

**Drafting and Design Presentation Standards  
Volume 3: Structural Drafting Standards**

**Chapter 2: Standard of Presentation**

**February 2014**

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## Chapter 2 Amendments

### Revision Register

Issue/Rev No.	Reference section	Description of revision	Authorised by	Date
1	-	First Issue	Manager (Structural Drafting)	Apr 2011
2	-	Document name change	Manager (Structural Drafting)	Nov 2011
	2.7	Cross referencing is done to drawing series number in an element, rather than the series number for the full set of drawing		
	2.9	Dimension arrow size increased to 3.5 mm. Dimension text offset from line 1.5 mm		
	2.17	Drawing sub codes removed		
	2.18	Drawing titles shall not be split up into sub-elements. Revision symbol is not longer required		
3	2.7	General: wording “and the numbers 1 and 0” deleted from line 10.	Team Leader (Structural Drafting)	Dec 2012
	2.18	Figure 2.18-5 Title Block – Partial view figure numbers corrected. Figure 2.18-6 Title Block (View A) – extra labelling added.		
4	2.6	General: Additional detail for font styles	Principal Drafter (Structural Drafting)	Feb 2014
	2.18	Title Blocks: Cad Files and Revisions sections. “Issue for construction” replaces “original issue”		

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## 2 Standard of Presentation

### 2.1 Glossary of terms

For a complete glossary of terms refer Chapter 1 *Introduction*.

### 2.2 Figures and examples shown in this volume

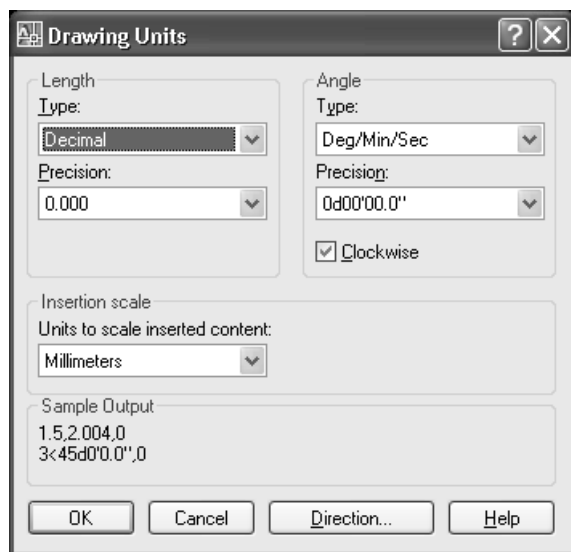
The figures and examples shown in this volume are for presentation purposes only, and may contain some details that are now superseded. These details have been included for ease of reference, to illustrate typical solutions, and to show the required standard of drafting presentation. The details are not to be used without an engineering check and certification by a Structural RPEQ to confirm that the details are appropriate for the specific project.

### 2.3 Drawing set up

This Section is provided as a guide only, and the drawing set up may be changed.

All drawings are to use colour dependant plot style tables (CTB), not style dependant tables (STB), General Arrangement drawings are to have the user coordinate system (UCS) set to world coordinates.

All drawings are to have the units set as follows:



The model is to be drawn at full scale in model space and view ports are to be created at the appropriate scales in paper space. All view specific text and dimensions are to be drawn in model space to match the scale of the view port for that view.

Drawing notes are to be in paper space in the bottom right-hand corner of the drawing.

### 2.4 Projection












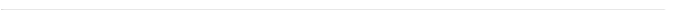
Third angle projection is to be used on all drawings for plan, elevation and any external views such as end views.

All sections should be orientated in the third angle where possible but may be placed at the most convenient location on the sheet. The plan and direction of these sections will be depicted by section arrows. Refer 2.6 *Lettering for further requirements*.

## 2.5 Linework

All linework on drawings shall be in accordance with AS 1100 - *Technical Drawing, Part 101: General Principles*, and the table of line types shown in Table 2.5-1 Line Styles. The thickness of lines are to be used on the drawings without change. The layer names and colours are provided as a guide only and may be changed. Further details of linework relating to steel reinforcement can be found in Chapter 3 *Concrete and Reinforcement Detailing*.

**Table 2.5-1 - Line Styles**

LINE STYLE	TYPICAL APPLICATION
<b>CONTINUOUS LINES – MR_CON</b>	
MR_CON_018 (0.18 mm thick cyan in AutoCAD) MR_CON_025 (0.25 mm thick white in AutoCAD) 	Dimensions, hatching, revision clouds, break lines and so on
MR_CON_035 (0.35 mm thick yellow in AutoCAD) 	Outlines for reinforcement views, internal linework
MR_CON_050 (0.5 mm thick green in AutoCAD) 	Outlines of views excluding reinforcement views
MR_CON_070 (0.7 mm thick blue in AutoCAD) 	Reinforcement
MR_CONTOUR_MAJOR (0.25 mm thick colour 250 in AutoCAD) 	Major contour lines (even metres)
<b>DASHED LINES – MR_DSH</b>	
MR_DSH_025 (0.25 mm thick white in AutoCAD) MR_DSH_035 (0.35 mm thick yellow in AutoCAD) 	Hidden detail
MR_DSH_050 (0.5 mm thick green in AutoCAD) MR_DSH_070 (0.7 mm thick blue in AutoCAD) 	Strip filters behind abutments, reinforcement in far face
MR_CONTOUR_MINOR (0.18 mm thick colour 250 in AutoCAD) 	Minor contour lines (intervals)
<b>DOUBLE CHAIN LINES – MR_DCH</b>	
MR_DCH_025 (0.25 mm thick white in AutoCAD) MR_DCH_035 (0.35 mm thick yellow in AutoCAD) 	Existing structures
<b>CHAIN LINES – MR_CHN</b>	
MR_CHN_025 (0.25 mm thick white in AutoCAD) 	Centre lines
MR_CHN_070 (0.7 mm thick blue in AutoCAD) 	Road and Bridge Controls
<b>CONSTRUCTION JOINT LINES – MRB_CJ</b>	
MRB_CJ_035 (0.35 mm thick yellow in AutoCAD) 	Construction joints

LINE STYLE	TYPICAL APPLICATION
<b>VIEW PORT LINES – MR_VPT</b>	
MR_VPT – user defined (Non plotting layer)	View ports
<b>CONSTRUCTION LINES – MR_CON</b>	
MR_CON – user defined (Non plotting layer)	Construction lines

## 2.6 Lettering

The lettering on all drawings shall be in accordance with the font style details as outlined in Volume 1 *Drafting and Design Presentation Standards*, Chapter 2: *General Standards*.

