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| Victorian Cadastral Surveys Practice Directives  Surveyor-General Victoria July 2021 - Edition 2 |

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| Acknowledgment  We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.  We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond. |
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| Victorian Cadastral Surveys Practice Directives  Surveyor-General Victoria July 2021 - Edition 2 |
| Surveyor-General Victoria |
| July 2018 |

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Surveyor-General Victoria

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| July 2021 |

Revision History

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| Edition | Commence | Summary of Revisions | Sections |
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|  |  | Specify Network Real Time Kinematic (NRTK) GNSS techniques | 2.3 |
|  |  | References to MGA changed to MGA2020 | All |

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# Cadastral Surveys Practice Directives

These practice directives concern the connection of cadastral surveys to the Survey Control Network (SCN), the preparation of survey documents by a licensed surveyor and other matters relating to cadastral surveying. The following sections detail the requirements of surveyors in fulfilling legislative obligations.

Current regulations are available for download from the Government’s [Victorian Law Today](http://www.legislation.vic.gov.au/) website at [www.legislation.vic.gov.au](http://www.legislation.vic.gov.au).

## Purpose of Cadastral Surveys Practice Directives

Under the provisions of the *Surveying Act 2004*, two functions of the Surveyor-General are to ‘set and monitor standards for surveying and survey information’ and ‘monitor surveying matters affecting the Victorian cadastral system’. In accordance with these functions, Surveyor-General Victoria (SGV) issues practice directives to support licensed surveyors in interpreting relevant aspects of the Acts and regulations relating to surveying.

These Victorian Cadastral Surveys Practice Directives, July 2021 are effective from 31 July 2021 and replace the Victorian Cadastral Surveys Practice Directives, July 2018.

Comments on these practice directives, and other matters relating to cadastral surveying, are welcome from surveyors. All enquiries can be directed to:

Mr Eddie Cichocki   
Manager, Cadastral Infrastructure and Standards  
Level 11, 2 Lonsdale Street Melbourne, VIC 3000   
Email: surveyor.general@delwp.vic.gov.au

## Disclaimer

These practice directives offer guidance to licensed surveyors on the interpretation of the relative legislative requirements and processes they may apply in carrying out their professional roles. They do not override a surveyor’s responsibility to exercise professional judgement. These practice directives are to be viewed and adopted in conjunction with the relevant legislation, best practice guidelines (as available) and general good practice principles and procedures.

## Role of the Surveyor-General of Victoria

The Surveyor-General of Victoria is the primary government authority on cadastral surveying and maintenance of the integrity of the cadastre. The roles and responsibilities of the Surveyor-General are prescribed under a diverse range of Acts and regulations.

## Compliance and Survey Audit Program

The Surveyor-General is responsible for setting and monitoring the standard of surveying in Victoria. The most visible component of this is the Survey Audit Program, undertaken by SGV on surveys lodged at Land Use Victoria (LUV). Through this program, the Surveyor-General gauges practitioners’ compliance with the regulations, practice directives and guidelines for best practice, and contributes to any required collective or individual rectification or adjustment processes.

SGV aims to audit every practising licensed surveyor at least once every three years. The audit process involves a field and survey document check by SGV survey auditors and a plan examination by Land Registry Services (LRS) plan registration officers. SGV survey auditors use a ‘Survey Audit Checklist’ covering the abstract of field records, re-establishment, MGA2020 connection, licensed surveyor’s report and elements of the field survey. LRS plan registration officers at LUV use an ‘Audit Plan Exam Checklist’ covering drafting standards, plan notations, easements and building boundaries.

The [survey audit and plan exam checklists](https://www.land.vic.gov.au/surveying/cadastral-survey/survey-audit-program) are available at:

www.land.vic.gov.au>Surveying>Cadastral Survey>Survey Audit Program

The checklists are provided as an optional resource for licensed surveyors to help maintain the quality of surveys lodged at LUV.

Non-conformance with aspects of the survey and/or documentation as indicated by items on the survey audit and plan exam checklists will result in the registration of the associated dealing being delayed until the issues identified are rectified to the satisfaction of SGV and LRS.

In addition, checklist items are categorised into serious and non-serious non-conformances, as classified in the Categories of Audit Non-Conformances document available from the web link above. An ‘unsatisfactory’ survey audit result will occur when one or more serious non-conformances and/or 10 or more non-serious non-conformances are identified.

Surveyors who receive two consecutive unsatisfactory survey audit results within a three-year period are required to discuss their surveys with the Manager, Cadastral Infrastructure and Standards, SGV to review the audit findings and identify opportunities and processes for improved performance.

If a surveyor receives three consecutive unsatisfactory audit results, the findings of the audits will normally be forwarded to the Surveyors Registration Board of Victoria (SRBV) for investigation.

A provision also exists under Section 18 of the *Surveying Act 2004* for the Manager, Cadastral Infrastructure and Standards to lodge a complaint with the SRBV in relation to any survey that returns an unsatisfactory audit result.

# Connection of cadastral surveys to MGA2020 and the Survey Control Network

## 2.1 General comments

The primary function of connecting cadastral surveys to the national coordinate datum, the Map Grid of Australia 2020 (MGA2020), is to ensure consistent and standardised coordinate and bearing information, enabling efficient integration and alignment with spatial information. For cadastral surveys this supports updating of the state’s digital cadastre, where improved spatial accuracy will allow industry and the community to take full advantage of improved integration of multiple datasets, augmentation with emerging technologies and better decision making and interoperability within and between organisations. Improving spatial accuracy also facilitates the uptake of more advanced GIS capability and applications across the community.

The Digital Cadastre Modernisation (DCM) project commenced in February 2019. The project will capture and adjust survey measurements observed as part of cadastral surveys to improve the accuracy of the digital cadastre throughout the state.

Connection of cadastral surveys to MGA2020 can be achieved:

* through conventional traversing connection to SCN marks, available through the Survey Marks Enquiry Service ([SMES](https://maps.land.vic.gov.au/lassi/SmesUI.jsp)) at www.land.vic.gov.au>Surveying>Services>Survey Marks Enquiry Service, or
* using Global Navigation Satellite System (GNSS) positioning services, such as [GPSnet](http://gnss.vicpos.com.au/) to correct GNSS observations in real time or by post processing. GPSnet is available at www.land.vic.gov.au>Surveying>Services>Positioning.

## 2.2 Specific requirements for connection to the Survey Control Network

On 11 October 2017, the Geocentric Datum of Australia 2020 (GDA2020) was gazetted as the Recognised Value-Standard of Measurement of Position for Australia. MGA2020 is the associated Universal Transverse Mercator (UTM) projection for GDA2020. This replaced the Geocentric Datum of Australia 1994 (GDA94) and associated Map Grid of Australia 1994 (MGA94) as the national datum.

On 1 November 2018, authorised amendments to the Survey Co-ordination Regulations 2014 came into effect and MGA2020 became the official horizontal datum for cadastral surveys in Victoria. GNSS positioning services and SMES were updated to provide MGA2020 coordinate information to support surveying in Victoria. The MGA2020 coordinates for SCN marks have been derived from a rigorous national least-squares adjustment and provide a more accurate position for survey marks compared to MGA94.

The SCN is the network of survey marks in Victoria whose coordinates have been computed by SGV Geodesy through a rigorous national least-squares adjustment of observational data. A survey mark that forms part of this network is known as an ‘SCN Mark’ and can be a permanent mark (PM) or primary cadastral mark (PCM) that has adjusted horizontal MGA2020 coordinates. Only SCN marks with adjusted MGA2020 coordinates are to be used when there is a requirement for a cadastral survey to be brought onto MGA2020 bearing datum.

Regulation 11 of the Surveying (Cadastral Surveys) Regulations 2015 requires a licensed surveyor making a cadastral survey to adopt and verify a datum in accordance with a previous cadastral survey or plan. The regulation also stipulates that if an abstract of field records is to be lodged with the Surveyor-General or the Registrar of Titles, the licensed surveyor must “bring the bearing datum onto the Map Grid of Australia 2020 (MGA2020) as is reasonable in the circumstances” – Regulation 11(1)(b).

