



## ESTIMATING AND QUANTITY SURVEY

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IC-QA-PS391

<p>VERSION FOR: <i>Macquarie Park Bus Priority and Capacity Improvement Project - Stage 2</i> DATE: <i>November 2018 (RFT Issue)</i></p>
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## FOREWORD

### ROADS AND MARITIME SERVICES COPYRIGHT AND USE OF THIS DOCUMENT

Copyright in this document belongs to the Roads and Maritime Services of New South Wales.

#### When this document forms part of a contract

This document should be read with all the documents forming the Contract.

### PROJECT SPECIFIC CHANGES

Any project specific changes have been indicated in the following manner:

- (a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.
- (b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

# **RMS SPECIFICATION PS391**

## **QUANTITY SURVEY**

### **1 INTRODUCTION**

#### **1.1 PROFESSIONAL SERVICES SPECIFICATION**

This specification is one of a set of Professional Services Specifications for detailed design. Refer to PS301.

#### **1.2 SCOPE & PROJECT DESCRIPTION**

This Specification sets out the requirements for an aspect of detailed design. It requires C72 Panel Deed for Professional Services or equivalent Professional Services Conditions of Contract.

##### **1.2.1 Project Specific Requirements**

Refer to Annexure PS391/A for Project Specific Requirements for Quantity Survey.

#### **1.3 PROJECT INTRODUCTION**

Refer to PS301 for Project Introduction details.

#### **1.4 STRUCTURE OF THE SPECIFICATION**

##### **1.4.1 Schedules of HOLD POINTS, WITNESS POINTS, DELIVERABLES, MEETINGS AND WORKSHOPS.**

The schedules in Annexure PS391/C list the **HOLD POINTS, WITNESS POINTS, DELIVERABLES, MEETINGS AND WORKSHOPS** that must be produced / observed. Refer to specification PS301 for definitions of **HOLD POINTS**.

##### **1.4.2 Design Reference Documents and Support Information.**

The schedules in Annexure PS391/M list the **DESIGN REFERENCE DOCUMENTS, REFERENCE DOCUMENTS & SUPPORTING INFORMATION** that apply to this Specification.

Unless otherwise specified the applicable issue of a referenced document, other than a RMS Specification, is the issue current at the date one week before the closing date for tenders, or where no issue is current at that date, the most recent issue.

### **2 QUANTITY TAKE-OFF AND DETAILED ESTIMATES**

#### **2.1 OBJECTIVES**

- (i) To calculate, detail and substantiate schedule(s) of quantities to enable preparation of detailed estimates and for inclusion in the construction and tender documentation.
- (ii) To calculate and detail a schedule of construction costs for the project to use for RMS program and project management.

- (iii) To prepare detailed estimates in accordance with RMS Estimating Manual - and RMS ProjectPack Estimating procedure ILC-MI-TP0-601.
- (iv) To prepare, update and present project estimates at ~~20%~~, 80%, and final detailed stages and at any major occurrences which impact on the costs.
- (v) To prepare and submit a final Project Estimate Report and Quantity Take off Source documents indicating from what drawings each quantity has been measured. This is required for the final detailed estimate.

## **2.2 KEY ISSUES/ACTIVITIES**

If the PSC is not part of RMS Infrastructure Project Cost Estimating panel, the PSC must engage an organisation from RMS Infrastructure Project Cost Estimating panel to prepare the estimate information necessary to complete the requirements of this brief. The requirements specified below must be undertaken by either the PSC or the organisation commissioned from RMS Infrastructure Project Cost Estimating panel.

### **2.2.1 General**

The PSC must take off quantities at various stages of the detailed design for the project. The calculation of quantities is not to be left until the completion of the detailed design.

Details of quantities are to be provided at each presentation associated with the detailed design hold points (~~20%~~, 80% and final detailed). At the final detailed design stage, the Quantity Take off Source documents indicating from what drawings each quantity has been measured must be submitted.

The schedule of quantities must use the pay items described in RMS QA specifications, where applicable. Where items of work are not covered by standard specification pay items, the PSC must develop an appropriate pay item description and quantity breakdown in conjunction with the construction and tender documentation preparation. The new pay item description must include as a minimum: a description of the item, what it includes, the method of measuring, the quantity and units of pay.

Refer to Annexure PS391/A for Quantity Survey and estimate update frequency.

The Quantity Survey update must be based on the latest design and project information, and the latest quantities calculated from this information. The RMS Representative may request that the PSC provide an update of the project estimate at any time in addition to the regular project estimate updates. Any additional estimate updates requested by the RMS Representative will be paid as a Variation.

