Checklist

Submission Requirements for Work As Constructed (WAC) Plans

1. Purpose

This document summarises drafting requirements from various standards as a guide to assist designers and drafters in the preparation of Work-As-Constructed (WAC) or Work as Executed (WAE) plans/drawings to submit to Sydney Water. It should be read in conjunction with all other relevant standards when preparing WAC plans. Following this checklist ensures the efficient and timely capture of asset data in Sydney Water's GIS database – Hydra and uploading of plans/drawings in Sydney Water's EDMS storage and retrieval system.

2. Scope

This document specifies information required when submitting WAC Plans of:

- Pipeline infrastructures (portable water, recycled water, wastewater and stormwater)
- Facility assets and related pipeline infrastructure,
- Developer Direct: Minor works (Sewer)

Note: As part of Sydney Water's continuous improvement approach, standards are subject to review and may be updated as required— this includes the Technical requirements and work instructions for minor works (sewer) document.

3. Minimum requirements

Any individual or team with responsibility to submit work as constructed plans to Sydney Water for the creation of asset and data information into Hydra-GIS.

4. WAC plan submission requirements and checklist

WAC Plan Submission Requirements

The following are the mandatory requirements for submitting WAC plans/drawings by contractors, Sydney Water internal infrastructure delivery team members and Water Service Coordinators through the eDeveloper process:

- When constructing a new facility asset, please follow the Maximo Guideline - Creation and modification of data for Asset, Location and Facility records to submit a Maximo Facility Number request through SW Delivery Portal during the DABC development stage.
- Drawing numbers can be requested from EDMS at the beginning of a project.
- System areas, major main details, drainage and supply information will need to be defined at the beginning of a project and provided on the WAC.
- All WAC/WAE plans shall comply with following drafting requirements:
    - Appendix SW 3 – Drafting Requirements of “WSA 02-2002 Sewerage Code of Australia - Sydney Water edition version 4.0 2017”.
    - Appendix SWM – Drafting Requirements of “WSA 03-2011 Water Supply Code of Australia - Sydney Water edition 2014”.
    - Computer aided drafting (CAD) standard and specification CDPMS0021 is available on the Sydney Water website.
    - “Maintenance-related Clauses for Capital and Operating Projects” available on the Sydney Water website.
    - Technical requirements and work instructions for minor works (sewer) sets out technical requirements and work instructions for construction activities allowed under the Minor Works (sewer) process and assist designers comply with requirements in the preparation of WAC/WAE plans.

WAC Plan Submission Checklist

- The information to be shown on the WAC/WAE drawings ~~shall~~ include but not be limited to following information.

Drawing Files

- All drawings shall be submitted in AutoCAD format as per Computer aided drafting (CAD) standard and specification CDPMS0021 on Sydney Water’s Standards and specifications page
- Drawing objects in the model space are referenced in Geocentric Datum Australia (GDA) 1994, Map Grid Australia (MGA) 2020 Zone 56 co-ordinates
- All drawings, other than electrical schematics, process & instrumentation drawings, and other similar unscaled drawings must include a North point
- All drawings, other than electrical schematics, process & instrumentation drawings, and other similar unscaled drawings, shall be supplied as AutoCAD files utilising the "paper space/model space" feature of AutoCAD

- Electrical schematics drawings, process & instrumentation drawings and other similar unscaled drawings may be supplied entirely in “model space” (i.e. "Tilemode" one) with the drawing form, notes, dimensions, etc. scaled appropriately
- All data should be clean e.g. No overlaps / gaps in property boundaries, over / undershoots etc

Real Property Information

- Layout of roads, Sydney Water and/or council easements and property lots
- Lot numbering and street names

The Title Block

- Pipe schedule showing size, material, type, class, length and joint type of all pipes laid with individual breakup e.g. DN 150, uPVC, ribbed wall, SN8, 6 m, RRJ
- Name of Developer
- Name of Project Manager or Water Servicing Coordinator (Company)
- Name of Designer or agent
- Name of Constructor
- Case Number (for the eDeveloper process)
- Plan to be marked “Work As Constructed” in the top right corner
- Date of completion of construction
- Date of drawing up of WAC plan
- UBD grid reference
- Australian Height Datum (AHD)
- Boundary trap information