Bringing the bearing datum of a survey onto MGA2020 means rotating the survey onto the datum and showing the bearings on the plan and abstract of field records relative to MGA2020 Zone 54 or 55.

Regulation 10 of the Survey Co-ordination Regulations 2014 specifies the appropriate MGA2020 zone to be used for cadastral surveys. The zone boundary has been established such that Parishes lie wholly within either zone 54 or 55. The Parish Zone Boundary can be viewed in LASSI and SMES as a Survey Information layer within the Build Map function. Alternatively, Figure 7.3, Part 2, [*Survey Practice Handbook – Victoria*](http://www.surveyorsboard.vic.gov.au/content/91/surveypracticehandbook.aspx) *,* which is available at [www.surveyorsboard.vic.gov.au](http://www.surveyorsboard.vic.gov.au), shows the location of the zone boundary and the Parishes in its vicinity.

All cadastral surveys commenced after **1 July 2022** except those supporting partial survey subdivisions and Records of having re-established a cadastral boundary **must** connect to MGA2020.   Having cadastral surveys connected to MGA2020 is essential for the maintenance and accuracy of the digital cadastre and the lodgement of digital survey files in Single CAD Format File (SCFF), ePlan or other approved formats.

Surveys commenced prior to 1 July 2022, including staged Plans of Subdivision, can remain on their initial bearing datum.

If only conventional traversing techniques are available to surveyors, then the statement “…as is reasonable in the circumstances” in Regulation 11(1)(b) of the Surveying (Cadastral Surveys) Regulations 2015 is generally governed by the parameters of Regulation 13 of the Survey Co-ordination Regulations 2014. Regulation 13 requires connection to at least two coordinated survey or permanent marks (SCN marks) that fulfil all the following requirements:

1. properly verified as to position at the time of survey
2. at least 200 metres apart
3. within 500 metres of, or a greater distance from the limits of the cadastral survey, if the connection can be made by establishing no more than three instrument points from each SCN mark.

Regulation 7(1)(c) of the Surveying (Cadastral Surveys) Regulations 2015 states that licensed surveyors must ensure all lengths are measured or determined to an accuracy of 10 millimetres + 60 parts per million (PPM). Furthermore, the Surveyor-General’s requirement for the accuracy of an MGA2020 bearing datum determination is **at least 20” of arc**.

The following discussion elaborates on how surveyors can meet the above requirements when only conventional traversing techniques are available. Section 2.3 provides information regarding the conditions for connection to MGA2020 when GNSS observations are used.

### 2.2.1 Land subdivisions (large and small), building subdivisions, application surveys under the *Transfer of Land Act 1958*, boundary plan surveys and Crown surveys

1. When there are two or more SCN marks within the parameters of Regulation 13, Survey Co-ordination Regulations 2014, surveyors **must** do all the following:
   1. connect to at least two of those SCN marks that are at least 200m apart (or if using GNSS observations, see section 2.3 below)
   2. connect to at least one other PM or PCM to satisfy Regulation 11(3)(a), Surveying (Cadastral Surveys) Regulations 2015
   3. rotate the survey onto MGA2020 bearing datum.
2. When only one SCN mark or no SCN marks exist within the parameters of Regulation 13, Survey Co-ordination Regulations 2014, surveyors should use GNSS observation techniques to establish MGA2020 connection (see section 2.3). If GNSS observation techniques are not available, surveyors can contact SGV Geodesy via phone (03) 9194 0770 or email to [smes.support@delwp.vic.gov.au](mailto:smes.support@delwp.vic.gov.au) to discuss the options for the establishment of SCN marks in the vicinity of the survey. Following the establishment of suitable SCN marks, surveyors **must** do all the following:
   1. connect to at least two of those SCN marks that are at least 200m apart
   2. connect to other PMs or PCMs to satisfy Regulation 11(3)(a), Surveying (Cadastral Surveys) Regulations 2015
   3. rotate the survey onto MGA2020 bearing datum.
3. When the same surveyor or survey firm has completed a nearby survey within the last five years that is already connected to two SCN marks, the earlier survey can be used for MGA2020 bearing datum without the need to re-connect to those SCN marks. In this case surveyors **must** do all the following:
   1. connect to at least two PMs or PCMs from the earlier survey that are at least 200 metres apart
   2. connect to at least one other PM or PCM to satisfy Regulation 11(3)(a), Surveying (Cadastral Surveys) Regulations 2015
   3. rotate the survey onto MGA2020 bearing datum.

For scenarios a., b. and c. above, surveyors are encouraged to connect to non-SCN marks and unregistered PMs, where they exist within the immediate vicinity of the survey. Refer to section 2.5.1 regarding unregistered PMs.

## 2.3 MGA2020 bearing connection derived by GNSS equipment

### 2.3.1 General

GNSS may be used to derive MGA2020 datum and connect a cadastral survey to the Victorian SCN. GNSS can achieve centimetre-level measurement quality and is therefore well suited to deriving an MGA2020 bearing datum, provided appropriate standards and guidelines are adopted.

Surveyors are advised to familiarise themselves with the [*Standard for Australian Survey Control Network*](https://www.icsm.gov.au/publications/standard-australian-survey-control-network-v22)*, Special Publication 1 (SP1) version 2.2* and[*Guideline for Control Surveys by GNSS*](https://www.icsm.gov.au/publications/guideline-control-surveys-gnss-v22) *version 2.2* published by the Intergovernmental Committee on Surveying and Mapping (ICSM). These are available at www.icsm.gov.au/publications. Furthermore, surveyors are to be familiar with Section 12, Part 2 – Survey Procedures, [*Survey Practice Handbook – Victoria*](http://www.surveyorsboard.vic.gov.au/content/91/surveypracticehandbook.aspx), which is available at www.surveyorsboard.vic.gov.au.

Network Real time kinematic (NRTK) GNSS survey methods are the most commonly used by surveyors to obtain MGA2020 coordinates and bearings for a cadastral survey in Victoria.

Static GNSS survey techniques, in which data is logged and post processed, can also be used to establish MGA2020 coordinates and bearing datum. This is particularly useful where existing SCN marks are limited, far apart, difficult to traverse between or poor communication reception prohibits NRTK GNSS survey techniques.

SGV Geodesy encourages surveyors to submit logged, static GNSS data on PMs for processing and inclusion in the Victorian SCN adjustment. An informative fact sheet entitled [Submission of GNSS data](https://www.land.vic.gov.au/surveying/services/survey-marks-enquiry-service) at www.land.vic.gov.au>Surveying>Services>Survey Marks Enquiry Service, provides guidance to surveyors contributing to this free service to enhance the Victorian SCN. Additionally, static GNSS data can be submitted to the AUSPOS free, online GPS processing service for the determination of MGA2020 coordinates. AUSPOS is managed by Geoscience Australia at [www.ga.gov.au/scientific-topics/positioning-navigation/geodesy/auspos](http://www.ga.gov.au/scientific-topics/positioning-navigation/geodesy/auspos).

Surveyors must ensure MGA2020 bearings determined by GNSS techniques meet the 20” of arc accuracy requirement discussed previously.

### 2.3.2 GNSS measurement quality and site-specific error sources

Surveyors are responsible for assessing the suitability of GNSS for use in a cadastral survey. In each case, surveyors must decide what is the appropriate GNSS equipment and measurement technique for the survey and adopt proper verification procedures to ensure the required level of quality has been achieved.

Under good conditions, GNSS positioning techniques with modern GNSS equipment can achieve positioning uncertainties of less than a few centimetres. It is recognised that site specific GNSS error sources that limit GNSS measurement from achieving normal or expected positioning quality can often be present in cadastral survey environments. Surveyors must endeavour to minimise the influence of site specific errors at all times when using GNSS surveying techniques.

