Engineering Services Surveying Section

Preservation of Survey Infrastructure

Technical Procedure

OTV-TP-03

Issue B - draft

Issue date 28 06 2016

Authorised by Principal Surveyor
ESQMS file name
Review Frequency 5 years

Printed copies of this document are uncontrolled.

Change history

<table>
<thead>
<tr>
<th>Issue</th>
<th>Date</th>
<th>Description of change</th>
<th>Author</th>
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<tbody>
<tr>
<td>B</td>
<td>28.06.16</td>
<td>First Draft</td>
<td>R. Gilmour</td>
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1. Purpose

Preservation of Survey Infrastructure (POSI) is critical for the integrity of the land ownership, infrastructure development and spatial industries of New South Wales. Roads and Maritime Services have a legal and moral duty to preserve and enhance the reliability of the cadastre and survey control network.

2. Scope

This procedure is limited to surveying activities undertaken for RMS projects by either in-house resources, Professional Service Contractors, Contractors or Delivery Offices organisations.

3. Definitions

Also, refer to G71 Construction Survey and G73 Detail Survey clause 1.3

<table>
<thead>
<tr>
<th>Term</th>
<th>Comment</th>
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<tbody>
<tr>
<td>RMS</td>
<td>Roads and Maritime Services</td>
</tr>
<tr>
<td>Preservation of Survey Infrastructure (POSI)</td>
<td>State survey marks and cadastral survey marks as recognised in legislation that must be protected. Not to be confused with Plan for Survey Information – cadastral Deposited Plan.</td>
</tr>
<tr>
<td>survey infrastructure</td>
<td>Permanent survey marks and cadastral reference marks as defined by the Surveying &amp; Spatial Information Regulation. This may or may not include survey marks identified on the Drawings as Primary Survey Control Marks.</td>
</tr>
<tr>
<td>POSI drawing</td>
<td>A post design drawing showing all of the survey control marks and cadastral reference marks that may be disturbed or destroyed by the planned construction activities. This should be provided at the pre-tender stage.</td>
</tr>
<tr>
<td>Survey Mark Register</td>
<td>A schedule of all survey control marks and cadastral marks with additional information suitable for specification G71 Constructions Survey requirements. Template OTV-TP-03T1 may be used.</td>
</tr>
<tr>
<td>Deposited Plan of Survey Information Only</td>
<td>Survey information placed on public record. Provides valuable evidence for the location of adjoining owner boundaries during and after construction.</td>
</tr>
<tr>
<td>Deposited Plan of Redefinition</td>
<td>Defining parcel boundaries, as they exist today.</td>
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</table>

4. Procedure

4.1. Asset life cycle impact

Most physical developments undertaken by RMS may affect the survey infrastructure and can unintentionally destroy survey marks. The figure below is an overview of the current situation for development projects with the associated survey activities.
4.2. Specification G73 Detail Survey process requirements

All Project Managers are responsible for ensuring the investigation of existing survey marks is undertaken and adequate for the design phase and POSI analysis. The Project Manager will seek the guidance of the contract Surveying Technical Representative to develop the survey 'brief'. Refer to step 6 of Roads and Maritime specification Annexure G73/E1 and G73/E8.

As a minimum, the Survey Mark Register is to be completed. The Register lists all survey marks within and adjacent to the project area with co-ordinates and status. The co-ordinates may be approximate if not surveyed and the status can state that the mark is ‘calculated’ or as described in the Deposited Plan. The Register can form part of the metadata associated with any spatial data transfer. If the footprint of the development area is known, then a Preservation of Survey Infrastructure Drawing can be created displaying a traffic light system to indicate the vulnerability of the mark. The drawing is to be registered in the RMS Plan Management System in Objective and is indicated by identifier DSYYYY/nnnnnn where YYYY is the year and nnnnnn is a sequential number allocated by the Plan Management Centre.