Wastewater Plans

Sewer Details

- WAC/WAE plans must indicate Long or Short Property Connection Sewer (PCS) as: gravity inspection shaft or terminal inspection shaft
- Low Pressure Sewerage must show pump unit number, e.g. SL1234
- Position of sewers relative to property boundaries
- Locations and details of known utility services and stormwater drains
- Insets and diagrams
- Notations and standard labels indicating current status e.g. “Existing end to be extended”
- Ties to structures and downstream distances
- Where sewers can only be tied to local features i.e. trees, posts, etc., bearing and distances of sewers with azimuth of survey

- Junction distances to downstream structure (to be shown above arrow); if a vertical riser is required to service a property, indicate by adding a “v” after the distance (e.g. 56.6v)
- Unsurveyed property connection sewers shown with downstream distance and length e.g. 12.5 PCS 2.0, with distance shown first in all cases
- Directions for connecting to existing system
- A note specifying that non-detectable tape, raised to the surface, is to be laid above junctions
- Drainage limits—full or partial
- Design assumptions for ancillary structures (Refer to Clause 1.3.3 and Section 7 of WSA)
- Method and type of construction if boring to be undertaken
- Intersection and tangent point details for setting out any curves
- Additional services located during construction

Structures

- Position of structures relative to property boundaries
- Survey level control points
- Ties and/or downstream distance
- Type of structure
- Details of all inlets and property connection sewers
- Water seal requirements
- Ties to additional structures
- MGA 2020 Zone 56 co-ordinates if available
- Vent shafts showing size, type and height
- Amended positions and/or depths of sewers. If sewer is amended in position and/or depth, redefined drainage limits on WAC drawings.
- Attribute information as required for Sydney Water’s GIS-HYDRA
- Longitudinal Sections (Profiles):
    - Clearly indicate the start chainage and the end chainage for each concrete-encased sections, if applicable
- Size and class (stiffness, SDR and/or pressure) of sewer to be laid
- Material designation of sewer to be laid (Refer to list of acronyms on WSAA website)
- Chainages of structures and other on line and nearby features
- Locations and details of known utility services and stormwater drains (additional services located during construction to be shown on WAC drawings)
- Grades (percentage) and levels of sewers (including depths to invert and surface levels)

Specific features of structures

- (e.g. fibreglass MH with solid-top, bolt-down DI Class B watertight cover, vertical concrete encased with lamp hole type cover etc.)
- Design type of structures e.g. MH, segmental MH, etc.
- Types of joints and extent of each type (Refer to list of acronyms on WSAA website)

- Concrete surrounds or concrete bulkheads with relevant chainages
- Protective coatings or other protective measures with relevant chainages
- Piling—size, type and extent
- Types of pipe support used—chainage noted
- Method and type of construction if boring to be undertaken
- Strata Information
- Intersection and tangent point details and invert levels for setting out any curves.
- Trench support system left in ground – chainages noted
- Ground water levels encountered
- Where totally sand-filled trench – chainages noted. Leak tight and low infiltration construction must comply to specification

Standard Notes

- Standard notes should only be shown when applicable and are to be located under scale bar. A few sample notes are shown below. Further samples are available in “Appendix SW 3 – Drafting Requirements” of “WSA 02-2002 Sewerage Code of Australia - Sydney Water edition version 4.0”
- Disconnected details to be supplied, e.g. type and length
- Alteration to existing surface levels which will need to be taken into consideration when constructing Manholes (MHs), Maintenance Shafts (MSs) etc., shall show as: “ALL STRUCTURES TO BE CONSTRUCTED TO PROPOSED FINISHED SURFACE LEVELS”.
- Mine Subsidence information shall note on plan: “DESIGNED IN ACCORDANCE WITH THE MINE SUBSIDENCE BOARD. SYDNEY WATER’S APPROVAL DATED…… ON FILE NO…….”
- If in slip area, note on plan: “POTENTIAL SLIP AREA. SEE SEWERAGE CODE OF AUSTRALIA WSA – 02”
- Flood information shall note on plan as: “PROPERTY CONNECTIONS TO PROPERTIES WITHIN FLOOD CONTOUR MAY REQUIRE SPECIAL CONDITIONS”

Other

- Municipal boundaries.
- Major features e.g. creeks, railway lines, power transmission lines.
- Additional geological, construction and safety requirements.
- Geotechnical data, special foundation conditions, dewatering requirements
- Groundwater levels.
- Locations and details of known and suspected sites with contaminated soil and acid sulphate or potential acid sulphate soil (additional sites located during construction to be shown on WAC drawings).
- Revised status of asset e.g. “Existing end to be extended” edited to “Existing end extended” in WAC documentation.
- Where sewer extensions or sewerage schemes pass through or are designed to serve lands subject to flooding, show:
    - Height of flood level.
    - Boundaries of flood liable land.

