PURPOSE

This document establishes the Singleton Council mandatory requirements for Works as Executed to be provided to The Development Engineer prior to the Final Inspection of the Works.

Work as Executed (WAE) Drawings that demonstrate works have been constructed to the approved line, level, specification tolerances and various element have been constructed in accordance with the approved drawings and this specification shall be prepared by a Registered Surveyor in the State of New South Wales and certified by that Registered Surveyor as being a true representation of the constructed works.

Work as Executed drawings are to be prepared using the approved construction drawings as a base to drawings in order to identify compliance of the works to that approved or approved changes that may have been required during construction.

SCOPE

These Requirements apply to any formal Submission for all Works.

OBJECTIVES

These Requirements are issued to:

inform of the type and nature of "Work as Executed" records that are required to be handed over to Singleton Council upon completion of the Works, and encourage high quality Submissions with complete supporting documentation that complies with these Requirements.

DEFINITIONS, TERMS AND ABBREVIATIONS

Developer

In the private sector, the organisation nominated in the Deed of Agreement as the 'Developer' including its employees, contractors, successors and agents.

In the public sector, the Department of Planning and Infrastructure or any other NSW Government agency responsible for development of public infrastructure works in the Singleton LGA including its employees, contractors, successors and agents.

Coordinator

The Developer, the Head Consultant or the agent nominated by the Developer as being responsible for the coordination of all disciplines of design and documentation prepared and certified by the relevant Consultant/s and for the superintendence of the construction of the Works. The Coordinator shall be responsible for the lodgment of the Submission with Singleton Council and shall be the sole point of contact between Asset Acceptance, through the Project Lead and the Developer throughout the life of the development. Asset Acceptance is not required to meet or communicate directly with any other entity or individual other than the nominated Coordinator on issues relating to the Submission.

Head Consultant

The organisation responsible on behalf of the Developer for the overall design and/or site superintendence of the whole of the Works and certification that the design and/or construction of the Works comply with these Requirements and Standards.

Consultant

The organisation responsible for the design and/or site superintendence of part or whole of the Works and certification that the design and/or construction of that part of the Works for which it is responsible complies with these Requirements and the Standards.

Asset Acceptance (AA)

Asset Acceptance is the section of Singleton Council responsible for coordinating the Asset and nominated capital works design and construction acceptance process on behalf of Singleton Council.

Asset Acceptance Lead

The Manager who will act as a single point of contact for the life of a project.

Standards

All Australian Standards, applicable NSW State and Local Government requirements, codes and guidelines and all statutory and regulatory requirements governing the design of the Works.

Works

The public infrastructure works for which Singleton Council will become the ultimate owner and operator.

Asset

The completed Works.

Base Plan

A plan defining the site and location of the Works.

Map Grid of Australia (MGA)

MGA is a grid coordinate system based on the Universal Transverse Mercator projection and the Geocentric Datum of Australia 1994. The unit of measure is the metre.

It is the official coordinate projection for use with the Geocentric Datum of Australia 1994 (GDA94).

Projection: Transverse Mercator

Zone Width: 6 degrees

Longitude of Origin: Central Meridian of each zone

Latitude of Origin: Equator (zero degrees)

False Easting: 500 000

False Northing: 10 000 000

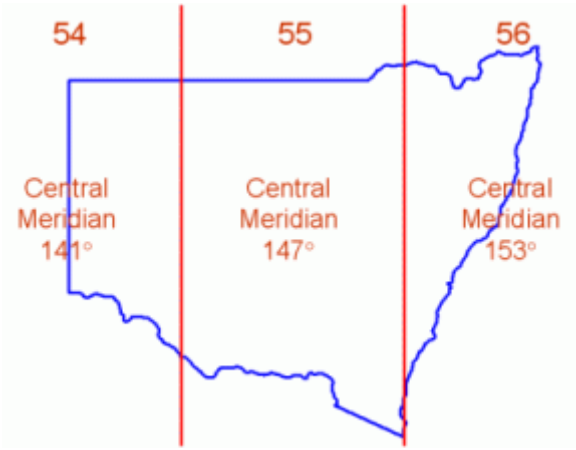
Central Scale Factor: 0.9996

Units: Metre

Ellipsoid: GRS80

More Information: Go to ICSM website.

MGA Zones for NSW



Decommissioned

Whenever an Asset is either demolished, deactivated, eradicated etc. and is no longer considered an Asset.