Text styles and heights shall be as outlined in Table 2.6.1 - Text Styles. The layer names and colours are provided as a guide only and may be changed.

**Table 2.6-1 - Text Styles**

STYLE	LAYER	TEXT HEIGHT (Final height on A1 size drawing)	APPLICATION
Upper and Lower Case	MR_TXT_035 (yellow in AutoCAD)	3.5 mm	Drawing text / Notes / Dimensions
Upper and Lower Case	MR_TXT_050 (green in AutoCAD)	4.0 mm	Heights
UPPER CASE	MR_TXT_050 (green in AutoCAD)	4.0 mm	Sub-Titles / Bridge Control
UPPER CASE	MR_TXT_070 (blue in AutoCAD)	5.0 mm	Titles

## 2.7 Sections, views and details

### General

Views and sections, where possible, shall be drawn adjacent to the plan or elevation to which they relate. Where details cannot be shown on the sheet of origin, they shall be cross referenced in accordance with AS 1100 - Technical Drawing, Part 501: Structural Engineering Drawing and Section 2.8 Orientation of Sections and Views.

If a series of cutting planes are used to define sections or views, any change in direction of the cutting plane shall be shown by 0.7 mm thick lines.

Use letters to nominate Sections and Views, and numbers to nominate Details. Do not reference views or sections with the same letter, or details with the same number, on the same drawing set for that element, for example Section A and View A on the abutment drawings.

Each element shall start labelling at the letter A and the number 1.

If the entire range of the alphabet is used, lettering shall continue with AA, BB etc. The letters I and O shall not be used to avoid confusion.

If the Section, View or Detail is shown on the same drawing it is taken from then '-' shall be shown in the title. If it is shown on another drawing, then the series number shall be shown, for example, 2, if referring to the second Abutment drawing.



Section arrows and titles shall be drawn in accordance with Figure 2.7-1 Sections, Views and Details and Figure 2.7-2 Examples of Sections and Details.

**Sections**

Sections are a view taken from a defined cutting plane. Other linework such as hidden detail lines or detail beyond the cutting plane may be included provided that it does not confuse the intent of the section. For example, a section taken through a headstock showing the wing wall that is beyond the cutting plane.

Sections should be hatched with the appropriate symbol. Refer Table 2.13-1 - Material Symbols. An exception to this is a section showing reinforcement detail. The hatching in this case shall be omitted as the intent of the section, showing the reinforcement, may be compromised.

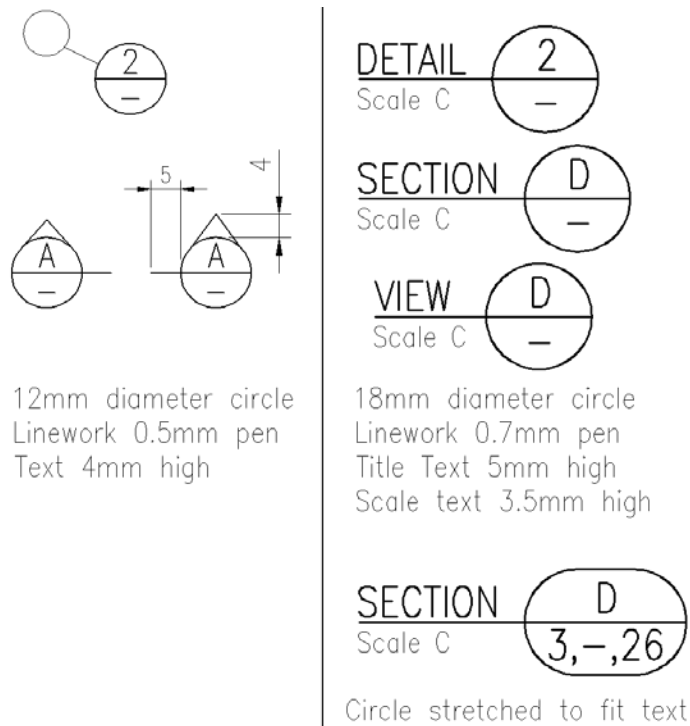
**Views**

Views are auxiliary elevations looking from a position external to previously drawn elevations and plans.

