SCIRT Rebuilding Infrastructure

LEARNING LEGACY

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

SCIRT Survey As-Built Guideline

Story: Data Governance – Standardise, Process and Deliver

Theme: Finance and Business Systems

A technical guideline which defines SCIRT Delivery Team requirements for as-built field surveying and attribute information.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit www.scirtlearninglegacy.org.nz

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SCIRT
Rebuilding Infrastructure

Survey As-Built Guideline

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Document Control

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Contents

Appendices

Revision History

Revision	Date	Name	Brief Description
A	17/12/12	Adam Churchill	Draft for feedback
B	2/07/13	Charlie Dickson	Revised to be in guideline format
C	1/08/13	Charlie Dickson	Modified diagrams for clarity
1	2/09/13	Charlie Dickson	• Formatted in line with other SCIRT Documents. • Formal Issue to Delivery Teams • From C to 1: • Appendix D- Figure D01 to D30 amended • Appendix E -WW pressure system diagrams added.

2	13/03/2014	Charlie Dickson Ekkehard Scheffler	Formal issue to Delivery Teams **From 1 To 2:** All sections have been revised. Major changes as below: • Glossary Updated –Figure amended to include outlines • Asset Category formatted – All Wastewater including Gravity /Pressure and Vacuum Systems added • Asset Category Tables Amended – Include all assets in Appendix E , F and G 4. Deliverables • 4.1 There are now two input sheets and two reference sheets • 4.1.1 Feature Template Sheet Added –Information added • 4.1.2 Pick Lists Sheet Added – Information Added. • 4.1.3 Input sheet modified • Lines • 4.1.4 Input sheet modified • 4.1.5 Pick List Clarifications Added • 4.1.5.1 Old and New Manholes • 4.1.5.2 Commission Decommission Date • 4.1.5.3 Location Certainty • 4.1.5.4 Service Status • 4.4 Removed / abandoned Assets added Appendix A • Flow chart modified to include FME Appendix B • Additional Construction Drawings added Appendix C • C.1 Points Clarified – Examples • C.2 Lines Clarified – Examples • Pressure/Full and Partial Lines Added • Relay Dig Open Trench Added • C.3 Outlines Clarified – Examples Added • All figures replaced Appendix D • Gravity Wastewater – Overview Diagram added) • Stormwater – Overview (Diagrams added) • Pumping Station – Overview (Diagrams added) • SAG Features for Stormwater and Wastewater updated and added • Reference Sheets D01 to D35 Appendix E • Wastewater Pressure System – Overview Diagram added • Reference Sheets E01 to E10 created Appendix F • Reticulated Water System – Overview Diagram added • Reference Sheets F01 to F11 created Appendix F • Vacuum Wastewater System – Overview Diagram added • Reference Sheets G01 to G04 created
2.05	14/07/2015	Ekkehard Scheffler	• Added serial number attributes to G01 • Clarification on vacuum survey

Background

Traditionally the Christchurch City Council's (CCC) 'Infrastructure Design Standard' (IDS) has specified the as-built recording process for the entire Christchurch City infrastructure. The IDS is an all-encompassing document providing for all situations and has allowed flexibility in delivery formats supplied by contractors and developers.

Subsequent to the creation of the Infrastructure Rebuild Management Office (IRMO) and the Stronger Christchurch Infrastructure Rebuild Team (SCIRT), a revision of the as-built process requirements was released under 'Notice to Contractor-31 – Project Closure Documentation' .This was largely based on the IDS with minor additions appended (including the requirement for metadata spreadsheets). In December 2012 the `IRTSG' (Infrastructure Recovery Technical Standards and Guidelines), which lays the foundation for the specific requirements for the horizontal infrastructure, was implemented.

With the establishment of a single survey and design system within SCIRT, the potential to simplify the survey as-built recording process has been identified. This document the 'Survey As-built Guideline' (SAG) lays out a new process which aims to minimise the effort expended on as-built deliverables while not reducing the overall deliverable quality.

The Survey As-built Guideline is intended to support SCIRT in meeting the IRTSG requirements and does not replace or override them.

Executive Summary

The purpose of this document is to provide a technical guideline for as-built field surveying requirements and attribute information for wastewater, stormwater and water supply construction projects within the Stronger Christchurch Infrastructure Rebuild Team (SCIRT).

This Survey As-built Guideline defines the requirements of the Delivery Team and details the deliverable format for wastewater and stormwater, and reticulated water networks.

Compliance with the Survey As-built Guideline is critical for the success of SCIRT handover processes to CCC.

This Survey As-built Guideline will be revised and expanded as required to encompass the future as-built survey needs of SCIRT.

All as-built surveys (and supporting documents) are to be submitted by document controller via Project Centre under the SCIRT project number.

1 Glossary

Regarding As-built:

- Asset – any item listed in Tables 1 to 6 (i.e. Manhole, Valve etc.).
- Asset Attribute (Asset Metadata) – refers to a particular detail or information regarding the as-built asset.
- CCC – Christchurch City Council.
- IDS – CCC Infrastructure Design Standard, last reviewed May 2013.
- IRTSG – Infrastructure Recovery Technical Standards and Guidelines, issued 31/10/1013.
- Line Asset – consists of at least two X Y positions such as a pipe/lateral (Figure 1).
- Outline Asset - consists of at least three X Y positions to form a polygon i.e. Pumping Station (Figure 1).
- Point Asset – is any asset that can be defined by one X Y position i.e. manhole (Figure 1).
- RL – reduced level.
- RW – reticulated water (= WS = water supply).
- SCIRT As-built Template (S.A.T.) – spreadsheet to collate as-built information about assets within one SCIRT project.
- SCIRT Survey As-built Guideline (S.A.G) – this document.
- SCIRT Survey As-built Guideline (S.A.G) features – refers to as-built requirement tables in appendices D, E, F and G - categories of assets.
- SW – stormwater.
- UID – unique identifier = unique name (e.g. WWMH-19912), consisting of prefix and unique number.
- Vertex – a known point along a line, e.g. pipe start and end, bends, changes in grade or other known points; corner points or bends on outlines.
- WW – wastewater.
- *All measurements are to be entered in mm unless stated otherwise (except for coordinates and levels which are entered in meters).*

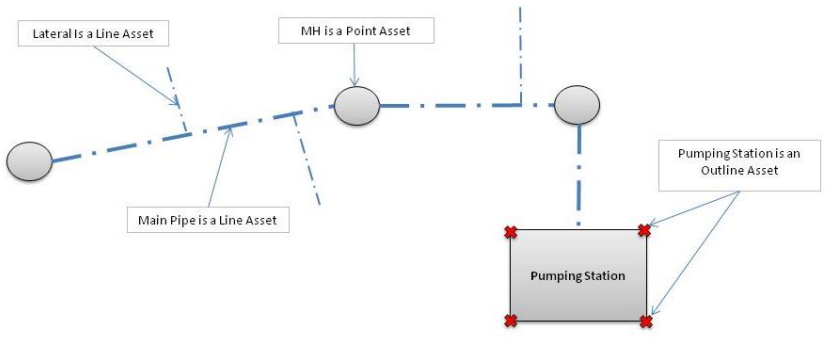


Figure 1: Point, Line or Outline Asset

2 Asset Category

2.1 Roading

Formal roading and pavement as-built requirements will remain the same as specified by the IRTSG. Additional survey as-built information may be required where there is a significant modification to road alignment, or where construction deviates from the design construction documentation.

Note: For the purposes of this guideline any Stormwater drainage within the road corridor is considered part of the Stormwater system contrary to other CCC asset management systems.

2.2 Retaining Walls

Retaining wall requirements will remain the same as specified by IRTSG.

2.3 Stormwater Drainage

All relevant Stormwater assets are to be surveyed according to this Survey As-Built Guideline. Appendix D lists and details the SW assets (and asset attributes) that are likely to be encountered and required to be recorded.

2.3.1 Stormwater Line Assets

Table 1 lists the SW line assets to be surveyed – see Appendix D for all features and attributes required.

Table 1: SW Line Assets

Line Asset (UID Prefix)	Feature to be Surveyed	SAG Feature No
Main Pipes (SWPI)	Location and invert of each end and bend of the pipe [X, Y, Z]	**D17**
Collector Pipes (SWPI)	Location and invert of each end and bend of the pipe [X, Y, Z]	**D18**
Lateral Pipes (SWLA)	X and Y position of each end and bend of the pipe	**D19**
Repair/Relay Dig (SWPR)	MH distance of start and end of the pipe repair	**D20**
Pipe Lining (SWPR)	MH distance of start and end of the lining patch	**D21**
Thrust Block [Outline] (SWST)	X and Y of corners of the surrounding feature	**D26**
Pump Station or Structure [Outline] (SWST)	X and Y of corners of the surrounding feature	**D27**
Culverts (SWPI)	Location and invert of each end of the structure [X, Y, Z]	**D31**
Structural Pipe Protection (SWPP)	X and Y of each end of the protection	**D34**
Electrical (WWEL)	X and Y position of each end and bend	**E10**

2.3.2 Stormwater Point Assets

Table 2 lists the SW point assets to be surveyed – see Appendix D for all features and attributes required.

Table 2: SW Point Assets

Point Asset (UID Prefix)	Feature to be Surveyed	SAG Feature No
Single Sump (SWSP)	Centre of Chamber [X , Y and Z at lid and base]	**D01**
Double Sump (SWSP)	Centre of Chamber [X , Y and Z at lid and base]	**D02**
Corner Sump (SWSP)	Centre of Chamber [X , Y and Z at lid and base]	**D03**
Triple Sump (SWSP)	Centre of Chamber [X , Y and Z at lid and base]	**D04**
Hillside Sump (SWSP)	Centre of Chamber [X , Y and Z at lid and base]	**D05**
Inspection Chamber (SWIC)	Centre of Chamber [X , Y and Z at lid and base]	**D06**
Small Trafficable Sump (SWSP)	Centre of Chamber [X , Y and Z at lid and base]	**D07**
House Drain Sump (SWSP)	Centre of Chamber [X , Y and Z at lid and base]	**D08**
Manholes (SWMH)	Centre of Chamber [X , Y and Z at lid and base]	**D09 to D12**
Junction (SWJC)	X and Y position	**D22**
Lateral Junction (SWEY)	X and Y position	**D23**
Inspection Point (SWIP)	X and Y position	**D24**
End Cap (SWEC)	X and Y position	**D25**
Pump (SWPM)	Centre of Pump [X , Y and Z]	**D28**
Outlet (SWOT)	X, Y and Z position	**D29**
Valve (SWVA)	Centre of Pump [X , Y and Z]	**D30**
Headwall (SWHWO/SWHWI)	X, Y and Z position	**D32**
Flow Restriction (SWRD)	X, Y and Z position	**D33**
Vent (SWVT)	Centre of Vent [X and Y]	**D35**

2.4 Wastewater Drainage

All relevant Wastewater assets are to be surveyed according to this Survey As-Built Guideline. Appendices D, E and G list and detail the Wastewater assets (and asset attributes) that are likely to be encountered and required to be recorded.

2.4.1 Wastewater Line Assets

Table 3 lists the WW line assets to be surveyed – see Appendices D, E and G for all features and attributes required.

Table 3: WW Line Assets

Line Asset (UID Prefix)	Feature to be Surveyed	SAG Feature No
Flush Tank [Outline] (WWFT)	X and Y of corners of the surrounding feature	**D14**
Flush Tank Water Supply Pipes (WWFT)	X and Y position of each end and bend of the pipe	**D15**
Main Pipes (WWPI)	Position and invert of each end and bend of the pipe [X, Y, Z]	**D17**
Collector Pipes (WWPI)	Position and invert of each end and bend of the pipe [X, Y, Z]	**D18**
Lateral Pipes (WWLA)	X and Y position of each end and bend of the pipe	**D19**
Repair/Relay Dig (WWPR)	MH distance of start and end of the pipe repair	**D20**
Pipe Lining (WWPR)	MH distance of start and end of the lining patch	**D21**
Thrust Block [Outline] (WWST)	X and Y of corners of the surrounding feature	**D26**
Pump Station or Structure [Outline] (WWST)	X and Y of corners of the surrounding feature	**D27**
Structural Pipe Protection (WWPP)	X and Y of each end of the protection	**D34**
WW Pressure Main (WWPI)	Position and invert of each end and bend of the pipe [X, Y, Z]	**E02**
WW Pressure Lateral (WWLA)	X and Y position of each end and bend of the pipe	**E08**
Electrical (WWEL)	X and Y position of each end and bend	**E10**
Vacuum Lateral (WWLA)	X and Y position of each end, bend and lift of pipe	**G03**
Vacuum Main (WWPI)	Position and invert of each end, bend and lift of the pipe [X, Y, Z]	**G04**

2.4.2 Wastewater Point Assets

Table 4 lists the WW point assets to be surveyed – see Appendices D, E and G for all features and attributes required.

Table 4: WW Point Assets

Point Asset (UID Prefix)	Feature to be Surveyed	SAG Feature No
Inspection Chamber (WWIC)	Centre of Chamber [X , Y and Z at lid and base]	**D06**
Manholes (WWMH)	Centre of Chamber [X , Y and Z at lid and base]	**D09 to D12**
Flush Manhole (WWMH)	Centre of Chamber [X , Y and Z at lid and base]	**D13**
Air Gap Separator (WWAG)	X and Y position	**D16**
Junction (WWJC)	X and Y position	**D22**
Lateral Junction (WWEY)	X and Y position	**D23**
Inspection Point (WWIP)	X and Y position	**D24**
End Cap (WWEC)	X and Y position	**D25**
Pump (WWPM)	Centre of Pump [X , Y and Z]	**D28**
Outfall (WWOF)	X, Y and Z position	**D29**
Valve (WWVA)	Centre of Valve [X , Y and Z]	**D30**
Vent (WWVT)	Centre of Vent [X and Y]	**D35**
Local Pressure Tank (WWLPT)	Centre of Pressure Tank [X , Y and Z]	**E01**
Local Pressure Boundary Kit (WWLPB)	Centre of Boundary Kit [X , Y and Z]	**E03**
Flushing Point Access (WWIC)	Centre of Flushing Point [X , Y and Z at lid and base]	**E04**
Isolation Valve (WWVA)	Centre of Isolation Valve [X , Y and Z]	**E05**
Reducing Coupler (WWJC)	X and Y position	**E06**
Local Pressure Control Panel (WWLPC)	X and Y position	**E07**
Vacuum Chamber (WWVC)	Centre of Vacuum Chamber [X , Y and Z at lid and base]	**G01**
Division Valve (WWVA)	Centre of Valve [X , Y and Z]	**G02**

2.5 Reticulated Water Systems

All relevant Reticulated Water assets are to be surveyed according to this Survey As-Built Guideline. Appendices D, E and F lists and details the RW assets (and asset attributes) that are likely to be encountered and required to be recorded.

2.5.1 Reticulated Water Line Assets

Table 5 lists the RW line assets to be surveyed - see Appendices D, E and F for all features and attributes required.

Table 5: RW Line Assets

Line Asset (UID Prefix)	Feature to be Surveyed	SAG Feature No
RW Thrust Block [Outline] (RWST)	X and Y of corners of the surrounding feature	**F03**
RW Pipes – Mains (RWPI)	Location and invert of each end and bend of the pipe [X, Y, Z]	**F04**
RW Pipes – Sub Mains (RWPI)	Location and invert of each end and bend of the pipe [X, Y, Z]	**F04**
RW Pipes - Crossover (RWPI)	Location and invert of each end and bend of the pipe [X, Y, Z]	**F04**
RW Pipes - Lateral (RWLA)	X and Y position of each end and bend of the pipe	**F04**
RW Reservoir [Outline] (RWRE)	X and Y of corners of the surrounding feature, Z at base	**F09**
RW Structure [Outline] (RWST)	X and Y of corners of the surrounding feature	**F11**
Electrical (WWEL)	X and Y position of each end and bend	**E10**
Flush Tank Water Supply Pipes (WWFW)	X and Y position of each end and bend of the pipe	**D15**
Structural Pipe Protection (RWPP)	X and Y of each end of the protection	**D34**

2.5.2 Reticulated Water Point Assets

Table 6 lists the RW point assets to be surveyed – see Appendices F and D for all features and attributes required.

Table 6: RW Point Assets

Point Asset (UID Prefix)	Feature to be Surveyed	SAG Feature No
RW Fire Hydrant (RWHR)	Centre of Asset [X, Y, Z]	**F01**
RW Valve (RWVA)	Centre of Asset [X, Y, Z]	**F02**
RW End Cap (RWEC)	X and Y position	**F05**
RW Pump (RWPM)	Centre of Asset [X, Y, Z]	**F06**
RW Connector (RWCN)	X and Y position	**F07**
RW Meter (RWMR)	X and Y position	**F08**
RW Reservoir Inlet/Outlet (RWIN / RWOT)	X and Y position	**F10**
RW Restrictor (RWRD)	X and Y position	**F12**
Air Gap Separator (WWAG)	X and Y position	**D16**

3 Survey Control

Every survey as-built is to be completed in terms of the project specific benchmark control (detailed on the construction drawings) - these are in Mt Pleasant 2000 projection (New Zealand Geodetic Datum 2000).

The benchmarks are SCIRT project specific (based upon the Christchurch Drainage Datum).

The benchmarks used for As-builting are to be the same as those used for construction set out.

If these benchmarks are destroyed please contact the SCIRT Handover Coordinator for advice on which benchmarks to use. Do not source benchmarks from elsewhere as each project is in terms of specific project benchmarks.

3.1 Accuracies

This document frequently refers to an accuracy margin i.e. +/- X [mm]. X is typically 10mm, 30mm, 50mm or 100mm depending on the feature surveyed. It defines X as representing 2 standard deviations from the mean (or at a 95% confidence interval). For example, if the Survey As-built Guideline requires an accuracy of +/- 10mm, the delivered value will be within +/- 10mm 95% of the time.

The required accuracy is determined by the type and nature of the asset. The tables 7 and 8 detail the required accuracies.

3.1.1 Location Certainty 'Survey Accurate'

All assets are to be surveyed to the accuracies are outlined in table 7 as specified in the IRTSG. The attribute 'Location certainty' is to be set accordingly to 'Survey Accurate'.

Table 7: Accuracies required for survey as-built (Survey Accurate)

Required survey as-built accuracy (±mm)				
	mmN	mmE	Height	Height Type
Pipe Invert	50	50	10	Invert
Manhole Lid	100	100	30	Lowest Corner
Manhole Base	100	100	30	Centre of Chamber Lowest Point
Lateral Pipe	100	100	N/A	N/A
All assets (unless specified above)	50	50	30	

Note: these accuracies cannot be reached using GPS devices.

3.1.2 Location Certainty 'Approximate'

In isolated cases it may not be possible to survey an asset to the required accuracy as specified in the IRTSG. These cases can be one of the following:

- Pipes laid without trench (e.g. directional drilling, pipe bursting) if pipe start/end not accessible
- Lined pipes (incl. laterals) without manhole access
- Lining or repair patches where the start and end distance from the upstream manhole is given
- Assets within structures (e.g. pumps inside wet wells)

These assets may be surveyed to the accuracies in table 8 and the attribute 'Location certainty' is to be set to one of the options in section 4.1.5.3 (except 'survey accurate').

If any asset was not surveyed to survey accuracy and location certainty 'approximate' has been used, the delivery team needs to supply justification for not meeting IRTSG requirements. This is to be supplied in the survey report.

Table 8: Accuracies for assets which are not surveyed to survey standard (Approximate)

Location Certainty 'Approximate' (±mm)				
	mmN	mmE	Height	Height Type
Pipe Invert	1000	1000	150	Invert
Manhole Lid	1000	1000	150	Lowest Corner
Manhole Base	1000	1000	150	Centre of Chamber Lowest Point
Lateral Pipe	1000	1000	N/A	N/A
All assets (unless specified above)	1000	1000	150	

3.2 Design Change

A design change can be constituted by the following criteria:

- The asset material differs from the design.
- The asset size differs from design.
- Any other attribute that differs from design including positional information that the Delivery Team surveyor considers a significant change from design.

4 Deliverables

This section specifies which documents are to be provided and the format for delivery.

To satisfy this document there are four deliverables to the survey as-built:

- SCIRT As-built Template (SAT) (4.1)
- Red Line Marked Up Drawings (4.2)
- Survey As-built Report (4.3)
- Removed/abandoned assets identified on SCIRT GIS (4.4)

4.1 SCIRT As-built Template file (.xlsx) 'SAT'

All required coordinate data, level data and asset attributes (metadata) are to be captured within the latest version of the SCIRT As-built Template (SAT) at the commencement of the survey. **A separate SAT for each network (WW, SW, RW) must be used.**

The SAT has been separated into two input sheets and two reference sheets (Figure 2).

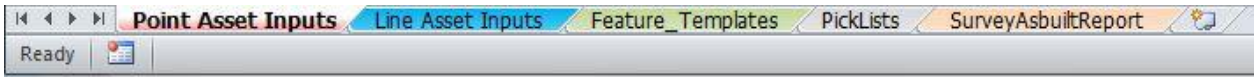


Figure 2: S.A.T. Sheets

4.1.1 Feature Templates Sheet

The SAT tab ‘Feature_Templates’ contains template rows for all SAG features (Figure 3). The templates are sorted by feature number (D01, D03 etc.) in column A. In order to use the template rows in the point or line asset input sheets, simply copy the respective row with the correct SAG feature number in column A and paste it into the point of line asset input sheet.

All cells highlighted in green contain pick lists which refer to the ‘PickLists’ tab (section 4.1.2). All other fields are to be completed or, if containing ‘LEAVE BLANK’, to be left blank or unchanged.

Refer to the individual feature descriptions for fields which may not need to be completed for all assets.

	A	B	C	D	E	F	G
1	**Single Sump**						
2	*Type of point feature*	*Specific type of sump*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
3	D01	Specific type of sump	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
4	**Double Sump**						
5	*Type of point feature*	*Specific type of sump*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
6	D02	Specific type of sump	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
7	**Corner Sump**						
8	*Type of point feature*	*Specific type of sump*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
9	D03	Specific type of sump	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
10	**Triple Sump**						
11	*Type of point feature*	*Specific type of sump*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
12	D04	Specific type of sump	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
13	**Hillside Sump**						
14	*Type of point feature*	*Specific type of sump*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
15	D05	Specific type of sump	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
16	**Inspection Chamber**						
17	*Type of point feature*	*Type of manhole or access*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
18	D06	Type of manhole or access	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
19	**Small Trafficable Sump**						
20	*Type of point feature*	*Specific type of sump*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
21	D07	Specific type of sump	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
22	**House Drain Sump**						
23	*Type of point feature*	*Specific type of sump*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
24	D08	Specific type of sump	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
25	**Square Manhole Vented**						
26	*Type of point feature*	*Type of manhole or access*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
27	D09	Type of manhole or access	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
28	**Square Manhole Non Vented**						
29	*Type of point feature*	*Type of manhole or access*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
30	D10	Type of manhole or access	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
31	**Circular Manhole Vented**						
32	*Type of point feature*	*Type of manhole or access*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
33	D11	Type of manhole or access	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No
34	**Circular Manhole Non Vented**						
35	*Type of point feature*	*Type of manhole or access*	*Old or new asset*	*Differs from design (yes/no)*	*Unique identifier from drawing*	*Centre of structure in Easting coordinate*	*Centre of structure in No*
36	D12	Type of manhole or access	Old or new asset	Differs from design (yes/no)	Unique identifier from drawing	Centre of structure in Easting coordinate	Centre of structure in No

Point Asset Inputs | Line Asset Inputs | Feature_Templates | PickLists

Figure 3: Feature Templates Tab in the SCIRT As-built Template

4.1.2 Pick Lists Sheet

A table of all valid pick list values can be found in the SAT tab ‘PickLists’. The table can be filtered by list name, value or description (Figure 4).

The version number of the SAT can be found in cell D2. Please ensure to always use the latest SAT version when starting a new survey.

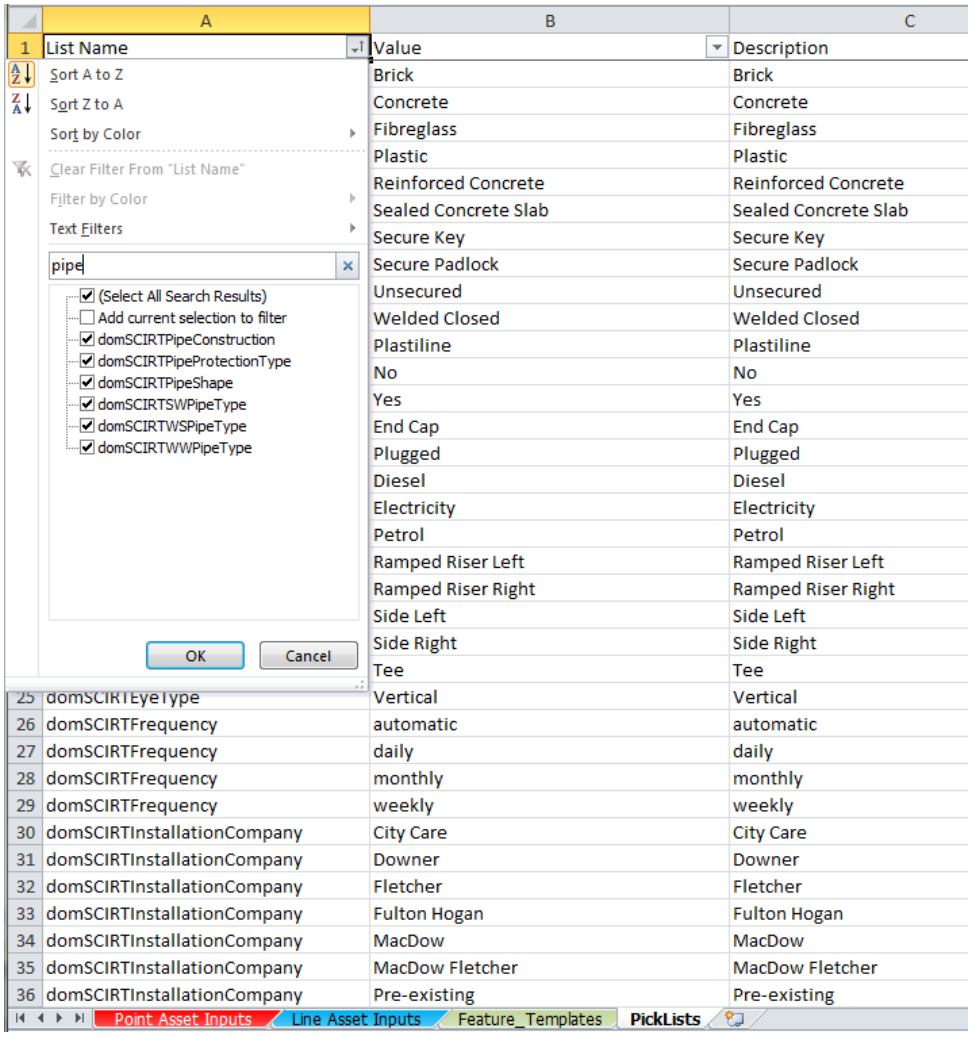


Figure 4: Pick ListsTab in the SCIRT As-built Template

4.1.3 Point Asset Input Sheet

The ‘Point Asset Inputs’ Sheet holds all point assets, a unique number needs to be specified for every asset. Refer to Appendices D, E, F and G for details of geospatial and attribute requirements. Figure 5 shows the SAT headers for point assets.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	I	SUMP Base Level Z	Pit Size	Date of Commission	Location Certainty	Service Status	Main Contractor	Date of Survey	Guideline Revision Used

Figure 5: Point Asset Input Sheet Headings

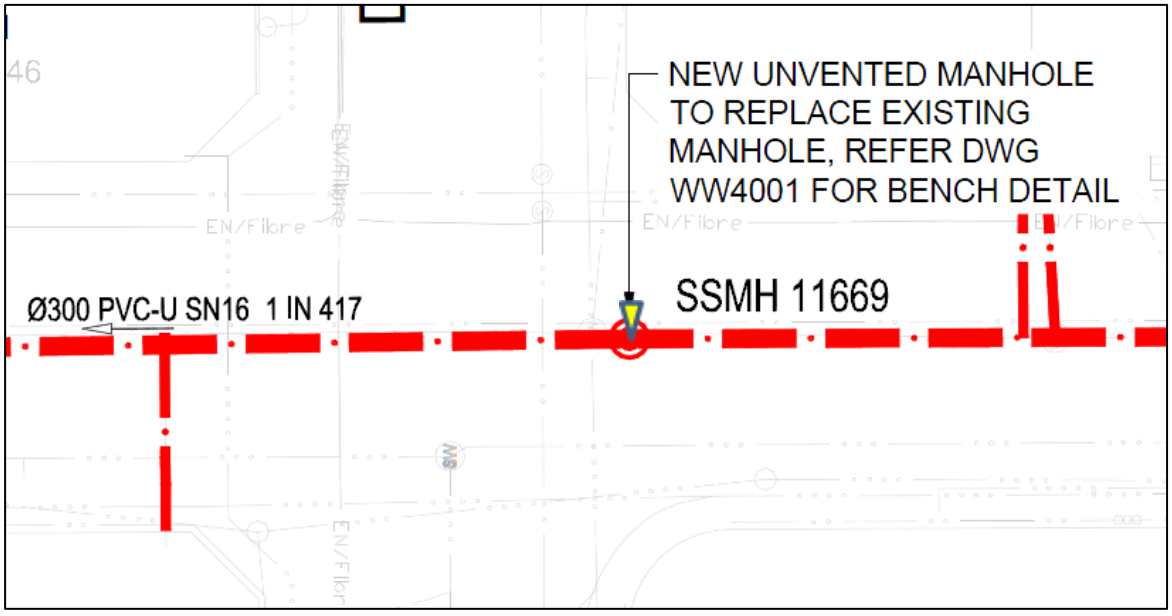
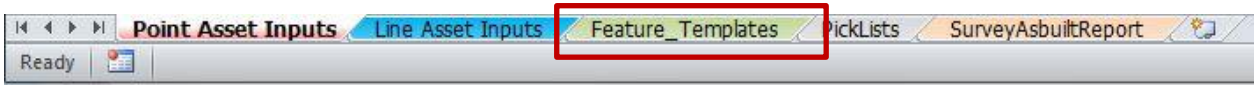


Figure 6: Point Asset Input Example – Manhole with unique name SSMH 11669 (New)

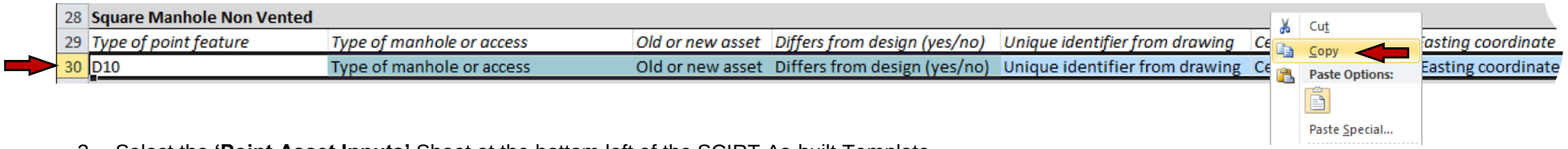
Point Asset – Input Sheet – directions for using feature templates

The following explains the use of the Point Asset Input sheet for the example manhole in figure 6 (see Appendices C-G for further notes and examples).

