



## **DESIGN GUIDELINES**

DG 01 Roundabouts

DG 02 Engineering Drawings

**DG 03 As Constructed Information**

DG 04 Local Area Traffic Management

DG 05 Pavement Design

DG 06 Recreational Trails – Planning, Construction and Maintenance

DG T10 Landscape Construction on Road Reserves,  
Parks and Drainage Reserves

DG T11 On-Site Carparking and Service Vehicle Facilities



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## **DG 03**

# **PROVISION OF AS CONSTRUCTED DRAWINGS AND ASSET INFORMATION FOR CIVIL INFRASTRUCTURE**

# DG 03

## PROVISION OF AS CONSTRUCTED DRAWINGS AND ASSET INFORMATION FOR CIVIL INFRASTRUCTURE

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**1.0.0****PURPOSE**

The purpose of this Guideline is to outline the requirements for the preparation and presentation of as constructed drawings and asset information for civil infrastructure works. These drawings may be the subject of:-

- ❖ an application under a Transitional Planning Scheme;
- ❖ a commission for a Pine Rivers Shire Council project

As constructed drawings and asset information will be used by the Pine Rivers Shire Council as a record of the constructed assets, and for their continued maintenance. The Pine Rivers Shire Council will also provide this information to other parties where it is required to assist with identifying the location of infrastructure, connecting to existing infrastructure, to avoid damage to the infrastructure, for its alteration, or other relevant reasons.

## **2.0.0 SCOPE**

### **2.1.0 INCLUDED WORKS**

This Guideline covers the presentation of as constructed drawings and asset information for civil infrastructure including:-

- ❖ bulk earthworks
- ❖ road works
- ❖ allotment earthworks
- ❖ allotment conditioning works
- ❖ retaining structures
- ❖ stormwater drainage infrastructure
- ❖ stormwater quality improvement devices
- ❖ wetlands
- ❖ water supply mains and associated works
- ❖ pits and chambers housing water supply, sewerage, or stormwater works
- ❖ sewerage mains and associated works
- ❖ "standard" sewerage pumping stations
- ❖ all works generally associated with a project except as discussed in 2.2 below

These standards shall apply to all works whether they are constructed in association with new or existing developments, and shall also apply to such works to be constructed in privately or publicly owned land.

### **2.2.0 WORK NOT COVERED BY THIS GUIDELINE**

Whilst this Guideline does not cover the following, the principles included in this Guideline in addition to industry professional standards and best practice should be followed for:-

- ❖ landscaping works on public land
- ❖ reservoirs and elevated storage tanks
- ❖ major pumping installations
- ❖ raw water delivery systems
- ❖ associated major infrastructure such as treatment plants etc.

### **3.0.0 REFERENCE DOCUMENTS**

Various Pine Rivers Shire Council standard drawings for the presentation of as constructed Information.

ADAC (Asset Design and As Constructed) website for general references and PRSC specific technical guides.

## 4.0.0 DEFINITIONS

- ❖ Council – Pine Rivers Shire Council
- ❖ Director, Assets and Infrastructure Services Division - the person occupying that position within the Pine Rivers Shire Council, or their nominated representative
- ❖ Manager, Development Services - the person occupying that position within the Pine Rivers Shire Council, or their nominated representative
- ❖ General Manager, Pine Water - the person occupying that position within the Pine Rivers Shire Council, or their nominated representative
- ❖ Manager, Electrical and Mechanical Services - the person occupying that position within the Pine Rivers Shire Council, or their nominated representative
- ❖ A Pine Rivers Shire Council Engineer - the Engineer employed by the Pine Rivers Shire Council to approve, supervise, or inspect civil infrastructure construction, or their nominated representative.
- ❖ Developer - the company, organisation or person whom, under the provisions of the Planning Scheme, approval has been given to carry out the works and who acts as principal for the purpose of works carried out by contract.
- ❖ Consulting Engineer - the registered professional engineering company or registered professional engineer engaged by the principal to carry out the investigation, and design of the water supply works to be constructed by the principal. When engaged for the construction phase, the company or engineer shall act as superintendent or project manager for the purpose of works carried out by contract
- ❖ Consulting Surveyor – the surveyor or survey company engaged by the principal for the purpose of collecting and/or certifying as constructed drawings and information. The surveyor or company shall have a Cadastral (Land) or Engineering endorsement, and be a consulting surveyor in accordance with the Surveyors Act 2003.
- ❖ Contractor - as defined in AS 2124, the company, organisation or person engaged to carry out the construction of water supply works.
- ❖ ADAC – Asset Design and As Constructed electronic system used to facilitate the collection and lodgement of detailed information on contributed civil infrastructure and associated assets provided by the private sector to Councils.