### 2.3.3 Maximising NRTK positioning quality

While every effort may be given to minimising site specific GNSS error sources, it is not always possible to remove all sources of error when using NRTK positioning techniques.

#### Survey control for MGA2020 bearing in a cadastral survey

When establishing survey control to enable an MGA2020 bearing datum to be determined, the following techniques are to be used:

1. To assist with identifying erroneous position determinations, the use of NRTK positioning techniques on a survey control mark (PM or PCM) must consist of at least two independent occupations.
2. Each occupation must be of at least one-minute duration. The second initialisation and occupation is to be separated by at least 20 minutes, and preferably more than 60 minutes, from the first occupation. It also must be of at least one-minute duration.
3. The horizontal component of the differences between the two NRTK determinations should be comparable to the expected level of agreement that would normally be obtained from the GNSS equipment and RTK positioning technique. The difference between two NRTK determinations should not exceed 0.05 metres.

#### General survey marks in a cadastral survey

For other general survey marks located within the cadastral survey, the observation times may be reduced, but suitable checking techniques are to be employed. A second initialisation and occupation of every mark is required.

### 2.3.4 Verifying GNSS measurements

All MGA2020 coordinate values derived from GNSS measurement to determine MGA2020 bearing datum must be verified by connecting to at least one existing SCN mark which is as near as practicable to the site of the cadastral survey. Connection to SCN marks remote from the cadastral survey and beyond that of nearer practicable marks is not permitted. When connecting to SCN marks, the MGA2020 coordinates must be compared with the values published in SMES. A variation in the horizontal component of the coordinate difference of up to 0.10 metres is acceptable. This difference takes into consideration the likely uncertainty in GNSS measurement and uncertainty in the published coordinates.

Where this variation exceeds 0.10 metres, the surveyor **must** do both of the following:

1. connect to at least one other SCN mark to ideally identify the cause of the difference
2. advise SGV Geodesy of the discrepancy by email to smes.support@delwp.vic.gov.au

SGV Geodesy will assess and endeavour to rectify the reported anomaly and improve the published coordinate and uncertainty values.

Verification comparisons are to be reported upon in the licensed surveyor’s report of the cadastral survey. See section 5 – Licensed Surveyor’s Report.

### 2.3.5 Deriving bearing and ground distance from GNSS positioning

Unlike bearing and distance measurements obtained using a theodolite/EDM or total station, bearings and distances derived from GNSS positioning techniques are based upon relative differences of absolute positions. Since the respective positions each have an associated uncertainty, it is essential to keep in mind the way in which uncertainty propagates into GNSS-derived bearings and distances.

A surveyor must show on the abstract of field records the derived connection from the SCN mark (used for verification purposes) to at least one of the survey control marks (PM or PCM) in the survey. The connection shown must consist of the MGA2020 bearing and **ground** distance (grid distance multiplied by mean combined scale factor and what would be measured in the field) and the distance must be accompanied by the description ‘Ground’ on the abstract. See section 6.3 – Format of the abstract of field records.

## 2.4 Cadastral surveys exempt from connection to MGA2020

Connection to MGA2020 is not required for surveys supporting:

1. partial survey subdivisions that create one small lot from a significantly larger allotment (applicable primarily to a rural environment), or
2. Records of having re-established a cadastral boundary pursuant to Regulation 16 of the Surveying (Cadastral Surveys) Regulations 2015.

However, where SCN marks exist within the vicinity of a partial or re-establishment survey or GNSS equipment is used in the survey, surveyors are encouraged to connect to those marks and bring the survey onto MGA2020 bearing datum.

## 2.5 Permanent marks

### 2.5.1 Registration of new and/or unregistered permanent marks

In accordance with Regulations 6 and 7 of the Survey Co-ordination Regulations 2014, where new permanent marks are established in a cadastral survey, or unregistered PMs are found and connected to, surveyors must do all the following:

1. obtain an allocated number for the PM using SMES
2. prepare an Original Permanent Mark Sketch Plan and lodge it with Surveyor-General Victoria using SMES within one month of the establishment or location of the mark
3. include the registration number of the PM on the sketch plan and the plan and survey documents associated with the survey.

SMES should be used to determine whether a PM is registered or not. If a PM is not recorded in SMES, it can be accepted as being unregistered and dealt with in accordance with this section.

Surveyors are also encouraged to prepare supplementary sketch plans for PMs when the existing sketch is no longer consistent with the situation in the local area. Supplementary PM sketch plans can be submitted to SMES as an update to an existing mark. Through SMES surveyors can update the status of PMs, provide additional details, and submit supplementary PM sketch plans, photos and GNSS data for processing and inclusion in the Victorian SCN.

### 2.5.2 Provision of Permanent Mark information on survey documents

The Digital Cadastre Modernisation project aims to improve the spatial accuracy of the digital cadastre through the capture of surveyor’s observations and connection to the SCN. Information required from surveyors will be their observations to the SCN marks located within the survey and the provision of the PM and PCM number/s on the survey documentation.

When a PM is connected to in a cadastral survey, surveyors must do all the following:

1. check that the PM is registered. If the surveyor finds that the PM is not registered, the surveyor must register the PM in accordance with 2.5.1 above
2. show the connection to the PM on the abstract of field records or Record of having re-established a cadastral boundary (RE Plan)
3. reference the PM number on the survey documents (abstract of field records, RE Plan and licensed surveyor’s report).

## 2.6 Primary cadastral marks

### 2.6.1 What is a primary cadastral mark?

A primary cadastral mark (PCM) is a survey mark of a permanent nature that can be connected to as part of a cadastral survey to satisfy the monumentation requirements of Regulation 11(3) of the Surveying (Cadastral Surveys) Regulations 2015. To qualify as a PCM, a survey mark must be all of the following:

1. made of a durable material
2. permanent and stable in construction
3. placed so that it can be readily found and accessed
4. placed such that it does not present a hazard to the public.

When establishing PCMs, surveyors should endeavour to place them in locations where they are not likely to be damaged or destroyed, such as in concrete kerbs and other places away from pedestrian or vehicular traffic. Surveyors should also endeavour to establish PCMs in locations suitable for GNSS observation.

Marks suitable for nomination as PCMs include:

1. For hard artificial surfaces (e.g. concrete, brick and stone):
   1. aluminium rivets
   2. hardened survey nails
   3. expanding metal dowels with a collar
   4. drill holes at least 10mm deep with wings
   5. etches (or chisel cuts) that are prominent and well-defined with wings at least 50mm in length and not less than 3mm deep.

Survey marks placed in bitumen or asphalt are not considered suitable as PCMs.

1. For natural surfaces:
   1. steel star posts or other survey marks of metal construction (e.g. rods or pipes) at least 600mm in length. Such marks should be placed with the top not less than 50mm beneath the surface.

Surveyors are encouraged to use existing PMs and PCMs, where possible, and avoid establishing new PCMs in close proximity to existing PMs and PCMs.

### 2.6.2 Provision of PCM information on survey documents

For all PCMs connected to and established in a cadastral survey, surveyors must do all the following:

1. preserve the PCM numbers already assigned to existing PCMs connected to in the survey
2. assign numbers to all new PCMs from the series of numbers pre-allocated to them by the Surveyor-General
3. show the connections to the PCMs on the abstract of field records or RE Plan
4. include the PCM numbers on the survey documents (abstract of field records, RE Plan and licensed surveyor’s report) associated with the survey.

## 2.7 Recording the map projection and zone

All survey plans and abstracts of field records related to MGA2020 are to clearly display the datum as MGA2020 and the relevant zone (54 or 55) of the map projection as notations on the north point. Other written documentation is to include similar notations as applicable.