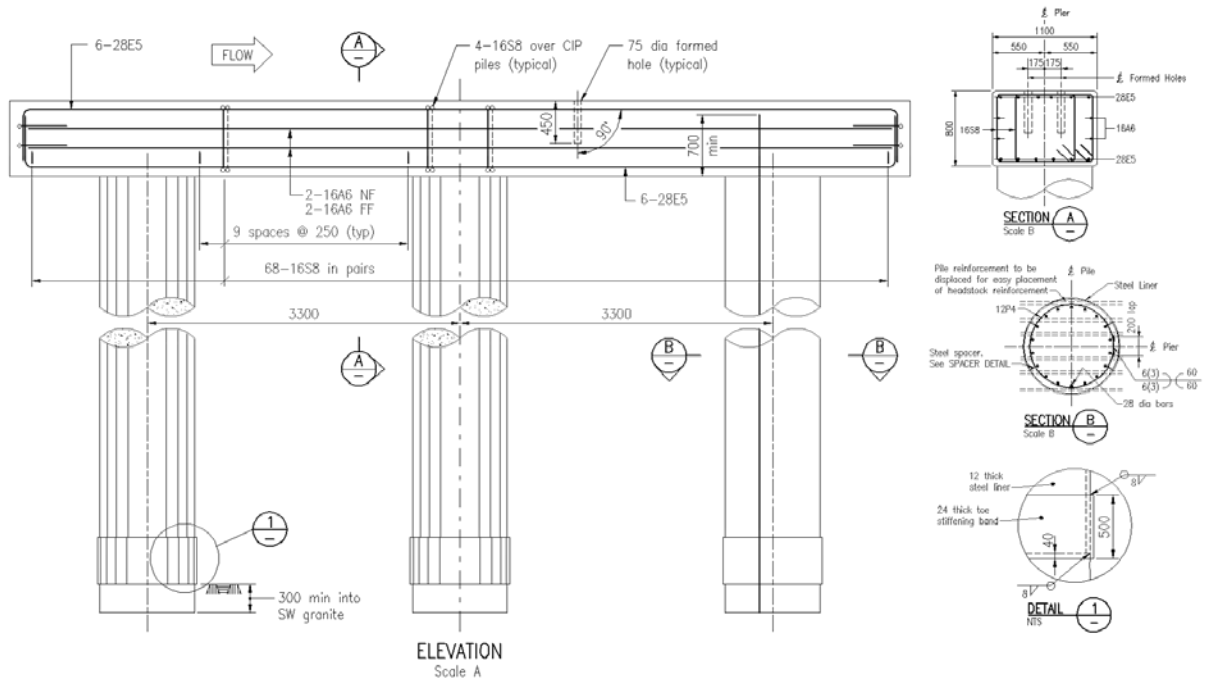
**Details**

Details are drawn to show a magnified view of a specific area shown on an element. The target area is defined by a circle on the parent view, and a leader line runs out to the detail symbol, or to the detail itself. Refer Figure 2.7-1 Sections, Views and Details and Figure 2.7-2 Examples of Sections and Details.

**Figure 2.7-1 - Sections, Views and Details**



**Figure 2.7-2 - Examples of Sections and Details**



**2.8 Orientation of sections and views**

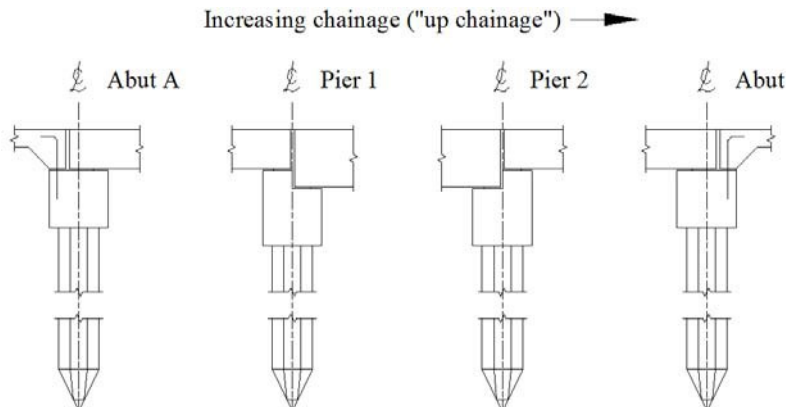
**Orientation**

Plan views of the bridge are to be drawn with increasing chainage starting left of the page to right.

**Section and views**

All section and view arrows are to be orientated so that they show the "up chainage" side of the bridge component at the right hand side of the section or view. Refer Figure 2.8-1 - Section Orientation.

**Figure 2.8-1 - Section orientation**



**Abutment and pier elevations**

On Abutment B and Pier drawings the elevations are drawn looking "up chainage", however at Abutment A, the elevation is drawn looking "down chainage".

## **2.9 Dimensions**

Each dimension necessary for the complete definition of a particular element shall be clearly shown on the drawing and shall be shown once only. Dimension and leader line arrows are to be 3.5 mm (A1 drawing) filled in type.

The dimensioning of any element shall be such that:

1. no dimension relating to that element need be deduced from other dimensions
2. all dimensions necessary to construct the element shall be shown so that there is no need to scale off a drawing to determine a dimension
3. dimensions shown on drawings shall be in millimetres and shall be placed parallel and above its dimension line and be able to be read either from the bottom or the right hand side of the drawing
4. a chain of dimensions shall be covered by an overall dimension except where dimensional tolerances are of critical importance
5. where practical, dimensions shall be placed centrally between the arrows denoting the limit for the dimension.

### **Order of accuracy for dimensions**

6. dimensions for all components shall be calculated to an accuracy of 1 mm. Dimensions to be shown on the drawings may then be rounded off as shown:
  - concrete - 1 mm
  - reinforcing bar spacing - 5 mm
  - steel plate - 1 mm.

### **Order of accuracy for heights and chainages**

7. heights shall be calculated to an accuracy of 1 mm. This is done to avoid any cumulative error that may occur. Heights shown on the final drawings may then be rounded off where necessary
8. heights and Chainages shall be shown in metres to three decimal places as shown below:
  - designed surface heights - 0.001 metres
  - chainages - 0.001 metres
  - contours - 0.250 metres generally, - 0.100 metres acceptable where ground is extremely flat
  - existing surface, flood and existing water heights, as reported.