## 5.0.0 PREPARATION OF DRAWINGS

### 5.1.0 GENERAL

As constructed drawings shall be prepared by a consulting engineer or designer, or a consulting surveyor competent in each discipline associated with the project.

A consulting engineer or consulting surveyor shall certify the as constructed drawings prior to their submission to the Pine Rivers Shire Council – refer Section 7.4.0 of this Guideline

### 5.2.0 SCALES

As constructed drawings are to be produced based on the suite of accepted engineering scales, or multiples of these scales. These are:-

❖ Overall Plans	1:5000 1:2500 1:1000	
❖ Layout Plans	1:500 1:1000	
❖ Longitudinal Sections	1:500 1:1000	Horizontal / 1:50 Vertical Horizontal / 1:100 Vertical
❖ Cross-sections	1:100 1:100	Horizontal / 1:50 Vertical * Horizontal and Vertical *
❖ Details	1:200 1:250 1:100	
❖ Pipework and Pit Details etc.	1:100 1:50 1:20	

Although not preferred, 1:25 and 1:125 and 1:1250 may be used on occasion.

\* The selection of distorted scales will depend on the cross slope of the ground and clarity required on the drawing.

### 5.3.0 MEDIA AND SHEET SIZES

All as constructed drawings for civil infrastructure shall be based on standard size sheets, the following sheet sizes being the only ones accepted:-

- ❖ A1 841 mm x 594 mm
- ❖ A2 594 mm x 420 mm
- ❖ A3 420 mm x 297 mm
- ❖ A4 297 mm x 210 mm - building site plans only

Copies or originals of drawings are to be supplied for as constructed drawings. These are to be presented as black ink drawings on either polyester film or tracing paper.

Colour should be avoided for drawings.

## **5.4.0 SURVEY DATUM**

### **5.4.1 Horizontal**

As constructed control shall be based on the Geocentric Datum of Australia (GDA 94) and be projected to the Map Grid of Australia 1994 (MGA 94) Zone.

### **5.4.2 Vertical Datum**

As constructed levels shall be levelled to Australian Height datum (AHD)

## **6.0.0 RELATIVITY TO DESIGN DRAWINGS**

As constructed drawings and asset information will provide all information necessary to show and describe the infrastructure as, and where, it has been constructed. Work originally included in the design drawings and omitted from construction shall be crossed out on the drawings and deleted from any associated asset information included at the design stage.

As constructed drawings and asset information shall be prepared, or checked by the consulting engineer, superintendent or project manager for the project to ensure the information is a complete and accurate record of the constructed works.

Generally, professionally produced AutoCAD based design drawings produced in accordance with the Pine Rivers Shire Council *Design Guideline DG-02 - Engineering Drawings for Civil Infrastructure* will be suitable as the basis for preparation of as constructed drawings, depending on the variation between the original design and constructed works.

Drawings produced at the design phase with the collection and presentation of as constructed information in mind may be suitable as the basis for as constructed plans and information. The validity of the design drawings must be checked for compliance with this Guideline, as their suitability should not be assumed.

Design drawings produced as stand alone drawings without their future use for as constructed drawings may not be suitable as a basis for as constructed drawings.

Design drawings may not be satisfactory where the Pine Rivers Shire Council various standard drawings for the presentation of as constructed drawings differ from conventional design practices.