# Marking of boundaries

In accordance with the requirements of Regulation 9, Surveying (Cadastral Surveys) Regulations 2015, a key objective of a cadastral survey is marking the title boundaries of the parcel(s) defined in the survey. Title boundaries can be marked either directly or indirectly, given the circumstances on the ground, with the preference being for direct marking of boundary corners where practicable. Licensed surveyors are to apply their professional judgement to determine if, how and when boundaries are to be marked. The default position is that boundaries must be marked where it is appropriate and practicable to do so.

## Direct marking

Where direct marking of title boundaries is practicable, boundary marks are to be placed at the perimeter corners of the land under survey. Intermediate boundary ‘line’ marks are also required at distances no greater than 200 metres apart on boundaries of significant length and/or when the ends of the boundaries are not intervisible.

It is important that boundaries are marked such that there is no doubt or ambiguity on the ground regarding their identification, location and direction. Options for providing identification of boundaries and their direction include trenching, staking, stamping numbers on pegs (front and rear); or, by using a combination of these methods. In each case, the surveyor must apply their professional judgement about the most appropriate method of defining or indicating the direction of the boundary on the ground.

In rural environments, and when appropriate in urban areas, the preferred method of indicating boundary direction is by trenching, rock-filled trenches, or laying rock mounds.

Spray paint directional markings are acceptable on hard artificial surfaces such as concrete and bitumen, but are not to be used on natural surfaces.

When numbers are stamped on pegs, the numbering must be done in such a manner that the interpretation of the lot numbers cannot be ambiguous.

## Indirect marking

Where direct marking of title corners is impractical or inappropriate, another form of marking the boundaries in the vicinity of the corners, such as offset marks, is to be implemented. This may include, but is not limited to, situations where access to an adjoining property is not possible (e.g. fencing surrounding the land under survey is too high) or, when the placement of a boundary mark at a corner would result in it being inaccessible and not capable of being used for construction on the subject land.

Where indirect marking of title corners is implemented, the boundary marks placed are to relate closely to the boundaries at regular distances. Offset marks are to be placed at regular offsets (e.g. 1m x 1m) or, where appropriate and practicable to do so, on the production of boundaries at a regular distance (e.g. 1m, 1.5m, 2m…). Title pegs are not to be used as offset or production marks for indirect marking of corners.

## Non-marking

Where it is impractical or inappropriate to mark title corners directly or indirectly as described above, the reason for the non-marking must be provided in the survey documentation. The descriptions ‘Impractical to Mark’ and ‘Not Marked’ can be added to an abstract of field records or Record of having re-established a cadastral boundary to indicate the non-marking of specific corners. The description ‘Not Marked’ is to be used in situations where it is practical to mark a title corner, but it has not been marked for some other reason. In such cases the reason for the non-marking is to be described in the licensed surveyor’s report or as a notation on the Record of having re-established a cadastral boundary.

The types of surveys and situations where it may be acceptable for title boundaries not to be marked include:

* surveys to locate assets or infrastructure with respect to boundaries
* lengthy corridor surveys
* surveys for the creation of lease areas, easements or restrictions
* where mature fencing conflicts with title and possessory rights may have accrued
* where the surveyed dimensions of boundaries differ from title dimensions
* where site demolition or clearing is imminent.

Circumstances where it is unacceptable not to mark title boundaries include:

* the surveyor’s client requests the boundaries not to be marked or for the marking to be deferred. Surveyors must apply their professional judgement to determine whether requests of this nature are appropriate in the circumstances and provide their reasoning as to why the boundaries should not be marked in the survey documentation.
* avoidance of a return visit to the site for the purpose of marking boundaries

For a typical title re-establishment, feature and level survey performed for the purpose of planning or building permit applications, the default position is for surveyors to mark the title boundaries and the marks placed to be shown on the plan of survey. If a licensed surveyor determines that the appropriate course of action is to defer the placement of boundary marks, the expectation is that the boundaries will be marked by the surveyor at an appropriate time in the future and the client provided with an updated plan of survey showing the marks placed. It is also expected that the cost of the boundary marking will be included in the initial survey fee and not be charged as an ‘additional fee’ to the client at the time of the placement of the marks.

Surveyors should also take appropriate action to inform their client in writing of the possible ramifications of their re-establishment and/or marking of a title boundary particularly if the re-establishment identifies circumstances when an adjoining property or properties may be adversely affected.

# Record of having re-established a cadastral boundary

When a licensed surveyor undertakes a cadastral survey that will not be supported by an abstract of field records lodged with LUV, a Record of having re-established a cadastral boundary (RE Plan) must be prepared and lodged with the Surveyor-General within 60 days of the completion of the survey, pursuant to Regulation 16 of the Surveying (Cadastral Surveys) Regulations 2015.

RE Plans add significant value to Victoria's cadastral system as they are an official legal record of a cadastral boundary re-establishment and alert other surveyors to the existence of the survey. It should be kept in-mind that a title re-establishment survey documented and registered as an RE Plan carries more weight legally than an unregistered cadastral survey. It is also more likely that other licensed surveyors will respect or at least consider the boundaries re-established in an RE Plan which will assist in avoiding boundary disputes between neighbours and conflicting surveys of common boundaries.

For these reasons, licensed surveyors are encouraged to prepare and lodge RE Plans for their re-establishment surveys to a standard which demonstrates the accurate re-establishment of title boundaries. For many reasons in the past, RE Plans have been considered by some as being records of inferior cadastral surveys and subsequently ignored in any boundary determination deliberations. To eliminate this perception, surveyors are required to perform their re-establishment surveys and document their work on an RE Plan such that it is as reliable and beneficial as any other cadastral survey. To that end, and in-line with feedback received from the surveying industry, surveyors are now expected to place a greater emphasis on the description of the cadastral datum and re-establishment on RE Plans lodged for registration. This is to ensure that the integrity of the cadastre is maintained, and other licensed surveyors are provided with sufficient information on how the boundaries were re-established.

When an RE Plan is lodged with the Surveyor-General, SGV performs an acceptance examination to ensure that the document complies with the requirements of the regulations, these practice directives and SPEAR Technical Note 4.

## RE Plan requirements

RE Plans are required to be prepared in accordance with Schedule 4 of the Surveying (Cadastral Surveys) Regulations 2015 and must also adhere to the following requirements:

### SPEAR

The preferred method of lodgement of RE Plans is through [SPEAR](https://www.spear.land.vic.gov.au/spear/) (www.spear.land.vic.gov.au). SPEAR requires RE Plans to be prepared in A3 page size with Sheet 1 in portrait orientation and subsequent sheets in either portrait or landscape orientation.

There is the ability to add a licensed surveyor’s report to an RE Plan application in SPEAR should there be insufficient room on the RE Plan itself to adequately describe the cadastral datum and re-establishment. This can be done in the ‘Details’ tab of the application under ‘Actions’ then ‘Other Actions’ then ‘Add Surveyor’s Report’.

### RE Plan diagram

The RE Plan diagram is to include sufficient detail to validate the survey work performed including the re-establishment of the boundaries and alignments. It is expected that the diagram will provide all of the following as a minimum:

1. the major traversing of the survey
2. the connections to PMs, PCMs and reference marks placed or located
3. the survey monumentation used as the cadastral datum and the connection of the survey to it
4. the dimensions of the re-established boundaries and alignments, and
5. the boundary marks placed.

### Boundary marking in re-establishment surveys

Boundary marking is to be performed in accordance with the requirements of section 3 of these practice directives. Licensed surveyors are to apply their professional judgement to determine if, how and when boundaries are to be marked.

All boundary marks placed at the date of the completion of the re-establishment survey are to be shown on the RE Plan. The date of completion is the date on which the site was last visited for the purpose of the re-establishment survey and, in many circumstances, will be the date on which the site was revisited to perform the required boundary marking following the computation of the re-establishment.

It is acknowledged that there are many circumstances where the marking of boundaries in re-establishment surveys may be inappropriate, impractical or needs to be delayed. Some of these are listed in section 3. In such situations, the reason why boundary marking did not occur at the date of the completion of the re-establishment survey is to be stated on the RE Plan or accompanying report, if provided.