### **Dimension, projection and leader lines**

9. dimension lines shall not be shown as centrelines or as part of an elements outline. Projection lines for dimensions shall extend from a point not less than 2 mm (A1 drawing) from the surface of the object to a point not less than 2 mm (A1 drawing) beyond the dimension line
10. leader lines, projection lines, centre lines and the like are to be kept clear of dimension text, if possible, otherwise the clashing line is to be broken to provide an uninterrupted view of the dimension text
11. leader lines shall commence from either the beginning or end of a note with a short horizontal line (length 4 mm - A1 drawing) before being angled to the point of reference

12. the termination of the leader line shall be with an arrow to the outline of the element, or with a fully shaded dot (1.5 mm diameter - A1 drawing) within the area being noted.

**Text**

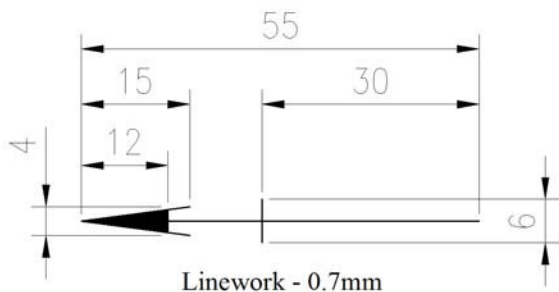
13. dimension text height shall be 3.5 mm and offset 1.5 mm (A1 drawing) from the dimension line.

**2.10 Arrows**

The dimensions shown in the following diagrams are for A1 drawings. The dimensions shall be halved for A3 drawings.

**North point arrow**

The north point is to be shown on the plan view of the General Arrangement drawing clear of all contours and notation. The north point is to be detailed as follows:

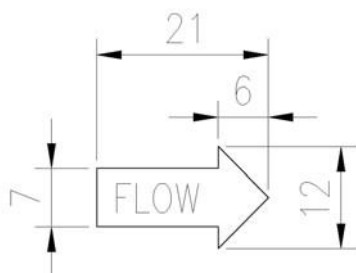


**Flow arrows**

A flow arrow is to be shown on the Plan view of the General Arrangement drawing view to clearly show the direction of stream flow, where applicable, whether there is water present in the waterway or not.

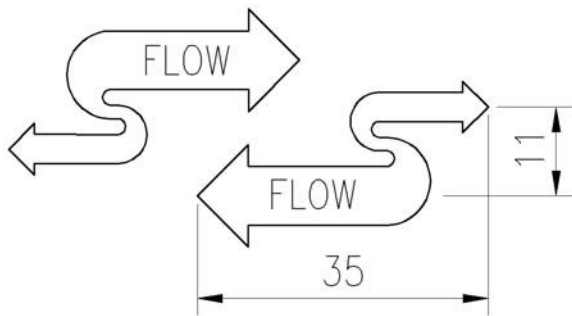
Flow arrows should be shown on specific views throughout the bridge drawings to confirm correct orientation. Flow arrows are to be detailed as follows:

**One way flow**



Text - 3.5mm, linework - 0.5mm

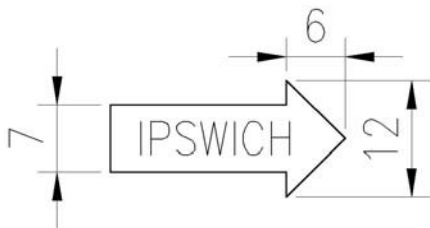
**Tidal flow**



Text - 3.5mm, linework - 0.5mm

**Road direction arrows**

Direction arrows are to be shown on the Plan view of the General Arrangement drawing to indicate the nearest town in each direction from the bridge. Generally the towns are those nominated in the road name of the title block. Direction arrows are to be detailed as follows:



Text - 3.5mm, linework - 0.5mm

**2.11 Sloping features**

**Grades**

Grades of roads and bridges shall be represented as a percentage. A slope of 5% indicates a displacement of five units vertically to 100 units horizontally. Grades rising in the direction of increasing chainage are shown as positive figures and grades falling in the direction of increasing chainage are shown as negative figures.

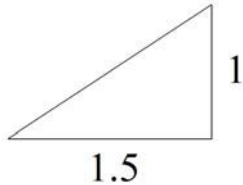
**Crossfalls and superelevations**

Crossfall is the resultant slope of the road surface in cross section, designed primarily to drain water from the road surface. Superelevation is the resultant slope of the road surface in cross section, designed primarily to counter the effects of a horizontal curve.

Crossfalls and superelevations of roads and bridges shall be represented as a percentage. A slope of 3% indicates a displacement of three units vertically to 100 units horizontally. Where a surface slope is shown an arrow shall indicate the downhill direction.

### Slopes and batters

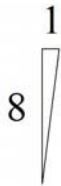
These shall be expressed as the vertical distance, given as unity, relative to the horizontal distance, for example the slope of an embankment should be expressed as 1 on 1.5 (1 unit vertical to 1.5 units horizontal). A small right angled triangle showing the horizontal and vertical relationship may be drawn adjacent to the slope or pile to indicate the angle of the feature being shown as follows:



EMBANKMENTS

### Piles

When a pile is not set vertically, but at a slight angle to the vertical, it is said to be raked. The rake of a pile is expressed as the horizontal distance (given as unity) relative to the vertical height, for example the slope of a pile is expressed as one in eight (one unit horizontal to eight units vertical).



PILES

### 2.12 Contours

Contours are lines on a drawing joining points on the ground which are all at the same height above a known datum.

Contour lines are generally shown in intervals of 0.25 metres. Major contours at even metres, 123, 124 and so on, are labelled and shown as a full line. 0.25 m interval minor contours are not labelled and are shown as short dashed lines. Refer Table 2.5-1 - Line Styles.

The height of a contour is to be shown at a convenient point on an even metre contour line such that each contour can be easily and clearly defined.

The frequency of numbering should be such that the height of any contour line can be determined readily.

### 2.13 Symbols

#### General

Some symbols are reserved; refer *TMR Drafting and Design Presentation Standards Manual – Volume 1, Chapter 2-General Standards, Appendix 2A*.