- Fitting levels of all buildings within subject land
- Note re flood liability to be added below Scale Bar

Water Plans

Watermain Details

- Show type and class of pipe, including PVC pipe type as:
  - oPVC
  - mPVC
  - uPVC
- Position of mains relative to property boundaries (PL offset) including where mains are eased around, over or under obstructions
- Insets and diagrams to be amended where necessary
- Main laying instructions to indicate current status of main (e.g. “Lay DN 150 main” to be edited to “Laid DN 150 main”)
- Ties from property lines and boundaries for starting and finishing points of the main(s) (i.e. at existing mains and terminations near the boundaries of the subdivision)
- Where main can only be tied to local features (i.e. trees, posts, etc.) show bearing and distance of mains and azimuth of survey.
- Provide MGA 2020 Zone 56 coordinates if available
- Horizontal, vertical and compound bends with angle of deflection and chainage
- Special conditions (e.g. material type such as steel in a DICL main, construction technique such as boring, concrete encasing and bulkheads, trench drainage installations, etc.) and start and finish chainages
- Additional services not indicated at design state but located during construction, with type, depth and chainage from starting point of main
- Draw diagrams to a larger scale where there is insufficient room to clearly detail all relevant information
- Additional Items for Renewals, Adjustments and Concurrent Construction Of Mains And Property Services:
  - Main constructed alongside, over or within a disconnected main or in place of a removed main
  - Fire services and large domestic or combined water services to be labelled with pipe size (e.g. DN 150 fire service)

Fittings

- Anchored Valves details (thrust and anchor block details)
- Show fittings on the plan at actual chainage on the main
- Ties to property boundaries or PL offset distance if not as for remainder of water main
- Chainages for all fittings (hydrants, sluice (stop) valves, tapers etc.) with start of line being chainage ‘00’

Main taps

- Inserted and chainage. Include pre-laid property service where appropriate (required for renewals, adjustments, dual water areas and specially approved main and pre-laid property service construction)
- MGA 2020 Zone 56 coordinates to be shown if required to adequately fix the fitting location.
- Restrained Joints information on pipes where applicable
- Longitudinal Sections (Profiles)
- Concrete encasement and concrete bulkheads with relevant chainages
- Types of pipe support used – chainages noted
- Additional services located during construction
- Strata and ground water level where encountered (if required to be recorded)
- Standard Notes:
    - Standard notes should only be shown when applicable and are to be located under scale bar. Several sample notes are available in “Appendix SW M – Drafting Requirements” of “WSA 03-2011 Water Supply Code of Australia - Sydney Water edition 2014”

Stormwater Plans

Stormwater Channels

- Position of channels relative to property boundaries
- Insets and diagrams to be amended where necessary
- Notation and Standard Labels to indicate current status (e.g. “Existing Channel to be broken out” to be edited to “Existing Channel broken out”)
- Ties to structures and downstream distance where appropriate
- Show bearing and distance of all channels with azimuth of survey (see Clause 5.16 of WSA 3).
- MGA 2020 Zone 56 coordinates for bends, junctions, tangent points and intersection points
- Additional services located during construction

Stormwater Structures

- Position of structures relative to property boundaries
- Ties
- Type of structure
- Inlets
- MGA 2020 Zone 56 coordinates
- Attribute information as required for HYDRA
- Longitudinal Sections (Profiles)
- Size and type of channel laid
- Depths to invert, surface level and relative levels
- Chainages of structures and other features
- Curved and straight sections- start, end nodes and radius.