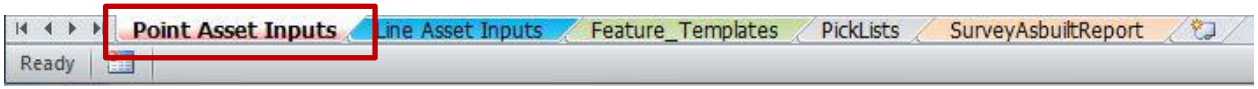
1. Select the **'Feature_Templates'** Sheet at the bottom left of the SCIRT As-built Template.



2. Select the correct SAG Feature (D10 for Square Manhole Non Vented) and **copy the whole row** starting with that number (D10).



3. Select the **'Point Asset Inputs'** Sheet at the bottom left of the SCIRT As-built Template.



4. **Paste** the feature template into the next empty row (Figure 7).
5. **Complete all columns** according to the SAG Feature table (regardless of design change).

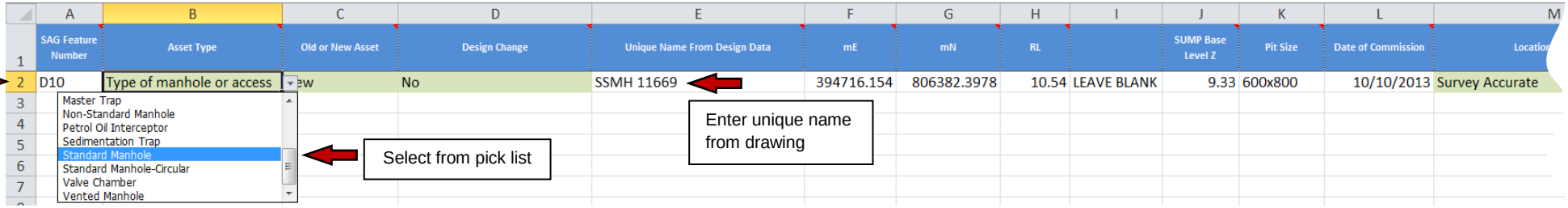


Figure 7: Point Asset Input Example of Square Manhole Non Vented (D10) with the unique name 'SSMH 11669'

- In most cases the asset being surveyed will be a new asset, but there is an option for old assets to be entered if required. (i.e. previously in the CCC database).
- For **old assets** which were not installed by the contractor (col C = Old)but do exist on the ground, enter all attributes which are known. Unknown attributes can be left blank/unchanged.
- 'Design Change' will be either 'Yes' or "No' depending on whether the delivery team surveyor considers the asset has a design change (see section 3.2)
- Select values from pick lists where highlighted in green
- Enter the unique name as shown on the construction drawing.
- Columns containing 'LEAVE BLANK' are to be left blank or must hold the value 'LEAVE BLANK'

4.1.4 Line Asset Input Sheet

A line or outline asset is any asset that is defined by more than one point e.g. a pipe or structure. Similar to the point inputs, a unique number needs to be specified for every asset. For example, if the asset is a lateral, the user will need to specify the same unique number for each point (vertex) surveyed on that lateral. Figure 8 shows the SAT headers for line assets.

Figure 8: Line Asset Input Sheet Headings

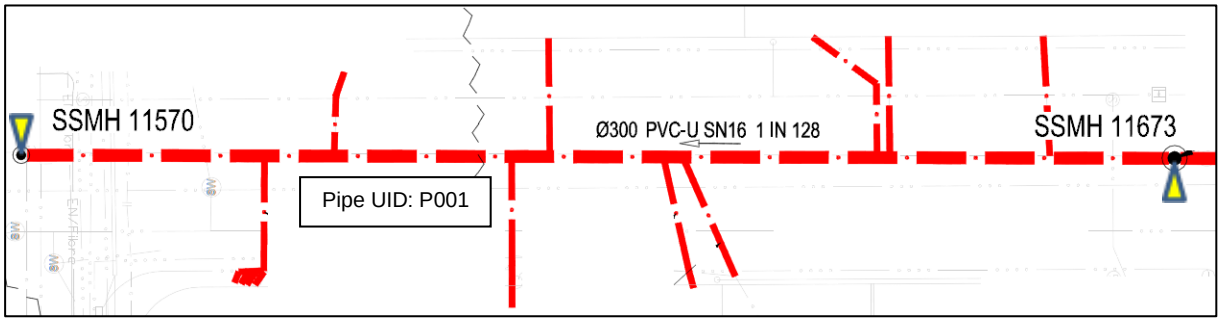
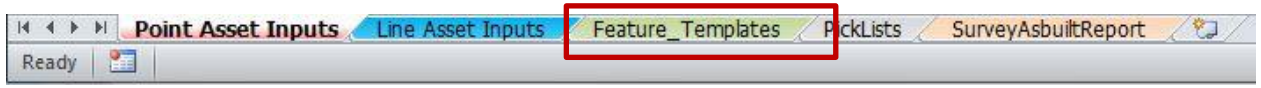


Figure 9: Example of gravity pipe between SSMH 11570 and SSMH 11673 with the unique name 'P001'

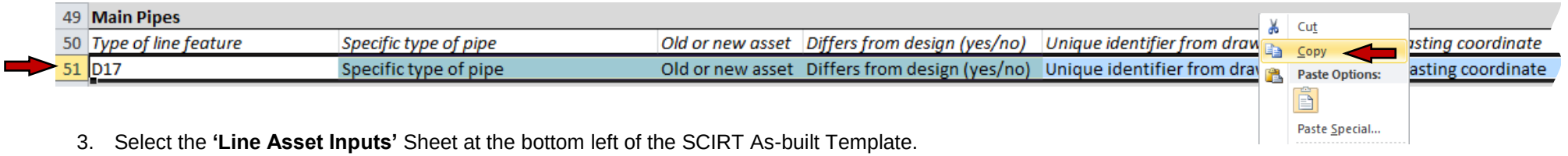
Line Asset – Input Sheet – directions for using feature templates

The following explains the use of the Line Asset Input sheet on the example gravity pipe in figure 9 (see Appendices C-G for further notes and examples).

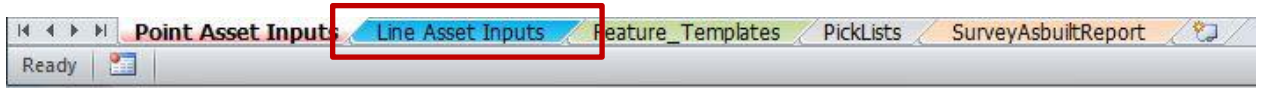
1. Select the **'Feature_Templates'** Sheet at the bottom left of the SCIRT As-built Template.



2. Select the correct SAG Feature (D17 for Main Pipes in Gravity) and **copy the whole row** starting with that number (D17).



3. Select the **'Line Asset Inputs'** Sheet at the bottom left of the SCIRT As-built Template.



4. **Paste** the feature template into the next empty row (create one row for each line or outline vertex) (Figure 10).
5. **Complete all columns** according to the SAG Feature table (regardless of design change) starting with the downstream vertex followed by all line/outline vertices in the correct order to the upstream vertex (please also enter the vertex number into column I) .

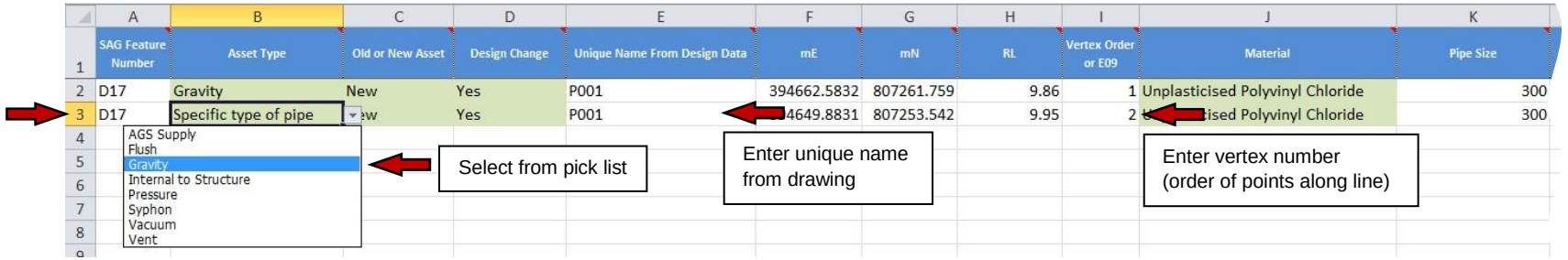


Figure 10: Line Asset Input Example of gravity pipe between SSMH 11570 and SSMH 11673 with the unique name 'P001' (column A-K)

- In most cases the asset being surveyed will be a new asset, but there is an option for old assets to be entered if required. (i.e. previously in the CCC database).
- For **old assets** which were not installed by the contractor (col C = Old)but do exist on the ground, enter all attributes which are known. Unknown attributes can be left blank/unchanged.
- 'Design Change' will be either 'Yes' or "No' depending on whether the delivery team surveyor considers the asset has a design change (see section 3.2)
- Select values from pick lists where highlighted in green
- Enter the unique name as shown on construction drawing.
- **Column I** is used to indicate the order of the point (vertex) along the pipe. I.e. enter 1 for the first point, 2 for the second point and so on.
- Column I may also be used to indicate the start and end points of an arc (curved line). Enter SA for start of arc and EA for end of arc. For more details see feature E09.
- Columns containing 'LEAVE BLANK' are to be left blank or must hold the value 'LEAVE BLANK'

- The **'At Pit' and 'To Pit'** fields are required by the system to assign coordinate levels for each invert. If surveying an invert, the pit which you are surveying is the 'At Pit' and the pit at the other end of the pipe is the 'To Pit'. Always start at the downstream pit (for examples see Appendix C). See figure 11 below for example data in the SAT.

	H	I	J	K	L	M	N	O
1	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit	Manufacturer	Main Contractor
2	9.86	1	Unplasticised Polyvinyl Chloride	300	SSMH 11570	SSMH 11673	Humes Pipeline Systems	City Care
3	9.95	2	Unplasticised Polyvinyl Chloride	300	SSMH 11673	SSMH 11570	Humes Pipeline Systems	City Care
4								

Downstream

Upstream

Invert at 'At Pit'

'At Pit' Manhole UID: Pit at which coordinates and invert level were surveyed

Figure 11: Line Asset Input Example of gravity pipe between SSMH 11570 and SSMH 11673 with the unique name 'P001' (column H-P)

4.1.5 Pick List Clarifications

The following clarifies some values used in the SAT pick lists

4.1.5.1 Old and New Manholes

Old Manhole	Less than 50% repair (maintenance i.e. cracking, minor repairs) Use old asset ID (from SCIRT GIS), e.g. WWMH-19912
New Manhole	More than 50 % (Refurbishment i.e. new lid and riser section) New asset ID, e.g. WWMH_10569_01

4.1.5.2 Commission/Decommission Date

Commission Date	When the asset was commissioned, when it became operational
Decommission Date	When the asset was either abandoned or removed (Service Status abandoned or removed)

4.1.5.3 Location Certainty

See section 3.1 for further details regarding Location Certainty.

Survey Accurate	Asset surveyed to surveying standards - see 3.1.1
Below options are exceptions and to be used in rare cases only	
Survey Accurate XY, Approximate Z	Horizontally surveyed to surveying standards, vertically surveyed to approximate height
Survey Accurate Z, Approximate XY	Vertically surveyed to surveying standards, horizontally surveyed to approximate location
Approximate XYZ	Asset surveyed to approximate location – see 3.1.2

4.1.5.4 Service Status

In Service	Asset functional i.e. operational
Abandoned	Decommissioned but still in place i.e. not operational
Removed	Permanently decommissioned and removed
Out of Service	Temporarily out of operation

4.2 Red-line Marked Up Drawings

Each survey as-built is to be accompanied by a complete set of scanned redline drawings. The purpose of these is to record and detail any changes (from the design) during construction other than slight positional changes.

The Red-line drawings need to contain the full drawing set as latest revisions, including any agreed design changes, with the specific changes (including survey as-built levels) marked up in red pen and annotated with exact details of the change. Such changes might include:

- Additional assets installed, e.g. Manholes, Sumps.
- Changes to material types.
- Changes to pipe sizes, e.g. 150mm changed to 225mm.
- Additional bends in pipe.
- Change in the depth of pipe, e.g. 0.8 m changed to 1.5 m.
- Change in pit sizes, e.g. 1050mm changed to 1200mm.
- Reduction of assets installed, i.e. manhole not installed.
- Any unexpected findings, e.g. redundant 1m brick barrel sewer.
- Change in structure type. e.g. manhole to sump.

Each page shall be signed and dated, even in case of ‘no changes’.

4.3 Survey As-built Report

A survey as-built report is required to provide detail for certain key areas detailed below. The purpose of this is to provide the SCIRT data team with the relevant information into how the survey was done. It also provides a measure of quality control ensuring that the key issues have been addressed.

The report is to be delivered as an additional tab within the SAT spreadsheet file and is to consist of the following headings:

1. To be titled ‘SCIRT Project number and name’ survey as-built report.
2. List of SCIRT construction drawings (list drawing numbers).
3. Survey benchmarks used for control.
4. Equipment used (and calibration expiry date).
5. Summary of redline drawing changes, (summarise changes from design).
6. General comments (include unexpected findings and any other comments worth noting).

4.4 Removed/Abandoned Assets

Previously, abandoned and removed assets were manually located on the SCIRT GIS viewer and entered into the Survey As-Built Template. This process proved to be problematic and time consuming.

A tool has been developed to assist Delivery Teams in the process of picking up abandoned and removed assets (Figure 12).

This tool is to be used by Delivery Teams as part of the Handover process of as built data. As-built data on abandoned assets (i.e. left in place, either as is or grouted or disabled in some way) and removed assets (i.e. entirely removed) will be recorded using this GIS tool, whereas data on new and existing in service assets are recorded in the Survey As-Built Template (SAT).

For detailed instructions on using this GIS tool, refer to NOR0066[1] GIS Abandoned/Removed Assets Tool, available from Project Centre.

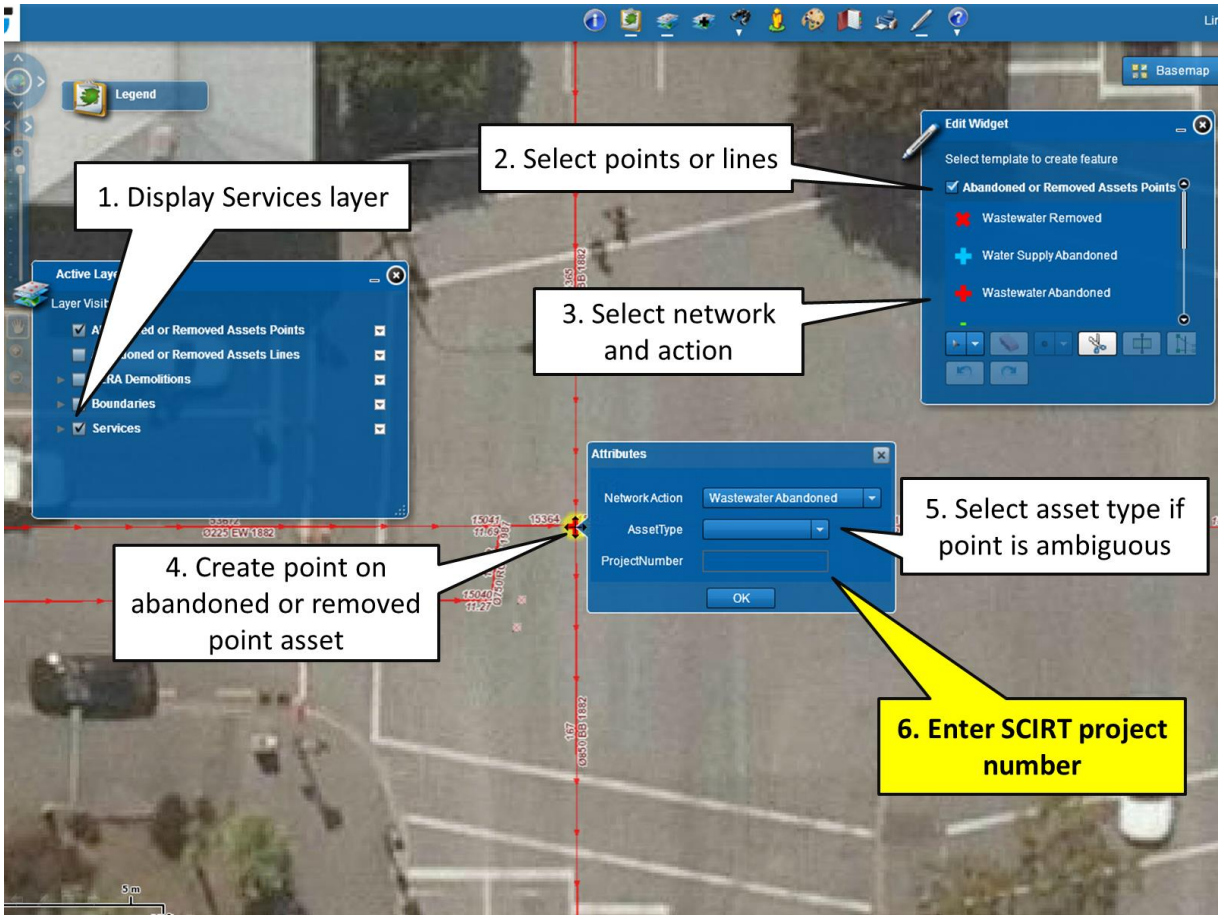


Figure 12: Screenshot from SCIRT GIS Tool 'Abandoned/Removed Assets'

4.5 Asset Naming (Unique Identifiers)

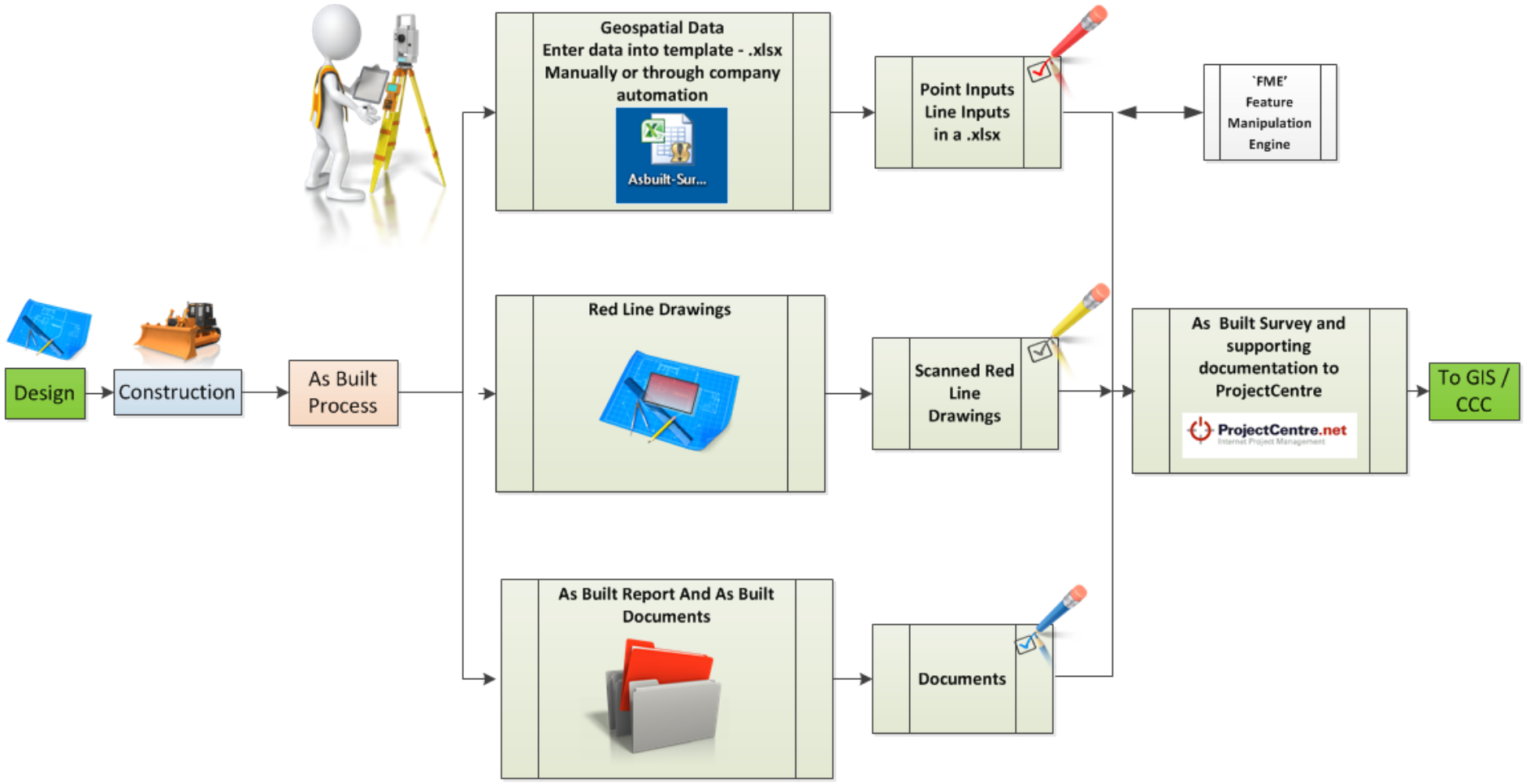
1. All assets must be named as per design drawings
2. If assets are installed/constructed outside of design drawings, the following convention is to be used to create a unique identifier:

   WWMH_10569_01
   (Prefix_ Project Number_Unique ID)

3. For prefixes please see table 1 to 6 in section 2

- **Please ensure that a unique identifier is used for each asset**

Appendix A Work Flow Chart for Survey As-Built



Survey As-Built Flowchart

Appendix B Design Drawing Examples

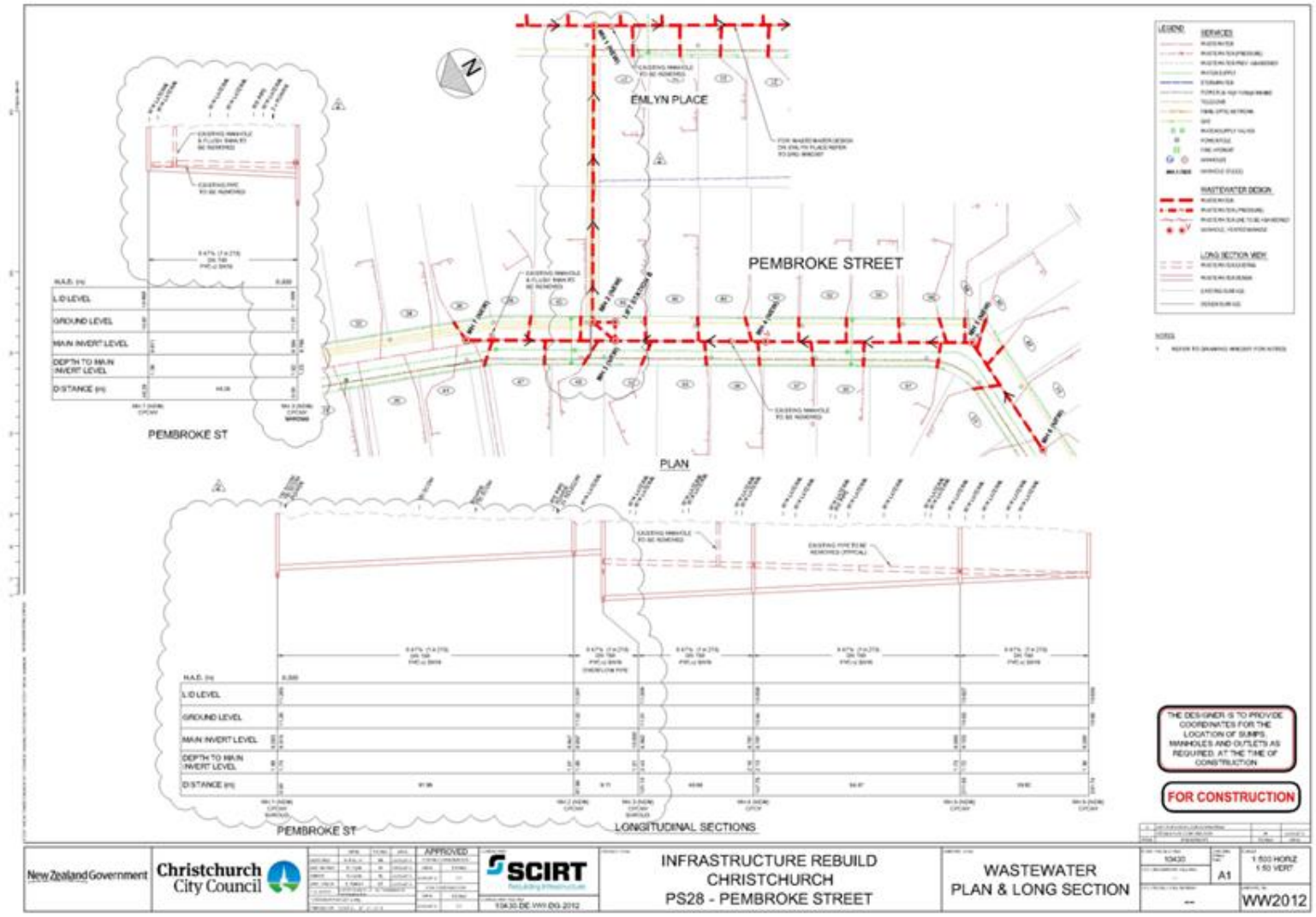


Figure 13: Design Drawing Example (WW gravity)