If the circumstances are such that boundary marks are required to be placed many months after the re-establishment survey, the RE Plan must still be lodged within 60 days of the re-establishment survey but there is no requirement to provide the Surveyor-General with details of any boundary marks placed after the registration of the RE Plan.

### Notations

A detailed description of the cadastral datum and re-establishment is to be provided on the RE Plan. This can be placed in the Notations panel, the body of the RE Plan or as an accompanying licensed surveyor’s report. As previously stated, surveyors will be expected to provide sufficient detail on the cadastral datum and re-establishment to adequately explain how the boundaries and alignments were determined.

If boundaries have not been marked, the reason for the non-marking is to be stated as a notation on the RE Plan.

If not all of the parcel boundaries shown on an RE Plan have been surveyed, for example, if only one boundary has been surveyed and marked but all the other parcel boundaries are also shown, then a notation that it is a partial survey is to be included on the RE Plan.

### Boundary dimensions

Surveyors must be mindful that RE Plans are not a mechanism to amend title dimensions. If the survey dimensions of boundaries differ to title dimensions, it is expected that the differences will be clearly indicated. For example, this can be achieved by showing both Title and Survey dimensions on the affected boundaries.

### Disclaimers

It is unacceptable for a licensed surveyor to ‘qualify’ an RE Plan with any notation advising that the information cannot be relied upon as it has not been examined or approved by LUV. By signing the certificate as required by Regulation 14(1) and Schedule 4 of the Surveying (Cadastral Surveys) Regulations 2015, the surveyor accepts full responsibility for the re-establishment survey as documented on the RE Plan.

### RE Plan Example

An example of an [RE Plan](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) is available at: www.land.vic.gov.au>Surveying>Cadastral Survey>Practice Directives

## Initial re-establishment surveys for subdivisions

Since the requirement to lodge RE Plans was introduced in 1995, it has not been mandatory for an RE Plan to be lodged for a re-establishment survey when it is known that a subdivision of the land is to follow. In many circumstances, this has resulted in a record of the re-establishment survey not being publicly available for some time or not at all. Situations where this has occurred include; when a proposed subdivision did not proceed due to financial or planning issues, a different surveyor or survey firm was engaged to perform the subdivision or there was a substantial time delay between the design and final survey for the subdivision.

To eliminate this occurring, licensed surveyors must now lodge an RE Plan for their re-establishment survey within 60 days even when a subdivision is known to be following. The only exception is if the subdivision application has already been created in SPEAR in which case the surveyor can be identified and contacted for the purpose of obtaining details of the re-establishment in the period leading up to the plan being registered.

The provision of an RE Plan will ensure that the initial re-establishment survey is documented and available for other surveyors to use or consider, and a link provided to old survey marks and monumentation that may have been destroyed in the time between the initial survey and the final survey for the subdivision.

## Plans of subdivision

It is still the case that RE Plans are not acceptable as survey documentation in support of plans of subdivision lodged at LUV. Regulation 18(1) of the Subdivision (Registrar's Requirements) Regulations 2011 specifically requires an abstract of field records to be submitted to the Registrar when a plan of subdivision is lodged. It is not acceptable to refer to a previously lodged RE Plan as the supporting documentation for a plan of subdivision, even though that RE Plan may have been prepared in an abstract of field records format and is supported by a complete licensed surveyor’s report.

# Licensed Surveyor’s Report

The licensed surveyor’s report is a formal declaration made in accordance with Regulation 15 of the Surveying (Cadastral Surveys) Regulations 2015 and must be prepared to accompany any plan or application lodged with the Surveyor-General or the Registrar of Titles.

## 5.1 Title and requirements

The report is to be titled **Licensed Surveyor’s Report**.

A clear and concise report is an important element of every cadastral survey and should be comprehensive to assist in justifying the re-establishment and its acceptability. The report and abstract should support each other and be consistent and compatible. If the licensed surveyor’s report is deemed inadequate or incomplete by the Surveyor-General or the Registrar of Titles, the surveyor will be required to submit an appropriate report prior to registration of the plan or application.

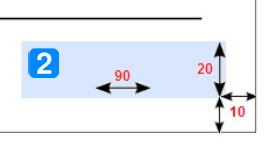
## 5.2 Format of report

The [licensed surveyor’s report](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) template available at www.land.vic.gov.au>Surveying>Cadastral Survey>Practice Directives can be used as a guide to the heading descriptions and the matters that should be addressed in the report, however further headings may be inserted as required.

## 5.3 SPEAR requirements

The survey company/firm/organisation details or logo must be positioned so that the requirements of [SPEAR Technical Note 4](http://www.spear.land.vic.gov.au/spear/pages/applicants/how-do-i-set-up-my-plan-templates.shtml), available at www.spear.land.vic.gov.au>Applicants>How do I set up my plan templates?, are accommodated to allow the insertion of the surveyor’s digital signature. Please note that a blank space of 90mm x 20mm must be reserved in the bottom right hand corner of each sheet as shown below.

Company information and page numbering can be included in the footer of the first and subsequent sheets but must continue to satisfy the above requirement.



## 5.4 EDM calibration and verification of GNSS/emerging technologies

The licensed surveyor must specify the calibration/verification details of EDM, GNSS and emerging technologies in the Licensed Surveyor’s Report.

### Calibration of EDM equipment

Regulation 6(2) of the Surveying (Cadastral Surveys) Regulations 2015 requires a licensed surveyor to retain full records of EDM comparisons. These records must be made available for inspection when requested by the Surveyor-General.

The Surveyor-General requires a summary of calibration details to be included in the licensed surveyor’s report that forms part of the cadastral survey documentation lodged with LUV, including all the following:

1. make and model of instrument
2. serial number of instrument
3. EDM calibration baseline site
4. date of calibration.

### Verification of GNSS Equipment

Where GNSS equipment is used during the survey, the licensed surveyor must fully describe the equipment used (make, model, serial number), the observation techniques, the methods of validating and obtaining redundancies of measurements, any other field checking technique and the method of analysing the results in the Licensed Surveyor’s Report. The locations within the survey where GNSS derived measurements were employed must also be clear on the abstract of field records and fully detailed in the licensed surveyor’s report.

When GNSS equipment is used during the survey, it must be verified by connecting to at least one existing SCN mark which is as near as practicable to the site of the cadastral survey. Verification comparisons to the values published in SMES must be reported on in the Licensed Surveyor’s Report. See section 2.3.4 of this document for further details

Harrietville PM 1 Easting Northing

SMES 505704.001 5919590.656

GNSS 505704.015 5919590.591

Diff. +0.014 -0.065

### Verification of emerging technologies

Measurement technologies and techniques are evolving rapidly, however the principles of best cadastral survey practice are fundamental to achieving acceptable results, and for determining derived measurements to be shown on abstracts of field records and plans. Redundancy of observations and independent checking of derived measurements is required when using any measurement technology.

Regulation 7 of the Surveying (Cadastral Surveys) Regulations 2015, relates to accuracy of surveys and licensed surveyors are reminded to adhere to the requirements of this regulation when undertaking a cadastral survey regardless of what measurement technology is being used.

Emerging technologies which are being used for cadastral surveys include, but are not limited to:

• Terrestrial Laser Scanning

• Mobile Laser Scanning

• LiDAR

• Photogrammetry

• Drone/UAV

It is the responsibility of the licensed surveyor to have a thorough understanding of the technology, its settings and limitations and the accuracies achievable. The licensed surveyor must use their professional judgement and report on measurement technologies used in the Licensed Surveyor’s Report.

## 5.5 Crown descriptions

Care should be taken to ensure correct Crown descriptions are included on all plan and survey documents. This includes the Crown allotment, Crown portion, Section, Township, Parish and County, as appropriate, with the details validated against the relevant Central Plan Office record plans. Close attention should also be given to whether a Special (Local) Description is current and applies to the land. A full listing of the current [Special Descriptions](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) is available at www.land.vic.gov.au>Surveying>Cadastral Survey>Practice Directives.

