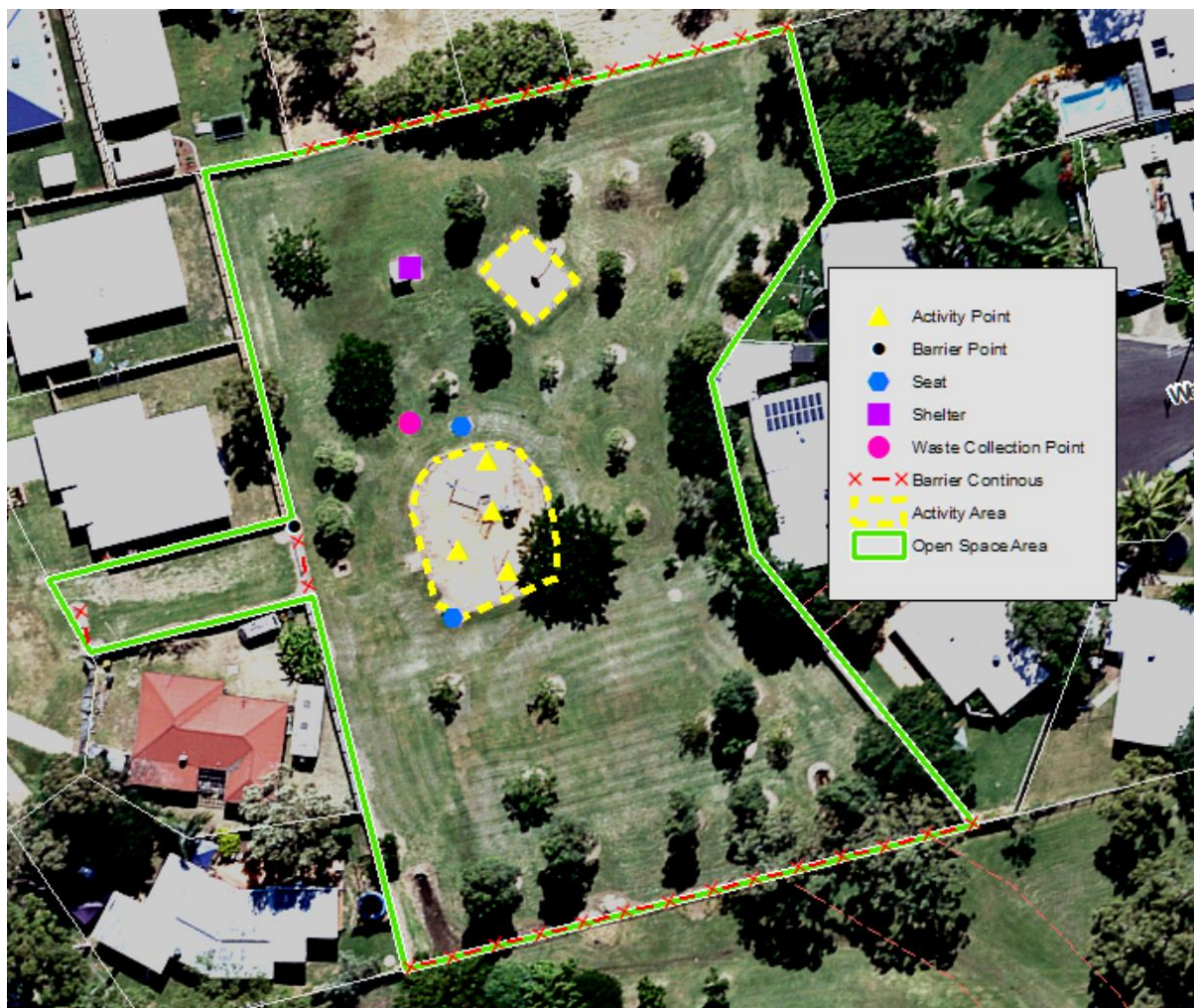


Figure 1: Open Space Assets

2.10 Sewerage Assets

2.10.1 Connection (House Connection)

Asset Capture: Complex linear feature (read: polylines including curves but not bézier curves) 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 2 below.

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.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Connection	SurfaceLevel_m	Surface level of this feature (in metres against the vertical datum).	Y
	InvertLevel_m	Invert level of this feature (in metres against the vertical datum).	Y
	Use	The function of the house connection in the network.	Y
	Diameter_mm	The nominal diameter of the connection conduit.	Y
	Material	The material of the connection conduit.	Y
	Class	The pipe class as specified by the manufacture.	Y
	Length_m	The material length in metres of the house connection branch conduit.	Y
	Type	Physical configuration of connection.	Y
	Chainage_m	The distance in metres from the centre of the downstream manhole to the point of connection of the offshoot branch.	Y
	Offset_m	The distance measured square from the centre of the sewer main to the point of connection.	Y
	LineNumber	The line identifier of the sewer main.	N
	DSMHID	Downstream manhole identifier.	N
	IO_Distance_m	Distance from a point perpendicular to the inspection opening to the centre of the downstream manhole along the axis of the sewer main.	Y
	SO_Nearest_m	Perpendicular distance from the inspection opening to the nearest cadastral boundary.	Y
	SO_Other_m	Perpendicular distance from the inspection opening to the next nearest cadastral boundary.	Y
	Sediment_Trap	True indicates that the connection includes an inline sediment trap.	Y

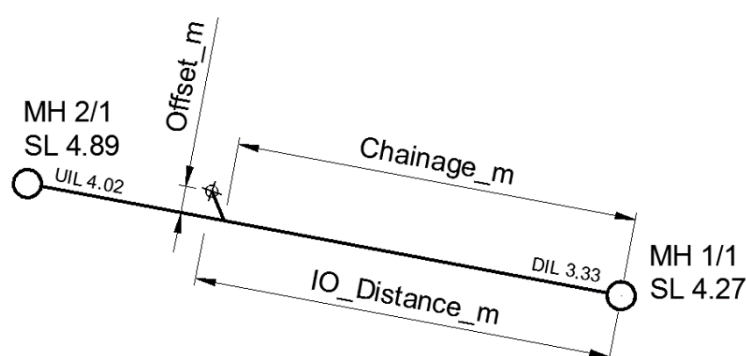


Figure 1: Sewer Connection Location

2.10.2 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.