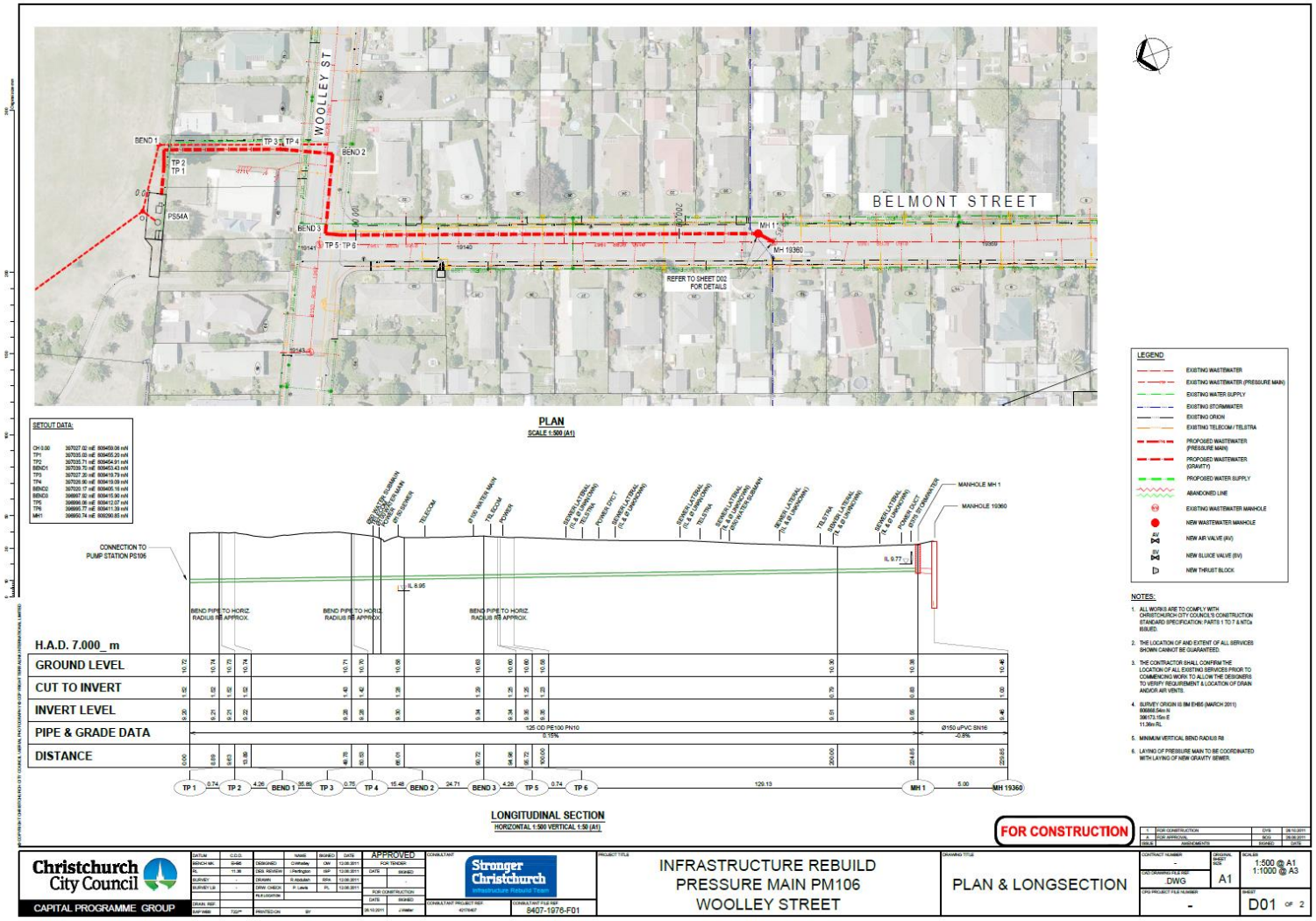


Figure 14: Design Drawing Example (WW pressure main)

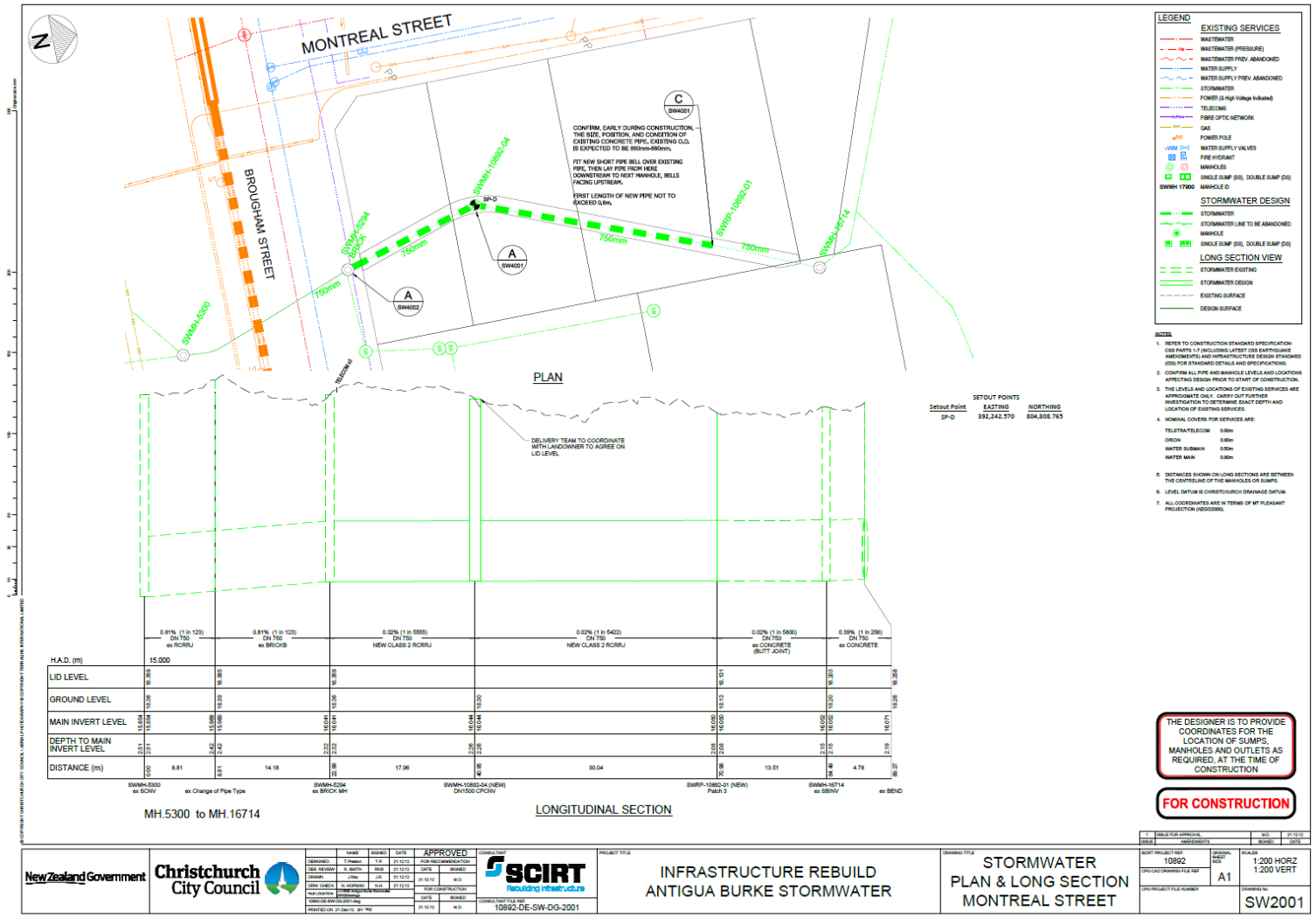


Figure 15: Design Drawing Example (SW gravity)

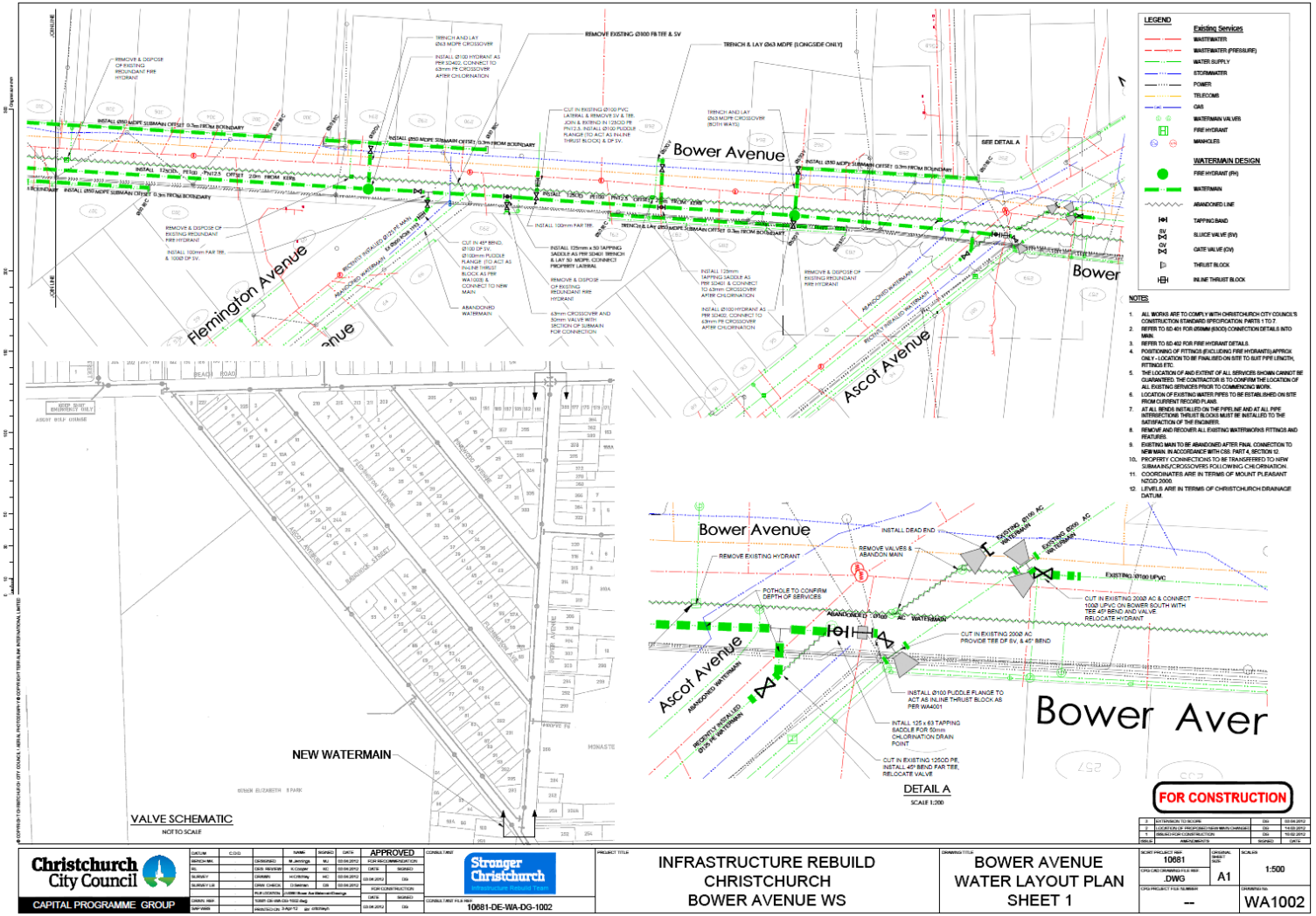


Figure 16: Design Drawing Example (RW)

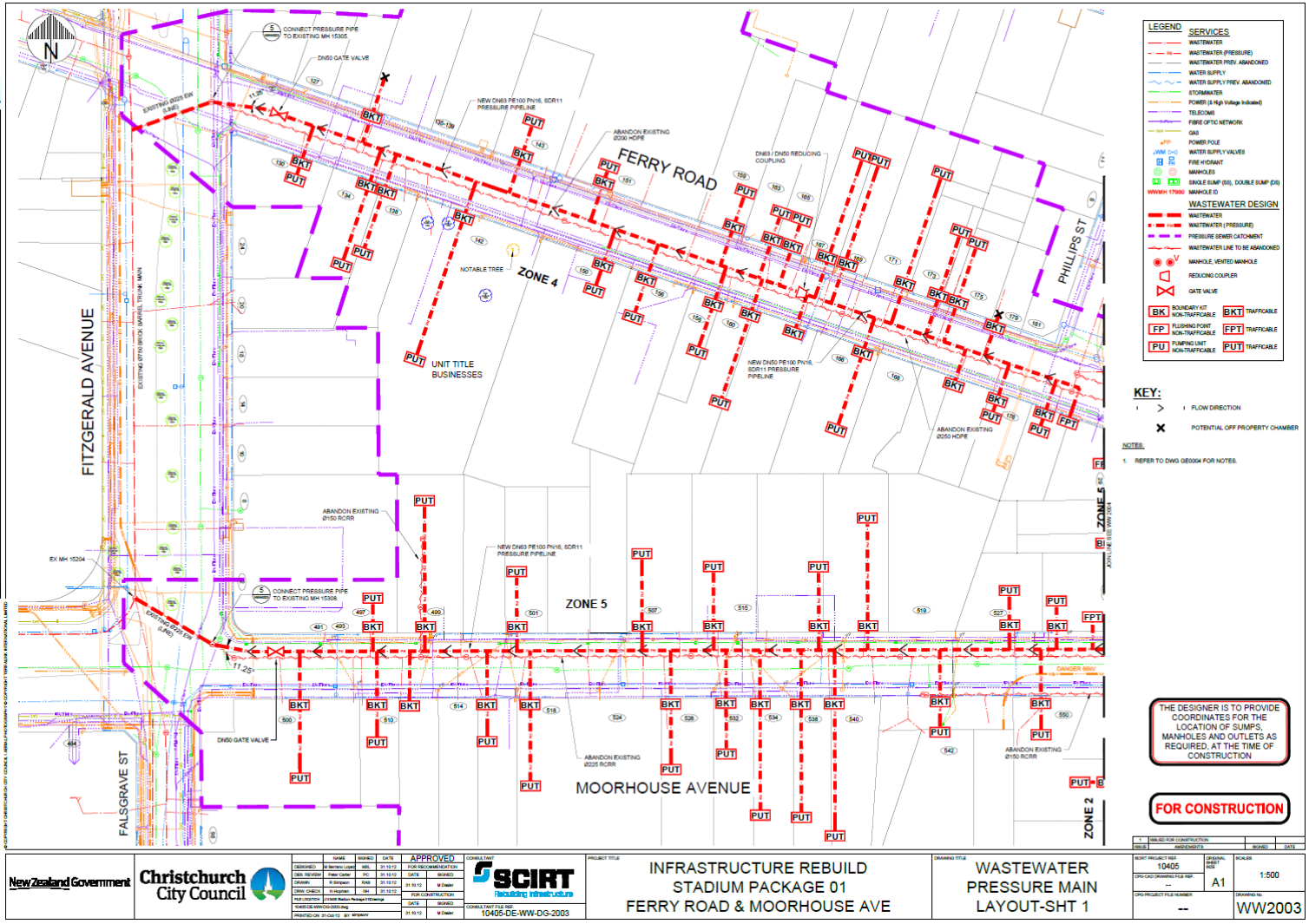


Figure 17: Design Drawing Example (WW Local Pressure Systems)

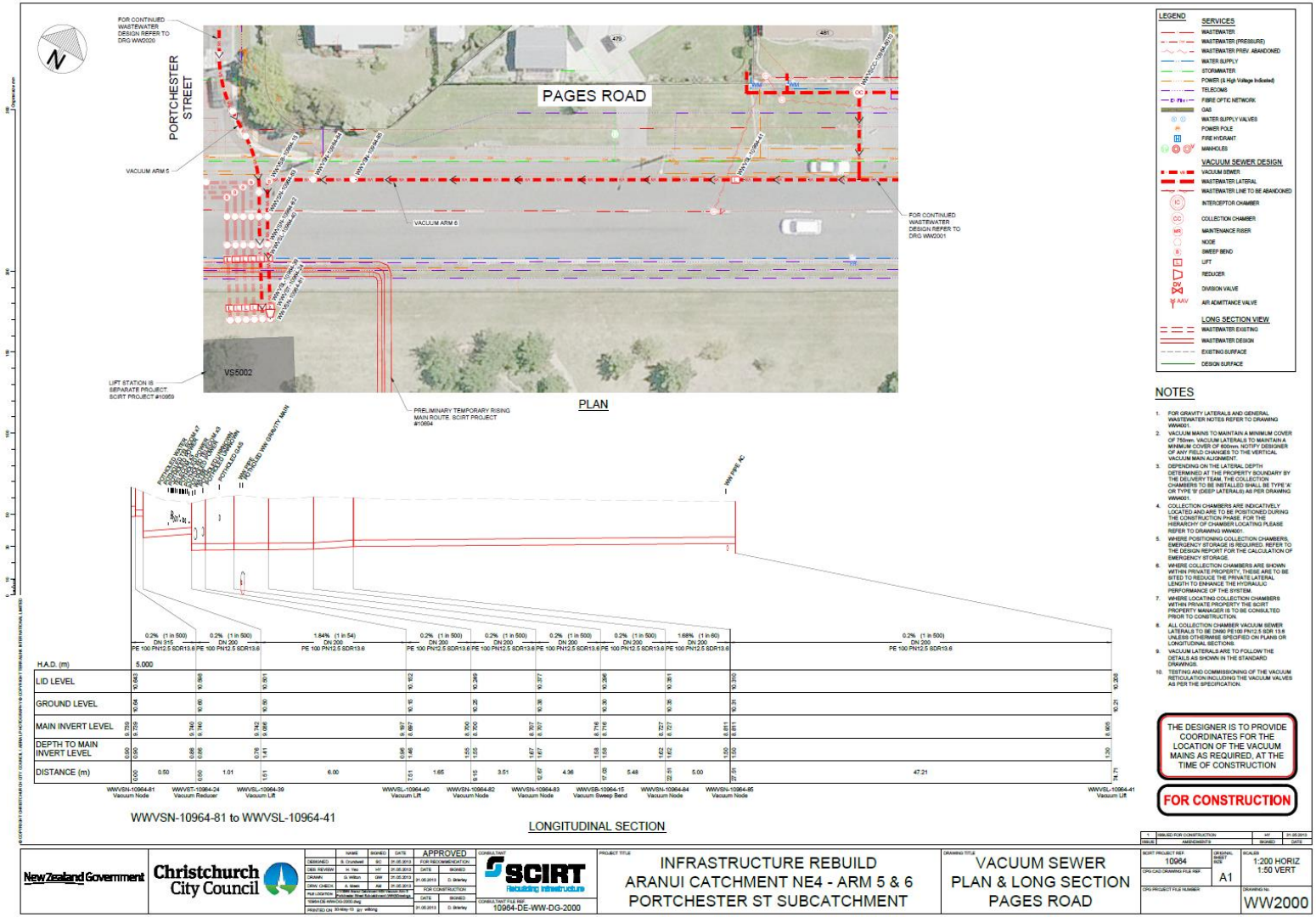


Figure 18: Design Drawing Example (WW Vacuum Systems)

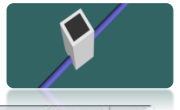
Appendix C Points, Lines and Outlines Examples

C.1 Points Examples

C.1.1 D10 Square Manhole Non Vented

Figure 19 is an example of typical SAT data for SAG feature **D10 Square Manhole Non Vented**. Please note the following:

- Col K: pit size entered as width x length as for square manhole
- Col X is left unchanged as there was no treatment on the new manhole



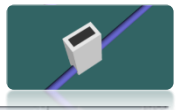
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	I	SUMP Base Level Z	Pit Size	Date of Commission	Location Certainty	Service Status
2	D10	Standard Manhole	New	No	WWMH-15687	394716.154	806382.398	10.5	LEAVE BLANK	9.33	600x800	14/10/2013	Survey Accurate	In Service

	O	P	Q	R	S	T	U	V	W	X
1	Main Contractor	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Attribute 5	Attribute 6	Attribute 7
2	Fulton Hogan	24/11/2013	2	Solid	Square	Humes Pipeline Systems	Concrete	Unsecured	25	Treatment material for refurbished manholes

Figure 19: Example – Manhole Square D10 (Point)

C.1.2 D02 Double Sump

Figure 20 is an example of typical SAT data for SAG feature D02 Double Sump.



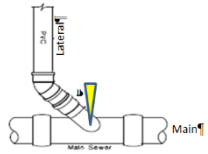
	A	B	C	D	E	F	G	H	I	J	K	L
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	I	SUMP Base Level Z	Pit Size	Date of Commission
2	D02	Double Sump	New	No	SWSP-4208	394716.1544	806382.3978	10.54	LEAVE BLANK	9.33	600x800	16/10/2013

	M	N	O	P	Q	R	S	T	U	V	W
1	Location Certainty	Service Status	Main Contractor	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Attribute 5	Attribute 6
2	Survey Accurate	In Service	Downer	24/11/2013	2	Wavy grated	LEAVE BLANK	Iplex Pipelines NZ Ltd	Concrete	Unsecured	35

Figure 20: Example – Double Sump D02 (Point)

C.1.3 D23 Lateral Junction

Figure 21 is an example of typical SAT data for SAG feature **D23 Lateral Junction** (i.e. a join between lateral and main pipe).



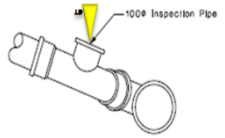
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	I	SUMP Base Level Z	Pit Size	Date of Commission	Location Certainty	Service Status	Main Contractor	Date of Survey	Guideline Revision Used
2	D23	Side Right	New	Yes	WWEY-80678	394714.6064	807647.3024	LEAVE BLANK	LEAVE BL	LEAVE BL	LEAVE BLA	26/07/2013	Survey Accurate	In Service	Downer	13/08/2013	2

Figure 21: Example – Lateral Junction D23 (Point)

C.1.4 D24 Inspection Point

Figure 22 is an example of typical SAT data for SAG feature **D24 Inspection Point**. Please note:

- Col H: RL can be left blank/unchanged.
- Col J: can be left blank/unchanged as not needed for inspection points.
- Col W: can be left blank/unchanged as not applicable to inspection points (and circular pits).
- Col X: can be left blank/unchanged as not applicable to inspection points.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	I	SUMP Base Level Z	Pit Size	Date of Commission	Location Certainty	Service Status	Main Contractor
2	D24	Inspection Point	New	Yes	WWPF-501256	394708.1522	807657.3715	8.56	LEAVE BLANK	RL at manhole base (lowest point)	150	13/09/2013	Survey Accurate	In Service	Fletcher

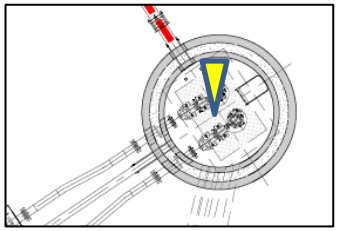
	O	P	Q	R	S	T	U	V	W	X
1	Contractor	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Attribute 5	Attribute 6	Attribute 7
2	cher	22/09/2013	2	Solid	Circular	Hynds Pipe Systems Ltd	Plastic	Unsecured	Pit angle - orientation of inner structure to nearest 5 degrees	Treatment material for refurbished manholes

Figure 22: Example – Inspection Point D24 (Point)

C.1.5 D12 Circular Manhole Non Vented (valve chamber manhole as part of a pump station)

Figure 23 is an example of typical SAT data for SAG feature **D12 valve chamber manhole as part of a pump station**. This is to be entered as the applicable manhole (here **Circular Manhole Non Vented D12**). Please note the following:

- Asset Type is set to Valve Chamber (rather than manhole).
- All other attributes are completed as for any other manhole.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	I	SUMP Base Level Z	Pit Size	Date of Commission	Location Certainty	Service Status	Main Contractor	Date of Survey
2	D12	Valve Chamber	New	No	WWMH-16726	394639.1379	807647.7889	10.89	LEAVE BLANK	8.77	2500	14/06/2013	Survey Accurate	In Service	City Care	28/06/2013

	P	Q	R	S	T	U	V	W	X
1	ate of Survey	Guideline Revision Used	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Attribute 5	Attribute 6	Attribute 7
2	3/06/2013	2	Solid	Circular	Humes Pipeline Systems	Concrete	Secure Padlock	Pit angle - orientation of inner structure to nearest 5 degrees	Treatment material for refurbished manholes

Figure 23: Example – Valve Chamber entered as Circular Manhole Non Vented D12 (Point)

C.2 Lines Examples

C.2.1 D17 Gravity Main

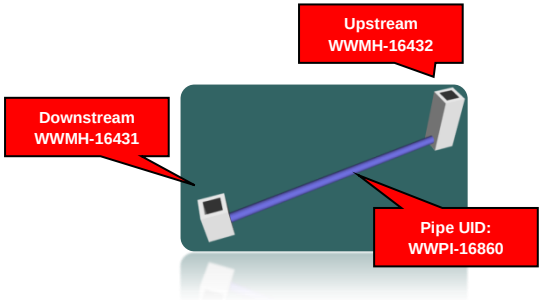
Figure 24 is an example of typical SAT data for SAG feature **D17 Gravity Main** with two vertices (points with XYZ coordinates). Please note:

- Asset Type is Gravity.
- First entry must be the downstream vertex (downstream 'At Pit', here WWMH-16431).
- Second entry is at the upstream vertex (upstream 'At Pit', here WWMH-16432), therefore 'At Pit' and 'To Pit' are swapped.
- Col Y: set to 0 (or left unchanged) as this applies to vacuum pipes only.

At Pit – Pit UID at survey location

To Pit – UID of pit at other end of pipe

Pick Lists are highlighted in green



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit
2	D17	Gravity	New	No	WWPI-16860	394573.6151	808107.2582	9.22	1	Unplasticised Polyvinyl Chloride	225	WWMH-16431	WWMH-16432
3	D17	Gravity	New	No	WWPI-16860	394477.2639	808107.3905	9.31	2	Unplasticised Polyvinyl Chloride	225	WWMH-16432	WWMH-16431

	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	To Pit	Manufacturer	Main Contractor	Pressure or Stiffness Class of Pipe	Date of Commission	Location Certainty	Service Status	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2	Attribute 3	Attribute 4
2	1H-16432	Hynds Pipe Systems Ltd	MacDow	SN16 (stiffness 16 kN/m2)	22/08/2013	Survey Accurate	In Service	15/09/2013	2	Circle	2.5	Yes	0
3	MH-16431	Hynds Pipe Systems Ltd	MacDow	SN16 (stiffness 16 kN/m2)	22/08/2013	Survey Accurate	In Service	15/09/2013	2	Circle	2.5	Yes	0

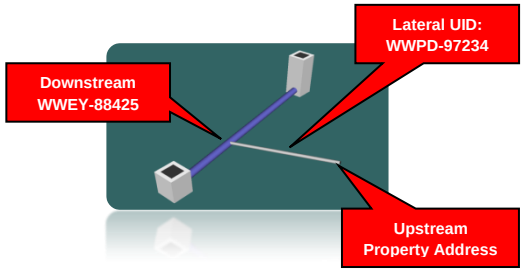
Figure 24: Example – Main Pipe Gravity (Line)

C.2.2 D19 Gravity Lateral

Figure 25 is an example of typical SAT data for SAG feature **D19 Gravity Lateral.** Please note:

- Asset Type is Gravity.
- As in the above example, vertices are entered in order from downstream to upstream (starting at the Lateral Junction).
- Col I holds the order of the vertices.
- Col Z: set to 0 (or left unchanged) as this applies to vacuum laterals only.