The list has been prepared for Crown surveys but applies equally to surveys of freehold land that lie within the relevant Parish and local area. The Parish code and County is not required for Plans of Subdivision. Similarly, the Parish code is not required for abstract of field records but the County should be included in the Crown description.

## 5.6 Other inclusions (Appendices)

When clarity of description can be gained by including images, such as the Record Plan or LASSI, these should be inserted with an appropriate descriptor under the relevant heading or Appendices. This extends to sketches, photographs, and diagrams.

# Abstracts of field records

## 6.1 General advice

### 6.1.1 The purpose for preparing an abstract of field records

1. For the maintenance of, and availability to, the public record.
2. To provide documentary evidence of conditions in the field that supports the method of re-establishment and justification.
3. To provide sufficient additional or redundant information to enable confirmation of the measurements recorded.
4. To provide a record of site conditions. The existence of traverse lines and positions of instrument points is a clear indication of site conditions such as topography and the existence of buildings, foliage or other obstacles.

### 6.1.2 Life of a survey and abstract of field records

1. The ‘currency conditions’ set out below describe the circumstances when a survey and abstract of field records will be regarded as valid by Land Use Victoria and further survey and/or documentation will not be required. The ‘currency conditions’ include all of the following:
   1. no substantial changes to occupational features since the date of the original survey
   2. the greater majority of original survey control marks remain and are readily accessible
   3. no additional land is included in the plan
   4. the original title pegs/marks as placed remain, or have been replaced
   5. the survey was undertaken no more than two years prior to lodgement of the current plan, i.e. the date of survey in the Certification by Surveyor is no more than two years prior to the date of lodgement of the current plan. This period is known as the ‘life of a survey’.
2. The life of a survey may be extended to a maximum of five years if the licensed surveyor’s report includes discussion on the currency of the survey and attests to conditions i, ii, iii and iv above.
3. If an abstract of field records is edited as part of meeting the ‘currency conditions’, for example, to describe minor changes to occupational features or survey marks that have been destroyed since the date of survey, the updated abstract of field records must bear the following notation in the ‘Amendments’ text box:

|  |
| --- |
| AMENDMENTS |
| This abstract of field records correctly represents the occupation and features existing on *[insert date]*, and the survey has been brought up to date. |

1. When occupation has substantially changed, or works have removed most of the survey marks (in the period between the completion of the survey/marking and the lodgement of the plan), surveyors must update the abstract of field records and discuss in the licensed surveyor’s report the alterations made prior to lodgement.

This process may involve the following:

1. when the abstract of field records and accompanying plan has not been lodged, surveyors must amend the original abstract of field records and discuss the alterations made in the licensed surveyor’s report; and
2. when the current plan relies on an abstract of field records already lodged with LUV, a new (‘additional’) abstract of field records is to be prepared showing the current occupation features, survey control marks and boundary marks.
3. If the survey was completed more than five years prior to lodgement of the current plan, a new abstract of field records is to be prepared showing the current occupation features, survey control marks and boundary marks.

## 6.2 Land Registry Services requirements

### 6.2.1 Requirement for an abstract of field records

1. All plans of subdivision lodged with LUV must be supported by an abstract of field records of the survey undertaken, except when the subdivision is one of the following:
   1. is based on a recent survey of the property by the same surveyor or surveying firm (i.e. a survey contained in a prior plan or application undertaken no more than five years prior to lodgement of the current plan), or
   2. does not create any new boundaries, or
   3. is prepared under section 32, Subdivision Act 1988 re-subdividing multi-storey buildings that only creates new boundaries fully contained within the existing building.
2. For *Transfer of Land Act 1958* application surveys, LUV requires the abstract of field records to be based on a survey completed no more than two years prior to the lodgement of the application. However, if it is known to the surveyor that changes have occurred to occupation along boundaries subject to the application, the abstract of field records must be updated to record those changes.
3. If LUV determines that a survey is inadequate, the surveyor will be required to provide appropriate survey documentation prior to registration.

### 6.2.2 Subdivision of ‘Super-Lots’ and subsequent stages of an ’estate’ type Master Plan

1. If the ‘currency conditions’ in 6.1.2, above, are not met, a new abstract of field records and licensed surveyor’s report must be lodged with LUV at the time the plan is lodged.
2. A new abstract of field records is not required to support a plan for the subdivision of either a Super-Lot or subsequent stage of a Master Plan for an ‘estate’ type subdivision, provided all the following apply:
   1. the survey requirements for estate subdivisions as outlined in Appendix B have been met
   2. the new plan is endorsed by either:
      * the same surveyor (from the same company) that attained council certification of the originating Super-Lot plan or stage in a Master Plan; or
      * a different surveyor from the same company as the originating surveyor. In this circumstance the subsequent surveyor must include all the following in their licensed surveyor’s report:
        1. confirmation that they are satisfied with the original re-establishment
        2. confirmation that they have marked the subject parcel(s) on site
        3. reference to the originating plan.
   3. The certifying surveyor advises that a ‘supplementary’ abstract of field records will be lodged at LUV following the completion of works.
3. A new abstract of field records and licensed surveyor’s report is required to support a plan that subdivides a Super-Lot or a subsequent stage of an ‘estate’ type Master Plan if the surveyor endorsing the new plan represents a different company from the company which attained council certification of the original plan that set out the Super-Lot or subsequent stage.

See Appendix B for further information regarding LUV guidelines, supplementary abstract of field records and licensed surveyor’s reports for ‘estate’ type subdivisions.

## 6.3 Format of the abstract of field records

### 6.3.1 If conventional traversing techniques have been employed

If surveys are carried out using conventional traversing techniques, the abstract of field records to be lodged is to take the format of the ‘traditional’ abstract of field records. The abstract is to show all traverse lines, chainages, radiations, offsets, fence and mark descriptions etc. as described in the Surveying (Cadastral Surveys) Regulations 2015 and these practice directives.

An example of a [‘traditional’ abstract of field records](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) is available at:

www.land.vic.gov.au>Surveying>Cadastral Survey>Practice Directives>Abstract of field records traditional

### 6.3.2 If non-conventional measurement techniques have been employed

Due to advancements in technology (e.g. GNSS, laser scanning & photogrammetry), an increasing number of situations will occur where traditional chainage/offset, radiation and traversing methods are not used to complete a cadastral survey. When non-conventional measurement techniques are used, the format of the ‘alternative’ abstract is to be adopted.

An example of an [‘alternative’ abstract of field records](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) is available at:

www.land.vic.gov.au>Surveying>Cadastral Survey>Practice Directives>Abstract of field records alternative

The ‘alternative’ abstract is to clearly show or state:

1. the measurement technology used to complete the survey
2. the survey datum and survey(s) of origin
3. where GNSS was used, the bearings rotated onto MGA2020 bearing datum
4. ground or site distances at mean elevation. Spheroid or grid distances are not to be shown on cadastral plans or abstracts of field records
5. the measurements that have been derived by means other than direct measurement (i.e. distinguish between derived and direct measurements)
6. features (other than traverses) as described in the Surveying (Cadastral Surveys) Regulations 2015 and these practice directives
7. any conventional traversing performed shown in the usual manner.

### 6.3.3 Postponement of placement of marks and/or lodgement of supplementary abstract of field records

1. If the placement of marks has been postponed in accordance with Regulation 11(4) of the Surveying (Cadastral Surveys) Regulations 2015 and PMs or PCMs have been placed in the process of construction or final marking of any subdivision, a supplementary abstract of field records is to be forwarded to LUV within 45 days after construction is completed.
2. If a supplementary abstract of field records is required, it is to show:
   1. connections to at least three PMs or PCMs from the original survey or a subsequent survey (i.e. a previous supplementary abstract) that can be linked to the original survey
   2. mark numbers for the PMs and PCMs established or located and references to other physical indicators (streets, occupation, sheet references, etc.) from the original abstract
   3. observed or derived connections between the established PMs and PCMs.

