

# Surveying Alert



Clarification surrounding CSR v7.0

7 August 2015  
Issue 15

Version 7.0 of the Cadastral Survey Requirements became effective on 1 July 2015. Some of you may have attended information sessions on the key features of the new requirements conducted by DNRM at various centres around the state. A number of surveyors have sought further clarification on a number of issues. This Alert provides response to the following matters:

- application of the standards
- reinstatement reports
- improvements on or near boundaries
- application of s.80 of SMI Act for first new plan of survey of tidal boundaries
- administrative boundaries
- connection to datum

### **Application of standards**

*"I have certified a plan prior to 1 July 2015, but it won't be lodged until well after 30 September, which version of the Standards do I have to comply with?"*

A plan has to comply with the requirements that are in place at the time the plan is certified (signed Form 13 or Form 18) regardless of when it is lodged. Therefore, if the plan is certified prior to 1 July 2015, then the Standards that apply to that time are the relevant Standards, i.e.:

- 1/8/10 -> 30/6/15 = CSR v6.0
- 23/10/08 -> 31/7/10 = CSR v5.0
- 2/12/05 -> 22/10/08 = CSR v4.0

### **Reinstatement reports**

Plans which reinstate existing boundaries, including identification surveys, must contain a reinstatement report. (See Standard 3.33 for the requirement and exceptions).

The report can be simple, if the reinstatement is not complex. It simply needs to describe how each line was established, based on the evidence found. Appendix F of the CSR v7.0 provides a range of examples.

Where identification survey plans are submitted without a report after 30 September 2015, the correction process under Section 28 of the SMI Act will be used.

*"Where can the reinstatement report be shown?"*

It is preferred that any report (reinstatement or water boundary) appear on the plan itself (face of the plan, additional sheet or even back of the plan if space permits). However, there are certain reports, particularly those that contain photographic or diagrammatic material, that are better suited to being submitted as survey records.

### **Improvements on or near boundaries**

All permanent improvements on or near the boundary must be shown on the plan, regardless of whether they encroach or not. However, notification is only required whenever an owner is adversely affected by a reinstatement. This situation arises:

- whenever any encroachment is present
- where a dividing fence is significantly off the boundary alignment, taking into account the density of development and the nature and use of the land
- if a permanent improvement is close to the boundary and it may impact on either owner's use of their lot.

### **Application of s.80 of SMI Act for first new plan of survey of tidal bdy**

There has been discussion recently about how to decide when to use s.80 and s.82 of the SMI Act. In lay terms, s.80 can be applied if there is a plan that defines the extent of the land and that plan clearly adopts a natural feature for the survey of the boundary. If there is more than one such plan for the land, the oldest is to be used to determine the relevant feature.

We are aware that historical directions to surveyors in relation to tidal boundaries instructed surveys to follow various types of features ('bank' in the case of watercourses, 'edge of beach' etc in relation to the sea). It is therefore likely that, in most cases, the original surveyor followed a feature, but we are not entitled to presume this to be the case without supporting evidence.

However, if the original surveyor's measurements lead the (present day) surveyor to conclude that there is little doubt about which feature the original surveyor adopted, even if:

- it is now in a different location and/or its shape has changed gradually and imperceptibly by natural means; or
- it is now in a different location and/or its shape has changed suddenly, and there is evidence of its location prior to the sudden change;

then arguably it is permissible to adopt that feature as constituting the boundary under s.80.

Consideration should be given to the application of s.82 only if there is no direct or indirect evidence that the original survey had clearly adopted a natural feature (taking into account the original survey plan, any associated material for the plan, the original deed of grant, the original survey records, and investigations into whether a feature can be identified based on measurements contained in these documents).

### **Administrative boundaries**

*"How do Administrative boundaries now work?"*

Parish and County are no longer shown on the face of plans. State, Local Government and Locality boundaries are shown where they intersect or adjoin the subject lot. Where multiple administrative boundaries are coincident, only one linestyle is required (hierarchy being State, Local Government, Locality respectively), but all relevant administrative areas must be named (e.g. if a local government boundary is shown, local governments and localities must be named).