Pick Lists are highlighted in green



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit
2	D19	Gravity	New	No	WWPD-97234	394476.9993	808130.6739	LEAVE	1	Polyvinyl Chloride	100	LEAVE BLANK	LEAVE BLANK
3	D19	Gravity	New	No	WWPD-97234	394486.9993	808135.6739	LEAVE	2	Polyvinyl Chloride	100	LEAVE BLANK	LEAVE BLANK

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
	Manufacturer	Main Contractor	Pressure or Stiffness Class of Pipe	Date of Commission	Location Certainty	Service Status	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Attribute 5
	RX Plastics Ltd	City Care	SN12 (stiffness 12 kN/m2)	22/08/2013	Survey Accurate	In Service	15/09/2013	2	Circle	1	Yes	No	0
	RX Plastics Ltd	City Care	SN12 (stiffness 12 kN/m2)	22/08/2013	Survey Accurate	In Service	15/09/2013	2	Circle	1	Yes	No	0

Figure 25: Example –Gravity Lateral (Line)

C.2.3 E02 Pressure Main

Figure 27 is an example of typical SAT data for SAG feature **E02 Pressure Main** with five vertices (Figure 26). Please note:

- The data has to be entered into the SAT starting from the downstream manhole ‘MH1’, followed by three bends and the upstream flange ‘Tee001’.
- Each vertex (point) is represented by a row in the SAT Line Asset Inputs Sheet.
- To avoid misunderstandings, please enter the vertex order in column I (numbers in yellow circles in figure 26).

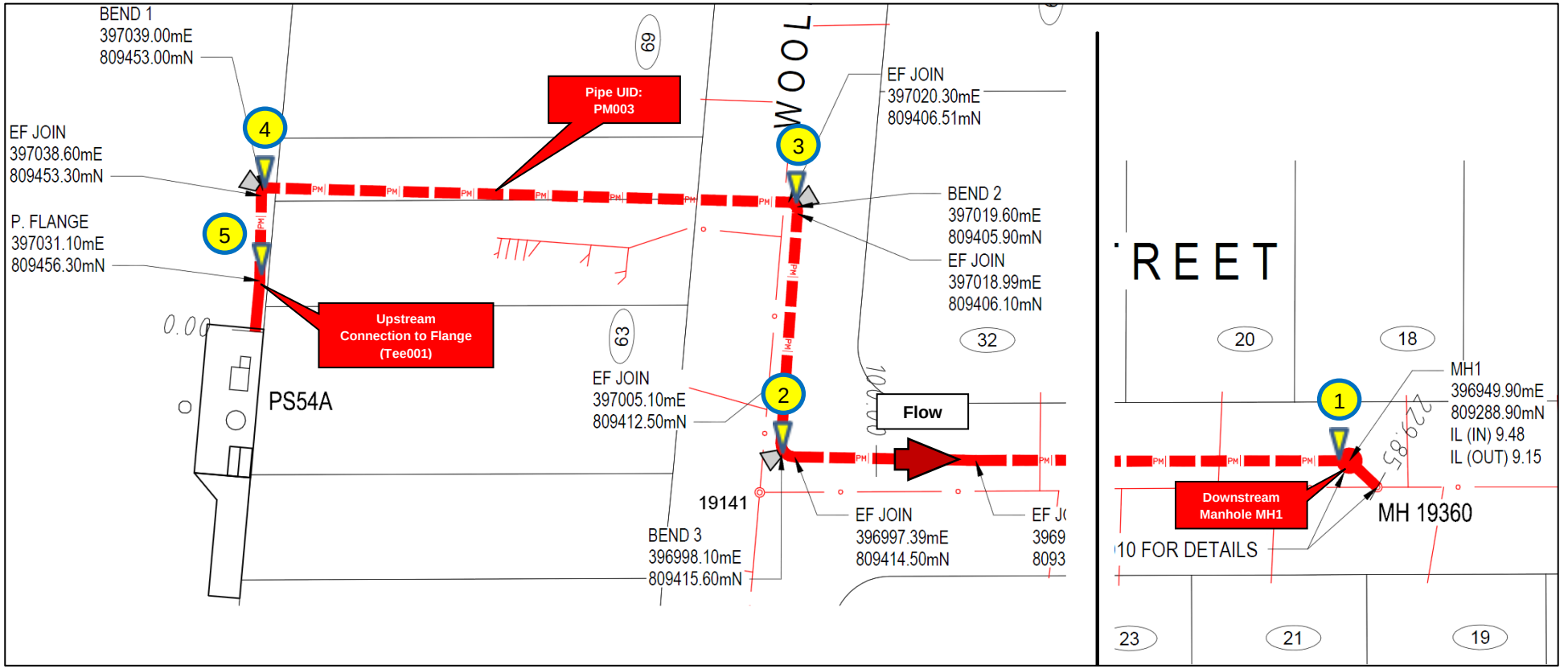


Figure 26: Example of Pressure Main between PS54 Flange ‘Tee001’ and Manhole ‘MH1’ with the unique name ‘PM003’ with 5 vertices

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit	Manufacturer	M Co
2	E02	Pressure	New	No	PM003	396949.23	809288.32	9.48	1	Polyethelene 100	125	MH1	Tee001	Hynds Pipe Syst	Fletc
3	E02	Pressure	New	No	PM003	396998.55	809415.62	9.51	2	Polyethelene 100	125	MH1	Tee001	Hynds Pipe Syst	Fletc
4	E02	Pressure	New	No	PM003	397019.54	809405.62	9.22	3	Polyethelene 100	125	MH1	Tee001	Hynds Pipe Syst	Fle
5	E02	Pressure	New	No	PM003	397039.85	809453.22	9.73	4	Polyethelene 100	125	MH1	Tee001	Hynds Pipe Syst	Fl
6	E02	Pressure	New	No	PM003	397031.15	809456.85	8.22	5	Polyethelene 100	125	Tee001	MH1	Hynds Pipe Syst	Flet

	N	O	P	Q	R	S	T	U	V	W	X	Y
	Manufacturer	Main Contractor	Pressure or Stiffness Class of Pipe	Date of Commission	Location Certainty	Service Status	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2	Attribute 3	Attribute 4
	nds Pipe Syst	Fletcher	PN12.5 (pressure 1250 kPa)	24/07/2013	Survey Accurate	In Service	15/09/2013	2	Circle	1.5	Yes	0
	ynds Pipe Syst	Fletcher	PN12.5 (pressure 1250 kPa)	24/07/2013	Survey Accurate	In Service	15/09/2013	2	Circle	1.5	Yes	0
	nds Pipe Syst	Fletcher	PN12.5 (pressure 1250 kPa)	24/07/2013	Survey Accurate	In Service	15/09/2013	2	Circle	1.5	Yes	0
	ds Pipe Syst	Fletcher	PN12.5 (pressure 1250 kPa)	24/07/2013	Survey Accurate	In Service	15/09/2013	2	Circle	1.5	Yes	0
	nds Pipe Syst	Fletcher	PN12.5 (pressure 1250 kPa)	24/07/2013	Survey Accurate	In Service	15/09/2013	2	Circle	1.5	Yes	0

Figure 27: Line Asset Input Example of Pressure Main between PS54 Flange 'Tee001' and Manhole 'MH1' with the unique name 'PM003' with 5 vertices (Line)

At Pit – Pit UID at survey location

To Pit – UID of pit at other end of pipe

Pick Lists are highlighted in green

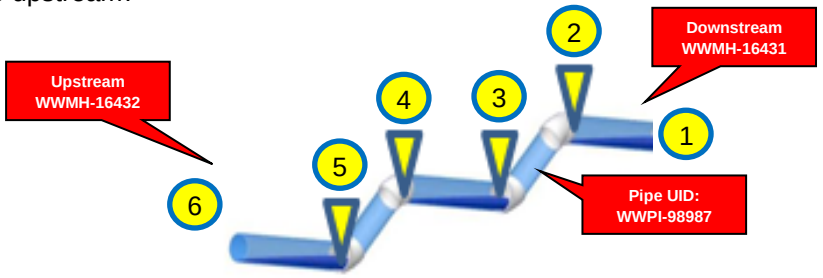
Note the following in the above SAT example (Figure 27):

- Col A: Pressure Main is SAG Feature E02
- Col B: Asset Type is Pressure
- Col E: all vertices are tagged with the same asset ID as all belong to one pipe
- Col F-H: coordinates and inverts are ordered from downstream vertex followed by all vertices in the correct order to the upstream vertex
- Col I: holds the vertex number (yellow numbers in figure 26), for **arc codes see feature E09**
- Col L-M: 'At Pit' is the downstream manhole except for the last vertex where 'At Pit' is the upstream Tee
- Col Y: can be left unchanged (or 0) as it doesn't apply to pressure pipes

C.2.4 G04 Vacuum Main

Figure 28 is an example of typical SAT data for SAG feature **G04 Vacuum Main** with two vacuum lifts. Please note:

- Asset Type is Vacuum.
- There is one SAT row per vertex (per pipe grade change), ordered from downstream to upstream.
- Col I: holds the vertex number (yellow numbers).
- Col Y: contains number of vacuum lifts (2).



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit	Man
2	G04	Vacuum	New	No	WWPI-98987	394576.6151	808107.2582	9.22	1	Polyethelene 100	150	WWMH-16431	WWMH-16432	Air
3	G04	Vacuum	New	No	WWPI-98987	394520.2639	808107.3905	9.18	2	Polyethelene 100	150	WWMH-16431	WWMH-16432	Air
4	G04	Vacuum	New	No	WWPI-98987	394522.6549	808107.6587	8.56	3	Polyethelene 100	150	WWMH-16431	WWMH-16432	AirV
5	G04	Vacuum	New	No	WWPI-98987	394497.2657	808107.7242	8.44	4	Polyethelene 100	150	WWMH-16431	WWMH-16432	Air
6	G04	Vacuum	New	No	WWPI-98987	394499.2457	808107.9574	8.11	5	Polyethelene 100	150	WWMH-16431	WWMH-16432	Air
7	G04	Vacuum	New	No	WWPI-98987	394477.2639	808107.9475	8.03	6	Polyethelene 100	150	WWMH-16432	WWMH-16431	Air

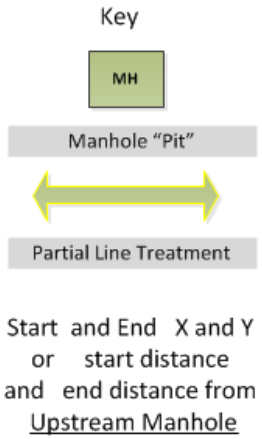
	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	To Pit	Manufacturer	Main Contractor	Pressure or Stiffness Class of Pipe	Date of Commission	Location Certainty	Service Status	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2	Attribute 3	Attribute 4
2	H-16432	AirVac	Fulton Hogan	PN12 (pressure 1200 kPa)	18/11/2013	Survey Accurate	In Service	15/12/2013	2	Circle	1.5	Yes	2
3	MH-16432	AirVac	Fulton Hogan	PN12 (pressure 1200 kPa)	18/11/2013	Survey Accurate	In Service	15/12/2013	2	Circle	1.5	Yes	2
4	VMH-16432	AirVac	Fulton Hogan	PN12 (pressure 1200 kPa)	18/11/2013	Survey Accurate	In Service	15/12/2013	2	Circle	1.5	Yes	2
5	MH-16432	AirVac	Fulton Hogan	PN12 (pressure 1200 kPa)	18/11/2013	Survey Accurate	In Service	15/12/2013	2	Circle	1.5	Yes	2
6	H-16432	AirVac	Fulton Hogan	PN12 (pressure 1200 kPa)	18/11/2013	Survey Accurate	In Service	15/12/2013	2	Circle	1.5	Yes	2
7	MH-16431	AirVac	Fulton Hogan	PN12 (pressure 1200 kPa)	18/11/2013	Survey Accurate	In Service	15/12/2013	2	Circle	1.5	Yes	2

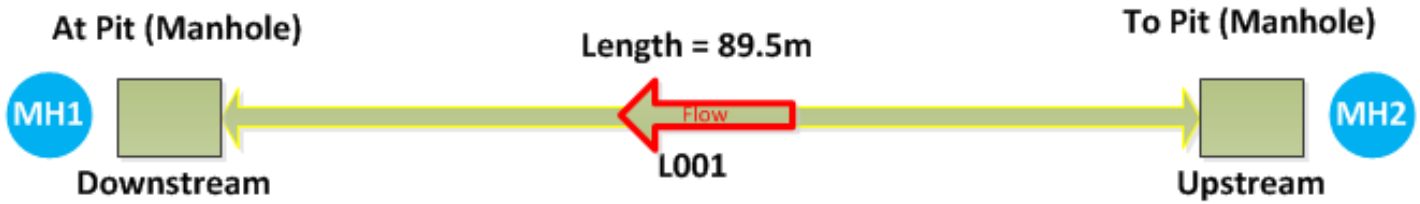
Figure 28: Line Asset Input Example of Vacuum Main MH1' with the unique name 'WWPI-98987' with 2 vacuum lifts (Line)

C.2.5 D21 Pipe Lining

Figure 29 is an example of typical SAT data for SAG feature **D21 Pipe Lining (**in this case a **fully lined pipe).** Please note:

- Pipe lining to be entered into SAG feature D21.
- Location given by one of the following:
  - Start and end distance from upstream manhole to be entered into col V & W (use full pipe length) **or**
  - Start and end coordinates may be entered into col F & G (if used, two SAT rows are required)
- Col B: select 'Full Lining'.
- Col J: select material or type of lining.
- Col K: diameter of 'host pipe'.
- **When recording lining of laterals, enter the property address into col L (At Pit) and provide start/end coordinates where possible.**





	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit
2	D21	Full Lining	New	No	L001	Line vertex Easting	Line vertex Northing	LEAVE BLANK	1	Cured in Place Pipe	250	MH1	MH2

	M	N	O	P	Q	R	S	T	U	V	W
	To Pit	Manufacturer	Main Contractor	Pressure or Stiffness Class of Pipe	Date of Commission	Location Certainty	Service Status	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2
	MH2	Agru Kunststofftechnik Gmbh	Downer	LEAVE BLANK	22/10/2013	Approximate XYZ	In Service	15/11/2013	2	0	89.5

Lining from 0 to 89.5 m (full length)

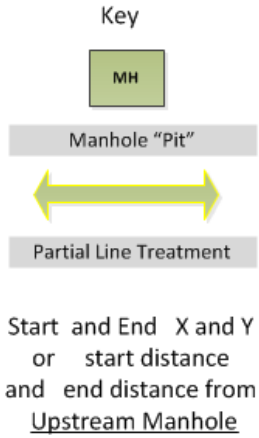
Figure 29: Full length pipe lining

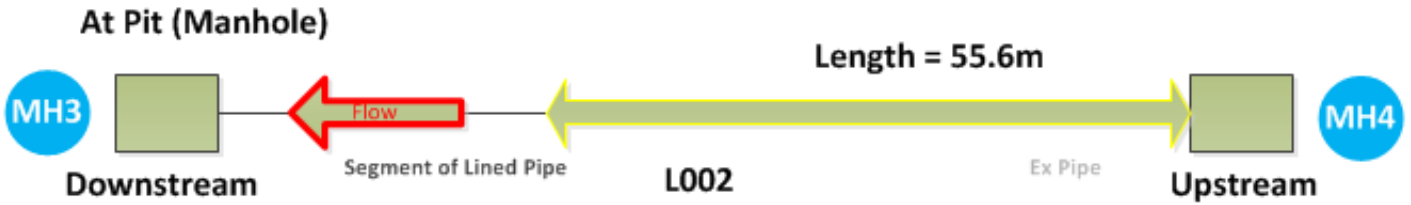
C.2.6 D21 Pipe Lining

Figure 30 is an example of typical SAT data for SAG feature **D21 Pipe Lining (**in this case a **partially lined pipe).** Please note:

- Pipe lining to be entered into SAG feature D21.
- Location given by one of the following:
  - Start and end distance from upstream manhole to be entered into col V & W **or**
  - Start and end coordinates may be entered into col F & G (if used, two SAT rows are required)
- Col B: select 'Lining Patch'.
- Col J: select material or type of lining.
- Col K: diameter of 'host pipe'.

- **When recording lining of laterals, enter the property address into col L (At Pit) and provide start/end coordinates where possible.**





	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit
2	D21	Lining Patch	New	No	L002	Line vertex Easting	Line vertex Northing	LEAVE BLANK	1	Cured in Place Pipe	250	MH3	MH4

	L	M	N	O	P	Q	R	S	T	U	V	W
1	t Pit	To Pit	Manufacturer	Main Contractor	Pressure or Stiffness Class of Pipe	Date of Commission	Location Certainty	Service Status	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2
2	H3	MH4	Agru Kunststofftechnik Gmbh	MacDow	LEAVE BLANK	22/10/2013	Approximate XYZ	In Service	15/11/2013	2	0	55.6

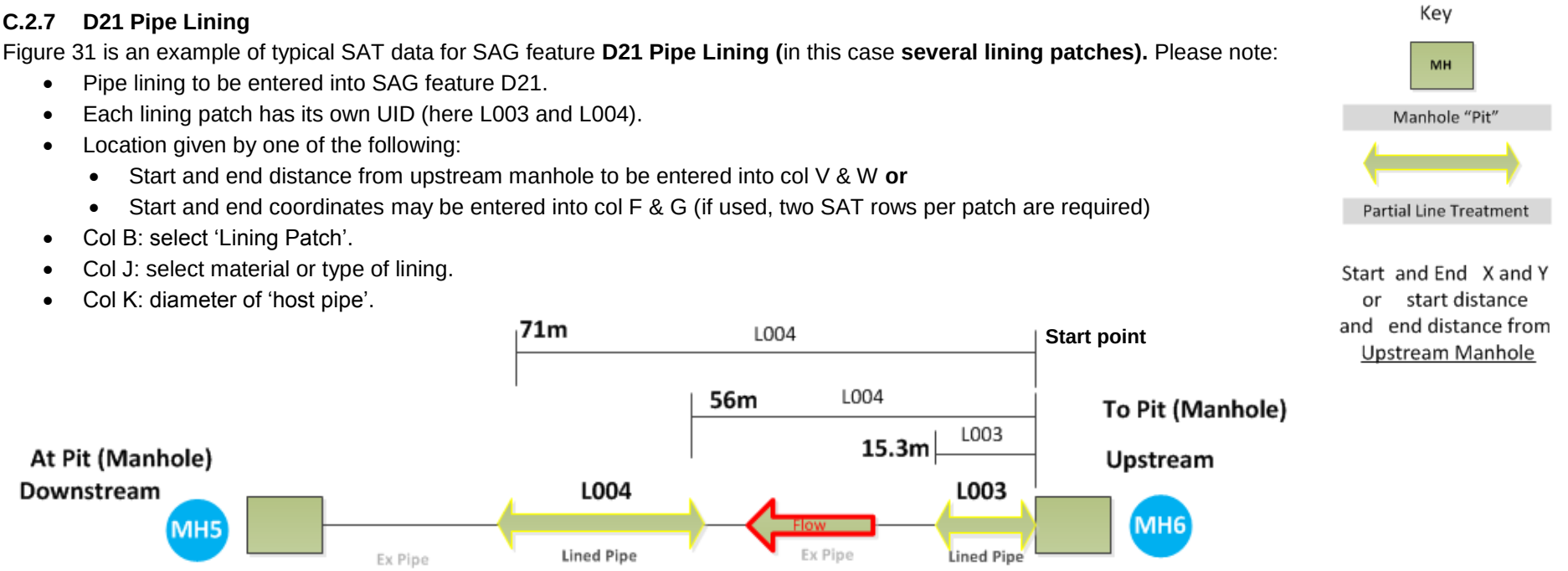
Figure 30: Partial length pipe lining

Lining from 0 to 55.6 m (partial)

C.2.7 D21 Pipe Lining

Figure 31 is an example of typical SAT data for SAG feature **D21 Pipe Lining (**in this case **several lining patches).** Please note:

- Pipe lining to be entered into SAG feature D21.
- Each lining patch has its own UID (here L003 and L004).
- Location given by one of the following:
  - Start and end distance from upstream manhole to be entered into col V & W **or**
  - Start and end coordinates may be entered into col F & G (if used, two SAT rows per patch are required)
- Col B: select 'Lining Patch'.
- Col J: select material or type of lining.
- Col K: diameter of 'host pipe'.



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit
2	D21	Lining Patch	New	No	L003	Line vertex Easting	Line vertex Northing	LEAVE BLANK	1	Cured in Place Pipe	250	MH5	MH6
3	D21	Lining Patch	New	No	L004	Line vertex Easting	Line vertex Northing	LEAVE BLANK	1	Cured in Place Pipe	250	MH5	MH6

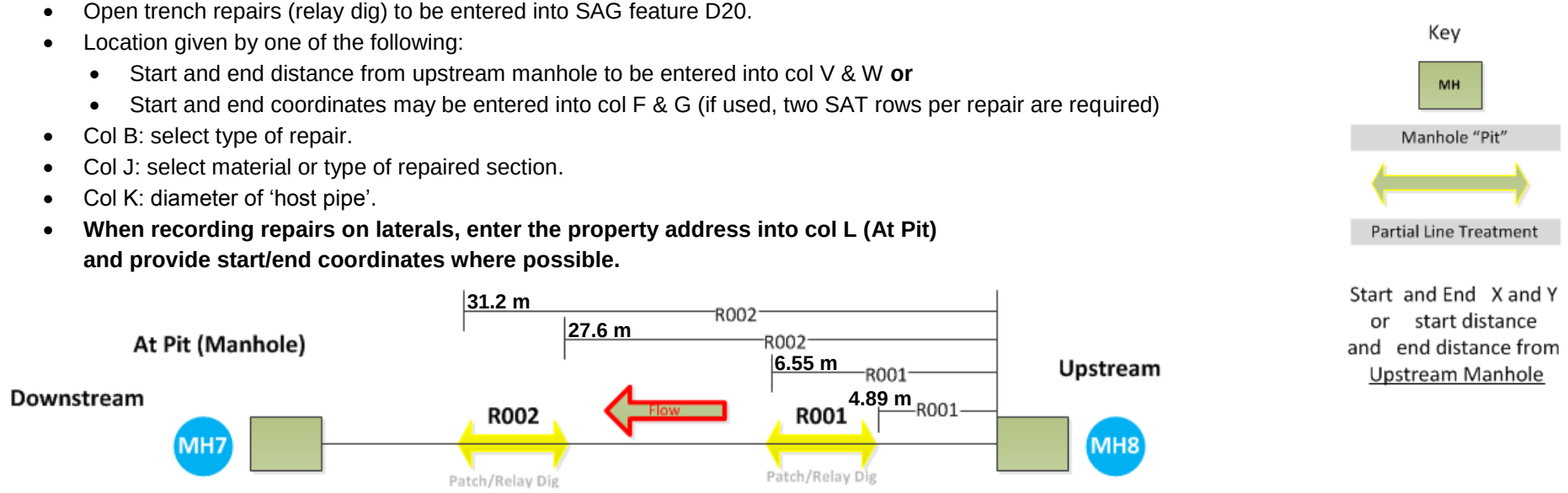
L	M	N	O	P	Q	R	S	T	U	V	W
At Pit	To Pit	Manufacturer	Main Contractor	Pressure or Stiffness Class of Pipe	Date of Commission	Location Certainty	Service Status	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2
H5	MH6	Agru Kunststofftechnik Gmbh	MacDow	LEAVE BLANK	22/10/2013	Approximate XYZ	In Service	15/11/2013	2	0	15.3
H5	MH6	Agru Kunststofftechnik Gmbh	MacDow	LEAVE BLANK	22/10/2013	Approximate XYZ	In Service	15/11/2013	2	56	71

Figure 31: Partial pipe lining – several patches

C.2.8 D20 Repair/Relay Dig

Figure 32 is an example of typical SAT data for SAG feature **D20 Repair/Relay Dig.** Please note:

- Open trench repairs (relay dig) to be entered into SAG feature D20.
- Location given by one of the following:
  - Start and end distance from upstream manhole to be entered into col V & W **or**
  - Start and end coordinates may be entered into col F & G (if used, two SAT rows per repair are required)
- Col B: select type of repair.
- Col J: select material or type of repaired section.
- Col K: diameter of 'host pipe'.
- **When recording repairs on laterals, enter the property address into col L (At Pit) and provide start/end coordinates where possible.**



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit
2	D20	Clamp	New	Yes	R001	Line vertex Easting	Line vertex Northing	LEAVE BLANK	1	Clamp	300	MH7	MH8
3	D20	New Pipe	New	Yes	R002	Line vertex Easting	Line vertex Northing	LEAVE BLANK	1	Polyvinyl Chloride	300	MH7	MH8

L	M	N	O	P	Q	R	S	T	U	V	W
At Pit	To Pit	Manufacturer	Main Contractor	Pressure or Stiffness Class of Pipe	Date of Commission	Location Certainty	Service Status	Date of Survey	Guideline Revision Used	Attribute 1	Attribute 2
MH7	MH8	Iplex Pipelines NZ Ltd	Fletcher	LEAVE BLANK	22/10/2013	Approximate XYZ	In Service	15/11/2013	2	4.89	6.55
MH7	MH8	Hynds Pipe Systems Ltd	Fletcher	LEAVE BLANK	22/10/2013	Approximate XYZ	In Service	15/11/2013	2	27.6	31.2

Repair from 4.89 to 6.55 m
and from 27.6 to 31.2 m

Figure 32: Open trench pipe repairs

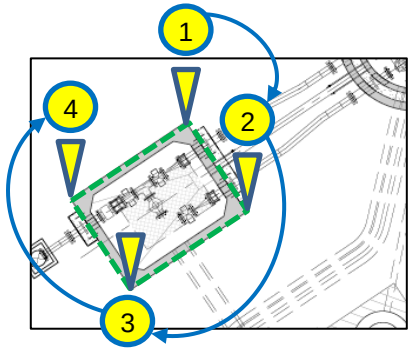
C.3 Outlines Example

C.3.1 D27 Pump Chamber

Figure 33 is an example of typical SAT data for SAG feature **D27 Pump Chamber.** Please note:

- Asset Type is Pump Chamber.
- There is one SAT row for each vertex along the outline of the structure, ordered along the outline.
- Col I: holds the vertex number (yellow number).