- Capacity of section
- Grade percentage

Special features of structures

- Design type of structures (e.g. energy dissipater, reflux valve)
- Type of joint and extent of each type
- Piling – size, type and extent
- Types of pipe support used – chainages noted
- Where totally sand filled trench – chainages noted
- Trench support system left in ground – chainages noted
- Ground water levels encountered
- Strata

Facility Assets

- Include all facility numbers on the plan. Contact Asset Information Management for further details. Examples of facility types are provided in Appendix A.
- Drawing numbers shall be obtained from EDMS at the beginning of the project.
- Submit all plans/drawings to Sydney Water via EDMS.
- All Facility assets data must be captured in Maximo before submitting WAC to Sydney Water. Please follow the Maximo Guideline - Creation and modification of data for Asset, Location and Facility records to submit relevant work request through SW Delivery Portal.

5. Definitions

Term	Definition
WAC	Work As Constructed plan
WAE	Work As Executed plan
Hydra	Sydney Water's corporate Geographic Information Systems
GIS	Geographic Information System
CAD	Computer Aided Drafting
CSV	The comma-separated values (CSV) file format
Metadata	A set of data that describes and gives information about other data
WWTP	Wastewater Treatment Plant
WFP	Water Filtration Plant
WRP	Recycled Water Plant
Facility	A system of infrastructure components designed to work together and controlled as a single entity. Facilities generally have all components located on the same site.
MGA	Map Grid Australia
Civil Drawing	Type of technical drawing that shows information about grading, landscaping, or other site details.
EDMS	Engineering Drawing Management System – A system to manage the Engineering Drawing Life Cycle.

References

Document type	Title	Notes
Compliance obligations	• Sydney Water Act 1994	
Policies	• Asset Management Policy	
WSSA codes	Sydney Water maintains its own editions of and supplements to Water Services Association of Australia (WSAA) codes. You must use these instead of the standard WSAA codes. You can purchase Sydney Water editions of the codes at the WSAA Shop: Sydney Water Codes. • *WSA 03-2011-3.1* Water Supply Code of Australia (Sydney Water Edition 2014) • *WSA 02-2002-2.2* Sewerage Code of Australia (Sydney Water Edition 1 Version 4) • *WSA 04:2005-2.1* Sewage Pumping Station Code of Australia (Sydney Water Edition 2012)	The following supplements must be used in conjunction with the relevant WSAA codes: • Sydney Water supplement to Pressure Sewerage Code of Australia WSA 07 2007 V1.1 D0001898 (7 MB) • Sydney Water supplement to Industry Standard for Submersible Pumps for Sewage Pumping Stations WSA 101 2008 D0000677 (677 KB) • Supplement to Sewage Pumping Station Code of Australia WSA 04-2005-2.1 – Sydney Water Edition – 2012 D0002313 (379 KB)

Developer Service	• Minor works (sewer) technical requirements and work instructions • Minor works sewer project completion package (PCP) checklist • Preparation of Work-As-Constructed plans for electronic file submission through eDeveloper process	• Sets out technical requirements and work instructions for construction activities allowed under the Minor Works (sewer). • Outline the minimum requirement for WAC plans submission for electronic file submission through eDeveloper process
Other documents	• Sydney Water Easement guidelines	

Appendix A

In the table below is a list of the facility asset examples:

Water	Recycled Water	Sewer	Stormwater
• Water Reservoir • Water Pumping Station • Water Pump Unit • Water Treatment Works • Water Chemical Dosing Unit • Water Flowmeter • Water Calibration Point • Water Facility Valve • Water Valve Unit • Water Gauge • Water Hydro Station	• Recycled Water Reservoir • Recycled Water Pumping Station • Recycled Water Pump Unit • Recycled Water Treatment Works • Recycled Water Chemical Dosing Unit • Recycled Water Flowmeter • Recycled Water Calibration Point • Recycled Water Facility Valve • Recycled Water Valve Unit • Recycled Water Gauge	• Sewer Pumping Station • Sewer Treatment Plant • Sewer Chemical Dosing Unit • Sewer Odour Control Unit • Sewer Overflow Storage Unit • Sewer Low Pressure Pump Unit • Sewer Gauge • Sewer Flowmeter	• Stormwater Pumping Station • Stormwater Gauging site • Stormwater Quality Improvement Device (SQID) • Stormwater Product Monitoring Point - Quality