ADAC Element	Attribute	Attribute Description	ADAC/RR C Required
Fitting	Type	<i>The physical configuration of the fitting</i>	Y
	Material	<i>Fitting material</i>	Y
	Lining	<i>The internal corrosion protection material or method for the fitting.</i>	Y
	Protection	<i>The external protection for the fitting.</i>	Y
	BodySize_mm	<i>The nominal diameter of the major connecting pipe.</i>	Y
	BranchSize_mm	<i>The nominal diameter of the minor connecting pipe.</i>	Y
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N

2.10.3 Maintenance Holes

Asset Capture: Single point feature located at centre of chamber on the top surface. Note: Capturing centre of lid is only suitable where it is centred over the chamber.
 Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description/Sub Attribute	ADAC/RR C Required
MaintenanceHole	Use	<i>Use or purpose of this MaintenanceHole in the network</i>	Y
	ChamberSize	<i>Data structure describing the chamber configuration and dimensions.</i>	
		Rectangular.Length_mm	Y
		Rectangular.Width_mm	Y
		Circular.Diameter_mm	Y
		Custom.Area_sqm	Y
	SurfaceLevel_m	<i>The height of the top surface of the lid, hatch, rim or roof.</i>	Y
	InvertLevel_m	<i>The height of the top surface of interior floor/bottom.</i>	Y
	FloorConstruction	<i>Method of chamber floor construction.</i>	Y
	FloorMaterial	<i>Material type for chamber construction</i>	Y
	WallConstruction	<i>Method of chamber wall construction.</i>	Y
	WallMaterial	<i>Material type for chamber wall construction</i>	Y
	RoofMaterial	<i>Material type for chamber roof construction</i>	Y
	Lining	<i>Material type of chamber lining</i>	Y
	LidMaterial	<i>Chamber lid configuration and material</i>	Y
	DropType	<i>Chamber drop types</i>	Y
	CatchmentPS	<i>The identifier of the pump station that this node flows to.</i>	N
	LineNumber	<i>The identifier of the line that this node connects to</i>	N
	MH_Number	<i>The identifier of this manhole or pit.</i>	Y
	Chainage_m	<i>The distance upstream from end of line.</i>	N
	TieDistance_m	<i>The tie distance in metres to a cadastral corner</i>	N
	OffsetDistance_m	<i>The offset distance in metres from a cadastral boundary</i>	N
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	Y

2.10.4 Non Pressure Pipes

Asset Capture: Complex linear feature (read: polylines including curves but not Bezier curves) 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 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.

Spatial Relationship: Not Applicable

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
PipeNonPressure	LineNumber	The sewer line identifier	N
	Use	The function of this pipe in the network.	Y
	Diameter_mm	Nominal pipe diameter in millimetres.	Y
	Material	Pipe material	Y
	Class	The pipe class as specified by the manufacture.	Y
	Lining	The internal corrosion protection method employed on the pipe material.	Y
	Protection	The external corrosion protection method employed on the pipe material.	Y
	JointType	Pipe to pipe join method.	Y
	US_InvertLevel_m	Invert level of this pipe end (in metres against the vertical datum).	Y
	DS_InvertLevel_m	Invert level of this pipe end (in metres against the vertical datum).	Y
	US_SurfaceLevel_m	Surface level (in metres against the vertical datum) vertically above this pipe end.	Y
	DS_SurfaceLevel_m	Surface level (in metres against the vertical datum) vertically above this pipe end.	Y
	Alignment_m	Average offset distance in metres from cadastral boundary to the main.	Y
	Depth_m	Nominal depth in metres to the top of the pipe.	Y
	Embedment	Embedment type.	Y
	RockExcavated	Value indicating whether rock was excavated from the pipe channel.	N
	PipeGrade	Pipe grade as a percentage.	N
	Length_m	Actual material length of the pipe. Not the horizontal length of the geometry.	Y

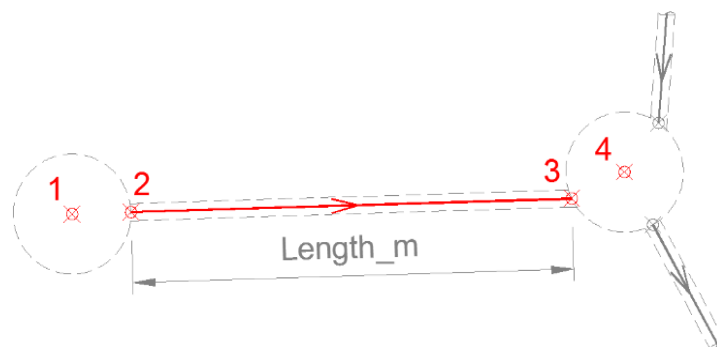


Figure 2: Non Pressure Pipes

2.10.5 Pressure Pipes

Asset Capture: Complex linear feature (read: polylines including curves but not Bezier curves) 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, class, embedment or direction etc. then it must be broken and captured separately.

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
PipePressure	Use	<i>The function of this pipe in the network.</i>	Y
	Diameter_mm	<i>Nominal pipe diameter in millimetres.</i>	Y
	Material	<i>Pipe material</i>	Y
	Class	<i>The pipe class as specified by the manufacture.</i>	Y
	Lining	<i>The internal corrosion protection method employed on the pipe material.</i>	Y
	Protection	<i>The external protection for the pipe.</i>	Y
	JointType	<i>Pipe to pipe join method.</i>	Y
	Alignment_m	<i>Average offset distance from cadastre boundary to the main.</i>	Y
	Depth_m	<i>Nominal depth in metres to the top of the pipe.</i>	Y
	Embedment	<i>Embedment type.</i>	N
	RockExcavated	<i>Value indicating whether rock was excavated from the pipe channel.</i>	N
	Length_m	<i>Actual material length of the pipe. Not the horizontal length of the geometry.</i>	Y

2.10.6 Valve

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

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Valve	Use	<i>The function of this valve in the network.</i>	Y
	Type	<i>The physical configuration of the valve</i>	Y
	Diameter_mm	<i>The nominal bore diameter of the valve</i>	Y
	Lining	<i>The internal corrosion protection method employed on the pipe material.</i>	N
	Protection	<i>The external protection for the pipe.</i>	N
	Manufacturer	<i>The Manufacturer of the unit</i>	Y
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	Y
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N

2.11 Stormwater

2.11.1 End Structure

Asset Capture: Simple point feature representing the top of the headwall. Please refer to figure 4.

Spatial Relationship: Headwall “floats” adjacent to the end of a Stormwater pipe feature.