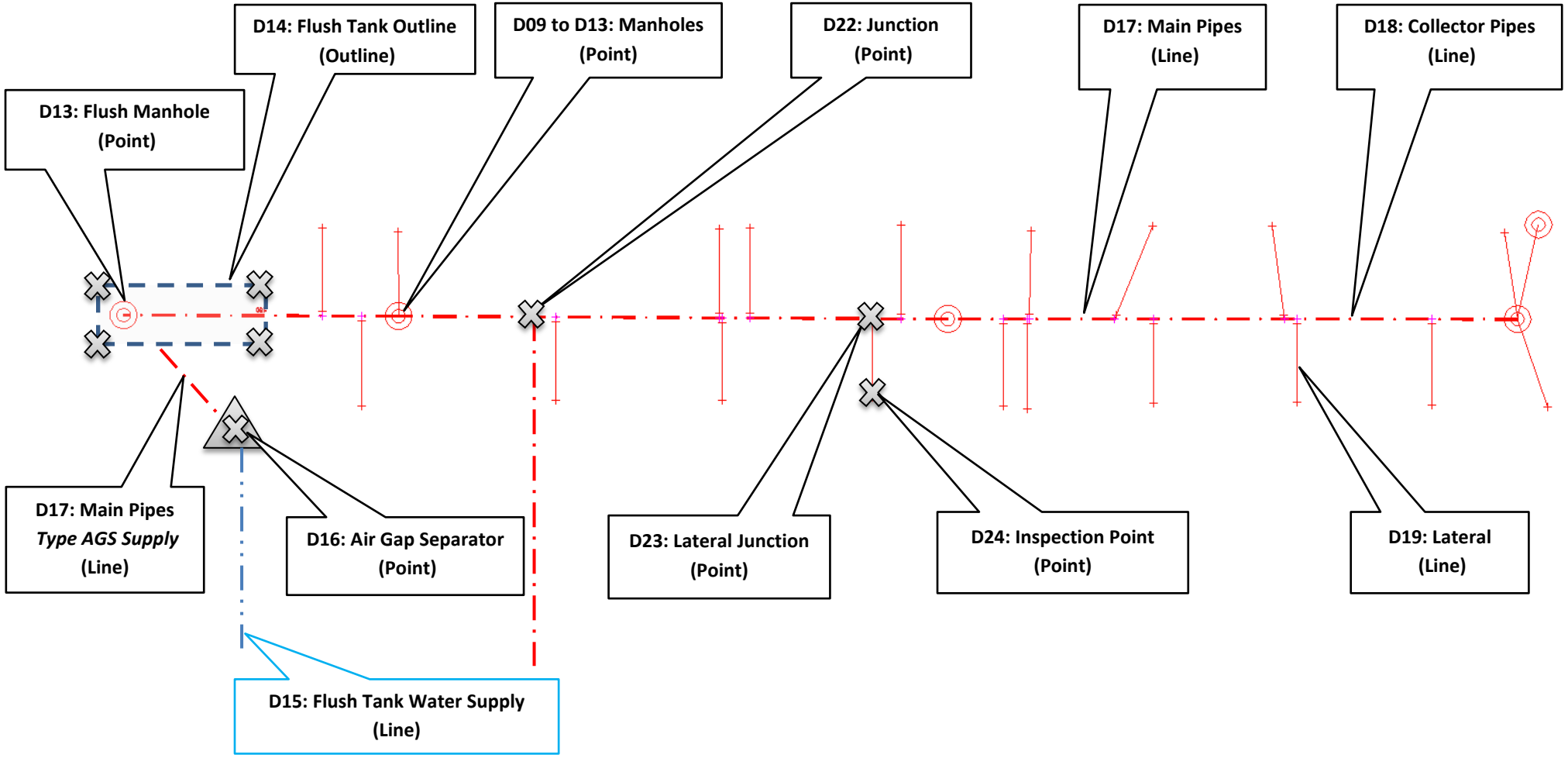
Pick Lists are highlighted in green



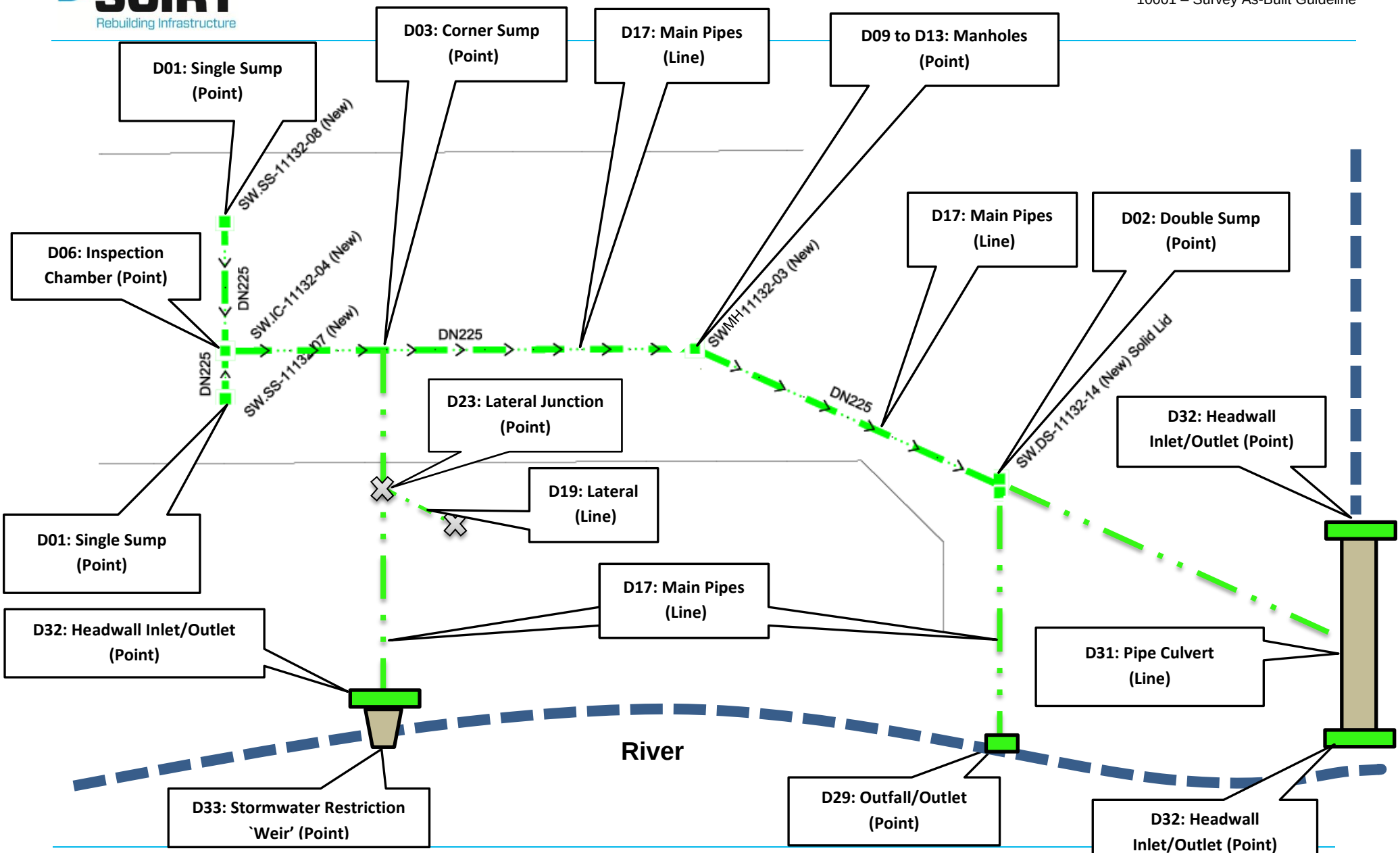
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size	At Pit	To Pit	Manufacturer	Main Contractor	Pressure or Stiffness Class of Pipe	Date of Commission	Location Certainty	Service Status	Date of Survey	Guideline Revision Used
2	D27	Pump Chamber	New	No	WWST-8765	394684.3802	807668.0841	LEAV	1	Concrete	LEAVE I	LEAVE	LEAVE I	LEAVE BLA	Fletcher	LEAVE BLANK	20/04/2013	Survey Accurate	In Service	28/04/2013	2
3	D27	Pump Chamber	New	No	WWST-8765	394692.7146	807668.1172	LEAV	2	Concrete	LEAVE I	LEAVE	LEAVE I	LEAVE BLA	Fletcher	LEAVE BLANK	20/04/2013	Survey Accurate	In Service	28/04/2013	2
4	D27	Pump Chamber	New	No	WWST-8765	394692.7146	807663.3878	LEAV	3	Concrete	LEAVE I	LEAVE	LEAVE I	LEAVE BLA	Fletcher	LEAVE BLANK	20/04/2013	Survey Accurate	In Service	28/04/2013	2
5	D27	Pump Chamber	New	No	WWST-8765	394684.5787	807663.4208	LEAV	4	Concrete	LEAVE I	LEAVE	LEAVE I	LEAVE BLA	Fletcher	LEAVE BLANK	20/04/2013	Survey Accurate	In Service	28/04/2013	2

Figure 33: Line Asset Input Example of Pump Station Structure Outline 'Pump Chamber' (Outline)

Appendix D As-built Requirements for Gravity Wastewater and Stormwater Systems

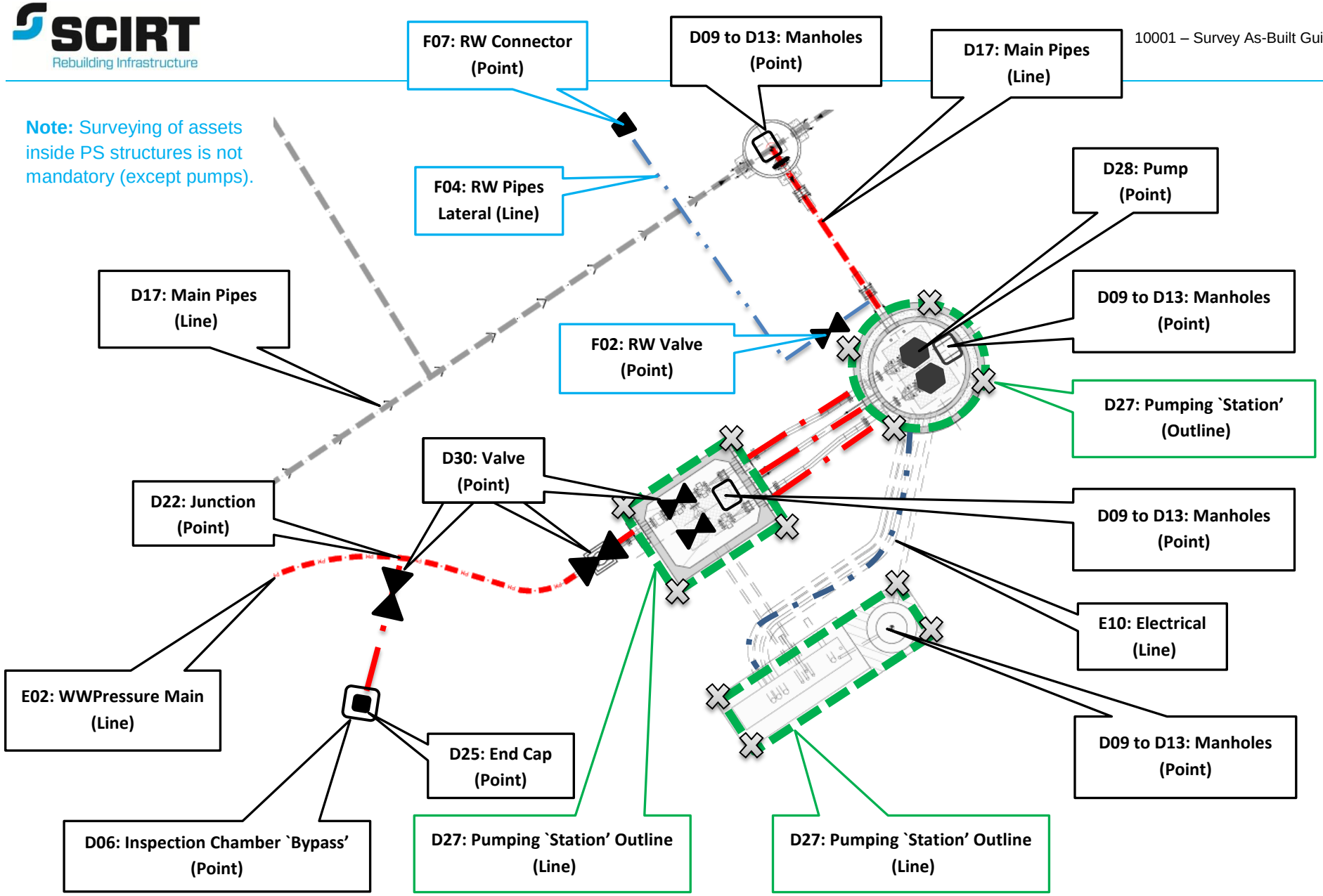


Gravity Wastewater – Overview



Stormwater – Overview

Note: Surveying of assets inside PS structures is not mandatory (except pumps).



Pumping Station – Overview

As-Built requirements (SW)

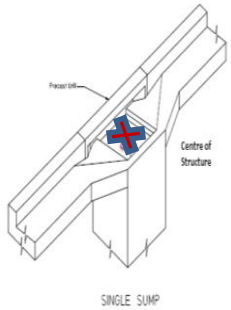
D01: Single Sump

Name **Single Sump (Point)**

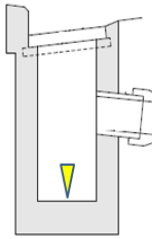
Point Type **D01** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D01
B	Specific type of sump	Select from pick list: domSCIRTSWInletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at base of pit (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of sump lid	Select from pick list: domSCIRTLidStyle
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material of Sump	Select from pick list: domSCIRTAccessConstruction
V	Type of security on sump access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number

Centre of Structure
X Y



Sump RL
Z



Lowest Corner Lid Z

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
See Appendix C.1.2 for an SAT example.

As-Built requirements (SW)

D02: Double Sump

Name **Double Sump (Point)**

Point Type **D02** "Point Asset Inputs"

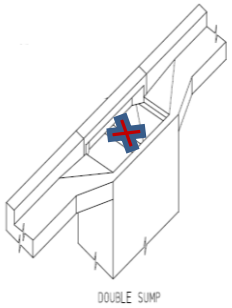
SAT Column	SAG Description	Valid Values
A	Type of point feature	D02
B	Specific type of sump	Select from pick list: domSCIRTSWInletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at base of pit (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of sump lid	Select from pick list: domSCIRTLidStyle
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material of Sump	Select from pick list: domSCIRTAccessConstruction
V	Type of security on sump access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number

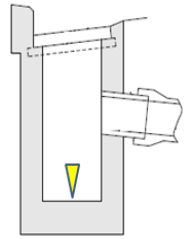
Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
See Appendix C.1.2 for an SAT example.

Centre of structure
X Y

Sump RL
Z





Lowest Corner Lid Z

As-Built requirements (SW)

D03: Corner Sump

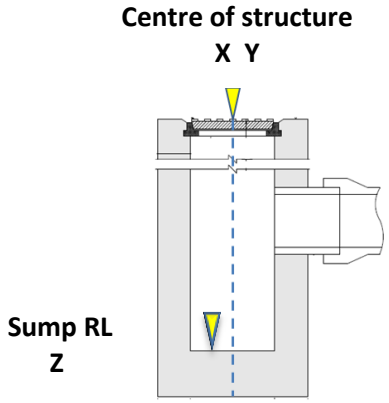
Name **Corner Sump (Point)**

Point Type **D03** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D03
B	Specific type of sump	Select from pick list: domSCIRTSWInletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at base of pit (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of sump lid	Select from pick list: domSCIRTLidStyle
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material of Sump	Select from pick list: domSCIRTAccessConstruction
V	Type of security on sump access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
See Appendix C.1.2 for an SAT example.



Lowest Corner Lid Z

As-Built requirements (SW)

D04: Triple Sump

Name **Triple Sump (Point)**

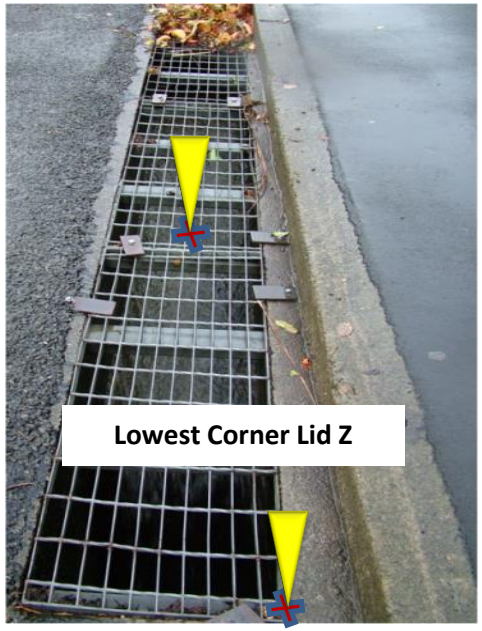
Point Type **D04** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D04
B	Specific type of sump	Select from pick list: domSCIRTSWInletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at base of pit (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of sump lid	Select from pick list: domSCIRTLidStyle
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material of Sump	Select from pick list: domSCIRTAccessConstruction
V	Type of security on sump access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
See Appendix C.1.2 for an SAT example.

Centre of structure
X Y



As-Built requirements (SW)

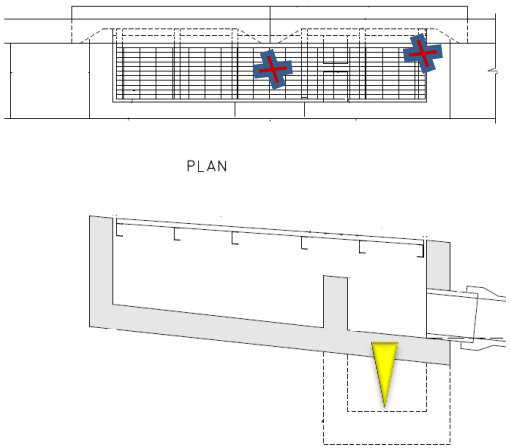
D05: Hillside Sump

Name	**Hillside Sump (Point)**
Point Type	**D05** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D05
B	Specific type of sump	Select from pick list: domSCIRTSWInletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at base of pit (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of sump lid	Select from pick list: domSCIRTLidStyle
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material of Sump	Select from pick list: domSCIRTAccessConstruction
V	Type of security on sump access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
See Appendix C.1.2 for an SAT example.



As-Built requirements (WW, SW)

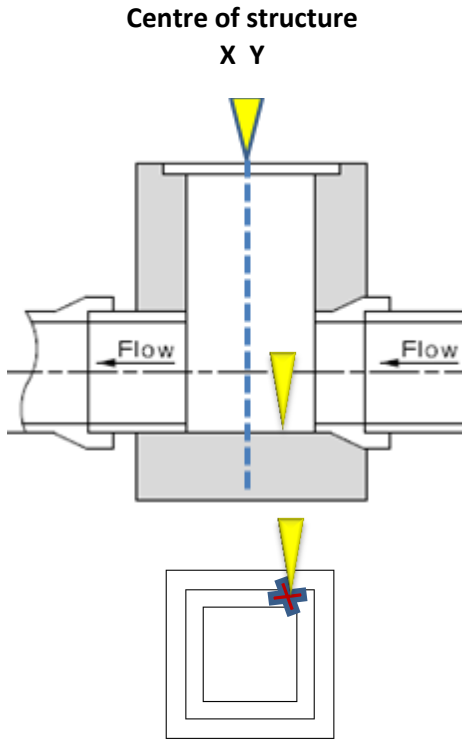
D06: Inspection Chamber

Name	**Inspection Chamber (Point)**
Point Type	**D06** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D06
B	Type of manhole or access	Select from pick list: domSCIRTXXAccessType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at manhole base (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of access lid	Select from pick list: domSCIRTLidStyle
S	Shape of access lid	Select from pick list: domSCIRTLidType
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material	Select from pick list: domSCIRTAccessConstruction
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number
X	Treatment material for refurbished manholes	Select from pick list: domSCIRTAccessTreatmentType

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col W: leave blank/unchanged for circular chambers
Col X: leave blank/unchanged if N/A
See Appendix C.1.1 for an SAT example.



As-Built requirements (SW)

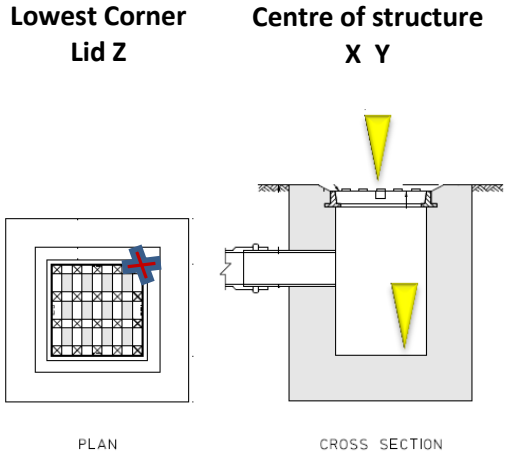
D07: Small Trafficable Sump

Name	**Small Trafficable Sump (Point)**
Point Type	**D07** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D07
B	Specific type of sump	Select from pick list: domSCIRTSWInletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at base of pit (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of sump lid	Select from pick list: domSCIRTLidStyle
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material of Sump	Select from pick list: domSCIRTAccessConstruction
V	Type of security on sump access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
See Appendix C.1.2 for an SAT example.



As-Built requirements (SW)

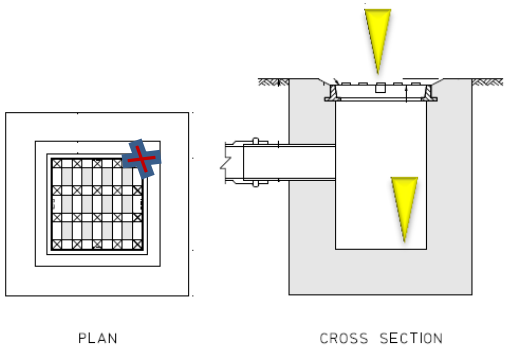
D08: House Drain Sump

Name	**House Drain Sump (Point)**
Point Type	**D08** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D08
B	Specific type of sump	Select from pick list: domSCIRTSWInletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at base of pit (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of sump lid	Select from pick list: domSCIRTLidStyle
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material of Sump	Select from pick list: domSCIRTAccessConstruction
V	Type of security on sump access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
See Appendix C.1.2 for an SAT example.



As-Built requirements (WW, SW)

D09: Square Manhole Vented

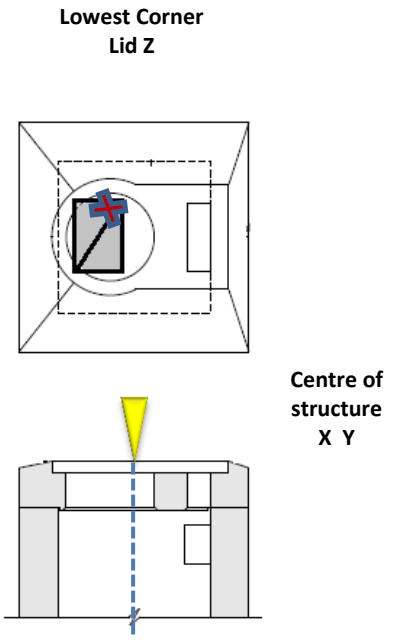
Name **Square Manhole Vented (Point)**

Point Type **D09** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D09
B	Type of manhole or access	Select from pick list: domSCIRTXXAccessType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at manhole base (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of access lid	Select from pick list: domSCIRTLidStyle
S	Shape of access lid	Select from pick list: domSCIRTLidType
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material	Select from pick list: domSCIRTAccessConstruction
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number
X	Treatment material for refurbished manholes	Select from pick list: domSCIRTAccessTreatmentType

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col X: leave blank/unchanged if N/A
See Appendix C.1.1 for an SAT example.



As-Built requirements (WW, SW)

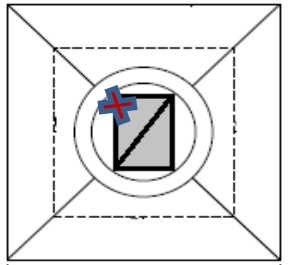
D10: Square Manhole Non Vented

Name **Square Manhole Non Vented (Point)**

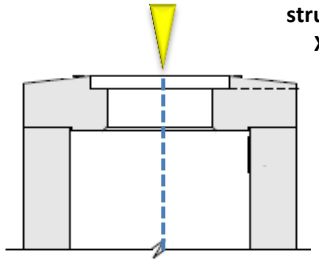
Point Type **D10** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D10
B	Type of manhole or access	Select from pick list: domSCIRTXXAccessType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at manhole base (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of access lid	Select from pick list: domSCIRTLidStyle
S	Shape of access lid	Select from pick list: domSCIRTLidType
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material	Select from pick list: domSCIRTAccessConstruction
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number
X	Treatment material for refurbished manholes	Select from pick list: domSCIRTAccessTreatmentType

Lowest Corner Lid Z



Centre of structure X Y



Manhole Base RL Z

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col X: leave blank/unchanged if N/A
See Appendix C.1.1 for an SAT example.

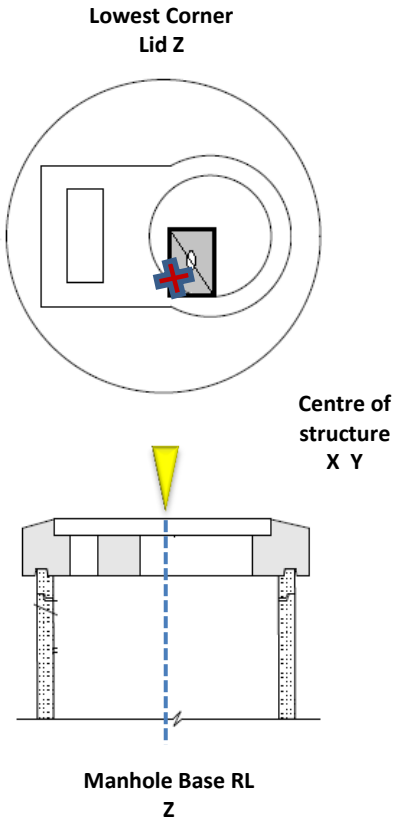
As-Built requirements (WW, SW)

D11: Circular Manhole Vented

Name **Circular Manhole Vented (Point)**

Point Type **D11** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D11
B	Type of manhole or access	Select from pick list: domSCIRTXXAccessType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at manhole base (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of access lid	Select from pick list: domSCIRTLidStyle
S	Shape of access lid	Select from pick list: domSCIRTLidType
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material	Select from pick list: domSCIRTAccessConstruction
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number
X	Treatment material for refurbished manholes	Select from pick list: domSCIRTAccessTreatmentType



Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col W: leave blank/unchanged for circular manholes
Col X: leave blank/unchanged if N/A
See Appendix C.1.1 for an SAT example.

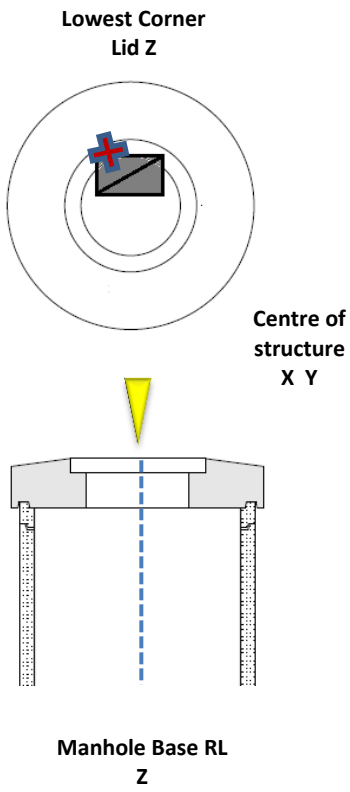
As-Built requirements (WW, SW)

D12: Circular Manhole Non Vented

Name **Circular Manhole Non Vented (Point)**

Point Type **D12** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D12
B	Type of manhole or access	Select from pick list: domSCIRTXXAccessType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at manhole base (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of access lid	Select from pick list: domSCIRTLidStyle
S	Shape of access lid	Select from pick list: domSCIRTLidType
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material	Select from pick list: domSCIRTAccessConstruction
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number
X	Treatment material for refurbished manholes	Select from pick list: domSCIRTAccessTreatmentType



Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col W: leave blank/unchanged for circular manholes
Col X: leave blank/unchanged if N/A
See Appendix C.1.1 for an SAT example.