4.3. Pre-Tender documentation

As part of the documentation compilation process, a review of existing information is required. This is to ensure that no gaps in the data exist either caused by; scope creep, old information needing updating or inadequacy of the original data.
The Contractor needs this information to prepare a cost estimate for this activity, which is essential when the fine could be of the order of $20,000 per lost or damaged mark.

### 4.4. Specification G71 Construction Survey process requirements

Referring to clause 1.4, a Project Quality Plan is required with a POSI strategy. Under clause 1.6, the onus is on the Contractor to preserve the survey marks. Under clause 2.1 all survey control marks are to be verified and under clause 2.3, all cadastral marks are to be surveyed. The information can be included in the Survey Mark Register. This may be a new Register or ideally, updates to the Pre-Tender Register can be made. Several HOLD points exist to control this process.

G71 is being updated from 2014 Edition 1 Revision 4 to better explain the new process based on the ‘RMS – LPI Collaborative Agreement’ signed in 2016. This document promotes the delegation of some of the LPI duties to RMS Principal Surveyor or delegate.

Approved destruction of the Survey Infrastructure can only occur when the fabric of the cadastre and survey control network are not damaged or lost. This may require a Deposited Plan of Survey Information or Plan of Definition and a full geodetic control survey as part of the Contract.

### 4.5. Surveyor General’s Directions process requirements

Interaction between the Contractor Surveyors, RMS Surveying Technical Representative and Land and Property Information will occur in three phases. Each phase of:

- Pre-construction
- Active construction, and
- Wind-up construction

Has an activity flowchart and are shown in the following sections.
### 4.5.1. Pre-construction phase

#### WHAT

- Review supplied Survey Mark Register and POSI Drawings
- Get new survey control and cadastral data
- Complete fieldwork to find and coordinate survey infrastructure

#### RECORDS

- Pre-tender documentation
- Refer to OTV-TP-03-T1 Survey Mark Register spreadsheet
- RMS to supply Drawing Set Number (DS Objective file)
- Refer to OTV-TP-03-T2 POSI strategy template

#### WHO

- Contractor

#### Strategy may include complete details of control network, observation techniques, equipment and observation network with reduction and adjustment methodologies. May include Deposited Plan requirements.

- RMS Surveying Rep

- LPI POSI Rep

- Site Induction, compound and Tool Box system for POSI.

- RMS Surveying Rep

- Contractor

- SGD 11 and cadastral legislation

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4.5.2. Active construction phase

**WHAT**
- Stake all marks to Site system. Place additional marks and conduct survey of cadastral and control marks to required tolerances. Monitor all marks.
- Provide notification of planned or unplanned destruction of survey marks ASAP to the RMS Surveying Rep.
- Review Notification for compliance with the POSI strategy, Survey Mark Register and POSI drawings.

**WHO**
- Contractor
- RMS Surveying Rep

**RECORDS**
- Update Survey Mark Register. Review POSI strategy.
- Notification record as defined in the POSI strategy.
- Report to RMS Contract Representative.
- Notification of destruction of marks.

Repeat process for the life of the Contract. Information satisfactory?
- Yes
- No
4.5.3. **Wind-up construction phase**

**WHO**
- Contractor

**WHAT**
- Review POSI strategy and Survey Mark Register and site DP information for compliance.
  - Information complies?
    - Yes
      - Complete Control and/or cadastral surveys – as per POSI strategy
      - Provide information to RMS Surveying Rep for assessment
    - No
      - POSI Strategy document, Project Plan, Survey Mark Register and DP for Survey Information (may require new DP).

**RECORDS**
- RMS Surveying Rep
- LPI POSI Rep
- RMS Surveying Rep

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This may include survey control network drawing, Report and adjustment data. May also include Deposited Plans of latest information.

- Provide advice to RMS Contract Rep and Contractor
- LPI concurs with RMS assessment?
  - Yes
    - Provide written concurrence to RMS Surveying
  - No
    - Provide feedback and required improvements

- Assessment valid?
  - Yes
    - Provide advice to RMS Contract Rep to release G71 HOLD point
  - No
    - Negotiate with LPI Rep for resolution. If issue is not resolved, escalate to LPI – RMS Surveying Collaboration Working Group.