**Reference symbols**

The following points are to be considered when using reference symbols:

- notes referenced by a symbol are to be used only when necessary, for example to reduce the number of similar notes of reference on the same drawing or to add extra notation for an item in a confined space on the drawing
- the reference note should be placed as close as possible to the point of interest on the drawing
- use different symbols for each subsequent reference on any drawing
- the size of the symbol is to be such that it is easily identified in all instances on an A3 size print of the drawing.

**Welding symbols**

The necessary information concerning the locations, type, size and length of welds in welded joints and whether the welds are to be made in the shop or at the site shall be given on the drawings with the use of standard symbols.

All symbols shall be in accordance with AS 1101.3 - Graphical Symbols for General Engineering, Part 3: Welding and Non-destructive Examination.

**Material symbols**

Hatching of sections is to be represented on drawings in accordance with Table 2.13-1 - Material Symbols. Hatching may be drawn in a grey pen, such as colour 250 in AutoCAD.

**Table 2.13-1 - Material Symbols**

MATERIAL	EXAMPLE
Earth	
Rock	
Filling	
Concrete blinding	
Mortar	
Concrete	
Compressible filler	
Joint materials	
Deck wearing surface	

### 2.14 Chamfers

Chamfers are to be formed on the edges of reinforced concrete components as noted on the drawings.

Chamfers shall be shown in a view if the scale of the view is such that the chamfers will be clearly seen.

### 2.15 Titles

Each drawing generally comprises several Sections, Views and Details and each view shall be given the appropriate title using 5 mm (A1 drawing) text for the title (0.7 mm thick blue pen) and 3.5 mm (A1 drawing) text for the scale (0.35 mm thick yellow pen) as shown in Figure 2.7-2 - Examples of Sections and Details.

### 2.16 Abbreviations

Abbreviations fall into three categories:

- metric units
- accepted abbreviations
- when space is limited.

There is no need for a full stop in any abbreviation.

#### Metric units

A list of standard abbreviations for metric units is shown in Table 2.16-1 - Standard Abbreviations - Metric Units. The arrangement of upper and lower case letters for each abbreviation shall be strictly adhered to.

**Table 2.16-1 - Standard Abbreviations - Metric Units**

UNIT	SYMBOL
Degree (Celsius)	°C
Kilogram	kg
Kilometre	km
Kilopascal	kPa
Kilonewton	kN
Megapascal	MPa
Metre	m
Millimetre	mm
Pascal	Pa
Radian	Rad
Tonne	t

#### Accepted abbreviations

A list of accepted abbreviations is shown in Table 2.16-2 - Accepted Abbreviations. Some abbreviations are widely accepted and can be used freely.



**Table 2.16-2 - Accepted Abbreviations**

<b>DESCRIPTION</b>	<b>ABBREVIATION</b>
Approximate	Approx.
Australian Certification Authority for Reinforcing Steel	ACRS
Australian Height Datum	AHD
Average Recurrence Interval	ARI
Bore Hole	BH
Bench Mark	BM
Bridge Inventory System	BIS
Bottom Face	BF
Centreline	CL
Centres	Crs
Circular Hollow Section	CHS
Construction Joint	CJ
Control Line	CTRL
Countersink	CSK
Curve-Curve	CC
Curve-Tangent	CT
Deck Wearing Surface	DWS
Diameter	Dia
Downstream	D/S
Environmental Design Report	EDR
Environmental Management Plan	EMP
Far Face	FF
Geocentric Datum of Australia	GDA
Horizontal Curve	HC
Height	Ht
Hot-dip Galvanised	Galv
Inside Diameter	ID
International System of Units	SI
Intersection Point	IP
Maximum	Max
Mean High Water	MHW
Mean High Water Springs	MHWS
Mean Low Water	MLW

<b>DESCRIPTION</b>	<b>ABBREVIATION</b>
Mean Low Water Springs	MLWS
Minimum	Min
Modulus of Elasticity	E
Near Face	NF
Nominal	Nom
Number	No
Outside Diameter	OD
Parallel Flange Channel	PFC
Percentage	%
Pitch Circle Diameter	PCD
Polytetrafluoroethylene	PTFE
Polyvinylchloride	PVC
Prestressed Concrete	PSC
Queensland Rail	QR
Radius	R
Rectangular Hollow Section	RHS
Reinforced Concrete	RC
Required	Reqd
Revision	Rev
Reference Point	RP
Second	S
Tangent-Curve	TC
Taper Flange Beam	TFB
Taper Flange Channel	TFC
Top Face	TF
Transport and Main Roads	TMR
Ultimate Limit State	ULS
Ultimate Tensile Strength	UTS
Universal Beam	UB
Universal Bearing Pile	UBP
Universal Column	UC
Unplasticised Polyvinylchloride	Upvc
Upstream	U/S
Vertical Curve	VC

**When space is limited**

Other than in the previous examples, using abbreviations is generally discouraged in normal drafting practice. There are however some abbreviations that may be used, if necessary, when space is limited. Refer Table 2.16-3 - Other Abbreviations.

**Table 2.16-3 - Other Abbreviations**

DESCRIPTION	ABBREVIATION
Average	avg
Drawing Number	Drg No
Holding Down	HD
Road	Rd
Spaces	sps
Supplementary Specifications	Supp Specs
Typical	typ
Ultimate	Ult

**2.17 Order of drawings as compiled in bridge schemes**

The order of drawings in a typical bridge design scheme is shown below:

- drawing index
- general arrangements
- abutments
- piers
- precast headstocks
- PSC deck units
- PSC girders
- PSC piles
- precast panels
- decks, cross girders and concrete barriers
- kerbs
- relieving slabs
- miscellaneous details
- bridge traffic barrier
- balustrade
- bridge jacking, inspection and maintenance.