As-Built requirements (WW, SW)

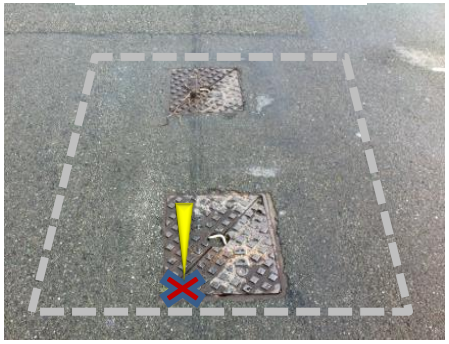
D13: Flush Manhole

Name **Flush Manhole (Point)**

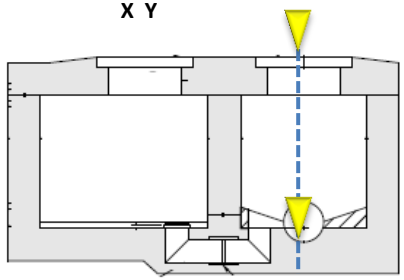
Point Type **D13** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D13
B	Type of manhole or access	Select from pick list: domSCIRTXXAccessType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at manhole base (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of access lid	Select from pick list: domSCIRTLidStyle
S	Shape of access lid	Select from pick list: domSCIRTLidType
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material	Select from pick list: domSCIRTAccessConstruction
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number
X	Treatment material for refurbished manholes	Select from pick list: domSCIRTAccessTreatmentType

Lowest Corner Lid Z



Centre of structure
X Y



Manhole Base RL
Z

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col W: leave blank/unchanged for circular manholes
Col X: leave blank/unchanged if N/A
See Appendix C.1.1 for an SAT example.

As-Built requirements (WW)

D14: Flush Tank

Name **Flush Tank (Outline)**

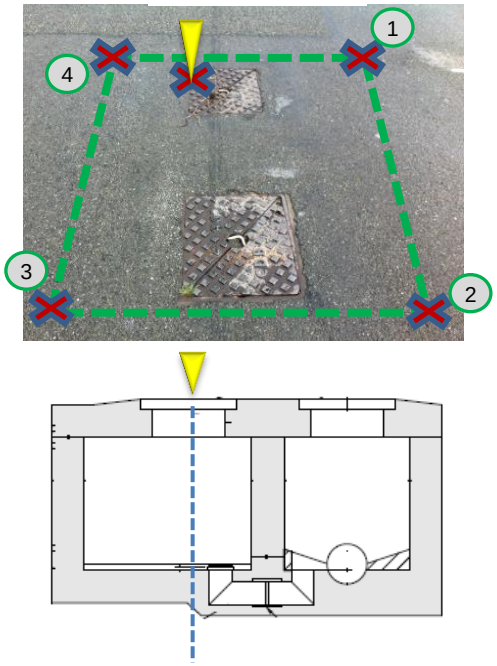
Point Type **D14** "Line Asset Inputs"

Outline features require at least three row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of polygon feature	D14
B	Vented or non vented	Select from pick list: domSCIRTWWFlushTankType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Polygon vertex Easting coordinate	data - decimal number
G	Polygon vertex Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
I	Number of vertex (point along outline) or arc code	data - text
J	Construction Material	Select from pick list: domSCIRTAccessConstruction
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Capacity of tank in litres	data - decimal number
W	Shape of access lid	Select from pick list: domSCIRTLidType
X	Type of security on access	Select from pick list: domSCIRTAccessSecurity
Y	Flushing interval of tank (pick closest)	Select from pick list: domSCIRTFrequency
Z	How is the tank operated	Select from pick list: domSCIRTWWFlushTankOperation

All corner points along outline to be surveyed.
Create one SAT row per surveyed point.

Lowest Corner Lid Z



Centre of structure X Y

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along outline
Col V: refers to the operational capacity of the tank
See Appendix C.3.1 for an SAT example.

As-Built requirements (WW, RW)

D15: Flush Tank Water Supply

Name **Flush Tank Water Supply (Line)**

Line Type **D15** "Line Asset Inputs"

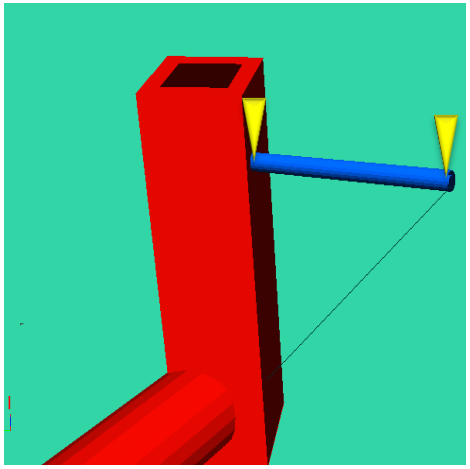
Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	D15
B	Specific type of pipe	Select from pick list: domSCIRTWSPipeType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end
Col W: accuracy 0.5m

Centre of structure
X Y



All bends, start/end points to be surveyed.
Create one SAT row per surveyed point.

As-Built requirements (WW)

D16: Air Gap Separator

Name **Air Gap Separator (Point)**

Point Type **D16** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D16
B	Specific point feature	data - text
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
K	Nominal diameter in mm	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of structure
X Y

As-Built requirements (WW, SW)

D17: Main Pipes

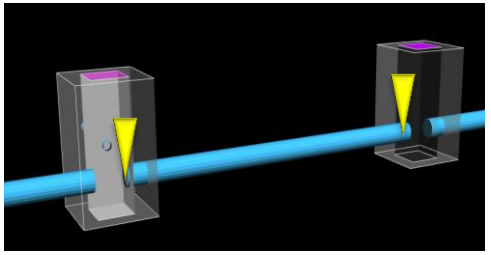
Name **Main Pipes (Line)**

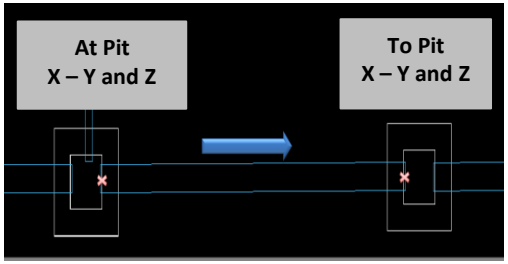
Line Type **D17** "Line Asset Inputs"

Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	D17
B	Specific type of pipe	Select from pick list: domSCIRTWWPipeType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
H	Invert level at vertex	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
L	At Pit - UID name from design drawing	data - text
M	To Pit - UID name from design drawing	data - text
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Pipe Shape	Select from pick list: domSCIRTPipeShape
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched

Centre of structure
X Y and Z





All bends, start/end points to be surveyed.
Create one SAT row per surveyed point.

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end
Col W: accuracy 0.5m
See Appendix C.2.1 for an SAT example.

As-Built requirements (WW, SW)

D18: Collector Pipes

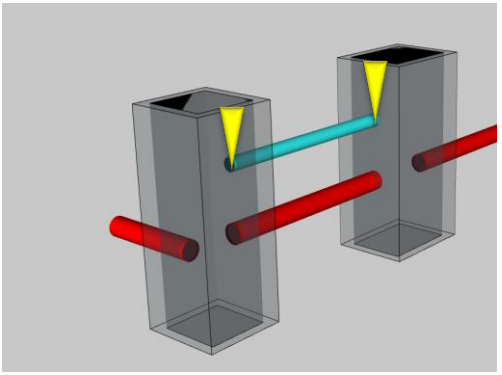
Name **Collector Pipes (Line)**

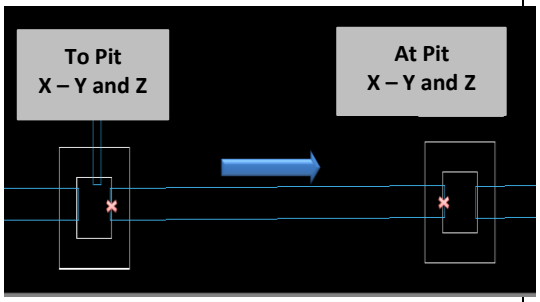
Line Type **D18** "Line Asset Inputs"

Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	D18
B	Specific type of pipe	Select from pick list: domSCIRTWWPipeType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
H	Invert level at vertex	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
L	At Pit - UID name from design drawing	data - text
M	To Pit - UID name from design drawing	data - text
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Pipe Shape	Select from pick list: domSCIRTPipeShape
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched

Centre of structure
X Y and Z





All bends, start/end points to be surveyed. Create one SAT row per surveyed point.

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end
Col W: accuracy 0.5m
See Appendix C.2.1 for an SAT example.

As-Built requirements (WW, SW)

D19: Lateral

Name **Lateral (Line)**

Line Type **D19** "Line Asset Inputs"

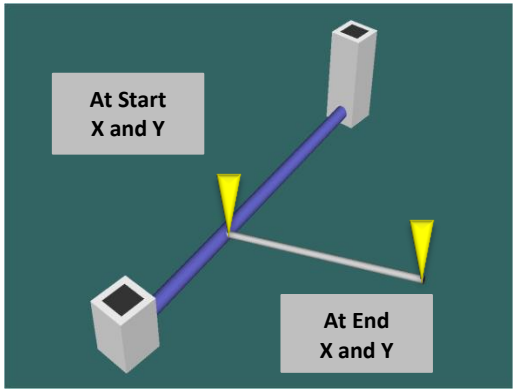
Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	D19
B	Specific type of lateral	Select from pick list: domSCIRTXXLateralType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Pipe Shape	Select from pick list: domSCIRTPipeShape
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched
Y	Do several units share this lateral? (yes/no)	Select from pick list: domSCIRTSharedConnection
AA	Type of lateral junction	Select from pick list: domSCIRTEyeType
AB	Distance of IP from lateral start (from connection to existing private lateral) in mm	data - number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end
Col W: accuracy 0.5m
See Appendix C.2.2 for an SAT example.

Centre of structure
X Y



All bends, start/end points to be surveyed.
Create one SAT row per surveyed point.

As-Built requirements (WW, SW, RW)

D20: Repair/Relay Dig

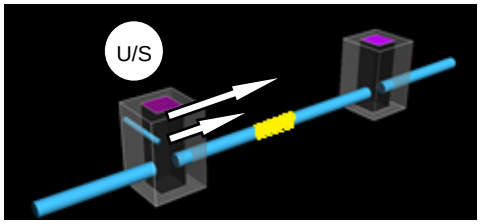
Name **Repair/Relay Dig (Line)**

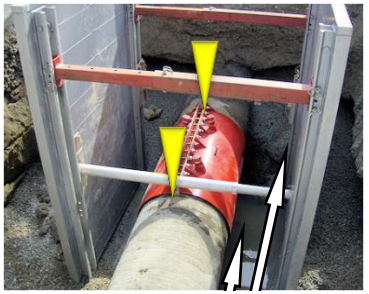
Line Type **D20** "Line Asset Inputs"

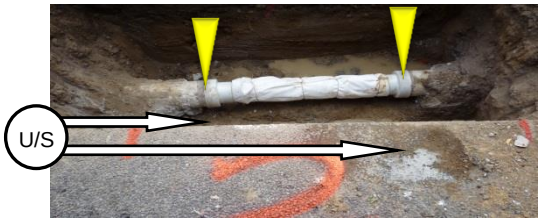
If entered without coordinates, this feature requires only one row per repair.

SAT Column	SAG Description	Valid Values
A	Type of line feature	D20
B	Type of repair	Select from pick list: domSCIRTRepairType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material used for repair	Select from pick list: domSCIRTRepairMaterial
K	Nominal diameter in mm	data - number
L	At Pit - UID name from design drawing	data - text
M	To Pit - UID name from design drawing	data - text
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Distance of lining/repair start from inner wall of structure of upstream MH in m	data - decimal number
W	Distance of lining/repair end from inner wall of structure of upstream MH in m	data - decimal number

Distance to start and end of repair from upstream MH







Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Use this feature for dig repairs only (new pipe sections or pipe clamps) – pipe lining is to be entered into D21
Col V&W: Make sure to measure distances from the inner wall of the upstream manhole structure.
See Appendix C.2.8 for an SAT example.

As-Built requirements (WW, SW)

D21: Pipe Lining

Name **Pipe Lining (Line)**

Line Type **D21** "Line Asset Inputs"

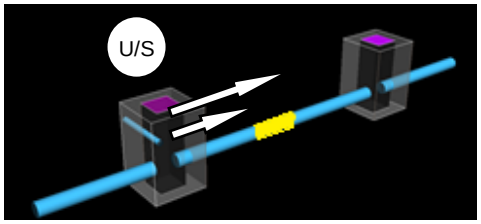
If entered without coordinates, this feature requires only one row per patch.

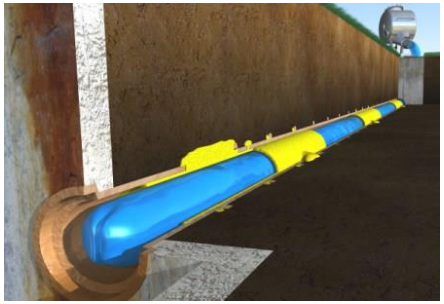
SAT Column	SAG Description	Valid Values
A	Type of line feature	D21
B	Type of repair	Select from pick list: domSCIRTRepairType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material used for repair	Select from pick list: domSCIRTRepairMaterial
K	Nominal diameter in mm	data - number
L	At Pit - UID name from design drawing	data - text
M	To Pit - UID name from design drawing	data - text
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Distance of lining/repair start from inner wall of structure of upstream MH in m	data - decimal number
W	Distance of lining/repair end from inner wall of structure of upstream MH in m	data - decimal number

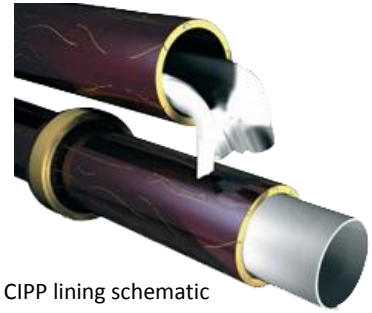
Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Use this feature for pipe lining only (lining patches or fully lined pipes) – pipe repairs are to be entered into D20
Col V&W: Make sure to measure distances from the inner wall of the upstream manhole structure.
See Appendix C.2.5 up to C.2.7 for SAT examples.

Distance to start and end of lining from upstream MH







CIPP lining schematic

As-Built requirements (WW, SW)

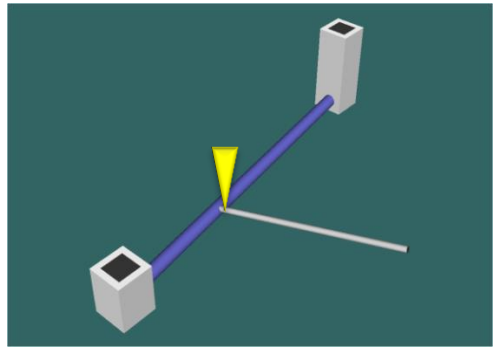
D22: Junction

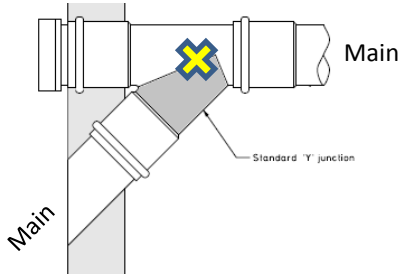
Name **Junction (Point)**

Point Type **D22** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D22
B	Type of junction	Select from pick list: domSCIRTJunctionType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number

Centre of Junction
X Y





Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

As-Built requirements (WW, SW)

D23: Lateral Junction

Name **Lateral Junction (Point)**

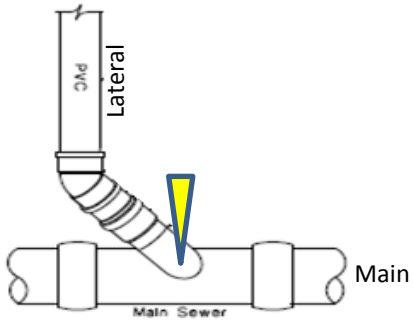
Point Type **D23** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D23
B	Type of lateral junction	Select from pick list: domSCIRTEyeType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
See Appendix C.1.3 for an SAT example.

Centre of Lateral Junction
X Y



This asset is located at the junction between a lateral and a main

As-Built requirements (WW, SW)

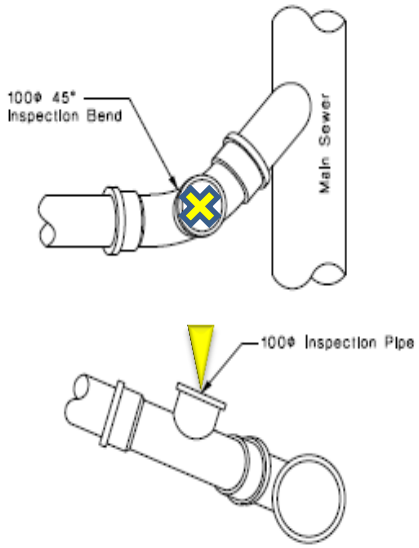
D24: Inspection Point

Name **Inspection Point (Point)**

Point Type **D24** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D24
B	Type of manhole or access	Select from pick list: domSCIRTXXAccessType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
U	Construction Material	Select from pick list: domSCIRTAccessConstruction

Centre of Inspection Point
X Y



Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
See Appendix C.1.4 for an SAT example.

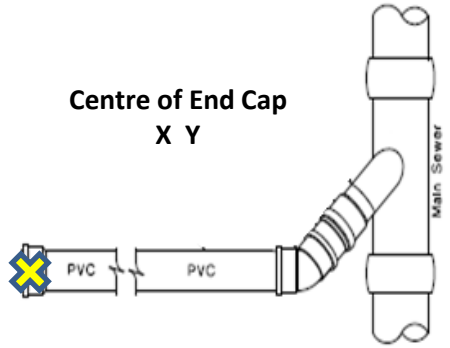
As-Built requirements (WW, SW)

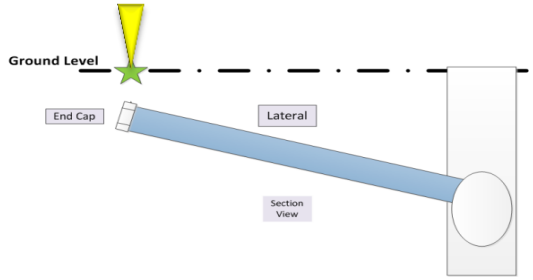
D25: End Cap

Name **End Cap (Point)**

Point Type **D25** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D25
B	Specific type of end cap	Select from pick list: domSCIRTEndCapType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number





Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

As-Built requirements (WW, SW)

D26: Thrust Block

Name **Thrust Block (Point or Outline)**

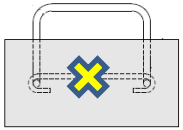
Line Type **D26** "Line Asset Inputs"

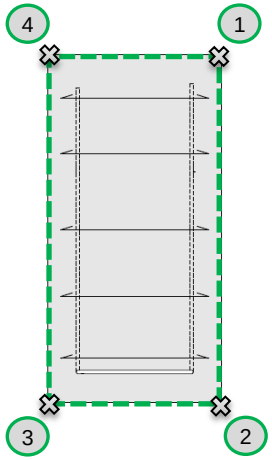
Outline features require at least three row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of polygon feature	D26
B	Specific type of structure	Select from pick list: domSCIRTXXStructureType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Polygon vertex Easting coordinate	data - decimal number
G	Polygon vertex Northing coordinate	data - decimal number
I	Number of vertex (point along outline) or arc code	data - text
J	Predominant material of structure	Select from pick list: domSCIRTXXStructureMaterial
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number

Centre of structure *or*
all corner points along outline to be surveyed.
Create one SAT row per surveyed point.

Thrust Block Outline *or*
Centre of Structure
X Y





Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along outline
See Appendix C.3.1 for an SAT example.

As-Built requirements (WW, SW)

D27: Pumping Station

Name **Pumping Station (Outline)**

Line Type **D27** "Line Asset Inputs"

Outline features require at least three row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of polygon feature	D27
B	Specific type of structure	Select from pick list: domSCIRTXXStructureType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Polygon vertex Easting coordinate	data - decimal number
G	Polygon vertex Northing coordinate	data - decimal number
I	Number of vertex (point along outline) or arc code	data - text
J	Predominant material of structure	Select from pick list: domSCIRTXXStructureMaterial
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number

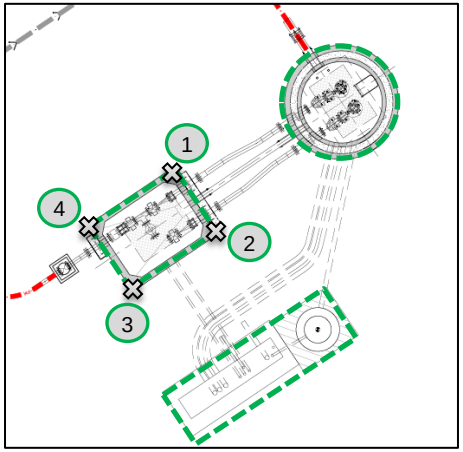
All corner points along outline to be surveyed.
Create one SAT row per surveyed point.

See SAG feature E10 for surveying pump station cables.

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Use this feature for all pump station related structures or other larger manholes, populate col B accordingly.
Col I: enter number of vertex along outline
See Appendix C.1.5 and C.3.1 for an SAT example and beginning of Appendix D for more information.

Pump Station or Structure Outline
X Y



As-Built requirements (WW, SW)

D28: Pump

Name **Pump (Point)**

Point Type **D28** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D28
B	Type of function pump used for	Select from pick list: domSCIRTXXPumpType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	Height above datum	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Name and/or number of pump station	data - text
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Serial number of asset	data - text
V	Backup Energy Source	Select from pick list: domSCIRTEnergySource
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number
X	Capacity of pump in litres per hour	data - number
Y	Manufacturer warranty reference	data - text
Z	Manufacturer warranty term in years	data - decimal number

Centre of Pump
X Y and Z (on pump)

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col R&W: leave blank/unchanged if N/A

As-Built requirements (WW, SW)

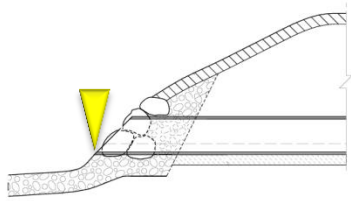
D29: Outfall/Outlet

Name **Outlet/Outfall (Point)**

Point Type **D29** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D29
B	Type of outfall/outlet	Select from pick list: domSCIRTOutletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	Height above datum	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
V	Type of security on outlet access	Select from pick list: domSCIRTAccessSecurity

Outlet/Outfall
X Y and Z



Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

As-Built requirements (WW, SW)

D30: Valve

Name	**Valve (Point)**
Point Type	**D30** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D30
B	Type of valve	Select from pick list: domSCIRTXXValveType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	Height above datum	data - decimal number
K	Nominal diameter in mm	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Valve normal operating position - open or closed	Select from pick list: domSCIRTValveNormalOperating
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Valve closure rotation direction	Select from pick list: domSCIRTValveClosureRotation
W	Main function of valve	Select from pick list: domSCIRTValveFunction
X	Valve control point	Select from pick list: domSCIRTValveControlPoint
Y	Manual or motorised valve	Select from pick list: domSCIRTValveActuation
Z	Manufacturer warranty term in years	data - decimal number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of Valve
X Y and Z

As-Built requirements (SW)

D31: Culvert

Name **Culvert (Line)**

Line Type **D31** "Line Asset Inputs"

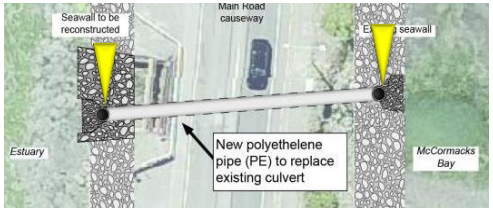
Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	D31
B	Specific type of pipe	Select from pick list: domSCIRTSWPipeType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
H	Invert level at vertex	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
L	At Pit - UID name from design drawing	data - text
M	To Pit - UID name from design drawing	data - text
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Pipe Shape	Select from pick list: domSCIRTPipeShape
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Create one SAT row for each vertex, starting at downstream pit
Col I: enter number of vertex along line starting with the downstream end
Col W: accuracy 0.5m

Centre of structure
X Y and Z



All bends, start/end points to be surveyed. Create one SAT row per surveyed point.

As-Built requirements (SW)

D32: Headwall Inlet/Outlet

Name **Headwall Inlet/Outlet (Point)**

Point Type **D32** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D32
B	Type of outlet/outfall	Select from pick list: domSCIRTOutletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	Height above datum	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
V	Type of security on outlet access	Select from pick list: domSCIRTAccessSecurity

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Outlet/Outfall
X Y and Z

As-Built requirements (SW)

D33: Stormwater Flow Restriction

Name **Stormwater Flow Restriction 'Weir' (Point)**

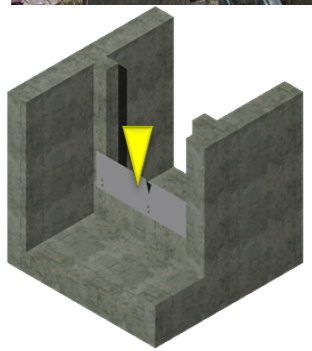
Point Type **D33** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D33
B	Type of stormwater flow restriction	Select from pick list: domSCIRTSWFlowRestrictionType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL at which water overflows	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Flow Restriction
X Y and Z



As-Built requirements (WW, SW, RW)

D34: Structural Pipe Protection

Name **Structural Pipe Protection (Line)**

Point Type **D34** "Point Asset Inputs"

Line features require at least two row entries in the SAT.

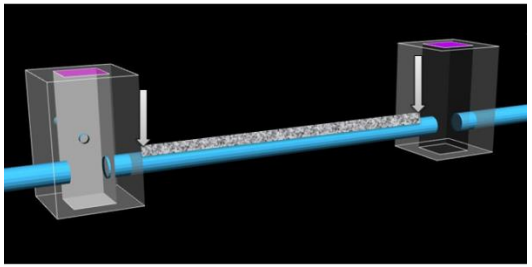
SAT Column	SAG Description	Valid Values
A	Type of line feature	D34
B	Type of structural pipe protection	Select from pick list: domSCIRTPipeProtectionType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number

Create one SAT row per surveyed point.