An example of a [supplementary abstract of field records](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) is available at:

www.land.vic.gov.au>Surveying>Cadastral Survey>Practice Directives>Supplementary abstract of field records

# EDM calibration and verification of GNSS/ emerging technologies

Adherence to measurement standards for boundary-related surveys is important in maintaining the integrity of Victoria’s cadastre and property boundary system, which supports land administration and registration.

Measurements are subject to errors inherent in surveying instruments and techniques. Observing ‘best practice’ surveying methods will minimise uncertainty that may be introduced to measurements. Also, instruments and equipment must be systematically tested for errors (calibrated) and standardised (compared to the national standard).

The Surveying (Cadastral Surveys) Regulations 2015 set minimum standards for surveying title boundaries, including calibration and standardisation of survey instruments and equipment.

## 7.1 Meeting EDM standards requirements

Regulation 6(1), Surveying (Cadastral Surveys) Regulations 2015 requires a licensed surveyor to:

1. use survey equipment that has been compared to a standard of measurement, and
2. ensure both the process and basis of comparison (with the standard) are adequate to obtain the accuracy required by the regulations.

The Surveyor-General requires surveyors using EDM devices to compare their instruments to a certified, calibrated EDM baseline at intervals not exceeding 12 months. Surveyors must exercise professional judgement to determine if more frequent comparisons are needed.

The Surveyor-General provides EDM calibration baselines across Victoria for surveyors to comply with instrument calibration and standardisation requirements. The six EDM calibration baselines in Victoria are located at Bendigo, Braeside, Cowwarr, Geelong, Hamilton, and Mitcham. To assist surveyors to meet the regulations, the following information is freely available to download online:

1. [EDM Calibration Handbook](https://www.land.vic.gov.au/surveying/services/equipment-calibration-services)
2. [EDM Calibration Booking Sheet](https://www.land.vic.gov.au/surveying/services/equipment-calibration-services)
3. [‘Baseline’ EDM Calibration Software](https://www.land.vic.gov.au/surveying/services/equipment-calibration-services)
4. [Baseline booking facility](https://maps.land.vic.gov.au/lassi/EdmBookingUI.jsp) (available through SMES) and [baseline location information](https://www.land.vic.gov.au/surveying/services/equipment-calibration-services).

To find go to: www.land.vic.gov.au>Surveying>Services>Equipment calibration services

## 7.2 Verification of GNSS

All MGA2020 coordinate values derived from GNSS measurement to determine MGA2020 bearing datum must be verified by connecting to at least one existing SCN mark which is a near as practicable to the site of the cadastral survey. Verification comparisons to the values published in SMES must be reported on in the Licensed Surveyor’s Report.

Refer to section 2.3.4 and section 5.4.2 of this document.

## 7.3 Verification of emerging technologies

Measurement technologies and techniques are evolving rapidly. It is the responsibility of the licensed surveyor to have a thorough understanding of the technology, its settings and limitations and the accuracies achievable. The licensed surveyor must use their professional judgement and report on measurement technologies used in the Licensed Surveyor’s Report.

Refer to section 5.4.3 of this document.

# Precision of dimensions on plans of cadastral surveys and abstracts of field records

Every adopted length, bearing and area shown on an abstract of field records or a plan prepared from a cadastral survey shall be shown in accordance with the following table, which replaces Table 7.1, Part 2, [*Survey Practice Handbook – Victoria*](https://www.surveyorsboard.vic.gov.au/content/91/surveypracticehandbook.aspx). An exception to the table exists for adopted lengths and traverse bearings on an abstract of field records, which may be shown to a greater precision if it is necessary for the purposes of the survey. For example, if the rotation to MGA2020 from a cadastral bearing datum is computed to 5” of arc, then the adopted bearings can be shown to that precision, where appropriate, on the abstract of field records.

The general notes on lengths, bearings and areas contained in Section 7.7, Part 2, [*Survey Practice Handbook – Victoria*](https://www.surveyorsboard.vic.gov.au/content/91/surveypracticehandbook.aspx)*,* are still applicable.

| Measurement | Unit/s to be used | Precision |
| --- | --- | --- |
| **Length** |  |  |
| Less than 500 metres | Metre | Correct to the nearest 0.01 metre, except where circumstances require greater precision, then correct to the nearest 0.005 metre. |
| 500 metres and up to 5000 metres | Metre | Correct to the nearest 0.01 metre |
| Over 5000 metres | Metre | Correct to the nearest 0.1 metre |
| **Bearings of Lengths** |  |  |
| Less than 30 metres | Degrees (°) and minutes (‘) of arc | Correct to the nearest minute of arc |
| Over 30 metres | Degrees, minutes and seconds (“) of arc | Correct to the nearest 10 seconds of arc |
| **Area** |  |  |
| Less than 100 square metres | Square metre | Correct to the nearest 0.1 square metre |
| 100 square metres and less than 1 ha | Square metre | Correct to the nearest square metre |
| 1 hectare and up to 10000 hectares | Hectare | Correct to four significant figures  (e.g. 1.234 ha) |
| Over 10000 hectares | Square kilometre | Correct to four significant figures  (e.g. 1.234 km²) |

# General advice

## 9.1 Surveyor-General consent to Crown land boundary determinations

A role of the Surveyor-General, set out in Section 42 of the *Surveying Act 2004*, is the formal determination of government road alignments and/or Crown land boundaries. The Surveyor-General’s consent is primarily sought when insufficient land exists to maintain widths of government roads; when differences exist within parcels such that title dimensions cannot be maintained to adjoining Crown land; or, when parcel boundaries are defined by a relationship to a water feature such as a river, lake or the sea.

Surveyors are advised to seek consent to the position of the alignments of government roads and other Crown land boundaries prior to plans being lodged with LUV for registration. The Surveyor-General will not provide consent without receiving a formal request from the surveyor accompanied by supporting documentary evidence such as a worksheet or abstract of field records, licensed surveyor’s report and photos of the Crown land boundaries. The request, and supporting documents, must be supplied by email to [sgv.surveyors@delwp.vic.gov.au](mailto:sgv.surveyors@delwp.vic.gov.au) and are typically processed within 45 days.

## 9.2 State border determinations

The Surveyor-General is responsible for advising on the position of state borders. Surveyors who determine land boundaries that form part of the state border must present the results of their survey to the respective Surveyors-General for agreement. SGV should be contacted in the preliminary stages of performing such a survey to identify the procedure, type of survey evidence and the format of the plan to be presented for agreement by the Surveyors-General.

Specific advice on the determination of the state border between New South Wales and Victoria along the Murray River is provided in the publication [*NSW-VIC Border Determination*](https://www.land.vic.gov.au/surveying/professional-resources/ambulatory-boundaries) available at:

www.land.vic.gov.au>Surveying>Professional resources>Ambulatory boundaries

## 9.3 Consideration of the width of roads

From time to time, surveyors adopt alignments without consideration to, or awareness of, the impact of their decisions on the land within the road ‘reserve’. It appears this situation arises when surveyors fail to survey an area of sufficient extent or measure the widths of roads.

The *Road Management Act 2004* and associated administrative processes highlight the need for surveyors to measure, record and give due consideration to occupation across and along streets and roads throughout Victoria when determining street and road alignments.

Sections 7.4, 7.8 and 7.9, Part 2, [*Survey Practice Handbook – Victoria*](https://www.surveyorsboard.vic.gov.au/content/91/surveypracticehandbook.aspx)refer to the requirements to measure and record aspects relating to road widths.

# Appendix A: Survey documents required when lodging a plan of subdivision or consolidation

The practice of permitting some plans of subdivision and consolidation to be submitted without survey (i.e. not supported by an abstract of field records) has been updated following consultation with the surveying profession. The profession agrees that plans lodged at LUV accompanied by complete and thorough survey documentation enhance the cadastre’s integrity and provide greater assurance that the Registrar issues ‘good title’.