## **6.1.0 COMPLIANCE WITH OPERATIONAL WORKS PERMIT**

The operational works permit will require the applicant to submit as constructed information or drawings as a condition of the permit. Information and drawings are to be submitted in accordance with this Guideline.

## **6.2.0 INFORMATION REQUIRED FOR COUNCIL PROJECTS**

Design drawings prepared for the Pine Rivers Shire Council projects produced in accordance with the Pine Rivers Shire Councils Guideline DG-02 should be suitable as the basis for preparation of as constructed drawings.

Where an arrangement exists between the Pine River Shire Council and another party (e.g. the superintendent, project manager, or a contractor) for the collection and supply of as constructed information, the information shall be collected and presented to Pine Rivers Shire Council in accordance with this Guideline.

## **6.3.0 TOLERANCES**

Variations may occur between the constructed location of the works, and the design position, level and details, for valid reasons and during the construction phase of any project.

Where the variation between the constructed works and the design drawings exceeds the tolerances for position or level provided in *Appendix A* of this Guideline, all drawings and asset information shall be amended to show the infrastructure in its as constructed location and form. All changes to design detail are to be presented on the drawings based on their as constructed condition. Asset information is also to be modified similarly.

## 7.0.0 PRESENTATION OF AS CONSTRUCTED INFORMATION

### 7.1.0 GENERAL INFORMATION

The project as constructed drawings shall include the following general information:-

- ❖ estate or development name and stage
- ❖ developer's name
- ❖ consultant's name, address and contact details
- ❖ scale and scale bar
- ❖ drawing title and number
- ❖ drawing revision schedule and description of amendments
- ❖ locality plan (may be included on a title sheet covering a multi-faceted project)
- ❖ legend
- ❖ area for indicating approval of the drawing (including amendments)

As constructed plans and asset information files are to show the true nature and extent of construction works carried out. Any deviation in construction from that indicated on the approved proposal plans, which is outside normal construction tolerances, is to be marked on or deleted from the plans. The Pine Rivers Shire Council standard construction tolerances are set out in *Appendix "A"* to this Guideline. Any ambiguities between notes or values (e.g. minimum depth etc.) are to be deleted and confirmed as actual figures.

Information on the plans submitted for approval and acceptance "on maintenance" is to be limited to only that stage or stages of the development for which approval is sought. All information for other stages shown on plan, sections or details, apart from general allotment layout and road network, is to be removed from the drawings or crossed through with the wording "**NOT IN THIS STAGE**" in large bold lettering.

### 7.2.0 HARD COPY DRAWINGS AND MANUALS

Hard copy, final as constructed drawings are to be submitted as transparencies. Typically, linework and shading should be presented as black or grey-scale.

Coloured linework and shading used for identification of elements should be avoided as plan reproductions are usually monochrome.

Operating manuals for pumps, multitrode controllers etc. are to be supplied as hard copy documents in a suitable binder.

### 7.3.0 SEPARATION OF DRAWINGS AND INFORMATION

The Pine Rivers Shire Council has provided a number of standard drawings showing presentation requirements for various asset groups. Where the project contains aspects of each of these works, information for each is to be provided on separate drawings or files. These drawings shall not contain information other than for the purpose of the drawing. Drawings for the following infrastructure may be presented either in accordance with the sample standard drawing for each asset group, or a separate hard copy of the ADAC file showing all asset information for each asset group with additional annotation for dimensions, alignments, offsets, contours and other details.

Examples include:-

- ❖ allotment earthworks
- ❖ reticulation water supply information
- ❖ gravity sewerage information
- ❖ inter-allotment stormwater drainage

#### **7.4.0 ADAC INFORMATION FILE**

Pine Rivers Shire Council requires ADAC as constructed asset information to be supplied as electronic files. Information contained in this format does not replace hard copy plans, but supplements these. Hard copy plans are to be amended to reflect changes during construction, and to ensure they are identical to the ADAC content, or vice versa.

The ADAC file shall contain all relevant information for each asset group. This shall be created using a recognised ADAC compliant tool using the most recent ADAC schema.

