Transport Roads & Maritime Services

QA SPECIFICATION PS321

DETAILED SURVEY AND UTILITY INVESTIGATION AND ADJUSTMENT

IC-QA-PS321

VERSION FOR: ***Macquarie Park Bus Priority and Capacity Improvement Project - Stage 2***
DATE: ***December 2018 (Addendum 2)***

CONTENTS

CLAUSE **PAGE**

FOREWORD

ROADS AND MARITIME SERVICES COPYRIGHT AND USE OF THIS DOCUMENT

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 PS321

DETAILED SURVEY AND UTILITY INVESTIGATION

1 INTRODUCTION

1.1 PROFESSIONAL SERVICES SPECIFICATION

This specification is one of a set of Professional Services Specifications for detailed design. Refer to PS301 Professional Service Scope and Requirements for Detailed Design (PS301).

1.2 SCOPE & PROJECT DESCRIPTION

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

Special notes relevant to Detailed Survey and Utility Investigations:

(i) Geospatial Surveys (Detail, Control) Cadastral Survey and Utility Location and Subsurface Mapping if procured by the PSC is to be conducted by a pre-registered RMS provider specified by in RMS PS321/A4.

1.2.1 Project Specific Requirements

Refer to Annexure PS321/A for Project Specific Requirements for Detailed Survey and Utility Investigation.

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 PS321/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 and WITNESS POINTS**.

1.4.2 Reference Documents and Support Information.

The schedules in Annexure PS321/M list the **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.

1.5 DEFINITIONS

In addition to the definitions provided in PS301, the following interpretations apply to this Specification:

Cadastral Survey	Identification surveys, digital cadastral models, marking existing property boundaries, surveys to define boundaries of land and stratum to facilitate land acquisition, disposal, access control, definition of easements and restrictions, and other statutory requirements.
Geospatial Survey - Control	Placement and survey of control marks in accordance with RMS QA Specification G73, SP 1.7 and the CADD Manual. For example, the use of GNSS and/or precise survey equipment. Calculation of three dimensional coordinates, to control survey accuracy generally on the Geocentric Datum of Australia, Australian Height Datum, and transformation between coordinate systems.
Geospatial Survey - Detail	Production of digital terrain models for road design and bridge design in accordance with RMS QA Specification G73 and the CADD Manual. May involve production of separate ground, utility, drainage and environmental models.
Utility Location and Subsurface Mapping – Two Dimensional	Two-dimensional Utility services location, including “dial before you dig” (DBYD) enquiries, using electronic detection methods, ground penetrating radar, in accordance with ASA 5488-213 Classification of Subsurface Utility Information (SUI), RMS QA Specification G73 and the CADD Manual
Utility Location and Subsurface Mapping – Three Dimensional	Three dimensional Utility services location, including “dial before you dig” (DBYD) enquiries, surveying of underground services using electronic detection methods, ground penetrating radar, pot-holing and non-destructive digging in accordance with ASA 5488-213 Classification of Subsurface Utility Information (SUI,) RMS QA Specification G73 and the CADD Manual

2 DETAIL SURVEY (DETAIL AND UTILITY)

The RMS representative will arrange a meeting with RMS Survey and the PSC within 10 days of the award of contract. RMS will provide the PSC with any available previous survey data of the corridor under investigation (including if available LiDAR, photogrammetry, existing detail survey, and digital cadastre). The PSC is required to review the content, accuracy and suitability of the survey information provided by RMS, and to conduct a gap analysis to advise RMS of incomplete, missing or inadequate data. The PSC must then advise RMS of any additional survey required to complete the detail design in accordance with the requirements of this Specification and RMS Specification G73 – Detail Survey.

HOLD POINT	
Process held:	Any additional surveys related to detailed design
Submission details:	Data gap analysis, detailed survey proposals.
Release of hold point	The RMS Representative will release the hold point following consideration of, the data gap analysis survey proposals

The PSC must scope any additional survey required, which may include survey control, cadastral overlays, utility investigations, drainage etc.

Refer to Annexure PS321/A2 for the requirements of proposed Survey works required for this project.

Additional survey shall be conducted by RMS or be procured by RMS and provided to the PSC.