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end

Pipe Protection
X Y



As-Built requirements (WW, SW)

D35: Vent

Name	**Vent (Point)**
Point Type	**D35** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	D35
B	Specific point feature	data - text
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Does it have telemetry ducts? (yes/no)	Select from pick list: domSCIRTWWTelemetryDucts

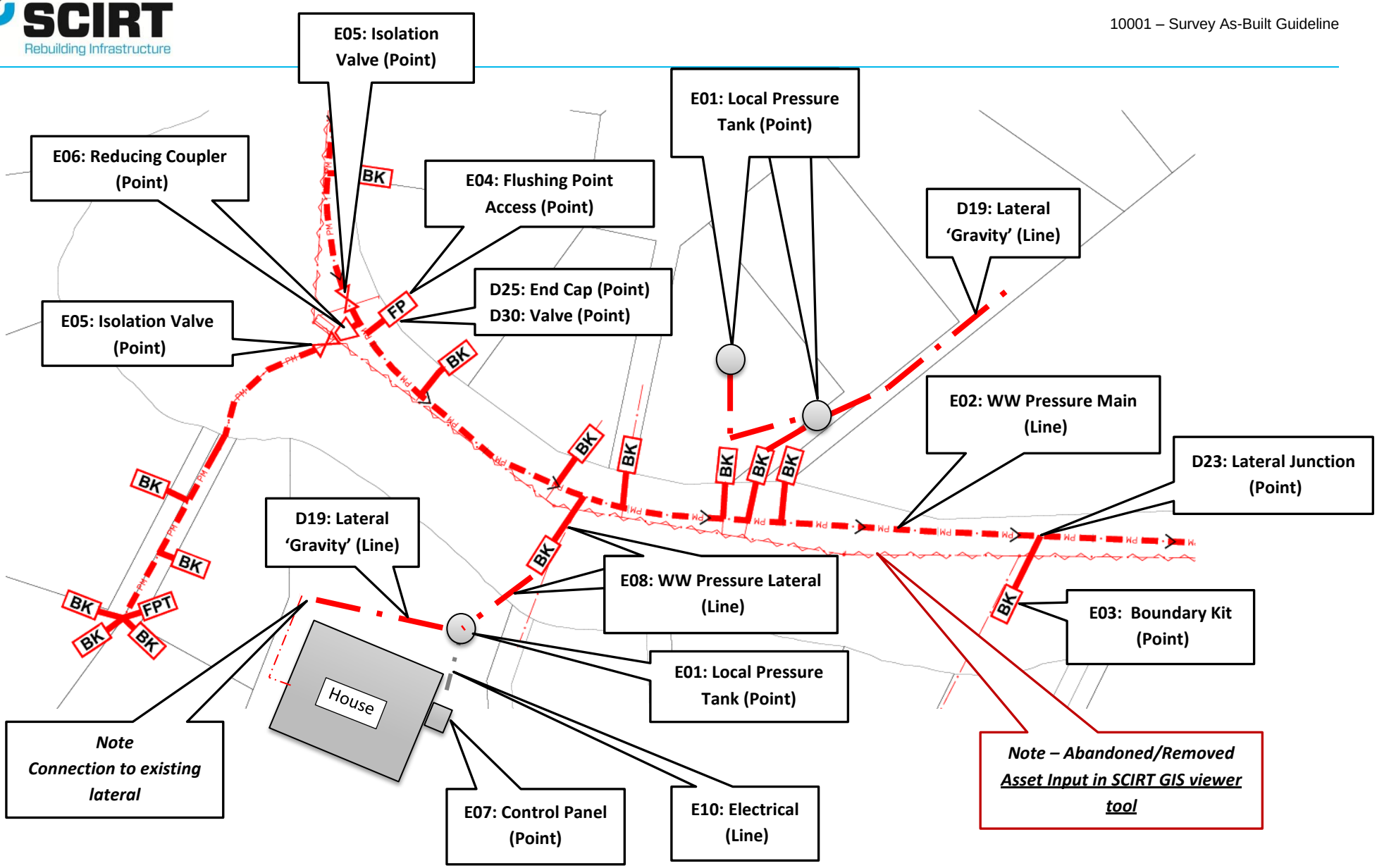
Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of Vent
X Y

See SAG feature E10 for surveying pump station cables.

Appendix E As-built Requirements for Wastewater Pressure System



Wastewater Pressure – Overview

As-Built requirements (WW)

E01: Local Pressure Tank System

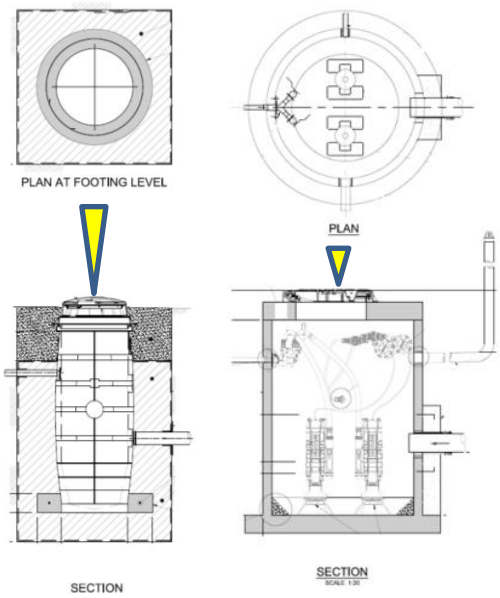
Name	**Local Pressure Tank System (Point)**
Point Type	**E01** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	E01
B	Specific type of pressure tank	Select from pick list: domSCIRTWWPressureTankType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
W	Number of pumps operating in tank	data - number
X	Capacity of tank in litres	data - decimal number
Z	Manufacturer warranty term in years	data - decimal number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of structure
X Y Z



non trafficable

trafficable

As-Built requirements (WW)

E02: WW Pressure Main

Name **WW Pressure Main (Line)**

Point Type **E02** "Line Asset Inputs"

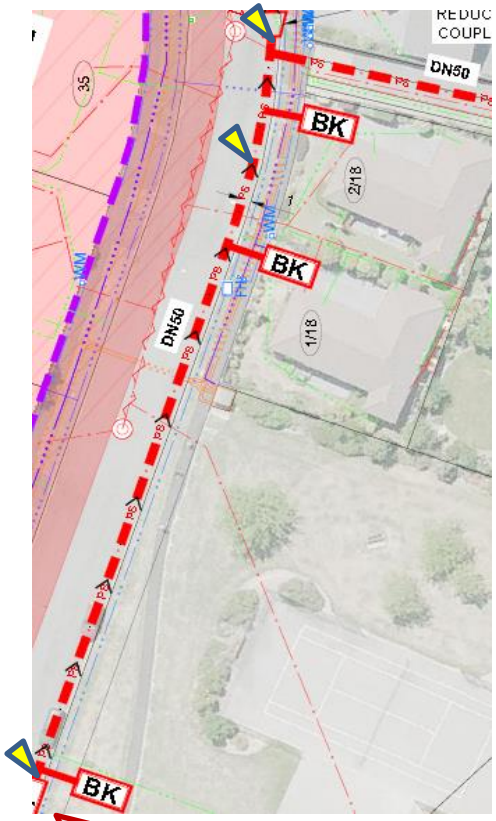
Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	E02
B	Specific type of pipe	Select from pick list: domSCIRTWWPipeType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
H	Invert level at vertex	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
L	At Pit - UID name from design drawing	data - text
M	To Pit - UID name from design drawing	data - text
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Pipe Shape	Select from pick list: domSCIRTPipeShape
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end
Col W: accuracy 0.5m
See Appendix C.2.3 for an SAT example

X Y and Z



All bends, start/end points to be surveyed. Create one SAT row per surveyed point.

As-Built requirements (WW)

E03: Local Pressure Boundary Kit

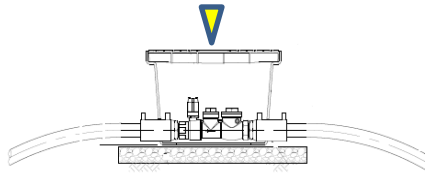
Name **Local Pressure Boundary Kit (Point)**

Point Type **E03** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	E03
B	Standard or non standard kit	Select from pick list: domSCIRTWWBoundaryKitType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Trafficable or non trafficable structure	Select from pick list: domSCIRTTrafficable
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
Z	Manufacturer warranty term in years	data - decimal number

Centre of structure
X Y and Z

PLAN



SECTION

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

As-Built requirements (WW)

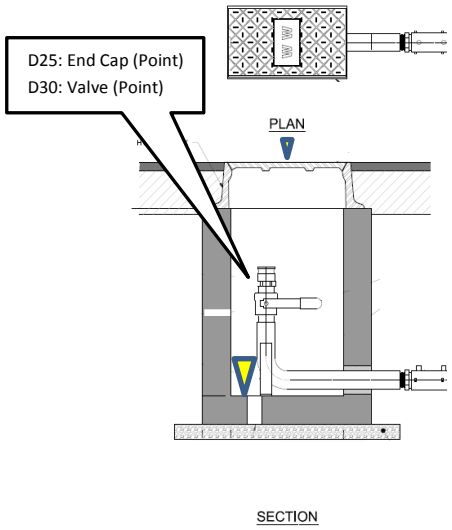
E04: Flushing Point Access

Name **Flushing Point Access (Point)**

Point Type **E04** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	E04
B	Type of manhole or access	Select from pick list: domSCIRTXXAccessType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at manhole base (lowest point)	data - decimal number
K	Width and length of pit (e.g. 600x800) or diameter of pit	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Style of access lid	Select from pick list: domSCIRTLidStyle
S	Shape of access lid	Select from pick list: domSCIRTLidType
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction Material	Select from pick list: domSCIRTAccessConstruction
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity
W	Pit angle - orientation of inner structure to nearest 5 degrees (rectangular pits only)	data - number
X	Treatment material for refurbished manholes	Select from pick list: domSCIRTAccessTreatmentType

Centre of structure
X Y and Z



Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col W: leave blank/unchanged for circular chambers
Col X: leave blank/unchanged if N/A
See Appendix C.1.1 for an SAT example.

As-Built requirements (WW)

E05: Isolation Valve

Name **Isolation Valve (Point)**

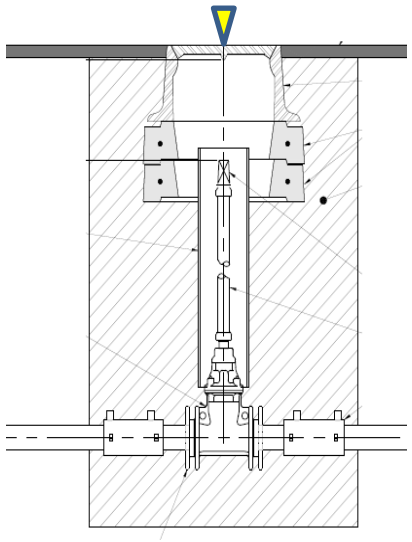
Point Type **E05** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	E05
B	Type of valve	Select from pick list: domSCIRTXXValveType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	Height above datum	data - decimal number
K	Nominal diameter in mm	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Valve normal operating position - open or closed	Select from pick list: domSCIRTValveNormalOperating
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Valve closure rotation direction	Select from pick list: domSCIRTValveClosureRotation
W	Main function of valve	Select from pick list: domSCIRTValveFunction
X	Valve control point	Select from pick list: domSCIRTValveControlPoint
Y	Manual or motorised valve	Select from pick list: domSCIRTValveActuation
Z	Manufacturer warranty term in years	data - decimal number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of structure
X Y and Z



As-Built requirements (WW, SW)

E06: Reducing Coupler

Name **Reducing Coupler (Point)**

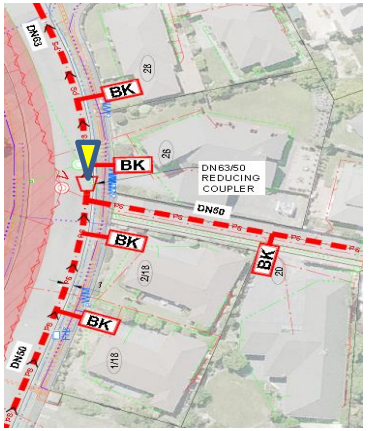
Point Type **E06** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	E06
B	Type of junction	Select from pick list: domSCIRTJunctionType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of structure
X Y



As-Built requirements (WW)

E07: Local Pressure Control Panel

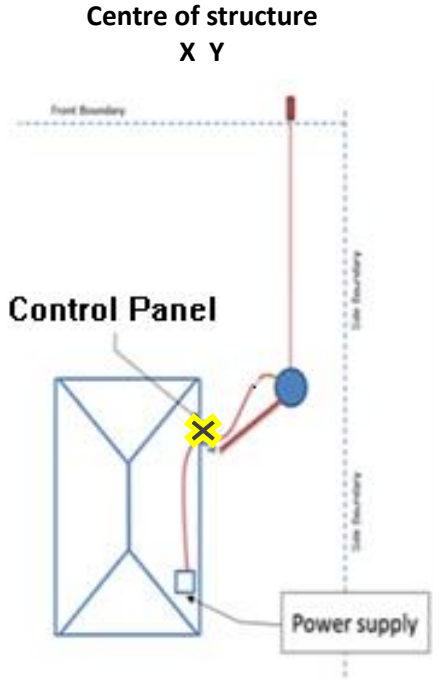
Name **Local Pressure Control Panel (Point)**

Point Type **E07** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	E07
B	Standard or non standard panel	Select from pick list: domSCIRTWWControlPanelType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Does the asset have telemetry? (yes/no)	Select from pick list: domSCIRTTelemetryFitted
Z	Manufacturer warranty term in years	data - decimal number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT



As-Built requirements (WW)

E08: WW Pressure Lateral

Name **WW Pressure Lateral (Line)**

Line Type **E08** "Line Asset Inputs"

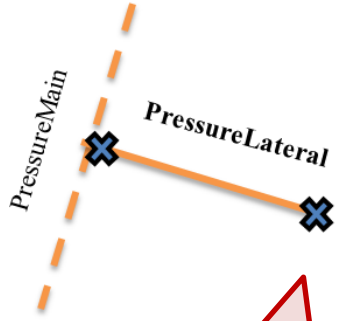
Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	E08
B	Specific type of lateral	Select from pick list: domSCIRTXXLateralType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Pipe Shape	Select from pick list: domSCIRTPipeShape
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched
Y	Do several units share this lateral? (yes/no)	Select from pick list: domSCIRTSharedConnection
AA	Type of lateral junction	Select from pick list: domSCIRTEyeType
AB	Distance of IP from lateral start (from connection to existing private lateral) in mm	data - number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end
Col W: accuracy 0.5m

X Y



All bends, start/end points to be surveyed.
Create one SAT row per surveyed point.

As-Built requirements (WW, SW, RW)

E09: Curved Pipes

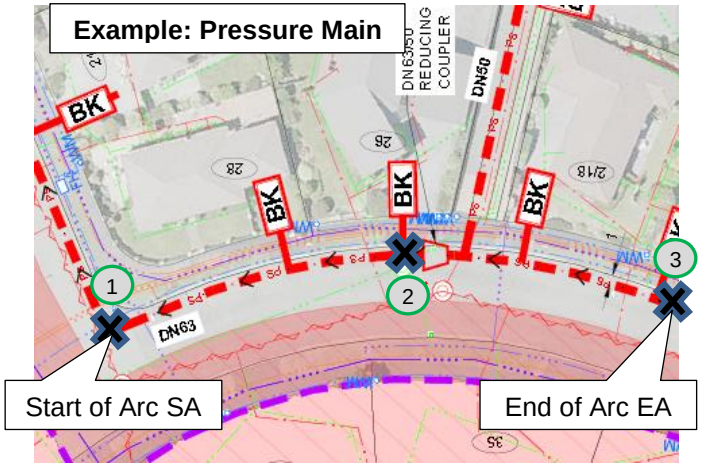
Line Type | **Curved Pipes (Line)**

E09 "Line Asset Inputs"

	A	B	C	D	E	F	G	H	I	J	K
1	SAG Feature Number	Asset Type	Old or New Asset	Design Change	Unique Name From Design Data	mE	mN	RL	Vertex Order or E09	Material	Pipe Size
2	E02	Pressure	New	No	P005	394576.6151	808107.2582	9.22	1 SA	Polyethelene 100	250
3	E02	Pressure	New	No	P005	394520.2639	808107.3905	9.18	2	Polyethelene 100	250
4	E02	Pressure	New	No	P005	394522.6549	808107.6587	8.56	3 EA	Polyethelene 100	250

Enter the below codes into column I

Column I Code Convention	Meaning
SA	Start of Arc
EA	End of Arc



Additional Information

The codes for curved pipes can be used in conjunction with any line feature. Above is an example for a pressure main.
This feature addition is to be used in SAT column I only.

As-Built requirements (WW, SW, RW)

E10: Electrical

Name **Electrical (Line)**

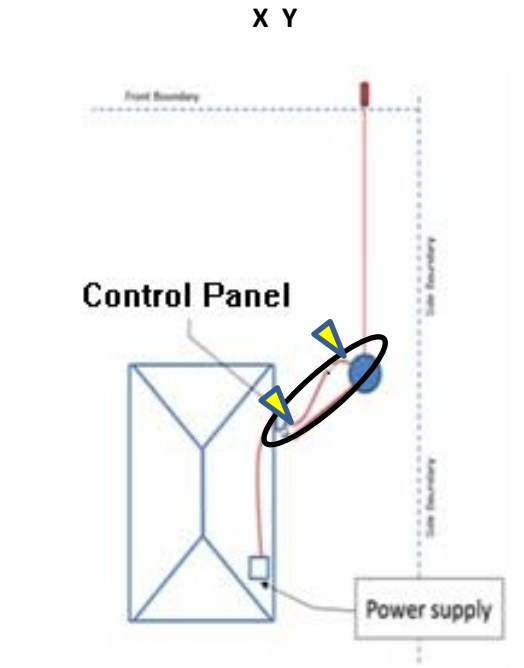
Line Type **E10** "Line Asset Inputs"

Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	E10
B	Type of cable	Select from pick list: domSCIRTWWPressureCableType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Conduit material	Select from pick list: domSCIRTPipeConstruction
K	Conduit diameter	data - number
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end



All bends, start/end points to be surveyed.
Create one SAT row per surveyed point.

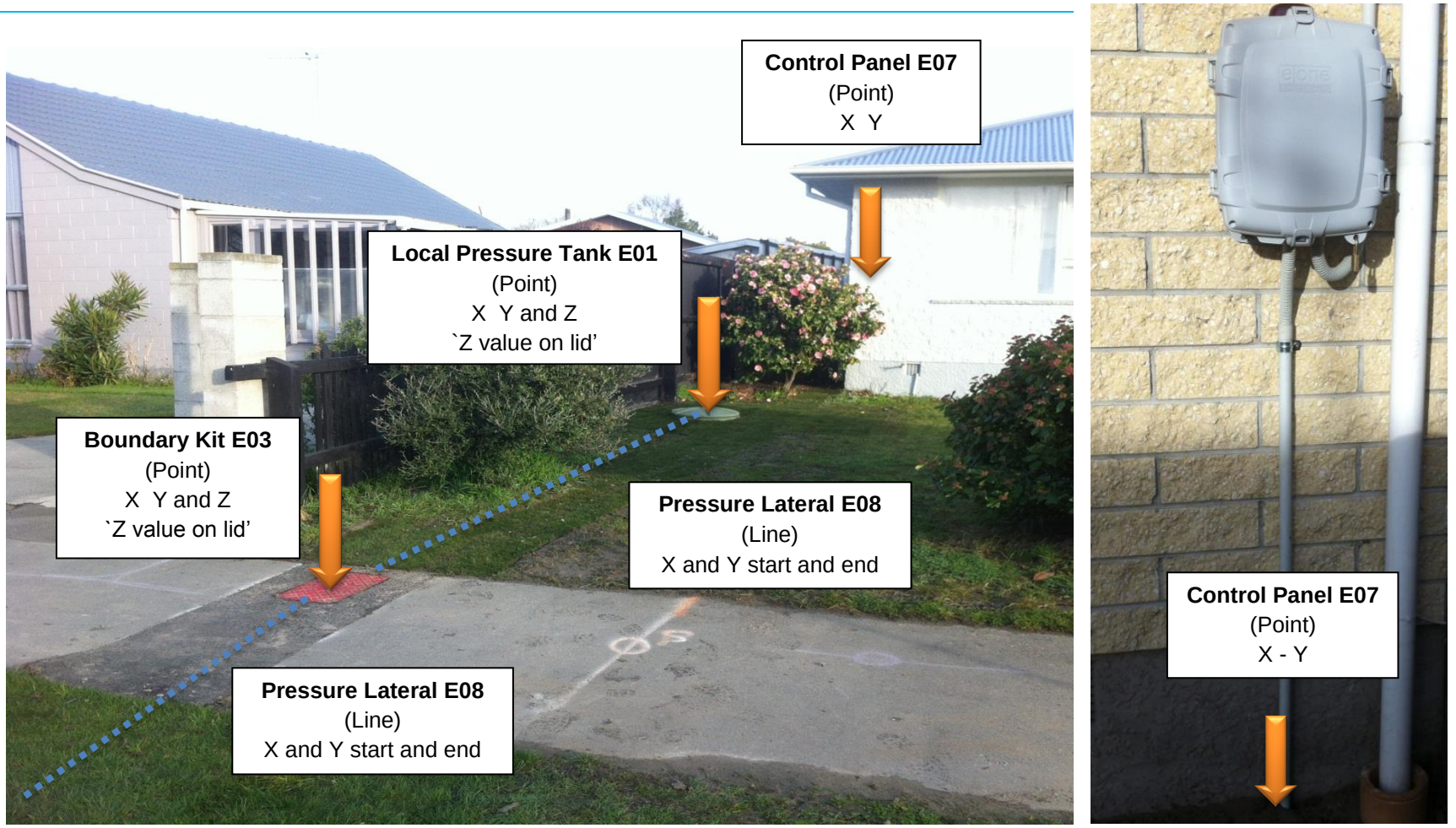


Figure 34: Pressure System Layout for a Typical Household

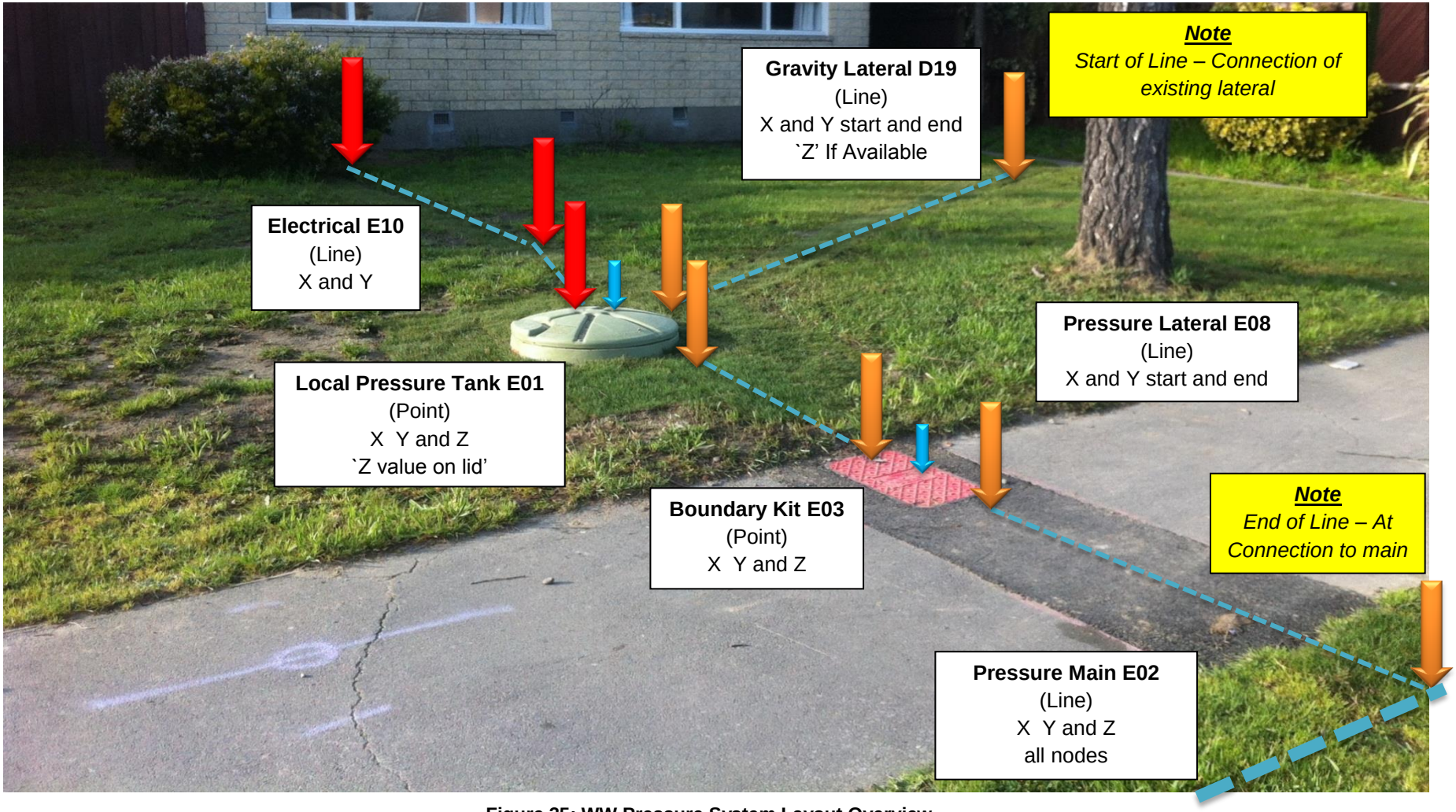
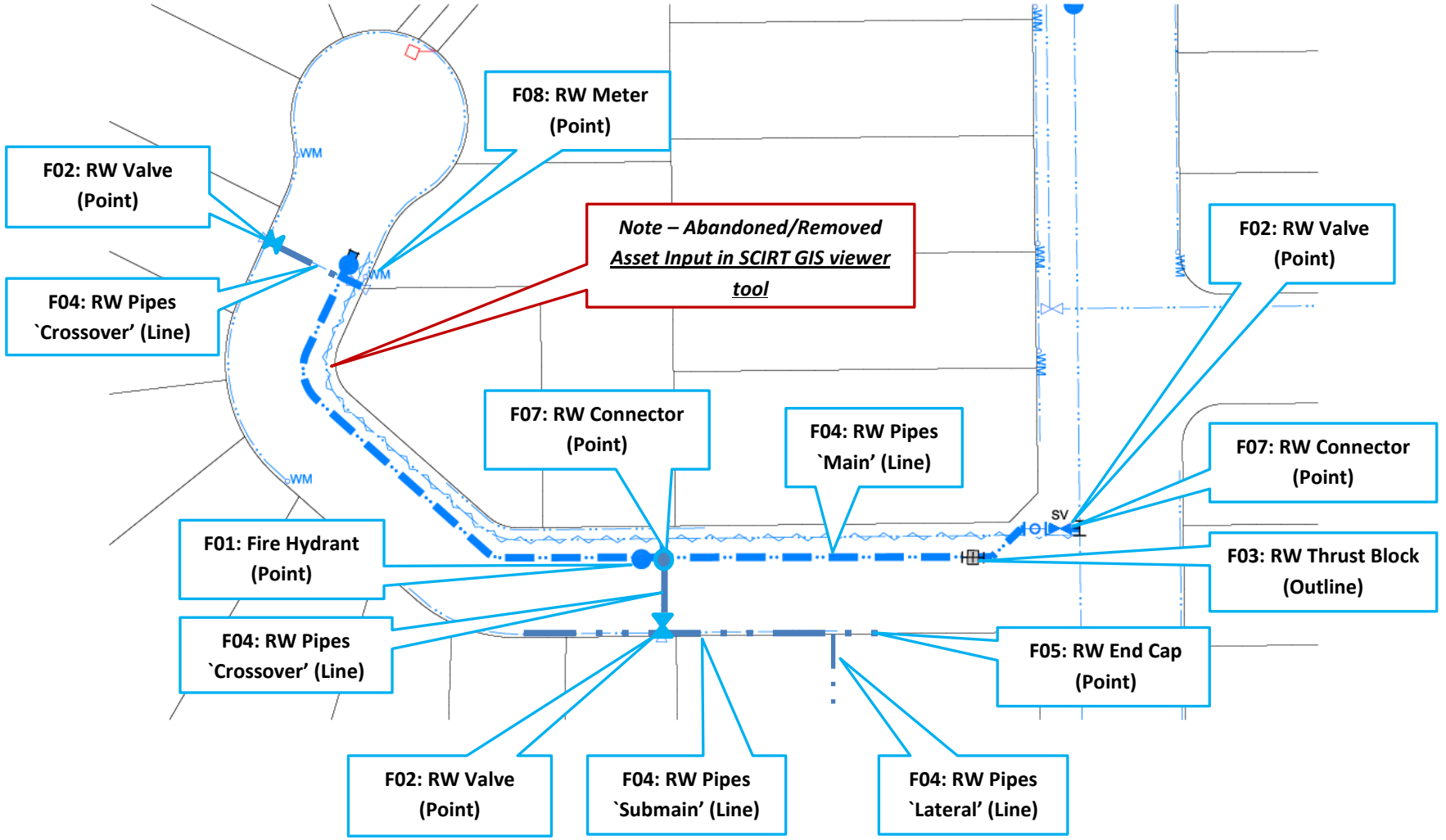


Figure 35: WW Pressure System Layout Overview

Appendix F As-built Requirements for Reticulated Water



Reticulated Water – Overview

As-Built requirements (RW)

F01: RW Fire Hydrant

Name **RW Fire Hydrant (Point)**

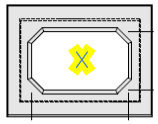
Point Type **F01** "Point Asset Inputs"

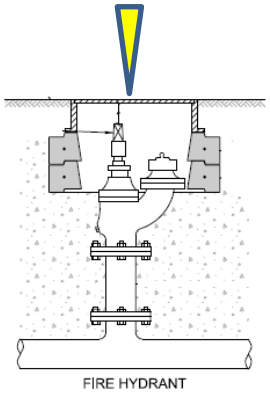
SAT Column	SAG Description	Valid Values
A	Type of point feature	F01
B	Standard or non standard	Select from pick list: domSCIRTWSHydrantType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of hydrant
X Y and Z





As-Built requirements (RW)

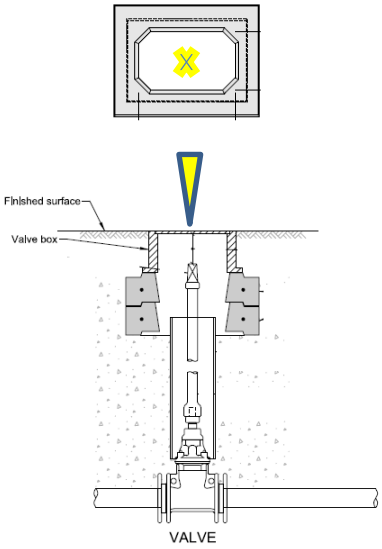
F02: RW Valve

Name **RW Valve (Point)**

Point Type **F02** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	F02
B	Type of valve	Select from pick list: domSCIRTXXValveType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	Height above datum	data - decimal number
K	Nominal diameter in mm	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Is the valve (incl. lid) buried below ground? (yes/no)	Select from pick list: domSCIRTWSValveBuried
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Valve closure rotation direction	Select from pick list: domSCIRTValveClosureRotation
V	Valve normal operating position - open or closed	Select from pick list: domSCIRTValveNormalOperating
W	Main function of valve	Select from pick list: domSCIRTValveFunction
X	Valve control point	Select from pick list: domSCIRTValveControlPoint
Y	Manual or motorised valve	Select from pick list: domSCIRTValveActuation
Z	Manufacturer warranty term in years	data - decimal number
AA	Pressure triggering opening/closing of valve in kPa	data - number

Centre of valve
X Y Z



Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

As-Built requirements (RW)

F03: RW Thrust Block

Name **RW Thrust Block (Point or Outline)**

Line Type **F03** "Line Asset Inputs"

Outline features require at least three row entries in the SAT.