## **2.18 Title blocks**

### **General**

This section is read in conjunction with *TMR Drafting and Design Presentation Standards Manual*, Volume 1, Chapter 2-*General Standards*, Clause 2.3.5 Title Block Data.

Standard title block templates have been developed for bridge drawings. MRB\_DETAIL shall be used on drawings produced by TMR, and MRB\_DETAIL\_CON shall be used on drawings produced Consultants.

The title block AutoCAD drawings can be downloaded from the TMR website. Drawings produced by Consultants do not show copyright details. Instead they show Transport and Main Roads. Refer Figure 2.18-10 - Contactor Drawing Requirements.

The following section details specific information for drafting title blocks for bridge projects. Examples are found in Figure 2.18-5 - Title Block.

### **Bridge design criteria**

As stipulated in AS 5100 - Bridge Design, the following bridge design criteria, if relevant, is to be shown on all TMR bridge drawings in the area immediately above the title block:

- design code
- design loading
- design speed
- fatigue criteria (for concrete railway bridges, steel bridges)
- pedestrian loading
- collision loading
- wind speed
- earthquake zone
- barrier performance level
- bridge type
- significant variation from the code
- differential settlement.

Other bridge design criteria are to be shown on one of the General Arrangement drawings, if applicable, for example:

- limits of HLP 400 Vehicle Diagram
- pier Design Flood Force and flood data, including flood velocities and immunity Heights.

### **CAD files**

All drawings that are to be registered with a drawing number shall also be recorded in an electronic filing system with an AutoCAD Reference Number that is unique and clearly identifies the relevant drawing. The following format, used in Bridge Design, is given as an example:

- 123\_PR2\_B .dwg.

Where:

- **123** denotes the bridge specific AutoCAD Reference Number
- **PR** denotes the Drawing Subtype Code. Refer *TMR Drafting and Design Presentation Standards Manual*, Volume 1, Chapter 2 – Appendix 2E - AutoCAD Drawing Environments
- **2** denotes the series number for this element, for example PIER – SHEET 2
- **B** denotes a drawing revision letter (A for 'Issued for Construction' issue, B for the first revision and so on)
- **.dwg** denotes the AutoCAD drawing file extension.

The example above refers to an AutoCAD drawing of the PIER – SHEET 2 (Revision B) for a bridge project with reference number 123.

Do not use spaces in the AutoCAD reference. Use an underscore to separate the divisions.

Once the drawing is signed and issued, external AutoCAD references should be bound into the drawings. If they are not, the references shall be listed after the AutoCAD Reference Number.

The previously mentioned CAD file requirements settings are internal TMR standards only, and not imposed on external consultants.

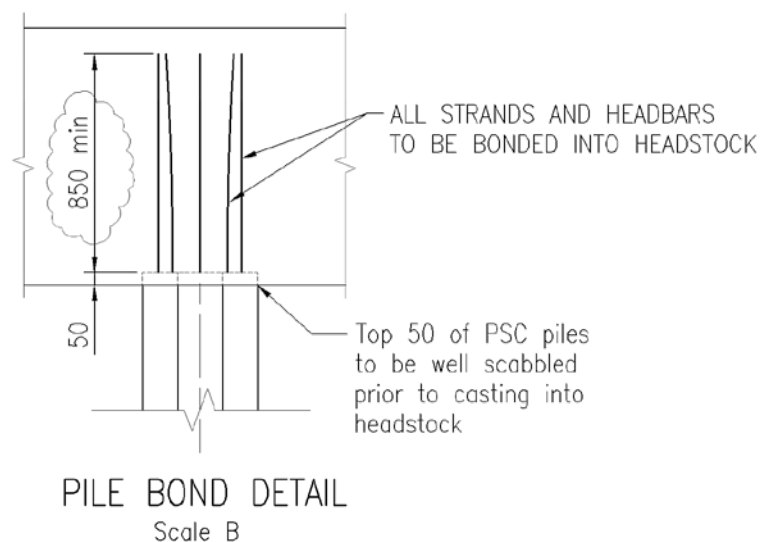
### Revisions

Revision A is always 'Issue for Construction' issue [A1/A3], the latter being the paper size of final print.

All amendments and reissue of drawings after certification shall be carried out in the following manner:

- make amendments to drawing where required and highlight significant amendments with a revision cloud. Remove revision clouds from previous revisions if applicable. Ensure that the cloud is clear of other details like dimension lines, leader lines and so on. Refer Figure 2.18- 1 Revision Cloud.

**Figure 2.18-1 - Revision Cloud**



- add current revision letter to title block near drawing number
- type name, RPEQ number and date of original signing for the Design Reviewer and Engineering Certifier of the original drawing

- change current revision letter in the AutoCAD Reference Number and rename the AutoCAD drawing
- add revision letter and short description of the changes to the revision box
- print drawing on the same media and at the same size as the original drawing
- add certification signature and date to revision box
- add initials of certification signatory to AutoCAD drawing for future reference.

### **Associated job and drawing numbers**

List job numbers and drawing numbers that are associated with this project, for example those numbers for the road works scheme. If unknown at time of release this may be left blank and added at a later stage by the Client.

### **Survey information**

These boxes list pertinent survey information for the project including GDA logo (Geocentric Datum of Australia). The GDA logo is only to be shown if the survey was completed using this system.

### **Shire**

Local Authority where the project is being constructed, for example SOMERSET REGIONAL COUNCIL.

### **Highway / road**

Highway or main road and road section where the project is being constructed, for example BRUCE HIGHWAY (INNISFAIL – CAIRNS) or GULF DEVELOPMENTAL ROAD (NORMANTON – CROYDON).

If the project is not on a highway state the road only, for example INNISFAIL – JAPOON ROAD.

Information may be found on TMR Regional Maps.

### **Control chainage**

Control Chainage represents the centreline chainages of Abutment A and Abutment B on the designated Control Line, for example CTRL CH 11988.175 to 12135.825 (MC01) on Control Line (MC01).