~~Alternatively, if so instructed by RMS, the PSC shall procure the additional survey. The additional survey shall be conducted by companies as listed in Annexure A4. A project specific G73 specification will be issued by RMS and payment to the PSC for the additional survey shall be in accordance with the Provisional Items in the Schedule of Fees.~~

The PSC must provide details of specific locations where additional survey is required to enable the design to be completed in accordance with the requirements of this Specification and RMS Specification G73 – Detail Survey.

3 UTILITIES AND SERVICES

3.1 OBJECTIVES

To ensure that the impact of the project on existing and proposed services and the impact of services on the project are mitigated and managed effectively.

3.2 PURPOSE

To identify and plan the use of, adjustment, modification and/or relocation requirements of each of the utility services impacted by the project works.

Additionally, the results of the utility investigations will be included in the environmental assessment (EIS/REF), to identify utilities actually or potentially impacted by the project, the impact of any adjustment/modification/relocation on the environment and appropriate management measures.

In so far as is reasonably practicable and in compliance with relevant design standards, RMS will require the existing communications infrastructure to be utilised for the ITS power and communications design. This investigation will ascertain the extent to which this is possible and inform the detailed design accordingly.

3.3 GENERAL

3.3.1 Utility Investigation Quality Levels

Australian Standard AS 5488-2013, Classification of Subsurface Utility Information (SUI)-provides a framework for the classification of subsurface utility location and attributes specified quality levels to

the information. The standard applies to all subsurface utilities and associated surface features that facilitate the location and identification of subsurface utility infrastructure. The standard does not apply to utility infrastructure that is above the surface, such as overhead wires. Refer to Section 2 – Detail Survey for the survey requirements in regard to the location of utility infrastructure that is above the surface.

Refer to AS 5488-2013 for a description of the attribute information and metadata for each quality level from D to A.

3.3.2 Identification of Utility Services

RMS will provide the PSC with any available previous utility surveys (not included in the detail survey). The PSC is required to review the content and accuracy of the information provided by RMS, and then to advise RMS of any additional utility survey required to complete the design in accordance with the requirements of this Specification

Additional utility survey shall be conducted by RMS or be procured by RMS and provided to the PSC.

Alternatively, if so instructed by RMS, the PSC shall procure the additional utility survey. The additional utility survey shall be conducted by companies as listed in Annexure A4. A project specific G73 specification will be issued by RMS and payment to the PSC for the additional survey shall be in accordance with the Provisional Items in the Schedule of Fees.

HOLD POINT	
Process held:	Any additional utility surveys related to any stage of detailed design
Submission details:	Data gap analysis, utility survey proposals.
Release of hold point	The RMS Representative will release the hold point following consideration of, the data gap analysis survey proposals

The PSC must identify all utility services potentially affected by or potentially useful for incorporation into the project works to determine the requirements for adjustment and protection and/or augmentation, and must refer to Section 2 Detail for survey requirements in regard to the location of utility services.

The PSC must seek advice from RMS Representative (RMS Representative to seek advice from regional survey manager) for developing a strategy specific to the project to have the location of underground utility services verified. The PSC must request a utility locate by a company which has proven expertise in locating and mapping subterranean utilities. The methods the company use must make reference to the levels of identification in AS 5488 to assure an accurate co-ordinate position and level (using technologies such as electronic detection, ground penetrating radar, acoustic listening devices, non-destructive potholing).

Refer to Annexure PS321/A for the quality level of the utility investigation required for the project.

Further to the requirements specified in Annexure PS321/A, the identification process must include:

(i) A "Dial Before You Dig" search of existing underground utility services and obtaining drawings from each of the affected service authorities.

(ii) A site inspection to confirm that all surface features for underground services and overhead services are included in the “ground” Digital Terrain Model (DTM).

(iii) Survey capture of any overhead services which are missing from the inspection. This may include spatial capture of lines (i.e. sag points).

(iv) Obtaining specific details of all existing overhead services (i.e. is the line Optus or a Telstra communications line?).

(v) Updating the DTM (where necessary) to allow an assessment of the impact of the design on existing services.

(vi) Liaising with each of the service authorities to establish the impact on existing and proposed utility services in the project area.

(vii) Preparation of a three dimensional model showing the existing utility services and the proposed design and identifying any conflicts.