Development Engineer

WaE signing off authority on Council's behalf.

DWG

Electronic drawing files in AutoCAD drawing format.

PDF

Electronic drawing files in Adobe Portable Document format.

WINCAN

Software that converts information produced by Closed Circuit Television (CCTV) to a report in digital format.

Traffic Control Devices (TCD)

Line marking, street signs, guide signs, traffic lights, pavement marking, kerbs crossings and barriers.

Work Lot

A subdivision of the Works defined as such for verification purposes by the nature of the work and its location (or equivalent).

Drawings and digital data shall be submitted in all of the following formats:

One full set of AutoCAD drawings compliant with the latest version of Singleton Council Drafting Standard.

One full set of drawings in Adobe® PDF format created at a minimum size of A3 with a resolution of 600 DPI or higher. These drawings shall be oriented correctly with respect to the original and of equal clarity to the hard copies created from AutoCAD using the same plot styles.

One full set of A3 hardcopy drawings.

Other digital format deliverables specified in the latest version of Singleton Council Drafting Standard.

1 WAE Quality Records for Asset Types

When certifying the drawings, Consultant shall pay particular attention to ensuring that every individual asset has been constructed to the design parameters and within the specified tolerances.

1.1 Transport WAE Drawings

Detailed drawing information for transport assets to be provided:

Item	DWG Layer	Entity Type	Quality Information
Road centerline	wae_rd_cl	3d polyline	Points to be provided along centerline at distances no greater than: 20m, in urban area 100m, in rural area
Road pavement	wae_rd_pavement	Closed, 3D polyline or 3D polygon	Points to be provided along pavement perimeter at distances no greater than: 20m, in urban area 100m, in rural area
Road kerb line	wae_rd_kerb	3D polyline	Points to be provided along lip of kerb at distances no greater than 20m. Kerb profile type to be clearly noted in DWG
Road sub soil drain	wae_rd_subsoildrain	3D polyline	Points to be provided along sub soil drain line at distances no greater than 20m
Carpark	wae_rd_carpark	Closed, 3D polyline or 3D polygon	Points to be provided along pavement perimeter at distances no greater than 20m
Road island	wae_rd_roadisland	Closed, 3D polyline or 3D polygon	Points to be provided along island perimeter at distances no greater than 10m

Pathway	wae_rd_pathway	3D polyline	Points to be provided along pathway line at distances no greater than 10m
Road pathway	wae_rd_roadpathway	3D polyline	Points to be provided along road pathway line at distances no greater than 10m
Path structure	wae_rd_pathstructure	3D polyline	Points to be provided along path structure line at distances no greater than 10m
Bus shelter	wae_rd_busshelter	3D point / Closed, 3D polyline or 3D polygon	Point to be provided at surface level of the paved area of the structure or Points to be provided along lip of the paved area at distances no greater than 10m
Crash barrier	wae_rd_crashbarrier	3D polyline	Points to be provided along the structure line at distances no greater than 10m

1.2 Stormwater WAE Drawings

Detailed drawing information for stormwater assets to be provided:

Item	DWG Layer	Entity Type	Quality Information
Stormwater pit	wae_sw_pit	3D point	Point to be provided at the surface level of the structure
Stormwater pipe	wae_sw_pipe	3D polyline	Points to be provided at the invert level of the end of each pipe section
Stormwater surface drain	wae_sw_surfacedrain	3D polyline	Points to be provided along surface drain line at

			distances no greater than 10m
Stormwater end structure	wae_sw_endstructure	3D point	Point to be provided at the surface level of the structure
Stormwater fitting	wae_sw_fittings	3D point	Point to be provided at the surface level of the structure
Stormwater GPT simple	wae_sw_gptsimple	3D point	Point to be provided at the surface level of the structure
Stormwater GPT complex	wae_sw_gptcomplex	3D point	Point to be provided at the surface level of the structure
Stormwater non GPT simple	wae_sw_nongptsymple	3D point	Point to be provided at the surface level of the structure
Stormwater WSUD area	wae_sw_wsudarea	Closed, 3D polyline or 3D polygon	Points to be provided along the perimeter at distances no greater than 10m

1.3 Sewer WAE Drawings

Detailed drawing information for sewer assets to be provided:

Item	DWG Layer	Entity Type	Quality Information
Sewer manhole	wae_sew_manhole	3D point	Point to be provided at the invert level of the structure
Sewer non pressure pipe	wae_sew_pipenonpressure	3D polyline	Points to be provided at the invert level of the end of each pipe section
Sewer pressure pipe	wae_sew_pipepressure	3D polyline	Points to be provided at the invert level of the end of each pipe section

Sewer valve	wae_sew_valve	3D point	Point to be provided at the surface level of the structure
Sewer fitting	wae_sew_fittings	3D point	Point to be provided at the surface level of the structure
Sewer connection	wae_sew_connection	3D point	Point to be provided at the invert level of the structure

1.4 Water WAE Drawings

Detailed drawing information for water assets to be provided:

Item	DWG Layer	Entity Type	Quality Information
Water manhole	wae_wat_manhole	3D point	Point to be provided at the invert level of the structure
Water pipe	wae_wat_pipe	3D polyline	Points to be provided at the invert level of the end of each pipe section
Water service fitting	wae_wat_servicefitting	3D point	Point to be provided at the surface level of the structure
Water valve	wae_wat_valve	3D point	Point to be provided at the surface level of the structure
Water fitting	wae_wat_fitting	3D point	Point to be provided at the surface level of the structure
Water meter	wae_wat_meter	3D point	Point to be provided at the surface level of the structure
Water hydrant	wae_wat_hydrant	3D point	Point to be provided at the surface level of the structure

Water irrigation fitting	wae_wat_irrigationfitting	3D point	Point to be provided at the surface level of the structure
Water storage tank	wae_wat_storagetank	3D point	Point to be provided at the surface level of the structure

2 Asset Description/Data

Each asset shown in the DWG is to be clearly labeled with a unique identifier (ID). This ID is to be created in the DWG in a layer named {asset layer}_ID. E.g. road pavement ID's would be in a layer called wae_rd_pavement_ID similarly stormwater pipe ID's would be in a layer called wae_sw_pipe_ID.

Detailed asset data is also required to be submitted with the WaE DWG. Asset details should be captured on Singleton Council's Asset Data Forms for Transport, Stormwater, Water and Sewer. The form is an excel spread sheet and is available for download from Councils website www.singleton.nsw.gov.au.

2.1 Transport WAE Data

The following table describes the minimum required data for each road asset. Detailed descriptions are available in Forms TRN 1 to TRN 11.

Asset	Data Attributes	Data Type	Quality Information
Road centerlines	• ID	Text	
	• Road Name	Text	
Road pavement	• ID	Text	
	• Surface Type	Text	
	• Pavement Type	Text	
	• Base Layer Type	Text	
	• Base Layer Stabilisation	Text	
	• Sub Grade CBR	Text	
	• Sub Grade Stabilisation	Text	
	• Area	Number	Square Metres, to one decimal place
Road kerb lines	• ID	Text	
	• Type	Text	
	• Length	Number	Metres, to one decimal place
Road sub soil drains	• ID	Text	
	• Type	Text	

	• Length	Number	Metres, to one decimal place
Carparks	• ID	Text	
	• Number of Carparks	Text	
	• Surface Type	Text	
	• Pavement Type	Text	
	• Base Layer Type	Text	
	• Base Layer Stabilisation	Text	
	• Sub Grade CBR	Text	
	• Sub Grade Stabilisation	Text	
	• Area	Number	Square Metres, to one decimal place
Road island	• ID	Text	
	• Infill Type	Text	
	• Area	Number	Square Metres, to one decimal place
Pathway	• ID	Text	
	• Surface Material	Text	
	• Width	Number	Metres, to one decimal place
	• Depth	Number	Metres, to one decimal place
	• Length	Number	Metres, to one decimal place
Road pathway	• ID	Text	
	• Surface Material	Text	
	• Width	Number	Metres, to one decimal place
	• Length	Number	Metres, to one decimal place
Path structure	• ID	Text	
	• Structure	Text	
	• Surface Material	Text	
	• Width	Number	Metres, to one decimal place
	• Length	Number	Metres, to one decimal place
Bus shelters	• ID	Text	
	• Floor Material	Text	
	• Wall Material	Text	

	• Roof Material	Text	
	• Area	Number	Square Metres, to one decimal place
Crash barrier	• ID	Text	
	• Type	Text	
	• Start Terminal	Text	
	• End Terminal	Text	
	• Length	Number	Metres, to one decimal place

****** Pram ramps, Flush points are not included.**

2.1 Stormwater WAE Data

The following table describes the minimum required data for each stormwater asset. Detailed descriptions are available in Forms SW 21 to SW 27.