Refer to Annexure PS391/A for the ratio of final project cost to the estimated final project cost.

Independent verification of the quantity take-off and rates/prices is to be arranged by the PSC – refer to PS301. Approval of the independent verifier must be obtained from the RMS Representative. The PSC must consider the comments made by the Independent Verifier and incorporate them into the quantities and/or estimate.

The independent verifier is to prepare a report of their findings and include all verification calculations. A copy of this report must be provided to the RMS Representative as part of the detailed design report.

### **2.2.2 Risk Management Workshop and Estimate**

In accordance with PS301, the PSC must undertake a series of Risk Management Workshops. The PSC must prepare source material to facilitate the risk evaluation of the project estimates and project risks. In the case of the schedule of rates, the following will be required:

- (i) Assign a level of confidence factor as to the accuracy of each quantity and assigned rate. The agreed level of confidence is to be supported by analysis and reason and included in the detailed design report. In the case of probabilistic estimating, assign the appropriate quantity and rate distribution.
- (ii) Determine appropriate allowances for (variations and) contingencies.
- (iii) Analyse provisional items to ensure that the assigned quantity is reasonable and justifiable.

The following steps are to be followed for the project risk:

- (i) All costs associated with the mitigation, elimination or transfer of risks must be included in the base estimate. All costs associated with residual risk must be included in the contingency.
- (ii) Identify the project residual risks then isolate those risks likely to have a financial impact on the project.
- (iii) Undertake assessment to determine the likely cost profile if the residual risk materialises.

### **2.2.3 Determination of Contingency**

For an empirical estimate, contingency must be determined by taking into consideration the confidence and reliability of the information used to prepare the estimate. Contingency must allow for the risk associated with the project.

Prepare P50 and P90 probabilistic estimate at 80% and Final Design in accordance with the requirements of the Roads and Maritime's Estimating Manual and the Roads and Maritime Project Pack Estimating procedure ILC-MI-TP0-601.

### **2.2.4 Detailed Estimate**

The PSC must prepare a detailed estimate of cost for the project works based on the calculated quantities, appropriate rates and the results of the risk management exercise.

The estimate must include a clear description of the project scope (i.e. description of the physical infrastructure to be constructed).

The estimate is initially to be developed using current day costs with the base date of costs to be clearly documented. In consultation with the RMS Representative an expenditure profile is to be developed for the duration of the project. The profile is to be adjusted to allow for the escalation factor provided to give an estimate of cost in out-turn dollars (\$OT).

The detailed estimate is to be presented as follows:

- (i) At the summary level.
- (ii) And the format requirements as per RMS Estimating Manual and the RMS ProjectPack Estimating Procedure ILC-MI-TP0-601.

### **2.2.5 Estimate Report**

The estimate report must be prepared to the requirements of RMS Estimating Manual.

**ANNEXURE PS391/A – PROJECT SPECIFIC REQUIREMENTS****A1 PROJECT DETAILS****Table PS391.A1 – Project Details**

<b>Project Name</b>	<i>Macquarie Park Bus Priority and Capacity Improvement Project - Stage 2</i>
<b>Project Number</b>	<i>P.0023019</i>
<b>Location</b>	<i>Epping Road, Herring Road, Waterloo Road and Lane Cove Road, Macquarie Park</i>
<b>Local Council</b>	<i>Ryde Council</i>
<b>Length (size) of the project</b>	<i>MR 373 Epping Road to MR 162 Lane Cove Road via Herring Road (7486) and Waterloo Road at Macquarie Park and MR 162 Lane Cove Road from Waterloo Road to Epping Road. Project length approximately 2.8km.</i>
<b>Project features</b>	<ul style="list-style-type: none"> <li>• <i>Upgrade of the state and local road network in the Macquarie Park precinct to improve travel times and reliability for buses and for other road users</i></li> <li>• <i>3 new signalised intersections and upgrades to the existing signalised intersections</i></li> <li>• <i>Installation of bus lanes and road widening with improved pedestrian and cyclist crossing facilities at signalised intersections</i></li> <li>• <i>Partial (strip) property acquisitions along Herring Rd, Waterloo Road, Byfield St, Khartoum Rd and Lane Cove Rd to enable the road widening and intersection upgrade works</i></li> <li>• <i>Service relocations to allow kerb relocation and lane widening</i></li> </ul>