Note: *End Structure Polyline is able to be captured in ADAC 5.0.1, RRC does not require or accept End Structures captured as Polylines.*



Figure 3: End Structure Point Capture

ADAC Element	Attribute	Attribute Description/Sub Attribute	ADAC/RRC Required
EndStructure	StructureID	<i>The identifier for this end structure. Usually the textual identifier it would be labelled with on the face of a plan.</i>	Y
	StructureLevel_m	<i>The surface level of the structure in metres against the vertical datum for the project.</i>	Y
	EndWall	<i>Data structure representing the end wall. Set to nil if this End Structure does not have an end wall.</i>	
		Type	Y
		Size	Y
		Length_m	Y
		Height_m	Y
		Thickness_m	Y
		Material	Y
		Construction	Y
	WingWall	<i>Data structure representing the wing wall. Set to nil if this End Structure does not have any wing walls.</i>	N
	Apron	<i>Data structure representing the apron.</i>	N
	GrateType	<i>Type of grate used, if applicable.</i>	Y
	TideGate	<i>Type of tide or flood gate used, if applicable.</i>	Y

2.11.2 Fitting

Asset Capture: Single point feature representing the centre point of the fitting. Features which can be captured include End Cap, Tide Gate, Frog Flap and Duckbill Valve.

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Fitting	FittingType	<i>The type of stormwater fitting.</i>	Y
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N

2.11.3 Flow Management Device

Asset Capture: To be captured as a single line feature representing the crown of a feature. Please capture Drop Structures here and populate Notes field accordingly.

Spatial Relationship: Not Applicable

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Flow Management Device	Sqid_Id	<i>The string identifier of the device, as it would appear on a plan.</i>	Y
	Type	<i>Stormwater Flow Management Device Type</i>	Y
	Material	<i>The predominant material of the Stormwater Flow Management Device.</i>	Y
	Length_m		Y
	CrestElevation_m		Y

2.11.4 Gross Pollutant Traps (GPT)

Asset Capture: Single point feature located at the centre of chamber on the top surface. Note: Capturing centre of lid is appropriate only when the lid is centred over the chamber. Known as Gross Pollutant Traps (GPTs) fall into and are captured in three primary categories:

- GPT Complex such as Commercial or Custom built device (e.g. Humes Interceptor)
- GPT Simple such as an "in pit" basket or "end of line" device
- GPT Non-Simple which represent basic and minor sand filtration storage

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

2.11.4.1 GPT Complex

ADAC Element	Attribute	Attribute Description/Sub Attribute	ADAC/RRC Required
GPTComplex	Sqid_Id	<i>The string identifier of the device, as it would appear on a plan.</i>	Y
	Construction	Commercial	
		Manufacturer	Y
		Model	Y
		Size Rectangular Length_mm	Y
		Size Rectangular Width_mm	Y
		Size Circular Diameter_mm	Y
		Custom	
		Size Rectangular Length_mm	Y
		Size Rectangular Width_mm	Y
		Size Circular Diameter_mm	Y

	Function1		Y
	Function2	The second function of the WSUD point, if applicable	N
	Function3	The third function of the device, if applicable	N
	US_PipeDiameter_mm	The upstream pipe diameter in millimetres	N
	DS_PipeDiameter_mm	The downstream pipe diameter in millimetres	N
	SurfaceLevel_m	The surface level at the top of the device	Y
	US_InvertLevel_m	Invert level of this pipe end (in metres against the vertical datum).	Y
	DS_InvertLevel_m	Invert level of this pipe end (in metres against the vertical datum).	Y
	CleanoutLevel_m	The level to which the device must be cleaned out, in metres against the vertical datum of the project.	Y
	Depth_m	The depth, in metres, of the device.	Y
	SumpDepth_m	The depth, in metres, of the sump, if applicable	Y
	HasFilterMedia	True if the device has filtration media or a filter capsule installed.	Y
	HasBasket	True if the device has a litter basket installed.	Y
	HasBoards	True if the device has drop-boards or penstock installed.	Y
	DesignFlow_m3s	Design Flow in cubic metres per second	Y
	MaxContaminantVolume_m3	Maximum contaminant retention volume in cubic metres.	Y
	MaxInternalVolume_m3	Maximum internal volume in cubic metres.	Y
	MaintenanceCycle_mnths	The minimum maintenance cycle in months (refer to specifications)	Y
	Rotation	Rotation angle (cartesian - anti-clockwise 0 degrees = East)	N

2.11.4.2 GPT Simple

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
GPTSimple	Sqid_Id	The string identifier of the device, as it would appear on a plan.	Y
	Construction	The construction method	Y
	Manufacturer	The manufacturer if applicable	Y
	ModelNumber	The model if applicable	Y
	TreatmentMeasure	Simple treatment measures fitted to existing infrastructure to intercept solid litter being transported in stormwater.	Y
	Function1	The first function of the WSUD point. Has a fixed value because all GPTSimple points are.	Y
	Length_mm	The length of the device	Y
	Width_mm	The width of the device	Y
	Material	Predominant material of device	Y
	MaintenanceCycle_mnths	The minimum maintenance cycle in months. This is the revisit interval for clearing captured rubbish.	Y
	Rotation	Rotation angle (cartesian - anti-clockwise 0 degrees = East)	N

2.11.4.3 Non GPT Simple

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
NonGPTSimple	Sqid_Id	The string identifier of the device, as it would appear on a plan.	Y
	Construction	The construction method	Y
	Manufacturer	The manufacturer if applicable	Y
	ModelNumber	The model if applicable	Y
	TreatmentMeasure	Treatment measures applicable to WSUD points that are neither simple nor complex Gross Pollutant Traps	Y
	Function1	The first function of the WSUD point. Must be supplied.	Y
	Function2	The second function of the WSUD point, if applicable	N
	Function3	The third function of the device, if applicable	N
	Length_mm	The length of the device	Y
	Width_mm	The width of the device	Y
	MaintenanceCycle_mnths	The minimum maintenance cycle in months. This is the revisit interval for maintenance or inspection, if applicable.	Y
	Rotation	Rotation angle (cartesian - anti-clockwise 0 degrees = East)	N

2.11.5 Pipe

Asset Capture:

Simple linear feature representing the invert of the pipe or midpoint of a box asset. Council requires each pipe to be captured individually, therefore the number of cells recorded in the "Cells" field is 1. Enforced line direction from Gravity Upstream (read: higher AHD level) to Gravity Downstream (read: lower AHD level) due to gravitation flow. Pipe features are captured from the intersection of pipe material and chamber wall. Refer to figures 5, 6 and 7 below.