3.3.3 Scope of Work - Utilities

The PSC is to identify all potential conflict locations between this detail design and existing utilities; both underground and overhead, at each stage of ***design*** development ***(50%, 80% and final detailed design)*** using all information obtained on subterranean utilities from, all sources (i.e. RMS supplied info, DBYD, asset owners data). The PSC must optimise the design to the greatest possible extent such that there is minimum impact on existing utilities while satisfying the requirements of this specification.

The PSC must identify utility assets that conflict with the proposed works and will require detailed investigation including field investigation and survey prior to construction. The PSC must propose a scope of works for utility location and subsurface mapping with reference to the level of identification required in AS 5488-2013 (minimum Quality Level B) using invasive and non-invasive techniques. Potholing of Existing Utility Services to achieve Quality Level A will be required (refer to Clause 3.3.4).

If required, additional utility survey shall be conducted by RMS or be procured by RMS and provided to the PSC.

The PSC must produce the detailed design for utility diversion or relocation if required by the detailed design. The design must be developed in consultation with the asset owner as required Refer to Annexure PS301 - Annexure A15 and A16).

3.3.4 Potholing of Existing Utility Services

The PSC must discuss any potholing strategy with the RMS representative before proceeding. RMS ~~may~~ ***will*** engage the potholing and survey company direct ~~or instruct the PSC to engage the potholing and survey company~~ after the strategy is agreed. The potholing and surveying of the exposed utilities will be undertaken at any potential conflict points between existing utility services and the proposed design

~~Prior to commencing any potholing the PSC must notify the relevant service authority in writing and comply with any requirements imposed by the service authority such as hand or non-destructive digging.~~

~~If the potholing involves work on an existing road the PSC must provide traffic management, obtain prior approval from the responsible authority and comply with any conditions attached to the approval.~~

~~The PSC must restore the surface to the satisfaction of the responsible authority on completion of the potholing.~~

3.3.5 Services co-ordination group

The PSC must set up and maintain a services co-ordination group that includes representatives from each of the service authorities and key RMS and PSC representatives. The group must meet as required throughout the design phase. The group must:

(i) Ensure that the requirements of each service authority are considered and fully documented.

(ii) Ensure that opportunities for the sharing of utility service corridors are considered and implemented where appropriate.

(iii) Establish requirements for the provision of future utility services.

(iv) Consider all options for avoidance, adjustment, protection and/or replacement of utility services.

(v) Minimise utility services conflicts and construction risks.

3.3.6 ITS Power and Communications Infrastructure

In so far as is reasonably practicable and in compliance with relevant ITS design standards (Refer to PS385), RMS may require the existing communications infrastructure to be utilised for the ITS power and communications design. This investigation will ascertain the extent to which this is possible and inform the detailed design accordingly.

The PSC must identify all the existing ITS communications infrastructure within the project corridor and identify that which can be incorporated into the project works for the ITS design.

RMS will provide all available data on the extent and condition of the existing ITS communications infrastructure. The PSC is required to review the content and suitability of the information provided as well as any additional information available to the PSC and to conduct a gap analysis to advise RMS of incomplete, missing or inadequate data.

In locations where it is proposed to utilise the existing communications infrastructure for ITS and / or power supply infrastructure, the PSC must:

(i) Consult with RMS (or other asset owner) regarding availability of utility for use in the design.

~~(ii) Upon written confirmation from RMS (or other asset owner), carry out field survey to prove the feasibility of use in the design and provide quantity and condition information to inform the design and project cost estimate.~~

~~(iii) Payment for the ITS utility condition survey shall be in accordance with the Provisional Items in the Schedule of Fees.~~

If required, additional ITS survey shall be conducted by RMS or be procured by RMS and provided to the PSC.

HOLD POINT	
Process held:	Additional field surveys and investigations regarding condition and location of existing ITS communications infrastructure.
Submission details:	Data gap analysis, detailed investigation proposals.
Release of hold point	RMS Representative will release the hold point following consideration of the data gap analysis and the survey proposals

3.3.7 Utility Services Strategy

The PSC must, in close consultation with RMS and the service authorities, develop strategies for the use of, avoidance, adjustment, protection and/or relocation of each utility service.

In developing the strategies for the management and design of utility services within the project, consideration must be given to the following:

(i) The requirements of the NSW Streets Opening Conference Guide to Codes and Practices for Streets Opening (http://streetsopening.com.au).

(ii) Expected geotechnical conditions.