Asset	Data Attributes	Data Type	Quality Information
Stormwater pit	• ID	Text	
	• Use	Text	
	• Chamber Construction	Text	
	• Chamber Size	Number	Millimetres
	• Lid Type	Text	
	• Depth	Number	Metres, to one decimal place
	• Inlet Type	Text	
	• Outlet Type	Text	
Stormwater pipe	• ID	Text	
	• Invert Level	Number	Metres, to one decimal place
	• Surface Level	Number	Metres, to one decimal place
	• Pipe Size	Number	Millimetres
	• Material	Text	
	• Class	Text	
	• Number of Cells	Number	
	• Length	Number	Metres, to one decimal place

Stormwater surface drain	• ID	Text	
	• Type	Text	
	• Shape	Text	
	• Lining Material	Text	
	• Line Width	Number	Metres, to one decimal place
	• Length	Number	Metres, to one decimal place
Stormwater end structure	• ID	Text	
	• Surface Level	Number	Metres, to one decimal place
	• End Structure Type	Text	
	• End Structure Construction	Text	
	• Grate Type	Text	
	• Outlet Protection	Text	
	• Material	Text	
Stormwater fitting	• ID	Text	
	• Type	Text	
Stormwater GPT simple	• ID	Text	
	• Construction	Text	
	• Manufacturer Model	Text	
	• Treatment Measure	Text	
	• Function	Text	
	• Length	Number	Millimetres, to one decimal place
	• Width	Number	Millimetres, to one decimal place
Stormwater GPT complex	• ID	Text	
	• Construction	Text	
	• Function	Text	
	• Pipe Diameter	Number	Metres, to one decimal place
	• Invert Level	Number	Metres, to one decimal place
	• Surface Level	Number	Metres, to one decimal place
	• Max Internal Volume	Number	Cubic Metres, to one decimal place

Stormwater non GPT simple	• ID	Text	
	• Construction	Text	
	• Manufacturer Model	Text	
	• Treatment Measure	Text	
	• Function	Text	
	• Length	Number	Millimetres, to one decimal place
	• Width	Number	Millimetres, to one decimal place
Stormwater WSUD area	• ID	Text	
	• Treatment Measure	Text	
	• Function	Text	
	• Ponding Area	Number	Square Metres, to one decimal place
	• Ponding Depth	Number	Metres, to one decimal place
	• Filter Area	Number	Square Metres, to one decimal place
	• Filter Depth	Number	Metres, to one decimal place
	• Sediment Volume	Number	Cubic Metres, to one decimal place

2.3 Sewer WAE Data

The following table describes the minimum required data for each sewer asset. Detailed descriptions are available in Forms SS 41 to SS 47.

Asset	Data Attributes	Data Type	Quality Information

Sewer manhole	• ID	Text	
	• Use	Text	
	• Chamber Size	Number	Millimetres
	• Surface level	Number	Metres, to one decimal place
	• Invert Level	Number	Metres, to one decimal place
	• Floor Construction	Text	
	• Floor Material	Text	
	• Wall Construction	Text	
	• Wall Material	Text	
	• Roof Material	Text	
	• Lining	Text	
	• Lid Material	Text	
	• Drop Type	Text	
	• Catchment Pump Station	Text	
	• Line Number	Text	
	• Chainage	Number	Metres, to one decimal place
Sewer non pressure pipe	• ID	Text	
	• Use	Text	
	• Diameter	Number	Millimetres
	• Material	Text	
	• Class	Text	
	• Lining	Text	
	• Protection	Text	
	• Joint Type	Text	
	• Invert Level	Number	Metres, to one decimal place
	• Surface Level	Number	Metres, to one decimal place
	• Average Depth	Number	Metres, to one decimal place
	• Length	Number	Metres, to one decimal place
Sewer pressure pipe	• ID	Text	
	• Use	Text	
	• Diameter	Number	Millimetres
	• Material	Text	