- Figure 5 represents a single pipe asset where vertices one and four represent the maintenance hole capture and vertices two and four are the intersection of the Pipe material and the chamber wall.
- Figure 6 represents a multi-cell culvert asset from inlet to outlet. In this case there is a spatial relationship between each end of the pipe asset and the End Structure point feature. Each pipe is captured individually.
- Figure 7 represents an irregular shaped pit with multiple pipes entering the pit asset and a large single-celled asset exiting the pit and out letting through an End Structure.

Spatial Relationship: May be coincident to Stormwater point features.

ADAC Element	Attribute	Attribute Description/Sub Attribute	ADAC/RRC Required
Pipe	US_InvertLevel_m	Invert level of this pipe end (in metres against the vertical datum).	Y
	DS_InvertLevel_m	Invert level of this pipe end (in metres against the vertical datum).	Y
	US_SurfaceLevel_m	Surface level (in metres against the vertical datum) vertically above this pipe end.	Y
	DS_SurfaceLevel_m	Surface level (in metres against the vertical datum) vertically above this pipe end.	Y
	PipeStructure	Container for a choice of pipe cross-sectional measures.	
		CircPipe	
		Diameter_mm	Y

		Material	Y
		Class	Y
		JointType	Y
		BoxPipe	
		Height_mm	Y
		Width_mm	Y
		Material	Y
		Class	Y
	Cells	The number of cells in the pipe course.	Y
	ConcreteCoverType	The pipe protection regime employed.	Y
	Grade	Pipe gradient as a percentage. Derivable from invert levels and horizontal length.	N
	Length_m	Pipe material length in metres.	Y

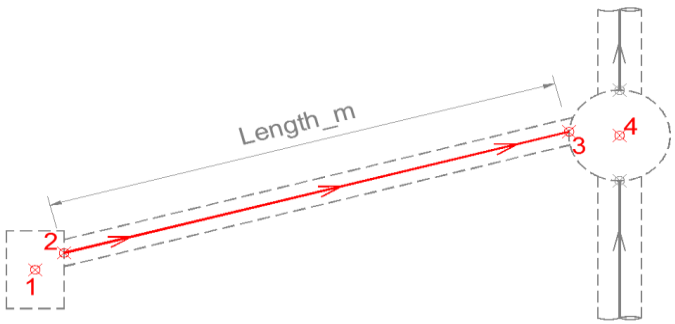


Figure 4: Single Pipe

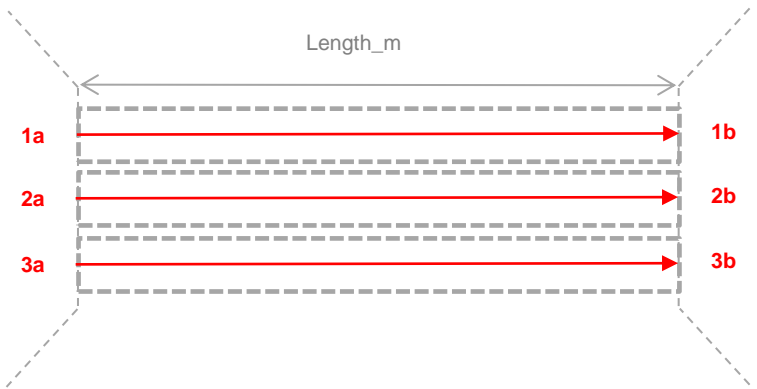


Figure 5: Multi-Cell Culvert

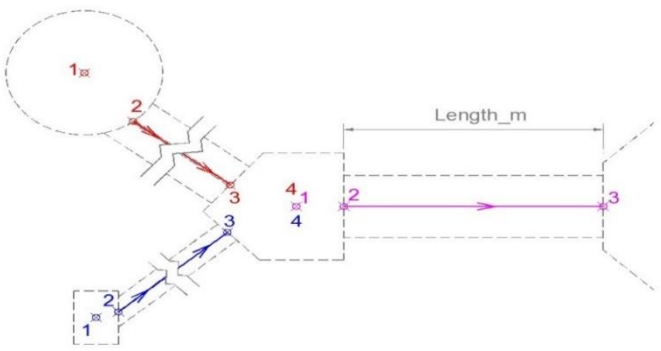


Figure 6: Complex Scenario

2.11.6 Pit

Asset Capture: Simple point feature representing the centre of chamber of a pit or manhole. Please note: If the asset's Use = "Pit" then the InletConfig and InletType elements must be populated. Note: InletConfig's Left/Centre/Right is referenced from the lintel looking at the road crown.

Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description/Sub Attribute	ADAC/RRC Required
Pit	PitNumber	<i>The pit identifier.</i>	Y
	Use	<i>Purpose of the feature in the network.</i>	Y
	ChamberConstruction	<i>Method of chamber construction.</i>	Y
	ChamberSize	<i>Represents the essential dimensions of the chamber. Contains a choice of structures that pertain to different configurations.</i>	
		Rectangular	
		Length_mm	Y
		Width_mm	Y
		Circular	
		Diameter_mm	Y
		Extended	
		Radius_mm	Y
		Extension_mm	Y
	LidType	<i>The type of lid or grate covering the opening.</i>	Y
	SurfaceLevel_m	<i>Surface level of this feature (in metres against the vertical datum).</i>	Y
	InvertLevel_m	<i>Invert level of this feature (in metres against the vertical datum).</i>	Y
	Depth_m	<i>The depth of the structure in metres. May be user-entered, or auto-calculated as the difference between the surface level and the invert level of the pit.</i>	Y
	Inlet <i>(for Kerb Inlet or Field Inlet)</i>	<i>Represents a surface inlet to the pit. Set to nil if this pit does not have a surface inlet</i>	
		InletConfig	Y
		InletType	Y*
		InletSize	Y
	Lintel <i>(for Kerb Inlet)</i>	<i>Represents the pit lintel. Set to nil if this pit does not have a lintel.</i>	
		LintelConstruction	Y
		LintelLength_m	Y
	OutletType	<i>The type of outlet for this pit.</i>	Y
	FireRetardant	<i>True of false value indicating whether fire retardant measures are incorporated.</i>	Y
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N