All modules in the latest ADAC schema are to be completed to represent the As Constructed attributes of the infrastructure.

#### **7.5.0 ELECTRONIC PROJECT DRAWINGS**

Electronic files in AutoCAD DWG format are to be submitted for each project drawing. The set of electronic drawings or files is to include all associated files used in drawing creation and printing (e.g. font, shape and linetype files, printer setup files, external reference files, image files etc.) to allow the drawings to be printed as intended.

#### **7.6.0 CERTIFICATIONS**

All as constructed drawings and information manuals are to include signed certificates in accordance with the examples included in *Appendices B and C* to this Guideline. The certificates are to be fixed onto the drawings, and bound into the manuals. Electronic copies of drawings and manuals are to include the signed certificate.

Electronic drawings or files are to contain the consulting engineer or consulting surveyor's certification, including electronic signature generally as shown in *Appendices B and C* to this Guideline. Certificates may be included on each drawing or file, or as a separate file supplied with and referencing the electronic file name or drawings to which it applies.

Certifications from consulting surveyors will be required on drawings showing the position and depth of filling placed on allotments. An engineer's certification will not be required on these drawings.

An engineer's certification will be required on all other drawings associated with the project. The matter of assurances between the engineer certifying the drawing and any other party collecting or presenting the information on drawings is an arrangement between those parties.

#### **7.7.0 MANUALS**

The Pine Rivers Shire Council requires copies of operating manuals and similar documents to be supplied in PDF file format.

### 8.0.0 INFORMATION REQUIRED

As constructed drawings and asset information is to be presented in accordance with Pine Rivers Shire Council's various sample presentation standard drawings or in an ADAC asset data format and the following general requirements.

In general, a drawing set for a project will contain:-

- ❖ locality plan
- ❖ layout plan for the project
- ❖ layout, locations and details of existing services
- ❖ final allotment layout
- ❖ details of any "future works" designed to enable detailing of proposed work
- ❖ stage boundaries where applicable, or limit of work
- ❖ origin of levels and set out information

### 8.1.0 ALLOTMENT WORKS

Engineering drawings for allotment works are to include the following information:-

- ❖ clearing plans
- ❖ retaining walls and similar
- ❖ drawings showing designated building site locations
- ❖ allotment earthworks – extent of cut and fill. Drawings showing allotment earthworks shall include final contours over the allotment, the area over which fill has been placed designated by translucent hatching or shading, and spot depths of fill shown at not more than 15m spacing and along gullies or ridges.

### 8.2.0 ROADWORKS

As constructed drawings for road works are to include the following information:-

- ❖ plan of each new road
- ❖ detailed plan of each intersection, cul-de-sac or speed control device
- ❖ longitudinal section of each road
- ❖ cross-sections of each road
- ❖ standard (typical) cross-section for each road
- ❖ access cross-sections (where necessary)
- ❖ noise attenuation barriers
- ❖ speed control devices
- ❖ signs and line marking
- ❖ other details as apply to the project

### 8.3.0 STORMWATER DRAINAGE WORKS

As constructed drawings for stormwater drainage works are to include the following information:-

- ❖ longitudinal sections of each drain line, showing pipeline, natural surface, and pipeline details at regular spacing (nominal 20 m)
- ❖ plan, longitudinal and cross-sections of open drain systems
- ❖ layout plan including the stormwater drainage system with numbered manholes and catchpits and culverts etc.
- ❖ inter-allotment drainage layout plan in accordance with the Pine Rivers Shire Councils standard drawing sample
- ❖ drainage details including information on manholes, catchpits, culverts etc.
- ❖ catchment plan
- ❖ drainage calculations sheet

- ❖ detention basin details
- ❖ gross pollutant traps
- ❖ wetlands systems
- ❖ erosion and sedimentation control plans and details of devices

## 8.4.0 WATER SUPPLY

### 8.4.1 Reticulation Mains (250 mm diameter and less)

A drawing set may be limited to a layout plan, accompanying details and notes, however information must include:-