### **Connection to datum**

The Cadastral Survey Requirements use the term 'connection to datum' to refer to connection to the State control survey. The State control survey is the whole of the state geodetic adjustment, tied to the ARGN stations – in other words, it's the geodetic datum. The marks (and CORS) in this adjustment can be used to connect to the State control survey. Marks that have derived coordinates are not part of the datum.

There are a number of requirements that relate to connecting surveys to datum:

- Standard 3.28 requires (with exceptions) plans of 10 or more lots to be connected to the geodetic datum (State control survey).
- Standard 3.28 allows connection to datum to be via CORS (i.e. AUSPOS or Network RTK service) and/or PSMs. It should be noted that although not expressly stated, the connection to PSMs are observed connections, not calculated through another survey.
- Standard 3.24 requires any plan that is connected to datum to use MGA bearings.
- Standard 3.14 requires any plan connected to datum to show a coordinate table.
- Guideline 9.32.1 allows plans on another meridian to show a swing to MGA. This is applicable to plans of <10 lots that are not connected to datum. (Plans  $\geq 10$  lots must be connected to datum and use MGA bearings [3.28 & 3.24] and plans <10 lots that have connected to datum must show MGA bearings [3.24]).

Connecting to datum and being on the MGA meridian is only mandatory for  $\geq 10$  lots (i.e. <10 lots it is not mandatory, but may be done).

A survey of <10 lots could still show MGA bearings if the underlying or adjoining plan was on MGA or shows a swing for MGA, but showing MGA bearings via an underlying plan is not connecting your survey to datum.

Connecting to datum and showing MGA bearings are two separate things. If you connect to datum then you must show MGA bearings, but you can show MGA bearings without connecting to datum (as per point above).

To connect to datum and put the survey onto MGA meridian, 2 points on the survey must have:

- a terrestrial connection to a PSM that has datum lineage, or
- a position determined by a network solution from AUSPOS or Network RTK services, or

- a position determined by a non-network solution, whereby the surveyor processes baselines from 2 individual datum marks within the State control survey, irrespective of if they are part of a CORS network.

However, connection to datum and MGA meridian can still be achieved by any of the above techniques for 1 point on the survey, in combination with an astronomical observation.

*"How do I search for PSMs that are part of the State control survey?"*

To find which marks are in the State control survey use the Queensland Globe Location Globe and search for marks with a lineage of "datum". All other marks that are not part of the State control survey have a lineage of "derived".

*"How do I connect to the State control survey using CORS?"*

A CORS network that is part of the department's datum control survey can be used to connect to the State control survey. A number of providers offer CORS networks for connection using either real time or post processing methodologies. Often the most convenient means of connecting to datum will be by using the AUSPOS service. For accuracy requirements please refer to Standard 3.28.1, in conjunction with ICSM SP1 for its explanation of survey and positional uncertainties.

### **Common scenarios of connection to datum situations**

*Plan of 10 lots or more with datum connection via CORS (ie, AUSPOS or Network RTK service):*

- plan bearings will be MGA
- meridian box will show "MGA zone 56 vide CORS"
- coordinates table shows 2 points on the survey with MGA cords, PU, lineage, method (these points could be corner pegs, reference marks, new PSMs or existing PSMs that do not have datum coords).
- meridian table is not shown

*Plan of 10 lots or more with datum connection via PSMs:*

- plan bearings will be MGA
- meridian box will show "MGA Zone 56 vide PSMs" or "MGA zone 56 vide meridian table"
- coordinates table shows the 2 datum PSMs and 2 points on the survey with MGA cords, PU, lineage, method (the 2 points on the survey could be corner pegs, reference marks, new PSMs or existing PSMs that do not have datum coords).
- meridian table shown as per 9.32.2 only if the meridian box refers to meridian table

*Plan of 10 lots or more with datum connection via CORS and PSM:*

- plan bearings will be MGA
- meridian box will show "MGA Zone 56 vide CORS & PSM" or "MGA zone 56 vide meridian table"
- coordinates table shows the datum PSM and 2 points on the survey with MGA cords, PU, lineage, method (the 2 points on the survey could be corner pegs, reference marks, new PSMs or existing PSMs that do not have datum coords).
- meridian table shown as per 9.32.2 only if the meridian box refers to meridian table

*Plan of 10 lots or more in existing staged subdivision that is on MGA and is not connected to datum\*:*