2.11.7 Surface Drain (Including Open Drain)

Asset Capture: Simple linear feature representing the invert of the channel.
 Spatial Relationship: May be coincident to EndStructures and WSUD regions/polygons.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
SurfaceDrain	Type	<i>The type of drain or channel.</i>	Y
	DrainShape	<i>Cross-sectional shape of the drain.</i>	Y
	LiningMaterial	<i>The material that the channel is lined with.</i>	Y
	LinedWidth_m	<i>The width, in metres, of the lined portion of the channel.</i>	Y
	BatterMaterial	<i>The material that the drain batter is lined with. A null value may be supplied where the drain has no batter.</i>	Y
	BatterWidth_m	<i>The total width, in metres, from lip of batter to opposite lip of batter. A null value may be supplied where the drain has no batter.</i>	Y
	US_InvertLevel_m	<i>Invert level of this pipe end (in metres against the vertical datum).</i>	Y
	DS_InvertLevel_m	<i>Invert level of this pipe end (in metres against the vertical datum).</i>	Y
	AverageGrade	<i>The average gradient over the whole length of the feature, as a percentage. Derivable from the difference in invert levels and the horizontal length of the geometry</i>	N
	Length_m	<i>The material length, in metres, of the centreline of the channel.</i>	Y

2.11.8 WSUD Area

Asset Capture: Water Sensitive Urban Design 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)
 Spatial Relationship: Not Applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
WSUD Area	Sqid_Id	<i>The string identifier of the device, as it would appear on a plan.</i>	Y
	TreatmentMeasure	<i>The treatment measure employed. Choose from a list relevant to complex area features.</i>	Y
	Function1	<i>The first function of the WSUD area. At least one function must be supplied. Choose from a list relevant to complex area features.</i>	Y
	Function2	<i>The second function of the WSUD area, if applicable.</i>	N
	Function3	<i>The third function of the WSUD area, if applicable.</i>	N
	PondingArea_m2	<i>Area of Temporary Ponding or Extended Detention in square metres.</i>	Y
	PondingDepth_m	<i>Average depth of Temporary Ponding or Extended Detention in metres.</i>	Y
	FilterArea_m2	<i>Area of Bioretention filter media in square metres.</i>	Y

	FilterDepth_m	<i>Depth of Bioretention filter media in metres.</i>	Y
	TransitionDepth_m	<i>Depth of the Bioretention Transition Layer in metres.</i>	Y
	DrainageDepth_m	<i>Depth of the Bioretention Drainage Layer in metres.</i>	Y
	MacrophyteZoneArea_m2	<i>The vegetated area in square metres (may be zero). Area of vegetated portion of constructed wetland (macrophyte zone)</i>	Y
	MacrophyteZoneDepth_m	<i>Average depth of vegetated portion of constructed wetland (macrophyte zone).</i>	Y
	CoarseSedimentArea_m2	<i>Maximum area of ponding (for coarse sediment capture) before bypass.</i>	Y
	SedimentVolume_m3	<i>Volume of sediment capacity in cubic metres</i>	Y
	MinSurfaceLevel_m	<i>Minimum surface level within structure (above or below water surface level).</i>	Y
	PermanentPondLevel_m	<i>Water surface level during normal dry weather.</i>	Y
	OutletLevel_m	<i>The surface level in metres of the bypass, or spillway, or other overflow outlet structure.</i>	Y
	DesignFlow_m3s	<i>The maximum design flow of the feature in cubic metres per second</i>	Y
	HasSpillway	<i>Whether the feature has a spillway</i>	Y
	MaintenanceCycle_mnth	<i>The minimum maintenance cycle in months (refer to specifications)</i>	Y

2.12 Supplementary

2.12.1 Point Feature / Polyline Feature / Polygon Feature

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

Spatial Relationship: Not applicable.

ADAC Element	Attribute	Attribute Description/Sub Attribute	ADAC/RRC Required
PointFeature PolylineFeature PolygonFeature	Class	User specified class names may be written here to identify the feature type. Not to be used for features that appear elsewhere in the ADAC Model.	Y
	Note	General purpose descriptive note.	N
	Attributes	A collection of named attributes. This element must be present but may be empty. Attributes of supported types may occur in any number and any order, but application developers are encouraged to exercise consistency in the use of supplementary attributes. It is recommended that supplementary features given the same class are also given the same list of named attributes in the same order, so as to facilitate easier passage into receiving systems. Attribute names should be chosen with the requirements of receiving systems in mind.	
		TextValue	N
		DecimalValue	N
		DateValue	N
		TimeValue	N
		DateTimeValue	N

2.13 Transport

2.13.1 Bridges

Asset Capture: Multi-patch region/polygon feature representing the area of a Road Bridge. Asset capture is based on physicality therefore separate regions/polygons are required for the different aspects of the Bridge.

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

2.13.1.1 Bridge Extent

Asset Capture: Footprint for the whole structure and all its parts

2.13.1.2 Bridge Deck

Asset Capture: Footprint of single deck unit between abutments and supports

2.13.1.3 Containment Class

Asset Capture: **Not required by RRC**

2.13.1.4 Bridge Superstructure

Asset Capture: Represents a single superstructure between abutments and supports

2.13.1.5 Bridge Abutment

Asset Capture: Represents the extent of one abutment for a bridge assembly.

2.13.1.6 Bridge Pier

Asset Capture: Represents a single supporting structure that supports deck spans.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
BridgeExtent	BridgeID	Unique identifier, used to associate components of the same bridge assembly.	Y
	Name	Road name or nearest road where bridge resides, or the recognised name of the bridge.	Y
	Use	Predominant use of bridge.	Y
	Type	Type of bridge construction.	Y
	CrossingType	The layout and configuration of this structure.	Y
	Spans	Number of spans.	Y
	MinimumClearance_m	Minimum clearance in metres.	Y
	PredominantMaterial	Predominant Material of bridge.	Y
	DesignLoad	Design load of bridge as per AS5100.	Y
BridgeDeck	BridgeID	Unique identifier, used to associate components of the same bridge assembly.	Y
	Material	Material types for Bridge deck.	Y
	NomWidth_m	Nominal Width of deck in metres.	Y
	DeckLength_m	Length of Bridge deck between joints at abutments in metres.	Y
ContainmentClass	BridgeID	Unique identifier, used to associate components of the same bridge assembly.	N
	ContainmentClass	Containment Class of Parapet/Railing as per AS5100.	N
BridgeSuperstructure	BridgeID	Unique identifier, used to associate components of the same bridge assembly.	Y
	Material	Material types for the Superstructure.	Y
BridgeAbutment	BridgeID	Unique identifier, used to associate components of the same bridge assembly.	Y
	Material	The predominant material of the abutment.	Y
BridgePier	BridgeID	Unique identifier, used to associate components of the same bridge assembly.	Y
	Material	Predominant Pier material type.	Y

2.13.2 Pathway / Road Pathway / Path Structure

Asset Capture: Complex linear feature (read: polylines including curves but not Bezier curves) representing the centre longitudinal axis of a pathway. Please refer to the green and red dash/dot line in figure 8 below. The green represents an existing pathway asset whereas the red denotes a newly constructed section of Pathway.