- ❖ plan layout of water mains, including legend for pipe sizes
- ❖ offset for mains from property boundaries, or other set out information as may be appropriate
- ❖ positions for valves and hydrants
- ❖ positions for pre-tapped property service fittings (where pipe diameters suit)
- ❖ diagrams/details of proposed bends, fittings etc. (may be provided as line diagrams or a table)
- ❖ class and material for pipes and fittings
- ❖ detail of proposed interconnections to existing mains
- ❖ location of service conduits
- ❖ project specific details where required

### 8.4.2 Trunk Mains (300 mm diameter and greater)

As constructed drawings associated with water supply infrastructure of this size is significant, and more precise information is required to enable future “design-in” and accurate location of this infrastructure.

As such, the information required is similar to that required for design and construction. An as constructed drawing set must contain the following information:-

- ❖ plan layout of new and original water mains, including legend for pipe sizes
- ❖ property details and final allotment layout
- ❖ locations/details of existing features
- ❖ stage boundary/limit of works
- ❖ offset for mains from property boundaries, or other set out information as may be appropriate
- ❖ positions for valves, hydrants and other key fittings
- ❖ longitudinal section showing pipeline, natural surface, and pipeline details at regular spacing (nominal 20 m)
- ❖ diagrams/details for bends, fittings etc. (scale details and / or line diagrams)
- ❖ details of proposed pits or chambers and included pipe work
- ❖ detailed sections of the main (plan and longitudinal sections etc.) for creek crossings, aerial mains or other areas requiring a high order of detail
- ❖ class and material used for pipes and fittings
- ❖ details of interconnections to existing mains
- ❖ project specific details as required

The amount of information and detail of the above will depend on the location and complexity of the project and the size of main.

## 8.5.0 SEWERAGE WORKS

### 8.5.1 Gravity Sewers

A drawing set may be limited to a layout plan, accompanying details and notes as follows. Information must contain:-

- ❖ details as required on the Pine Rivers Shire Council standard drawing sample
- ❖ plan layout of new sewer mains, including legend for pipe sizes
- ❖ locations of original sewer mains
- ❖ stage boundary/limit of works
- ❖ offset of mains from property boundaries, and other set out information as may be appropriate
- ❖ positions of manholes – dimensioned from boundaries
- ❖ positions of house connection points and details
- ❖ class and material for pipes and fittings
- ❖ interconnections to existing mains
- ❖ project specific details as required
- ❖ details of pipeline alignments into manholes will be required on pipelines 300 mm diameter or greater, unless they are aligned to manhole centres
- ❖ where sewer mains and manholes are located across large allotments and dimension ties to property boundaries are difficult to provide, bearings along the sewer mains are to be provided.

### 8.5.2 Pressure Sewers

As constructed drawings for these pipelines require more precise information to enable the future “design-in” and accurate location of this infrastructure. As such, the information required is similar to that required for design and construction. An as constructed must contain the following information:-

- ❖ plan layout of new sewer mains, including legend for pipe sizes
- ❖ plan layout showing original sewer mains, other services and features
- ❖ locations/details of existing features
- ❖ stage boundary/limit of works
- ❖ offset for mains from property boundaries, or other set out information as may be appropriate
- ❖ longitudinal section showing pipeline, natural surface, pipeline details, and hydraulic grade line at regular spacing (nominal 20 m)
- ❖ detailed sections of the main (plan and long. sections etc.) for creek crossings, aerial mains or other areas requiring a high order of detail
- ❖ details of interconnections to the existing sewerage system
- ❖ positions and details fittings and items along the main including bends, section valves, discharge manholes, venting and scour arrangements etc.
- ❖ class and material for pipes and fittings
- ❖ project specific details as required

The amount of information and detail of the above will depend on the location and complexity of the project.

### 8.5.3 Pumping Stations

Structural arrangements of sewer pump stations, electrical and mechanical fit-out are to be completed in accordance with the Pine Rivers Shire Council standards – also refer to sections in this guideline relating to structural works and electrical/mechanical works etc.