### **Reference points**

This information is supplied by the Road Designer or TMR Region. Reference points are required before and after the structure, Preceding RP and Following RP, along with the distance to the start of the structure (Abutment A) in kilometres, distance from the start to the end of the structure, and the distance from the end of the structure (Abutment B) to the following RP.

Through chainage from start of road section, for example:

- through Chainage from start of road 23.4km.

### **Bridge name**

Examples of typical bridge names are as follows:

- SANDY CREEK OVERFLOW BRIDGE
- MEWITT STREET OVERPASS
- SANDY CREEK BRIDGE WIDENING
- BALD HILLS RAILWAY OVERPASS
- TOOMBUL RAILWAY OVERPASS WIDENING
- SANDY CREEK PEDESTRIAN BRIDGE.

### **Drawing title**

The drawing title refers to the elements being drawn, for example PIER or PIER – SHEET 2.

For ease of cross referencing, simplifying drawing series numbering, and to ensure that the whole set of element drawings are read in a set, the drawings shall not be split up into sub- elements, for example ABUTMENTS – PROFILE and ABUTMENTS – REINFORCEMENT.

### **Signing drawings**

The first initial and surname of the relevant design / check drafters, design / verifying engineers are printed in the title block. These people do not need to hand sign the drawings.

The Design Reviewer and Engineering Certifier hand sign, date and enter their RPEQ number in the relevant area on the final print media when they are satisfied that the design is fit-for- purpose.

### **Job number and contract number**

The Job Number is shown in the format 158/8102/2 where:

- **158** is Local Authority Number
- **8102** is the Road Section
- **2** is an identifier assigned by Client.

The Contract Number is shown in the format PEND-102 or 158-8102-2. Note the use of dashes in the Contract Number and forward slashes in the Job Number.

### **Drawing number**

Drawing numbers are obtained from a block of numbers reserved for the project after the drawings required for the project have been identified. These numbers are issued by TMR Plan Room in the Spring Hill Office Complex, or by the TMR Region.

### **Drawing series number**

Structural drawings have an additional drawing series requirements to those described in the TMR Drafting and Design Presentation Standards Manual, Volume 1, Chapter 2 *General Standards*.

A typical set of series numbers for a bridge with seven drawings would be as follows:

- BR1-GA-1 of 2
- BR1-GA-2 of 2
- BR1-AB-1 of 1
- BR1-DU-1 of 1
- BR1-KE-1 of 1
- BR1-TR-1 of 2
- BR1-TR-2 of 2.

Where:

- **BR1** is bridge number 1 (there may be more than one bridge in the contract)
- **GA-1** is General Arrangement – Sheet 1 of 2
- **GA-2** is General Arrangement – Sheet 2 of 2 etc.

Note that single digits have been used where possible, for example, 1 rather than 01.

In the lower-right corner of structural drawing title blocks, an additional series of numbers shall be shown that cover the full set of structural drawings. Using the previously mentioned seven drawings, this series would run from BR1 Drgs 1 of 7 through to BR1 Drgs 7 of 7.

#### **Scheme approval status**

Scheme approval is signed off on the first drawing in the scheme which is titled Locality Plan and Drawing Index. All other drawings in the scheme refer to the drawing number of this plan. If this drawing number has not been assigned when the drawings are ready to be signed it shall be left blank in the title block. The number shall then be stencilled onto the drawings once the number is assigned.

#### **BIS number**

The Bridge Inventory System (BIS) number is a unique number assigned to each structure and is assigned by the relevant TMR Region. The number may not be assigned until after the bridge is constructed. In this instance, leave the BIS number blank in the title block. The number shall then be stencilled onto the drawings once the number is assigned.

#### **Preliminary drawings**

It is good practice for all drawings produced in a design office to have a date stamp which includes the file path of the drawing, and the name of who plotted it. Drawings given to external parties that are either preliminary, concept, or for tender only purposes, shall always be stamped as such, and dated. The stamp should be approximately 80 mm wide. Refer Figure 2.18-2 - Preliminary Stamp.

**Figure 2.18-2 - Preliminary Stamp**





### Scales

Scales shall be shown in the title block of a drawing, referenced by a letter and conforming to the format shown in Table 2.18-3 - Scale Format.

Quoting the scale used as a ratio, such as 1:200 at A1, is not permitted because it can lead to inaccuracy when the size of the drawing is slightly distorted during printing and/or copying.

All views are to be drawn to a recognised scale, for example 1:7 or 1:9.9 are not recognised scales, except where views are distorted for a specific purpose.

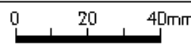
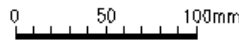
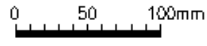
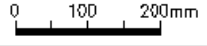
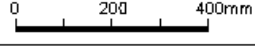
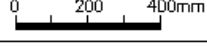
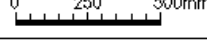
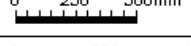
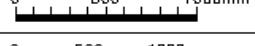
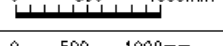
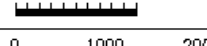
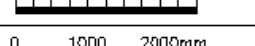
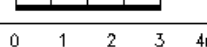
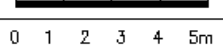
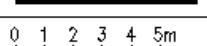
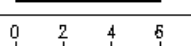
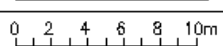
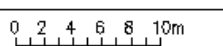
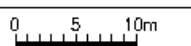
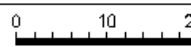
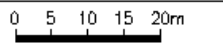

The scale is to be such that the drawing may be easily read when reduced to A3 size. Similar scales should not be used on the one drawing, for example 1:20 and 1:25.

Drawing views larger or smaller than needed and/or positioned sparsely on sheets necessitating extra drawings is to be avoided.