Spatial Relationship: May be coincident to a Pram Ramp point feature as well as changes in surface types or widths must be coincident points.

2.13.2.1 Pathway

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Pathway	Use	<i>Intended traffic use of the structure.</i>	Y
	Structure	<i>Type of pathway structure. A fixed value of In Ground is required for this sub type</i>	Y
	SurfaceMaterial	<i>Surface material of the structure.</i>	Y
	Width_m	<i>Nominal width of the pathway in metres.</i>	Y
	Depth_mm	<i>The nominal depth of the pathway material in millimetres.</i>	Y

2.13.2.2 Road Pathway

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
RoadPathway	Use	<i>Intended traffic use of the structure. A fixed value of CycleWay is applied to this sub type.</i>	Y
	Structure	<i>Type of pathway structure. A fixed value of On Road is required for this sub type</i>	Y
	SurfaceMaterial	<i>Surface material of the structure. A fixed value of Road Pavement is applied to this sub type.</i>	Y
	Width_m	<i>Nominal width of the marked pathway in metres.</i>	Y

2.13.2.3 Path Structure

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
PathStructure	Use	<i>Intended traffic use of the structure.</i>	Y
	Structure	<i>Type of pathway structure.</i>	Y
	SurfaceMaterial	<i>Surface material of the structure.</i>	Y
	SubStructureMaterial	<i>Material of the sub structure.</i>	Y
	Width_m	<i>Nominal width of the pathway in metres.</i>	Y

2.13.3 Pavement / Parking

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. Please refer to the solid blue transparent hatch in figure 9 below for a typical representation of Pavement capture.

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

2.13.3.1 Pavement

ADAC Element	Attribute	Attribute Description/Sub Attribute	ADAC/RRC Required
Pavement	Name	<i>The gazetted, or proposed, road name.</i>	Y
	Surface	<i>Data container for surface characteristics.</i>	
		SurfaceType	Y
		SurfaceThickness_mm	Y
		SurfaceNomWidth_m	Y
	PavementStructure	<i>Data container for pavement structure characteristics.</i>	
		PavementType	Y
		BaseLayer LayerType	Y
		BaseLayer Depth_mm	Y

		BaseLayer Stabilisation	Y
		SubBaseLayer LayerType	Y
		SubBaseLayer Depth_mm	Y
		SubBaseLayer Stabilisation	Y
		LowerSubBaseLayer LayerType	Y
		LowerSubBaseLayer Depth_mm	Y
		LowerSubBaseLayer Stabilisation	Y
	PavementGeoTextile	<i>Pavement geotextile type. Road Pavement Geotextile Types As per MRS11-27 Table 3.</i>	N
	SubGrade	<i>Data container for subgrade structure characteristics.</i>	
		CBR	Y
		Stabilisation	Y

2.13.3.2 Parking

ADAC Element	Attribute	Attribute Description/Sub Attribute	ADAC/RRC Required
Parking	Name	<i>Parking area name</i>	Y
	NoOfCarparks	<i>Number of individual vehicle spaces.</i>	Y
	OnOffStreet	<i>Value indicating whether the parking is an uninterrupted part of the road pavement, or a separate area with road access.</i>	Y
	Surface	<i>Data container for surface characteristics.</i>	
		SurfaceType	Y
		SurfaceThickness_mm	Y
		SurfaceArea_sqm	Y
	PavementStructure	<i>Data container for pavement structure characteristics.</i>	
		PavementType	Y
		BaseLayer LayerType	Y
		BaseLayer Depth_mm	Y
		BaseLayer Stabilisation	Y
		SubBaseLayer LayerType	Y
		SubBaseLayer Depth_mm	Y
		SubBaseLayer Stabilisation	Y
		LowerSubBaseLayer LayerType	Y
		LowerSubBaseLayer Depth_mm	Y
		LowerSubBaseLayer Stabilisation	Y
	PavementGeoTextile	<i>Pavement geotextile type.</i>	N
	SubGrade	<i>Data container for subgrade structure characteristics.</i>	
		CBR	Y
		Stabilisation	N



Figure 7: Pavement, Pathway and Pram Ramp

2.13.4 Pram Ramp

Asset Capture: Simple point feature representing a pram ramp. Please refer to red square on figure 8.

Spatial Relationship: Must be coincident to Pathway, Road Pathway or Path Structure assets. Pram Ramp Polygon is not required by RRC.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
PramRamp	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N

2.13.5 Road Edge

Asset Capture: Complex linear feature (read: polylines including curves but not bézier curves) representing the lip of kerb. Please refer to black dashed line on figure 8. In case of inverts, centre of invert.

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.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
RoadEdge	Type	<i>Road edge configuration</i>	Y
	Material	<i>Material of Road Edge.</i>	Y
	Width_mm	<i>Width in millimetres of the Edge feature.</i>	Y
	Length_m	<i>Length in metres of edge material.</i>	Y
	PavementExtension_mm	<i>The pavement extension, in millimetres, behind the back of kerb.</i>	Y

2.13.6 Road Island

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. Please refer to figure 9 for Road Island asset capture.

Spatial Relationship: Must be coincident to other regions representing road islands where there is a common boundary i.e. no slivers and/or overlaps.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
RoadIsland	Type	<i>Type of Road Island</i>	Y
	Area_sqm	<i>The area, in square metres, of the infill.</i>	Y
	InfillType	<i>Type of Road Island Infill</i>	Y

2.13.7 Sub-Soil Drain

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.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
SubSoilDrain	Use	<i>The use (orientation) of the drain.</i>	Y
	Type	<i>The type (configuration) of the drain.</i>	Y
	Length_m	<i>The length in metres of the drain.</i>	Y

2.13.8 Flush Point

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.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
FlushPoint	Function	<i>The function of the flushing out point</i>	Y