A number of standard drawings for sewer pump stations are to be completed and submitted with final as constructed drawings and information.



### **8.6.0 ELECTRICAL, MECHANICAL AND TELEMETRY WORKS**

Where the project includes any of these items of infrastructure, the following information and drawings are to be provided:-

- ❖ electrical circuit diagrams, including completed standard drawings
- ❖ switchboard layouts and details
- ❖ equipment lists
- ❖ pump curves including design point
- ❖ pipe resistance curves
- ❖ any other relevant project specific information required
- ❖ operation and maintenance manuals for pumps, multistroke controllers etc.
- ❖ replaceable components schedule and life expectancy details

### **8.7.0 STRUCTURAL WORKS**

Where structures and structural works form part of the project works, complete working drawings detailing all structures, (above and below ground) and structural elements are to be provided as part of the drawing set to be submitted.

By example, structures will include concrete pits for assorted valves, pipe galleries, pump stations, and other similar installations.

### **9.0.0 SUBMISSION OF AS CONSTRUCTED INFORMATION**

The requirements for submitting As Constructed information to the Pine Rivers Shire Council will depend on whether the project is part of an operation works permit, or a project commissioned by the Pine Rivers Shire Council.

Electronic files are to be submitted on CD, DVD, or USB storage device. Files shall not be emailed.

### **9.1.0 INFORMATION REQUIRED UNDER AN OPERATIONAL WORKS PERMIT**

For the purposes of conducting “on maintenance” inspections for a project, a set of A3 “preliminary” as constructed drawings may be submitted prior to lodgement of the final drawings. These may be in the form of hard copy, or PDF electronic format.

Final as constructed drawings and information required under an operation works permit shall include:-

- ❖ one hard copy set of all drawings for the works (except PRSC standards) in accordance with this guideline. Drawings are to be original size (not reduced).
- ❖ ADAC compliant asset data files
- ❖ two sets of hard copy operating manuals for pumps, multitrode controllers etc.
- ❖ an electronic drawing (AutoCAD DWG) for each project drawing is required. This includes all associated files used in drawing creation and printing.
- ❖ one set of electronic files (PDF file format) for operating manuals for pumps, multitrode controllers etc. may be required.

### **9.2.0 INFORMATION REQUIRED FOR COUNCIL COMMISSIONED PROJECTS**

Where as constructed drawings are required as part of an agreement for a project, the following information is to be provided:-

- ❖ one hard copy set of all drawings for the works (except the Pine Rivers Shire Council standards) in accordance with this guideline. Drawings are to be original size (not reduced).
- ❖ ADAC compliant asset data files
- ❖ two sets of hard copy operating manuals for pumps, multitrode controllers etc.
- ❖ one set of electronic drawings (AutoCAD DWG). This includes all associated files used in drawing creation and printing.
- ❖ one set of electronic files (PDF file format) for operating manuals for pumps, multitrode controllers etc.

### **9.3.0 REJECTION OF DRAWINGS AND INFORMATION**

Any hard copy as constructed drawing or electronic file which fails to comply with the requirements of this Guideline or which fails a validation check may be rejected. As constructed information will not be accepted, or works placed “on maintenance” until all as constructed information and presentation complies with this Guideline.

- ❖ Drawings and electronic files may also be rejected after the works have been accepted on maintenance should a Pine Rivers Shire Council engineer find they are unsuitable in any way with respect to this Guideline or contain errors or omissions.

These cases would normally come to notice during the transfer of information from the original drawings and files supplied, onto the Pine Rivers Shire Council information systems.

Material rejected by the Pine Rivers Shire Council is to be duly revised, re-certified and re-submitted to the Pine Rivers Shire Council within fourteen days.

#### **9.4.0 RECOVERY OF COSTS**

The Pine Rivers Shire Council reserves the right to recover any relevant costs from a consulting engineer and/or developer whom, in the opinion of the Director, Assets and Infrastructure Services Division, has not performed satisfactorily in the preparation of as constructed drawings and asset information.