It is important to note that Regulation 18 of the Subdivision (Registrar’s Requirements) Regulations 2011 requires licensed surveyors to provide a licensed surveyor’s report and abstract of field records when a plan is lodged. There is no legislative authority that permits the lodgement and registration of plans without a current survey.

From 1 July 2016 all plans signed by a licensed surveyor must be supported by an abstract of field records unless one of the exemptions below applies.

## Exemptions to providing an abstract of field records

Plans that satisfy the exemptions detailed below must still be lodged with an extensive licensed surveyor's report prepared in accordance with these practice directives:

* plans based on a current survey of the property by the same surveyor or surveying firm (i.e. a survey contained in a prior plan or application), or
* plans of subdivision that do not create any new boundaries, or
* plans prepared under Section 32 of the *Subdivision Act 1988* re-subdividing multi-storey buildings that only create new boundaries fully contained within the existing building, or
* plans of consolidation prepared from titles that have a clear common mathematical origin and there is no change to title dimensions. In this case, the licensed surveyor will still need to provide justification within the licensed surveyor’s report for how the titles fit together.

**Note:** LUV may request survey at any time.

## Partial surveys

Partial surveys are typical to rural areas and may be accepted when:

* creating one or more small lots from a significantly larger parcel, or
* subdividing a significantly large rural parcel into two lots

Provided that:

* the lot(s) subject to the partial survey are fully surveyed, and
* only one balance lot remains, which is not subject to full survey.

It is not acceptable to undertake a partial survey in an urban or peri urban area. All new boundaries of the lot subject to survey must be shown on the abstract of field records, together with sufficient information to adequately re-establish the title boundaries in which the new boundaries intersect.

An acquisition by an acquiring authority is not considered a partial survey in accordance with these parameters. When undertaking an acquisition survey, the land being acquired must be fully surveyed and connected sufficiently to the cadastre.

## Non-survey guidelines for plans lodged under Section 32, *Subdivision Act 1988*

An ‘addendum’ abstract of field records and licensed surveyor’s report will normally be required to support Section 32 plans, especially when a new survey was required to compute or mark new boundaries at ground level.

However, plans may be accepted without an abstract of field records if:

1. the original survey was carried out by the same surveyor or survey company within the last five years, and no additional land has been included in the plan, and
2. the new boundaries can be derived from existing information on the plan or abstract of field records without the need for further survey, or
3. the new boundaries are defined by, attached to, or contained within original buildings, and are not required to be marked at ground level.

In cases where it is doubtful if a plan will be accepted without an abstract of field records, surveyors should contact LUV for advice. It is possible that an ‘addendum’ licensed surveyor’s report could be required, which on its own may adequately satisfy the requirements of LUV.

Where an ‘addendum’ abstract of field records and licensed surveyor’s report are supplied, they should:

1. satisfy the Surveying (Cadastral Surveys) Regulations 2015
2. re-establish the datum of the original survey – partial surveys may be accepted, and
3. retain the bearing datum of the original plan/folio if that datum is not MGA2020, i.e. the original plan/folio was not based on a survey that included a connection to marks with MGA2020 coordinates.

If a connection to MGA2020 is observed in the new survey, an appropriate notation should be shown on the addendum abstract of field records describing the relationship to MGA2020 datum.

# Appendix B: LUV guidelines for estate subdivisions

LUV, in conjunction with Consulting Surveyors Victoria, has developed guidelines for licensed surveyors undertaking Estate Subdivisions (i.e. Section 37 stage plans, super-lot and large balance-lot style subdivisions). The aim of the guidelines is to:

* address deficiencies in survey documentation lodged for subsequent stages of an estate subdivision
* remove the need for a re-survey of the balance land of an estate once the original survey has reached 5 years of age
* place priority on the timely provision of supplementary abstracts of field records that will become the key survey information underpinning the estate’s cadastre into the future.

This will be achieved by:

* the inclusion of more detailed information within licensed surveyor’s reports, and
* the provision of ‘Plan Linking Diagrams’, and
* the lodgement of supplementary abstracts of field records on a stage-by-stage basis.

Subject to the ‘currency conditions’ (see 6.1.2) of a survey being met, LUV may accept enhanced survey information for estate-type subdivisions provided that:

* the location of the subject lot/stage is identified within the estate, and
* the survey link to the original survey is clearly defined, and
* the abutting supplementary abstracts of field records, where applicable, have been accepted by LUV and identified in the documentation.

This process will only apply to the same surveyor and survey company that attained council certification of the original plan or to a different surveyor from the same company as the originating surveyor.

A licensed surveyor may also at any time deem a new abstract of field records necessary to support a plan of subdivision of a super-lot or stage within an estate. In such cases the survey would need to be performed and documented in accordance with the current regulations and directives for cadastral surveys.

## Supplementary abstract of field records

Supplementary abstracts of field records are to be completed on a stage-by-stage basis following the completion of works in accordance with Regulation 11(5) of the Surveying (Cadastral Surveys) Regulations 2015, and must be forwarded to LUV for processing. They will be stored with the survey information for the associated plan of subdivision once accepted by LUV.

Supplementary abstracts of field records must show connections to at least three marks from the original survey or a subsequent survey that can be linked to the original survey.

An example of a [supplementary abstract of field records](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) is available at:

www.land.vic.gov.au>Surveying>Cadastral Survey>Practice Directives>Supplementary abstract of field records

## Licensed surveyor’s report

Licensed surveyor’s reports for stages of an estate subdivision must provide information that:

1. Identifies the location of the subject stage within the estate, and
2. Identifies the survey link between the original survey of the site and the survey of the subject stage, and
3. Identifies the location of abutting supplementary abstracts of field records that have been completed and accepted by LUV.

Depending on the particular circumstance of a stage, the licensed surveyor’s report may be accompanied by ‘Plan Linking Diagrams’ to show the location of the stage in relation to the overall estate and/or the identification of abutting stages where supplementary abstracts of field records have been accepted by LUV.

## Examples of licensed surveyor’s reports

The following links are provided as examples of the information that is to be supplied with licensed surveyor’s reports that accompany plans of subdivision for stages of an estate;

[Example 1](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) – to be used for the first stage or super-lot subdivision within an estate. Only an enhanced licensed surveyor’s report is required in this instance.

[Example 2](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) – to be used where there are adjoining stages within an estate. An enhanced licensed surveyor’s report and Plan Linking Diagrams 1 and 2 are to be supplied.

[Example 3](https://www.land.vic.gov.au/surveying/cadastral-survey/practice-directives) – to be used for a stage remote from other stages within the estate. An enhanced licensed surveyor’s report and Plan Linking Diagram 1 are to be supplied.

All examples are available at: www.land.vic.gov.au>Surveying>Cadastral survey>Practice Directives

# Appendix C: Abbreviations used in this document

DCM Digital Cadastre Modernisation

DELWP Department of Environment, Land, Water and Planning

EDM Electronic Distance Measurement

GDA94 Geocentric Datum of Australia 1994

GDA2020 Geocentric Datum of Australia 2020

GIS Geographic Information System

GNSS Global Navigation Satellite System

ICSM Intergovernmental Committee on Surveying and Mapping

LASSI Land and Survey Spatial Information

LRS Land Registry Services

LUV Land Use Victoria

MGA94 Map Grid of Australia 1994

MGA2020 Map Grid of Australia 2020

SGV Surveyor-General Victoria

PCM Primary Cadastral Mark

PM Permanent Mark

NRTK Network Real Time Kinematic

SCFF Single CAD Format File

SCN Survey Control Network

SMES Survey Marks Enquiry Service

SPEAR Surveying and Planning through Electronic Applications and Referrals

SRBV Surveyors Registration Board of Victoria

VCSPD Victorian Cadastral Surveys Practice Directives

delwp.vic.gov.au