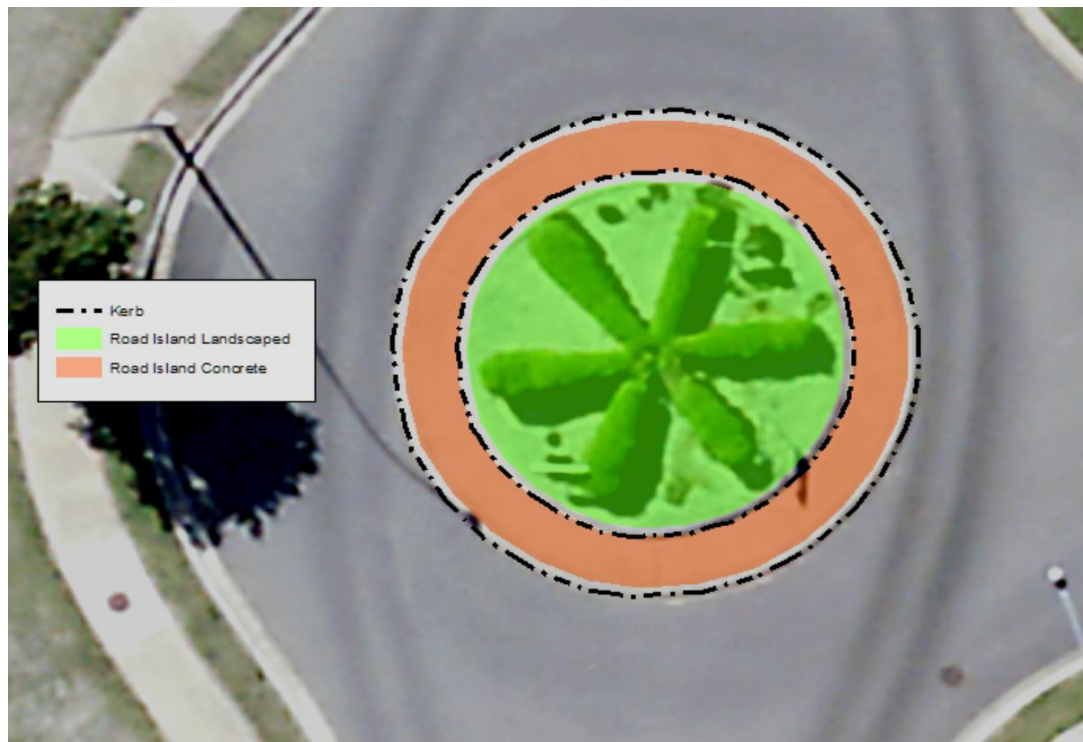


Figure 8: Road Islands

2.14 Water Supply Assets

2.14.1 Fittings

Asset Capture: Single point feature representing the centre point of the fitting. Please refer to the yellow circles in figure 11 below for representations of a Tee and Tapping Band.

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Fitting	Type	<i>The fitting type.</i>	Y
	Material	<i>The fitting material.</i>	Y
	Lining	<i>The internal corrosion protection method employed on the fitting material.</i>	Y
	Protection	<i>The external corrosion protection method employed on the fitting material.</i>	Y
	BodySize_mm	<i>The nominal diameter of the largest pipe entering the fitting.</i>	Y
	BranchSize_mm	<i>The nominal diameter of the smallest pipe entering the fitting.</i>	Y
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N
	WaterQuality	<i>The quality of the water being carried by the network to which the fitting is a part</i>	Y

2.14.2 Hydrants

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

Spatial Relationship: Must be coincident to a pipe asset.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Hydrant	Use	<i>The purpose of the hydrant in the network.</i>	Y
	Diameter_mm	<i>The nominal bore size of the hydrant.</i>	Y
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N
	WaterQuality	<i>The quality of the water being delivered through the hydrant.</i>	Y

2.14.3 Maintenance Holes

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

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

ADAC Element	Attribute	Attribute Description / Sub Attribute	ADAC/RRC Required
MaintenanceHole	Use	<i>Purpose of Water maintenance hole.</i>	Y
	ChamberSize	<i>Data structure describing the chamber configuration and dimensions.</i>	Y
		Rectangular Length_mm	Y
		Rectangular Width_mm	Y
		Circular Diameter_mm	Y
	SurfaceLevel_m	<i>The height of the top surface of the lid, hatch, rim or roof.</i>	Y
	InvertLevel_m	<i>The height of the top surface of interior floor/bottom.</i>	Y
	FloorConstruction	<i>Method of chamber construction.</i>	Y
	FloorMaterial	<i>Material type for chamber floor construction.</i>	Y
	WallConstruction	<i>Method of chamber wall construction.</i>	Y
	WallMaterial	<i>Material type for chamber wall construction.</i>	Y

	RoofMaterial	Material type for chamber roof construction.	Y
	LidMaterial	Chamber lid configuration and material.	Y
	Rotation	Rotation angle (cartesian - anti-clockwise 0 degrees = East)	N

2.14.4 Meters

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

Spatial Relationship: Must be coincident to a water pipe with a Use of “Fire Service”, “Service” or “Fire Service Thru Meter”.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Meter	Serial Number	The manufacturers serial number, as stamped or fixed on the meter.	Y
	Type	Configuration of the meter.	Y
	Diameter_mm	The nominal bore diameter of the meter.	Y
	Dials	The number of dials on the reading face.	Y
	Manufacturer	The Manufacturer of the unit	Y
	ModelNumber	The standard code, model number or part number for the unit	Y
	InitialReading	The reading on the meter face at the time of installation.	N
	PrivateBooster	True, Meter is associated with a private pressure boosting system.	Y
	OffsetSide	Is the offset from the left or the right side boundary when looking from the road.	Y
	Offset_m	The distance in metres to measure along the frontage from the indicated side.	Y
	InstallationDate	Installation Date of the meter. ISO 8601 is the accepted format.	Y
	LotNo	The lot number as described on the originating survey plan	Y
	PlanNo	The plan number of the originating survey plan.	Y
	Rotation	Rotation angle (cartesian - anti-clockwise 0 degrees = East)	N
	WaterQuality	The quality of the water being metered.	Y

2.14.5 Pipes

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 10 below. The red lines represent reticulation pipes whereas the green line represents a service pipe. Note: the dash/dot polyline is not broken at the fittings as the physical specification of the pipe doesn't change.