*Refer PS301: Professional Services for Detailed Design Scope and Requirements, Annexure PS301/A for project details, background and project specific requirements.*

**A2 QUANTITY SURVEY DETAILS****Table PS391.A2 – Quantity Survey Details**

<b>Quantity Survey Details</b>	<b>Requirements</b>
Quantity Survey Frequency	<del>20%</del> , 80%, 100% and Final submissions
Accuracy level such that when the final cost of the project is compared with the estimate, the ratio of final cost to the estimate does not exceed.	see RMS Estimating Manual
The contingency component in the project estimate is to be determined using the following level on the cost curve. That is, at this percentage of the time at this contingency level the project will be on or under budget.	see RMS Estimating Manual



## **ANNEXURE PS391/B – PAYMENT**

Payment will be made for all costs associated with completing the work detailed in this Specification in accordance with the Pay Item(s) in **PS301**.

Where no specific pay items are provided for a particular item of work, the costs associated with that item of work are deemed to be included in the rates and prices generally for the works.

## ANNEXURE PS391/C – SCHEDULES OF HOLD POINTS, WITNESS POINTS, DELIVERABLES, MEETINGS AND WORKSHOPS

### C1 SCHEDULE OF HOLD POINTS AND WITNESS POINTS

The PSC must give the RMS Representative at least five working days written notice prior to reaching any hold point for which a release by the RMS Representative is required. Only items with a **Y** are required for this project.

**Table PS391.C1 – Hold Point Requirements**

Section	Type and required Y/N	Process Held	Submission details	Release of hold point
Not Applicable				

### C2 SCHEDULE OF DELIVERABLES AND SUBMISSION DETAILS

The PSC must give the RMS Representative at least ten working days to review all deliverables identified in the table below. Only items with an **Y** are required for this project.

**Table PS391.C2 – Deliverables and Submission Details**

Section	Description of Deliverables	Delivery timeframe	Required Y/N
2.2.1	Estimates including schedule of rates, schedule of estimated quantities, schedule of prices as applicable.	To be include in submissions at 20%, 80%, 100% and Final IFC submission.	Y
2.2.5	Draft Estimate Report	To be included in the 80% & 100% submission.	Y
2.2.1	Independent verification report	To be included in the 80% submission and onwards.	Y
2.2.5	Final Estimate Report the quantity take off source documents indicating from what drawings each quantity has been measured, must be submitted.	To be included in the Final IFC submission	Y

**C3 SCHEDULE OF MEETINGS REQUIRED**

*Refer to PS301/A and PS301/C for meeting and workshop requirements and details. The quantity surveyor will be required to attend meetings as required.*

Table PS391.C3 – Meeting Requirements

Clause	Description of Workshops	Required	Location	Minimum Expected Duration
	<i>Refer PS301/A and PS301/C</i>			

**C4 SCHEDULE OF WORKSHOPS REQUIRED**

*The quantity surveyor will not be required to attend the workshops below. However, any cost estimate actions required or impacts that affect the cost estimate from the workshops must be co-ordinated with and fed back to the quantity surveyor by the PSC.*

Table PS391.C4 – Workshop Requirements

Clause	Description of Workshops	Required	Location	Minimum Expected Duration
	<del>HSiD &amp; Risk workshops</del>	<del>At the 20% Submission</del>	<del>In consultation with RMS Representative</del>	

**ANNEXURES PS391/D TO PS391/L – NOT USED**

## **ANNEXURE PS391/M – REFERENCE DOCUMENTS & SUPPORTING INFORMATION**

### **M1 DESIGN REFERENCE DOCUMENTS**

Refer to clause 1.4.2

*RMS Technical Directions and Quality Alerts*

*RMS Design Guides*

*RMS Standard Drawings*

*RMS Specifications*

*Austroads Guides*

*Australian Standards*

*Urban Design*

*Software Programs*

*All City of Ryde Specifications and Standards including:*

- *City of Ryde Stormwater and Floodplain Management, City of Ryde*
- *Council Stormwater and Floodplain Management Technical Manual*
- *City of Ryde Standard drawings*
- *City of Ryde, Macquarie Park Corridor, Public Domain Technical Manual*
- *City of Ryde Development Control Plan 2014 Part 8.3 Driveways*
- *City of Ryde Development Control Plan 2014 Part 8.5 Civil Works*
- *City of Ryde, Tree Management Policy*

### **M2 REFERENCE DOCUMENTS**

Refer to clause 1.4.2

### **M3 SUPPORTING INFORMATION**

Refer to clause 1.4.2