# APPENDIX "A"

## STANDARD CONSTRUCTION TOLERANCES

### 1. CLEARING

(a) Roadworks formation		- 0m + 3m
(b) Bulk earthworks	not outside approved area	
(c) Designated building areas	not outside approved area	
(d) Pipelines	(i) centreline	- 0m + 3m
	(ii) not outside approved area	

### 2. BULK EARTHWORKS

(a) Finished level	(i)	± 200mm
	(ii) free drainage at not less than min. grade	
	(iii) residential allotments not less than specified levels adjacent to rivers, creeks or other drainage features.	
(b) Formation position		± 200mm

### 3. ROAD FORMATION

(a) Formation level		+ 15mm - 30mm
(b) Box width		+ 150mm - 0mm
(c) Formation width	(i) top position for cut batter	+ 200mm - 0mm
	(ii) toe position for cut batter	+ 200mm - 0mm
	(iii) top position for fill batter	+ 200mm - 0mm
	(iv) toe position for fill batter	+ 200mm - 0mm
	(v) batters steeper than 1:4 clear of service allocations	
(d) Batter slope	(i) not steeper than specified	
	(ii) maximum variation to plane of cut batter	= 150mm
	(iii) maximum variation to plane of fill batter	= 300mm
(e) Formation limits	(i) Trunk Collector, Sub-Arterial and Arterial road formation contained within road reserve	
	(ii) comply with relevant verge cross-section	

#### 4. UNBOUND PAVEMENT

(a) Finished level	(i) any location	+ 25mm - 15mm
	(ii) average	± 10mm
(b) Surface	(i) maximum deviation from 3m straight edge	= 8mm
	(ii) no ponding	
(c) Crossfall	(i) any location	+ 0.50% - 0.20%
	(ii) average tolerance	± 0.20%
(d) Thickness	(i) each layer	+ 15mm - 10mm
	(ii) total depth	± 25mm and not less than min
(e) Match to lip level of concrete channel	(i) for AC seal lip level minus seal thickness	- 0mm - 5mm
	(ii) for bitumen seal	- 5mm - 15mm
(f) Surface evenness (AUSTROADS Count Rate)		≤ 60 counts / km

#### 5. SEAL

(a) A.C. seal	(i) match to lip level of concrete channel	+ 6mm - 0mm
	(ii) thickness - individual test	+ 20mm - 3mm
		- average
	(iii) crossfall - any location	+ 8mm - 0mm
		+ 0.50% - 0.20%
	- average	± 0.20%
	(iv) horizontal alignment	± 50mm
	(v) width - unkerbed	+ 150mm - 0mm
		- kerbed
		no gap at channel lip
(b) Bitumen seal	(i) match to lip level of concrete channel	+ 10mm + 5mm
	(ii) crossfall - any location	+ 0.50% - 0.20%
		- average
	(iii) horizontal alignment	± 0.20%
	(iv) width - unkerbed	± 50mm + 150mm
		- 0mm
	- kerbed	no gap at channel lip

## 6. KERB & CHANNEL

(a) Line and level	± 10mm
(b) No ponding	
(c) Grade not less than 0.4% slope	
(d) Cross section dimensions	± 5mm
(e) Maximum deviation from 3.0m straight edge	5mm

## 7. STORMWATER DRAINAGE

(a) Manholes	(i) plan position (longitudinal and lateral)	± 75mm
	(ii) no ponding in invert	
	(iii) top surface level	+ 25mm - 15mm
	(iv) match to adjacent surface - unpaved surface - paved surface	± 25mm ± 6mm
(b) Catchpits/Gullies	(i) longitudinal location	± 100mm
	(ii) lateral location	± 15mm
	(iii) no ponding in invert	
	(iv) top surface of backstone	true to line and level of adjacent kerb
(c) Pipework	(i) invert level	± 20mm
	(ii) not less than minimum grade	
	(iii) joint gap = specified gap	- 0mm + pipe dia/100 or + 20mm whichever is least