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Pipe	Use	The purpose of this feature in the network.	Y
	WaterQuality	The quality of the water being carried by the pipe.	Y
	Alignment_m	Offset from cadastral boundary to the main.	Y
	Diameter_mm	Nominal diameter of the pipe in millimetres.	Y
	Material	The pipe material.	Y
	Class	The pipe class as specified by the manufacture.	Y
	Lining	The internal corrosion protection method employed on the pipe material.	Y

	Protection	<i>The external corrosion protection method employed on the pipe material.</i>	Y
	JointType	<i>Pipe jointing method employed.</i>	Y
	Depth_m	<i>The average depth in metres that the pipe is buried.</i>	N
	Embedment	<i>Embedment types.</i>	Y
	Length_m	<i>Material length of the pipe in metres.</i>	Y

2.14.6 Service Fittings

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

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Fitting	Type	<i>The fitting type.</i>	Y
	Material	<i>The fitting material.</i>	Y
	Lining	<i>The internal corrosion protection method employed on the fitting material.</i>	Y
	Protection	<i>The external corrosion protection method employed on the fitting material.</i>	Y
	BodySize_mm	<i>The nominal diameter of the largest pipe entering the fitting.</i>	Y
	BranchSize_mm	<i>The nominal diameter of the smallest pipe entering the fitting.</i>	Y
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N
	WaterQuality	<i>The quality of the water being carried by the network to which the fitting is a part</i>	Y

2.14.7 Storage Tanks

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

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
StorageTank	Material	<i>The material that the storage tank is made from.</i>	Y
	Source	<i>The source of water in the tank.</i>	Y
	Manufacturer	<i>The Manufacturer of the unit</i>	Y
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	N
	Volume_m3	<i>The effective volume in cubic metres.</i>	Y
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N

2.14.8 Valves

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

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Valve	Use	<i>The purpose of the valve in the network.</i>	Y
	Type	<i>The type of valve.</i>	Y
	Diameter_mm	<i>The nominal bore diameter of the valve.</i>	Y
	Manufacturer	<i>The Manufacturer of the unit</i>	N
	ModelNumber	<i>The standard code, model number or part number for the unit</i>	N
	Rotation	<i>Rotation angle (cartesian - anti-clockwise 0 degrees = East)</i>	N
	WaterQuality	<i>The quality of the water in the network the valve is part of.</i>	Y

2.14.9 Water Service

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. Pipe diameter must not be smaller than 20mm or larger than 63mm.

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

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
WaterService	Diameter_mm	Nominal diameter of the pipe in millimetres.	Y
	Material	The service pipe material.	Y
	Class	The service pipe class as specified by the manufacture and relevant to the material.	Y
	Protection	Provision of conduit or other protection	Y
	Termination	Fitting or valve at the customer end of the service	Y
	WaterQuality	Type of water supplied through water service	Y
	Length_m	Material length of the pipe in metres.	Y

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

Figure 10

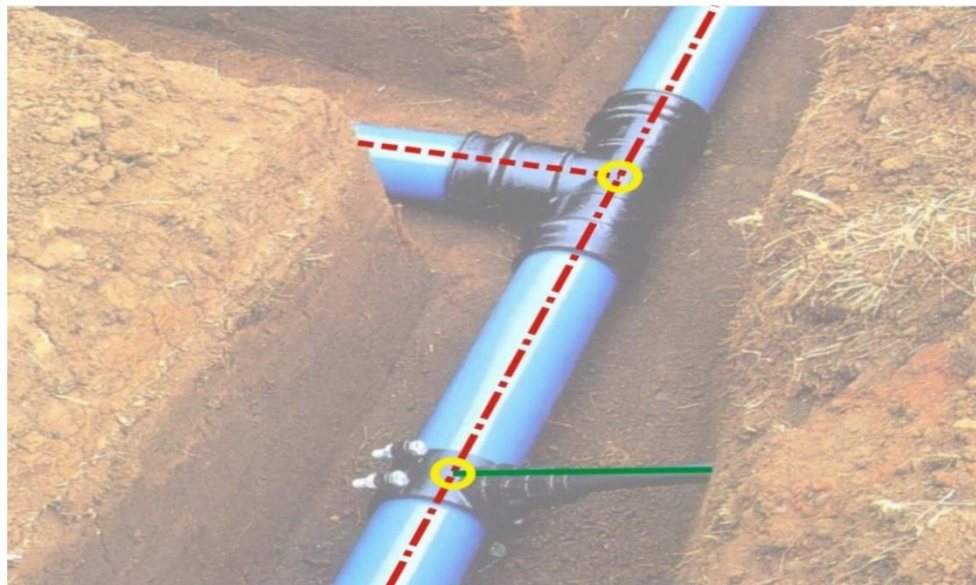


Figure 9: Water Service and Fittings

2.15 Surface

2.15.1 Contour

Asset Capture: Linear feature capturing a single contour feature.

Spatial Relationship: Not applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
Contour	Represents a single contour feature.	Status	Y
		Elevation_m	Y

2.15.2 Spot Height

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

Spatial Relationship: Not applicable.

ADAC Element	Attribute	Attribute Description	ADAC/RRC Required
SpotHeight	<i>Represents a single spot height feature.</i>	Status	Y
		Elevation_m	Y

2.15.3 Break Line

Asset Capture: **Not required by RRC**

2.15.4 Profile Line

Asset Capture: **Not required by RRC**

Table 4: Council Specific Asset Types

ADAC Asset Element	ADAC Feature	ADAC Detail	ADAC Detail	Description	Enumeration/Detail	Description
Sewer	Connection	Connection	Type	CMDG-S-030	Type A	Type A
					Type B	Type B
					Type C	Type C
					Type D	Type D
					Type E	Type E
					Type F	Type F
					Type G	Type G
Transport	Road Edges	Road Edge	Type	CMDG-R-060	TYPE 1	Barrier Kerb & Channel
					TYPE 2	Mountable Kerb & Channel
					TYPE 3	Barrier Kerb
					TYPE 4	Semi-Mountable Kerb (width 225mm)
					TYPE 5	Semi-Mountable Kerb (width 500mm)
					TYPE 6	Concrete Invert (width 600mm)
					TYPE 7	Concrete Invert (width 900mm)
					TYPE 8	Concrete Channel (width 900mm)
					TYPE 9	Rollover Kerb & Channel
					TYPE 10	Concrete Margin
Water Supply	Fittings	Fitting	Material	RRC Specific	Steel	Steel
Storm Water	Pits	Pit	Inlet Type	RRC Specific	Letterbox Gully Pit	Letterbox Gully Pit
					CM L12	CM L12
					CM C12	CM C12
					CM R12	CM R12
					CM L24R	CM L24R
					CM C24R	CM C24R
					CM R24R	CM R24R
					CM L36R	CM L36R
					CM C36R	CM C36R
					CM R36R	CM R36R

The Survey Capture, drawing specification requirements and Rockhampton Regional Council requirements for the ADAC .xml file are contained in Table 4 and Table 5 of this document.