Sectional and detail views are to be shown at approximately twice the size of the view it is taken from where practical. Scales for typical bridge drawings are shown in Table 2.18-4 - Preferred Scales.

When room on the drawing permits, the smaller of the preferred scales shall be used to fill the sheet.

**Table 2.18-3 - Scale Format**

APPLICATION	EXAMPLE
1:1 scale	A 
1:2 scale	A 
1:2.5 scale	A 
1:5 scale	A 
1:7.5 scale	A 
1:10 scale	A 
1:12.5 scale	A 
1:15 scale	A 
1:20 scale	A 
1:25 scale	A 
1:30 scale	A 
1:40 scale	A 
1:50 scale	A 
1:75 scale	A 
1:100 scale	A 
1:125 scale	A 
1:150 scale	A 
1:200 scale	A 
1:250 scale	A 
1:300 scale	A 
1:400 scale	A 
1:500 scale	A 

**Table 2.18-4 - Preferred Scales**

<b>APPLICATION</b>	<b>SCALE</b>
<b>GENERAL ARRANGEMENTS</b>	
Plan/Elevation for bridges up to 80 meters long	1:150 or 1:200
Plan/Elevation for bridges over 80 meters long	1:250, 1:300 or 1:40
Type Abutments and Piers	1:75 or 1:100
Section Deck	1:30 or 1:40
Anchorage Details	1:12.5 or 1:15
<b>ABUTMENTS AND PIERS</b>	
Plan/Elevation	1:30 or 1:40
Sections	1:15 / 1:20
<b>BRIDGE BARRIERS</b>	
Plan/Elevation	1:75 or 1:100
Sections, Post Assemblies, Joint Assemblies and Details	1:5, 1:7.5 or 1:10
<b>PSC DECK UNITS AND PSC GIRDERS</b>	
Plan/Elevation	1:40
Sections of Units and End Details	1:12.5
Anchors and Transverse Stressing Anchorage Details	1:7.5
<b>CAST INSITU KERBS, CROSS GIRDERS AND DECKS</b>	
Plan/Elevation	1:75 or 1:100
Sections	1:15



Figure 2.18-6 - Title Block (View A)

Revisions:--NTT = Notice to Tenders  
RFI = Request for Information  
VO = Variation Order  
SI = Site Inspection  
D = Direction

Certification:--  
Engineering Certification (RPEQ number and signature)

Date of Revision:--  
Actual date when the revision is signed off

BRIDGE DESIGN CRITERIA: DESIGN CODE: AS 51

Associated Job Nos

Auxiliary Drg Nos

Horiz. Grid

Height Origin

Survey Books

MR84016/18G

Original Issue A3

Revisions/Descriptions	Ref	Certification	Date	Microfiled
123_GAT_A.dwg				

CAD File

Original Issue

Associated Job/Drg No's

Survey Information

GDA logo - logo is only displayed when GDA datum is used

Bridge Design Criteria - data band extends View A to C

Figure 2.18-7 - Title Block (View B)

Bridge Design Criteria - data band extends View A to C

Highway/Road

Regional/Shire Council

5100:2004 DESIGN LOADING: SM1600 and HLP400 DESIGN SPEED: 120 km/h EARTHQUAKE ZONE: BEDC-2 BARRIER PERFORMANCE LEVEL: Regular

Scales

A 0 2 4 6 8 10m

B 0 1000 2000mm

C 0 500 1000mm

Dimensions shown in millimetres except where shown otherwise

MORETON BAY REGIONAL COUNCIL

BRUCE HIGHWAY (BRISBANE - GYMPIE)

CTL CHGE 11988.175 to 121135.825 (MC01)

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
10A/5	5.31	0.17	0.40	10A/6

Through Chainage from start of road 23.4 km

Control Chainage

Reference Points

Drawn

Checked

Design No.

Verified No.

Design

No. 1234

Figure 2.18-8 - Title Block (View C)

Bridge Design Criteria - data band extends View A to C

Drawing Title

Bridge Name

Signing drawings

BIS Number

LEVEL: Regular (DS) - Level 2 to HB77:1996 (US) BRIDGE TYPE: RC Deck on PSC Deck Units BIS No. 891

Drawn	C. Lamington	CABOOLTURE RIVER BRIDGE WIDENING GENERAL ARRANGEMENT - SHEET 1	ENGINEERING CERTIFICATION (RPEQ)	Far scheme approval status refer Drg. No. 390438 (DI-01 of 01)		
Checked	T. Leader					
Designed No.	A. Panini 5678					
Verified No.	M. Smart 3456					
Design	Reviews (RPEQ)	ENG. AREA	NAME	SIGNATURE	NO.	DATE
g		Structural	S. Steel	<i>S. Steel</i>	1234	10/10/10
6		Electrical	E. Cable	<i>E. Cable</i>	9876	12/10/10
No. 1234	Date: 10/10/10					

Design Reviews

Engineering Certification

Scheme Approval

Job



Con

Dra

Seri


MRE

**Figure 2.18-9 - Title Block (View D)**

 <b>Queensland Government</b>	
©The State of Queensland (Department of Transport and Main Roads) 2011  <a href="http://creativecommons.org/licenses/by/2.5/au">http://creativecommons.org/licenses/by/2.5/au</a>	
Job No.	25/10A/63C
Contract. No.	NCHD-1770
Drawing No.	333999   A
Series Number	BR1-DU-2 of 2
MRB_Detail (02/11)	BR1 Drqs 17 of 26

Department copyright – refer insert  
 Job Number  
 Contract Number  
 Revision Letter  
 Drawing Number  
 Series Number  
 Addition Series Number required on Structural Drawings

**Figure 2.18-10 - Contactor Drawing Requirements**

 <b>Queensland Government</b>	
Transport and Main Roads	
Job No.	25/10A/63C

Consultants drawings do not display TMR copyright requirements, only the department name