## 8. INTERALLOTMENT DRAINAGE

(a) Pits and chambers	(i) plan position (longitudinal & lateral)	± 100mm
	(ii) no ponding in invert	
	(iii) wholly within one property	
	(iv) top surface level relative to adjacent ground level - grated - ungrated	+ 0m - 50mm ± 25mm

**9. SEWERAGE RETICULATION (GRAVITY)**

(a) Manholes	(i) plan position (longitudinal and lateral)	± 75mm
	(ii) wholly within one property	
	(iii) no ponding	
	(iv) top surface level	± 15mm
	(v) match to adjacent surface	
	- properties	+ 85mm + 115mm
	- footpaths (grassed)	+ 10mm + 40mm
	- paved areas	± 6mm
(b) Pipework	(i) invert level	± 15mm
	(ii) not less than minimum grade	
	(iii) not more than maximum grade	
	(iv) true to line	
	(v) no ponding	

**10. SEWERAGE RETICULATION (RISING MAINS)**

(a) Alignment of pipe & fittings	(i)	± 100mm
	(ii) within approved service corridor	
(b) Cover specified	(i)	+ 100mm - 0mm
	(ii) adequate for installation of fittings	
(c) Location of fittings	(i) longitudinal	± 200mm

**11. WATER RETICULATION**

(a) Alignment of pipe & fittings	(i)	± 100mm
	(ii) within approved service corridor	
(b) Cover specified	(ii) adequate for installation of fittings	+ 0mm - 100mm
(c) Location of fittings	(i) longitudinal	± 200mm

**12. FENCING**

(a) General	(i) true to line	
	(ii) plan position	± 50mm lateral
	(iii) not less than specified height	
(b) Noise attenuation fence	(i) true to line	
	(ii) plan position	± 50mm lateral
	(iii) not less than specified heights	
	(iv) no gaps	

**13. CONCRETE FOOTPATH**

(a) Horizontal position		± 100mm
(b) Vertical alignment		+ 20mm - 10mm
(c) Width		+ 25mm - 10mm
(d) Surface	(i) maximum deviation from 3m straight edge	8 mm
	(ii) no ponding	

1. Works constructed outside these tolerances may not be accepted on maintenance.
2. Any deviations outside these tolerances, as approved by a Pine Rivers Shire Council engineer, must be shown on the "as constructed" drawings in accordance with this Guideline.
3. These tolerances have been compiled from a number of specifications and publications. Variations may exist between these tolerances and those indicated in some specifications, in which case, the applicable tolerance shall be at the discretion of a Pine Rivers Shire Council engineer.



## APPENDIX “B”

### SURVEYOR’S CERTIFICATION

“I, .....  
(Surveyor’s Name)

being a Consulting Surveyor and duly authorised representative of: -

.....  
(Company Name)

hereby: -

- ❖ certify the information contained in this drawing / file is an accurate "as constructed" representation of the works;
- ❖ accept responsibility for the "as constructed" information contained in this drawing / file; and
- ❖ acknowledge the "as constructed" information contained in this drawing / file may be relied on by the Pine Rivers Shire Council and others.

Certification for Stage..... by..... on.....”  
(Stage No.) (Signature) (Date)

for:.....  
(Company Name)

Note: - Where surveying firm or company and stage numbers do not apply, complete with N/A for "not applicable".

# APPENDIX “C”

## ENGINEER’S CERTIFICATION

“I, .....  
(Engineer's Name)

being a Certificated/Registered Engineer and duly authorised representative of:-

.....  
(Consulting firm or company)

hereby: -

- ❖ certify the information contained in this drawing / file is an accurate "as constructed" representation of the works;
- ❖ accept responsibility for the "as constructed" information contained in this drawing / file; and
- ❖ acknowledge the "as constructed" information contained in the drawing / file may be relied on by the Pine Rivers Shire Council and others.

Certification for Stage..... by..... on.....  
(Stage No.) (Signature) (Date)

for:.....  
(Company Name)

Registered Professional Engineering Company of Queensland .....  
(Number)

Note :- Where consulting firms or company and stage numbers do not apply, complete with N/A for "not applicable".