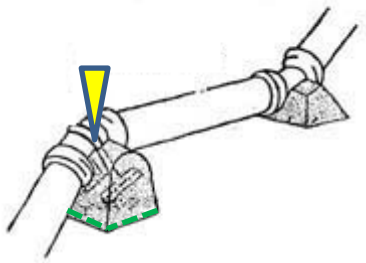
SAT Column	SAG Description	Valid Values
A	Type of polygon feature	F03
B	Specific type of structure	Select from pick list: domSCIRTXXStructureType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Polygon vertex Easting coordinate	data - decimal number
G	Polygon vertex Northing coordinate	data - decimal number
I	Number of vertex (point along outline) or arc code	data - text
J	Predominant material of structure	Select from pick list: domSCIRTXXStructureMaterial
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number

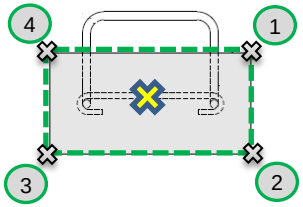
Centre of structure *or*
all corner points along outline to be surveyed.
Create one SAT row per surveyed point.

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along outline

Thrust Block Outline *or*
Centre of Structure
X Y





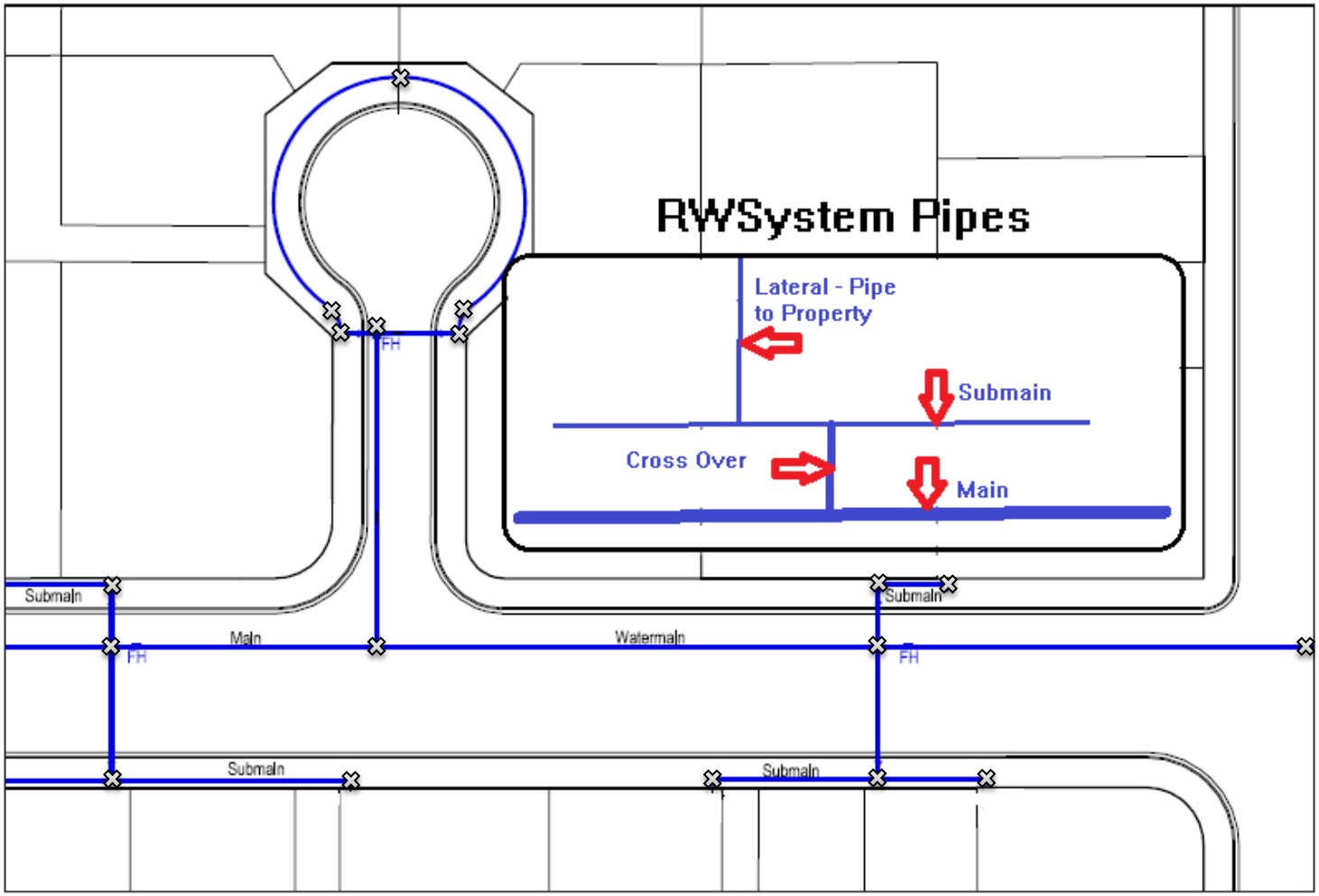


Figure RWSystem Pipes

As-Built requirements (RW)

F04: RW Pipes

Name **RW Pipes (Line)**

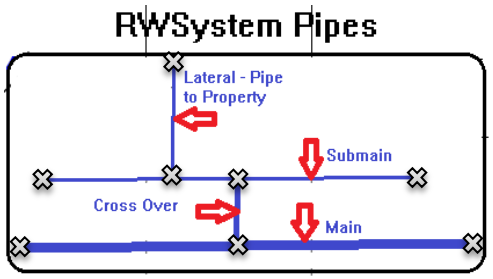
Line Type **F04** "Line Asset Inputs"

Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	F04
B	Specific type of pipe	Select from pick list: domSCIRTWSPipeType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
H	Invert level at vertex	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched

All bends, start/end points to be surveyed.
Create one SAT row per surveyed point.

Centre of pipe vertex
X Y



Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Use this feature for all RW pipe types incl. laterals.
Col I: enter number of vertex along line starting with the downstream end
Col W: accuracy 0.5m

As-Built requirements (RW)

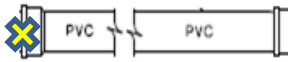
F05: RW End Cap

Name **RW End Cap (Point)**

Point Type **F05** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	F05
B	Specific type of end cap	Select from pick list: domSCIRTEndCapType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number

Centre of End Cap
X Y



Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

As-Built requirements (RW)

F06: RW Pump

Name **RW Pump (Point)**

Point Type **F06** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	F06
B	Type of function pump used for	Select from pick list: domSCIRTXXPumpType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	Height above datum	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Name and/or number of pump station	data - text
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Serial number of asset	data - text
V	Backup Energy Source	Select from pick list: domSCIRTEnergySource
X	Capacity of pump in litres per hour	data - number
Y	Manufacturer warranty reference	data - text
Z	Manufacturer warranty term in years	data - decimal number

Centre of Pump
X Y and Z (on pump)

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

As-Built requirements (RW)

F07: RW Connector

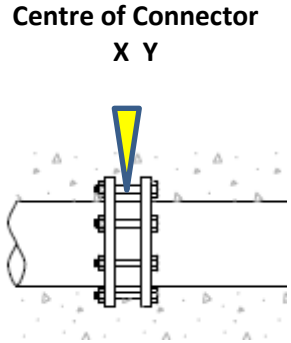
Name **RW Connector (Point)**

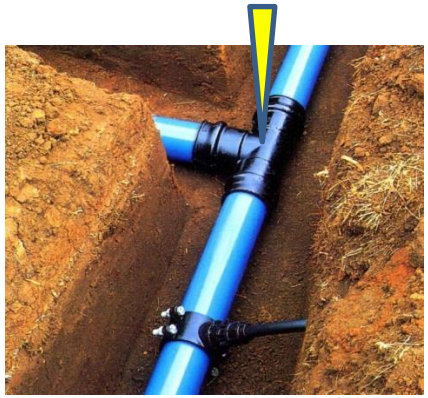
Point Type **F07** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	F07
B	Type of connector	Select from pick list: domSCIRTWSConnectorType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Connectors on laterals and between laterals and submains are not required.





As-Built requirements (RW)

F08: RW Meter

Name **RW Meter (Point)**

Point Type **F08** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	F08
B	Specific point feature	data - text
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
K	Nominal diameter in mm	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Serial number of asset	data - text
V	Does the asset have telemetry? (yes/no)	Select from pick list: domSCIRTTelemetryFitted

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of structure
X Y

PLAN

As-Built requirements (RW)

F09: RW Reservoir

Name **RW Reservoir (Outline)**

Line Type **F09** "Line Asset Inputs"

Outline features require at least three row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of polygon feature	F09
B	Specific polygon feature	data - text
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Polygon vertex Easting coordinate	data - decimal number
G	Polygon vertex Northing coordinate	data - decimal number
H	Height above datum	data - decimal number
I	Number of vertex (point along outline) or arc code	data - text
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Name of reservoir	data - text
W	Capacity in cubic metres	data - number
X	Type of security on access	Select from pick list: domSCIRTAccessSecurity

All corner points along outline to be surveyed.
Create one SAT row per surveyed point.

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along outline

Outline of structure
X Y and Z

As-Built requirements (RW)

F10: RW Reservoir Inlet/Outlet

Name **RW Reservoir Inlet/Outlet (Point)**

Point Type **F10** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	F10
B	Asset type on which outlet is installed	Select from pick list: domSCIRTWSOutletType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number

Centre of structure
X Y

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

As-Built requirements (RW)

F11: RW Structure

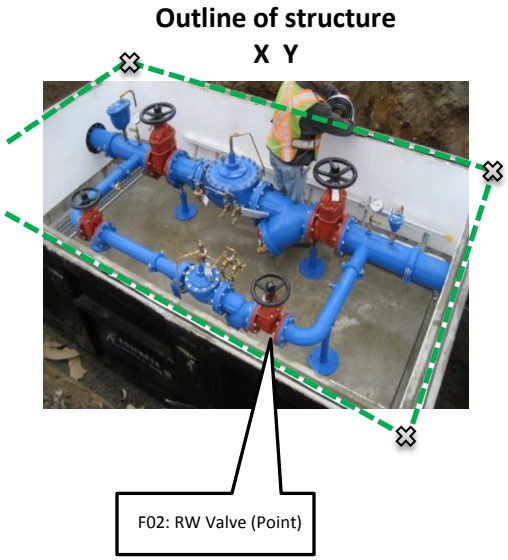
Name **RW Structure (Outline)**

Line Type **F11** "Line Asset Inputs"

Outline features require at least three row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of polygon feature	F11
B	Specific type of structure	Select from pick list: domSCIRTXXStructureType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Polygon vertex Easting coordinate	data - decimal number
G	Polygon vertex Northing coordinate	data - decimal number
I	Number of vertex (point along outline) or arc code	data - text
J	Predominant material of structure	Select from pick list: domSCIRTXXStructureMaterial
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity
W	Capacity in cubic metres	data - number
X	Construction style (for tanks)	Select from pick list: domSCIRTWSTankConstructionStyle

All corner points along outline to be surveyed.
Create one SAT row per surveyed point.



Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along outline
Col W&X: leave blank/unchanged if N/A

As-Built requirements (RW)

F12: RW Restrictor

Name **RW Restrictor (Point)**

Point Type **F12** "Point Asset Inputs"

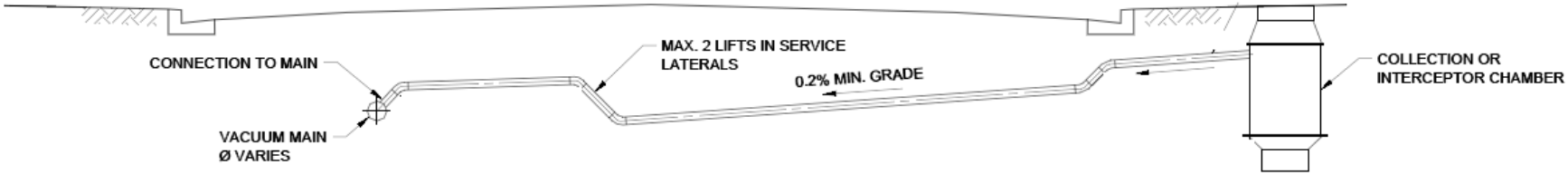
SAT Column	SAG Description	Valid Values
A	Type of point feature	F12
B	Specific point feature	data - text
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
W	Capacity in cubic metres	data - number

Additional Information

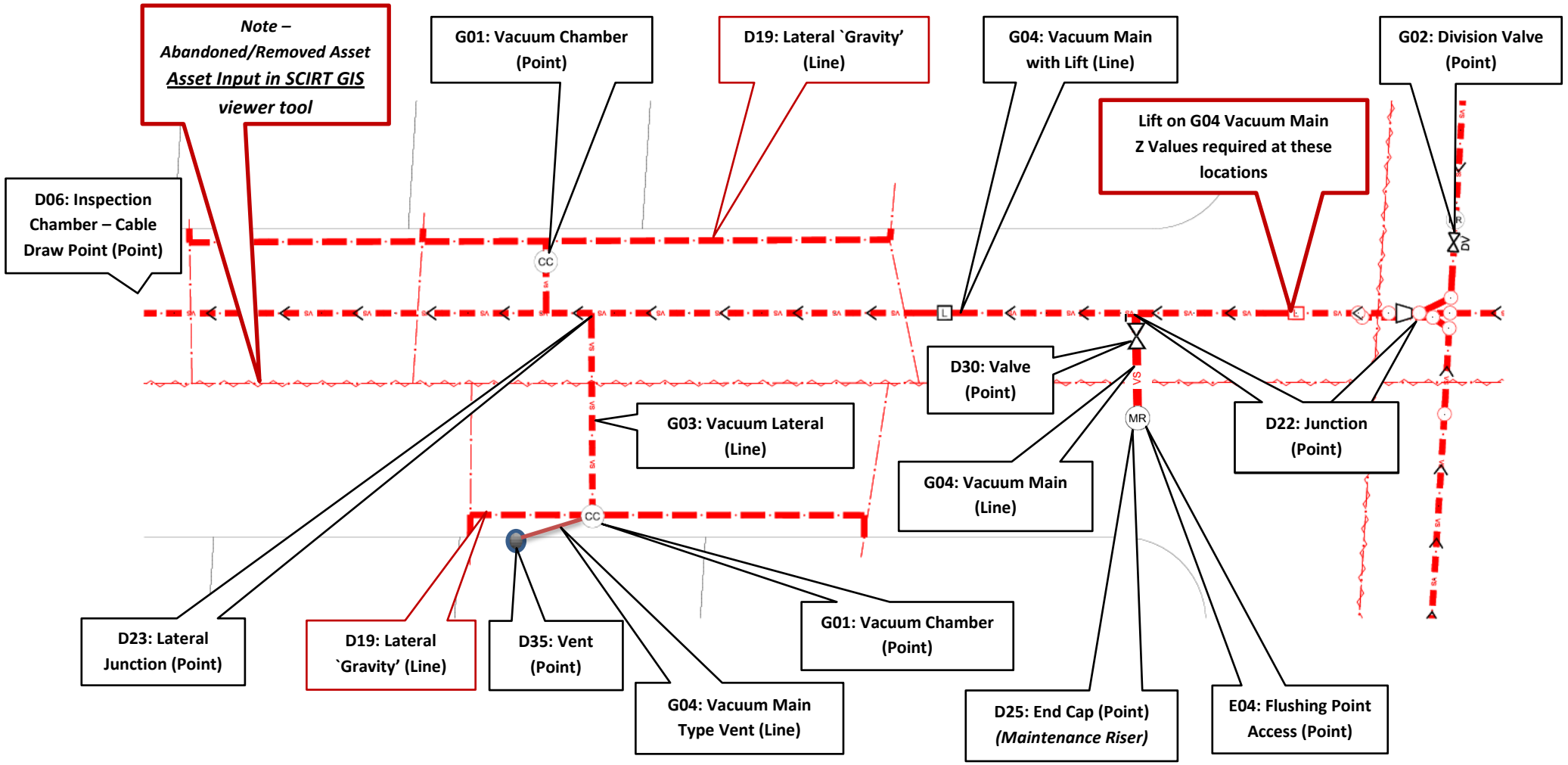
*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of restrictor
X Y

Appendix G As-built Requirements for Vacuum Wastewater System



VACUUM SERVICE LATERAL TYPICAL SECTION



Wastewater Vacuum – Overview

As-Built requirements (WW)

G01: Vacuum Chamber

Name **Vacuum Chamber (Point)**

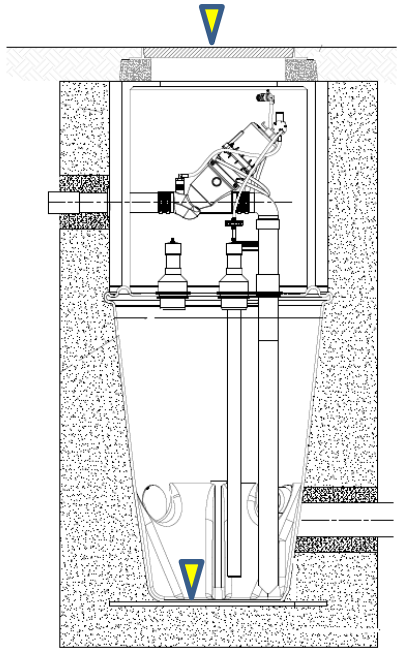
Point Type **G01** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	G01
B	Specific type of vacuum chamber	Select from pick list: domSCIRTWWVacuumChamberType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	RL on lowest corner of lid	data - decimal number
J	RL at base of pit (lowest point)	data - decimal number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Trafficable or non trafficable structure	Select from pick list: domSCIRTTrafficable
S	Shape of access lid	Select from pick list: domSCIRTLidType
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Construction material of chamber	Select from pick list: domSCIRTAccessConstruction
V	Type of security on access	Select from pick list: domSCIRTAccessSecurity
W	Serial number of tank	data - text
X	Capacity of tank in litres	data - decimal number
Y	Serial numbers of interface valves (divide by |)	data - text
Z	Manufacturer warranty term in years	data - decimal number
AA	Number of interface valves in chamber	data - number
AB	Has this chamber been installed with a bottom plate? (yes/no)	Select from pick list: domSCIRTWWTankBottomPlate
AC	Type of additional storage apart from this chamber	Select from pick list: domSCIRTWWTankAdditionalStorage
AD	Unique identifier for telemetry	data - text

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

Centre of structure
X Y and Z



Bottom of structure
Z

As-Built requirements (WW)

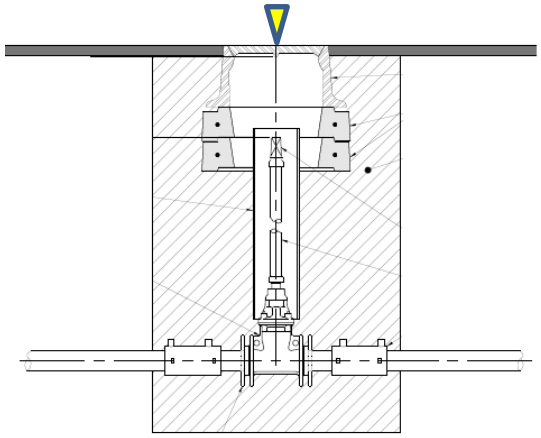
G02: Division Valve

Name **Division Valve (Point)**

Point Type **G02** "Point Asset Inputs"

SAT Column	SAG Description	Valid Values
A	Type of point feature	G02
B	Type of valve	Select from pick list: domSCIRTXXValveType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Centre of structure in Easting coordinate	data - decimal number
G	Centre of structure in Northing coordinate	data - decimal number
H	Height above datum	data - decimal number
K	Nominal diameter in mm	data - number
L	Date of commission, Decommission date	data - date (dd/mm/yyyy)
M	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
N	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Date of 'survey-start'	data - date (dd/mm/yyyy)
Q	Guideline revision used for survey	data - decimal number
R	Valve normal operating position - open or closed	Select from pick list: domSCIRTValveNormalOperating
T	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
U	Valve closure rotation direction	Select from pick list: domSCIRTValveClosureRotation
W	Main function of valve	Select from pick list: domSCIRTValveFunction
X	Valve control point	Select from pick list: domSCIRTValveControlPoint
Y	Manual or motorised valve	Select from pick list: domSCIRTValveActuation
Z	Manufacturer warranty term in years	data - decimal number

Centre of valve
X Y and Z



SECTION

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT

As-Built requirements (WW)

G03: Vacuum Lateral

Name	**Vacuum Lateral (Line)**
Line Type	**G03** "Line Asset Inputs"

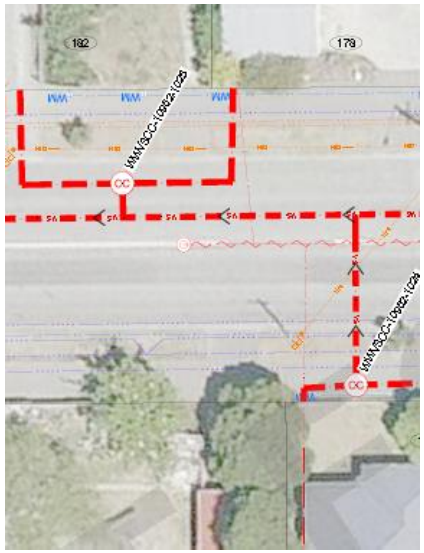
Line features require at least two row entries in the SAT.

SAT Column	SAG Description	Valid Values
A	Type of line feature	G03
B	Specific type of lateral	Select from pick list: domSCIRTXXLateralType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Pipe Shape	Select from pick list: domSCIRTPipeShape
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched
Y	Do several units share this lateral? (yes/no)	Select from pick list: domSCIRTSharedConnection
Z	Number of vacuum lifts (for vacuum pipes)	data - number
AA	Type of lateral junction	Select from pick list: domSCIRTEyeType
AB	Distance of IP from lateral start (from connection to existing private lateral) in mm	data - number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end (also survey grade changes at lifts)
Col W: accuracy 0.5m

Lateral Pipe
X Y



All bends, start/end points to be surveyed.
Create one SAT row per surveyed point.

As-Built requirements (WW)

G04: Vacuum Main

Name **Vacuum Main (Line)**

Line Type **G04** "Line Asset Inputs"

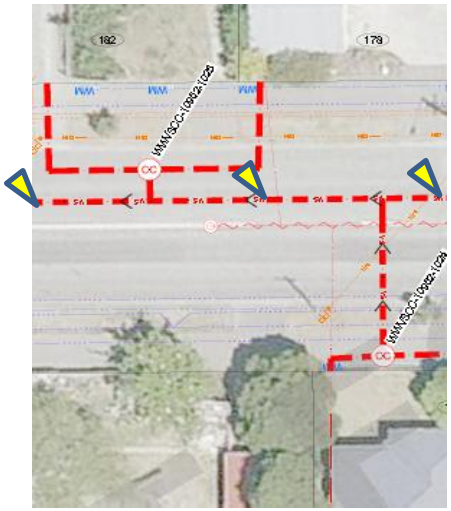
Line features require at least two row entries in the SAT.

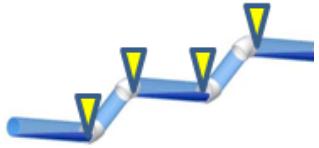
SAT Column	SAG Description	Valid Values
A	Type of line feature	G04
B	Specific type of pipe	Select from pick list: domSCIRTWWPipeType
C	Old or new asset	Select from pick list: domSCIRTOldOrNewAsset
D	Differs from design (yes/no)	Select from pick list: domSCIRTDiffersFromDesign
E	Unique identifier from drawing	data - text
F	Line vertex Easting coordinate	data - decimal number
G	Line vertex Northing coordinate	data - decimal number
H	Invert level at vertex	data - decimal number
I	Number of vertex (point along line) or arc code	data - text
J	Material of pipe	Select from pick list: domSCIRTPipeConstruction
K	Nominal diameter in mm	data - number
L	At Pit - UID name from design drawing	data - text
M	To Pit - UID name from design drawing	data - text
N	Manufacturer of asset	Select from pick list: domSCIRTManufacturer
O	Name of main contractor whom installed asset	Select from pick list: domSCIRTInstallationCompany
P	Pressure class (PN) or stiffness rating (SN)	Select from pick list: domSCIRTPressureStiffness
Q	Date of commission, Decommission date	data - date (dd/mm/yyyy)
R	Location certainty - accuracy of data	Select from pick list: domSCIRTLocationCertainty
S	Service status - phase of operation	Select from pick list: domSCIRTServiceStatus
T	Date of 'survey-start'	data - date (dd/mm/yyyy)
U	Guideline revision used for survey	data - decimal number
V	Pipe Shape	Select from pick list: domSCIRTPipeShape
W	Average burial depth to invert of pipe	data - decimal number
X	Was the pipe laid in a trench? (yes/no)	Select from pick list: domSCIRTTrenched
Y	Number of vacuum lifts (for vacuum pipes)	data - number

Additional Information

*All other columns must be left "blank" or hold the value "LEAVE BLANK" as default in SAT
Col I: enter number of vertex along line starting with the downstream end (also survey grade changes at lifts)
Col W: accuracy 0.5m
See Appendix C.2.4 for an SAT example.

Main Pipe
X Y and Z





Z Values at change of grade

All bends, lifts, start/end points to be surveyed.
Create one SAT row per surveyed point.

Notes : - Please refer to appendices D for pickups of assets associated with a Wastewater Vacuum System

D06	Inspection Chamber
D10	Square Manhole Non Vented
D12	Circular Manhole Non Vented
D19	Gravity Lateral
D22	Junction
D24	Inspection Point
D25	End Cap
D26	Thrust Block
D27	Pumping Station and Structures
D28	Pump
D30	Valve
D35	Vent