	• Class	Text	
	• Lining	Text	
	• Protection	Text	
	• Joint Type	Text	
	• Depth	Number	Metres, to one decimal place
	• Length	Number	Metres, to one decimal place
Sewer valve	• ID		
	• Use	Text	
	• Type	Text	
	• Diameter	Number	Millimetres
	• Protection	Text	
	• Manufacturer Model	Text	
Sewer fitting	• ID	Text	
	• Type	Text	
	• Material	Text	
	• Body Size	Number	Millimetres
	• Branch Size	Number	Millimetres
Sewer connection	• ID	Text	
	• Use	Text	
	• Diameter	Number	Millimetres
	• Material	Text	
	• Class	Text	
	• Length	Number	Metres, to one decimal place
	• Type	Text	
	• Downstream Manhole ID	Text	
	• Invert Level	Number	Metres, to one decimal place
	• Surface Level	Number	Metres, to one decimal place
	• Chainage	Number	Metres, to one decimal place

2.4 Water WAE Data

The following table describes the minimum required data for each water asset. Detailed descriptions are available in Forms WS 31 to WS 38.

Asset	Data Attributes	Data Type	Quality

				Information
Water manhole	•	ID	Text	
	•	Use	Text	
	•	Chamber Size	Number	Millimetres
	•	Surface level	Number	Metres, to one decimal place
	•	Invert Level	Number	Metres, to one decimal place
	•	Floor Construction	Text	
	•	Floor Material	Text	
	•	Wall Construction	Text	
	•	Wall Material	Text	
	•	Roof Material	Text	
	•	Lid Material	Text	
Water pipe	•	ID	Text	
	•	Use	Text	
	•	Diameter	Number	Millimetres
	•	Material	Text	
	•	Class	Text	
	•	Lining	Text	
	•	Protection	Text	
	•	Joint Type	Text	
	•	Average Depth	Number	Metres, to one decimal place
	•	Length	Number	Metres, to one decimal place
Water service fitting	•	ID	Text	
	•	Type	Text	
Water valve	•	ID		
	•	Use	Text	
	•	Type	Text	
	•	Diameter	Number	Millimetres
	•	Manufacturer Model	Text	
Water fitting	•	ID	Text	
	•	Type	Text	
	•	Material	Text	
	•	lining	Text	
	•	Protection	Text	

	• Body Size	Number	Millimetres
	• Branch Size	Number	Millimetres
Water meter	• ID	Text	
	• Serial Number	Text	
	• Type	Text	
	• Diameter	Number	Millimetres
	• Dial	Number	
	• Initial Reading	Number	
	• Manufacturer Model	Text	
Water hydrant	• ID	Text	
	• Use	Text	
	• Diameter	Number	Millimetres
Water irrigation fitting	• ID	Text	
	• Type	Text	
Water storage tank	• ID	Text	
	• Material	Text	
	• Source	Text	
	• Volume	Number	Cubic Metres, to one decimal place
	• Manufacturer Model	Text	

3 Construction Quality Records

3.1 Road

A Statement shall be provided detailing the procedure adopted for the infield confirmation of soil type boundaries, subgrade strength, stabilisation and pavement design. The statement shall be accompanied by soil classification, grading and CBR test records.

The Statement shall include a Work as Executed (A3 size) pavement plan detailing the various pavement configurations finally adopted and their respective boundaries. This plan shall be suitably annotated with street names and numbers, chainages, block boundaries, concrete structures etc.

Non-complying and retest results shall also be recorded and maintained. The Coordinator shall maintain and make available for inspection by the Government agencies, all quality records for a minimum period of seven (7) years after final handover and acceptance.

For unsealed roads on PCL land, a statement of compliance with PCL Roading Manual and the design drawings shall be provided.

3.2 Stormwater

Consultant shall include site inspection records, stormwater tie records and Closed Circuit Television (CCTV) reports which includes DVD video of all pipe work constructed including slim drains and/or similar (to be retained by Singleton Council).

3.3 Sewer

When certifying the drawings, Consultant shall pay particular attention to ensuring that every individual sewer asset has been constructed to the design parameters and within the specified tolerances.

3.4 Water

When certifying the drawings, Consultant shall pay particular attention to ensuring that every individual water asset has been constructed to the design parameters and within the specified tolerances.

4 Operations and maintenance manuals

Operations manuals and warranty information for any installed equipment shall be provided.

Forms:

S:\Document Catalogue\Asset Management\Singleton Standard\Data Collection\New Temps