If the process is managed and in a collaborative manner, the need for this is very unlikely
4.6. Minor improvement or maintenance projects

The Project Manager is responsible for compliance with Surveyor General’s Direction 11 – Preservation of Survey Infrastructure. Breaches could result in fines and loss of reputation for Roads and Maritime Services. To minimise the risks, technical advice is available from Roads and Maritime Services Regional Survey Managers.

As outlined in Direction 11, all survey infrastructure needs to be preserved or replaced if damaged or destroyed. However, the Regional Survey Manager may be able to reduce this requirement though negotiation with Land and Property Information Representatives.
Surveying Section

Preservation of Survey Infrastructure

**WHAT**

- Define limits of work. Obtain SCIMS survey mark information in and adjacent to works.
- Obtain cadastral Deposited Plans in and adjacent to works.

**RECORDS**

- SCIMS and DPs.
- POSI drawing and Survey Mark Register (OTV-TP-03-T1 example spreadsheet)

**WHO**

- Project Manager

**PROJECT**

- Project Manager may engage RMS Regional Survey Manager to undertake this activity

**WHAT**

- Develop drawing of position and co-ordinates of all POSI against proposed works.
- Are any marks likely to be affected?

**RECORDS**

- POSI drawing and Survey Mark Register (OTV-TP-03-T1 example spreadsheet)

**WHO**

- RMS Surveying Rep
- Contractor
- RMS Surveying Rep

**WHAT**

- Discuss project requirements with RMS Regional Survey Manager and scope requirements.
- Can savings be made by reducing the number of replacement survey marks?

**RECORDS**

- POSI drawing and Survey Mark Register (OTV-TP-03-T1 example spreadsheet)

**WHO**

- RMS Surveying Rep

**WHAT**

- Negotiate with LPI Rep for reduced marks (using process in clause 4.5)
- Comply with SG’s Direction 11 for ‘one-for-one’ mark replacement.

**RECORDS**

- POSI drawing and Survey Mark Register (OTV-TP-03-T1 example spreadsheet)

**WHO**

- RMS Surveying Rep

**WHAT**

- Provide mark sketches, observations and adjustment data to LPI. If required, lodge Deposited Plan of Survey Information with LPI.

**RECORDS**


**WHO**

- Project Manager

**WHAT**

- Archive data in Project area and organise payments.

**RECORDS**

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5. Reference documents

Surveying and Spatial Information Act  
In particular, sections 3, 5, 9, 24 and 36.  

Surveying and Spatial Regulation  
In particular, clauses 5, 6, 7, 9, 10, 12, 13, 14, 15, 17, 18, 22, 26, 27, 31, 32, 33, 34, 35, 36, 38, 39, 41, 42, 43, 52, 63, 67, 69, 71, 86, 88, 89  
Schedules 1, 2, 3, 4, 5, 7  

Survey General’s Direction No 1  
Approved Permanent Marks

Survey General’s Direction No 2  
Preparation of Locality Sketch Plans

Survey General’s Direction No 3  
Control for Cadastral Surveys

Survey General’s Direction No 11  
Preservation of Survey Infrastructure

Survey General’s Direction No 12  
Control Surveys and SCIMS

Registrar General’s Directions  
various

IC-QA-G2-C2  

IC-QA-G2-C41  
Specification G2 General Requirements (Minor Physical Works and Services)

IC-QA-G71  
Specification G71 Construction Survey

IC-QA-G73  
Specification G73 Detail Survey

ICN200  
RMS Infrastructure Contracts Notes – Care, Protection and Preservation of Survey Control Marks

ICSM SP1 (version 1.7)  
Inter-Governmental Advisory Committee on Surveying and Mapping. Standards and Practices for Control Surveys (SP1)

OTV-TP-03-T1  
Template – Survey Mark Register

OTV-TP-03-T2  
Template - Preservation of Survey Infrastructure Strategy Report