- seek exemption from 3.28 connection to datum and 3.14 showing coordinates table
- plan bearings will be MGA
- meridian box will show "MGA zone 56 vide SP123456" (the plan that actually determined MGA meridian)
- coordinates table is not shown
- meridian table is not shown

*Plan of 10 lots or more in existing staged subdivision that is not on MGA and the release is later/final stage:*

Case 1: survey is not connected to datum\*

- seek exemption from 3.28 connection to datum
- plan bearings will be other (not MGA) bearings
- meridian box will show "SP123456"
- coordinates table is not shown
- meridian table is not shown; or

Case 2: survey is is connected to datum via CORS

- seek exemption from 3.24 showing MGA bearings when connected to datum
- plan bearings will be other (not MGA) bearings
- meridian box will show "SP123456, Add 4° 20' for MGA zone 56 vide CORS"

- coordinates table shows 2 points on the survey with MGA cords, PU, lineage, method (these points could be corner pegs, reference marks, new PSMs or existing PSMs that do not have datum coords).
- meridian table is not shown; or

Case 3: survey is connected to datum via PSMs

- seek exemption from 3.24 showing MGA bearings when connected to datum
- plan bearings will be other (not MGA) bearings
- meridian box will show "SP123456, Add 4° 20' for MGA Zone 56 vide PSMs" or "SP123456, Add 4° 20' for MGA zone 56 vide meridian table"
- coordinates table shows the 2 datum PSMs and 2 points on the survey with MGA cords, PU, lineage, method (the 2 points on the survey could be corner pegs, reference marks, new PSMs or existing PSMs that do not have datum coords).
- meridian table shown as per 9.32.2 only if the meridian box refers to meridian table; or

Case 4: survey is connected to datum via CORS & PSM

- seek exemption from 3.24 showing MGA bearings when connected to datum
- plan bearings will be other (not MGA) bearings
- meridian box will show "SP123456, Add 4° 20' for MGA Zone 56 vide CORS & PSM" or "SP123456, Add 4° 20' for MGA zone 56 vide meridian table"
- coordinates table shows the datum PSM and 2 points on the survey with MGA cords, PU, lineage, method (the 2 points on the survey could be corner pegs, reference marks, new PSMs or existing PSMs that do not have datum coords).
- meridian table shown as per 9.32.2 only if the meridian box refers to meridian table

*Plan of less than 10 lots but is connected to datum:*

- presentation will be the same as for 10 or more lots with datum connection via CORS and or PSMs

*Plan of less than 10 lots that is not connected to datum:*

Case 1: underlying or adjoining plan is not on MGA meridian

- plan bearings will be other (not MGA) bearings
- meridian box will show "SP123456" or "CAM vide SP123456" or "RP123456 - add 5° 40' for MGA Zone 55 vide BN1234"
- coordinates table is not shown
- meridian table is not shown; or

Case 2: underlying or adjoining plan is on MGA meridian or MGA meridian is determined by observation (e.g. a sun/star obs or GNSS measurement)

- plan bearings will be MGA
- meridian box will show "MGA Zone 56 vide SP123456" or "MGA Zone 56 vide Sun Obs"
- coordinates table is not shown
- meridian table is not shown

\*Examples are given above, for the sake of completeness, addressing cases where an exemption is given from the requirement to connect to datum in 3.28. However, the situations are likely to be rare where it is impractical to comply with this requirement. The consideration for granting an exemption in relation to any standard is whether it is impractical to comply with standard.

Please note - connection to CORS. A connection to CORS is a network solution and therefore no single underlying datum PSM is shown in the coordinates table. A connection to a single GNSS base station (whether part of a CORS network or not) is a connection to the underlying PSM and therefore the underlying datum PSM is shown in the coordinates table.

When a survey is connected to datum and CORS are used to derive coordinate values for a PSM/s, to enable that data to be added to the State dataset, the data files should be [emailed](#) to the survey control business area of the department with "SCDB" contained within the subject field. The following files should be attached:

- [permanent survey mark plan](#) or [maintenance form](#) as PDF, and
- the AUSPOS processing report as PDF and the RINEX input file(s), or
- where the observation is network RTK, the files attached should be the project files that include the raw observation data and processing results.

Please refer to Survey Alert issue 7 for further information.