(iii) Likely construction methods and staging.

(iv) Proposed construction staging of utility service adjustments and/or protection, and the proposed road infrastructure.

(v) Conflicts between existing and proposed utility services.

(vi) Conflicts between utility services, the proposed road infrastructure and traffic signal infrastructure.

(vii) Maintenance access to utility services during and after construction.

The PSC must prepare a utility services strategy report that:

(i) Details the utility services in the project area.

(ii) Justifies the proposed approaches and measures considered in developing strategies.

(iii) Recommends strategies for each utility service in the project area.

(iv) Shows the utility locations with respect to the road design including drainage, structures and other utilities

The report must include drawings to the standard and format required by the RMS Representative to show the impact of the proposed road infrastructure on existing utility services.

HOLD POINT	
Process held:	Utility services design, program and cost estimate
Submission details:	Utility services strategy report
Release of hold point	The RMS Representative will release the hold point following review of the utility services strategy report and incorporation of RMS and services co-ordination group comments by the PSC

3.3.8 Utility Services design, program and cost estimate

If relocation and/or protection of existing utility services are required the PSC ***must undertake the design and obtain the service authority's approval for the design the cost of which must be priced and included in the PSC tender submission. All service authority fees and associated design costs are excluded from the PSC's costs and will be paid directly to the service authority by RMS.*** ~~must, in close liaison with RMS, establish whether the service authority will undertake the design or require the design to be undertaken by accredited consultants.~~

~~In cases where the service authority undertakes the design of the relocation and/or protection, RMS will engage the service authority and pay costs associated with the service authority's work. The PSC must:~~

~~(i) Provide the digital terrain model (DTM) and detailed design in a format acceptable to the service authority.~~

~~(ii) Co-ordinate the service authority's design with the design.~~

~~(iii) Obtain a program for the utility relocation and/or protection design and construction work.~~

~~(iv) Obtain a construction cost estimate.~~

~~In cases where the service authority requires~~ The design of the relocation and/or protection ***of services must*** be undertaken by accredited consultants, ***the cost of which must be priced and included in the PSC tender submission. All service authority fees and associated design costs are excluded from the PSC's costs and will be paid directly to the service authority by RMS.*** ~~the PSC must obtain a written estimate from an accredited consultant and submit it to the RMS Representative as a variation of service. Following approval of the variation by the RMS Representative,~~ The PSC must:

(i) Provide the DTM and design to the accredited consultant.

(ii) Co-ordinate the accredited consultant's design with the design.

(iii) Obtain the service authority's approval for the design.

The PSC must liaise with the service authorities to determine its adjustment and/or protection requirements for inclusion in the design, such as:

(i) Scope of work to be undertaken by the service authority or by the works contractor.

(ii) Pre-qualification requirements, if any, for work undertaken by the works contractor.

(iii) Supply of materials.

(iv) Prior notice required and anticipated duration of work to be undertaken by the service authority during the works contract.

(v) Notice and/or approvals required, if any, for work to be undertaken by the works contractor.

(vi) Fees, security or bond to be paid by the works contractor prior to commencing adjustment and/or protection work.

3.3.9 Utility Services Works Report

A utility services works report must be included in the detailed design report detailing:

(i) The existing and proposed utility services in the project area.

(ii) The reasons for the adjustment and/or protection of each utility service including why the service cannot or should not be avoided by changing the design or by appropriate construction methods and temporary works.

(iii) The design of the adjustment and/or protection of each utility service.

(iv) The strategy for adjustment and/or protection of each utility service.

(v) Each service authority's requirements for its utility services.

(vi) The program and cost estimate for each utility service.

(vii) The critical approvals and hold points that apply to the design and adjustment of utility services.

ANNEXURE PS321/A – PROJECT SPECIFIC REQUIREMENTS

A1 PROJECT DETAILS

Table PS321.A1 – Project Details

Project Name	***Macquarie Park Bus Priority and Capacity Improvement Project - Stage 2***
Project Number	***P.0023019***
Location	***Epping Road, Herring Road, Waterloo Road and Lane Cove Road, Macquarie Park***
Local Council	***Ryde Council***
Length (size) of the project	***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.***
Project features	• ***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*** • ***3 new signalised intersections and upgrades to the existing signalised intersections*** • ***Installation of bus lanes and road widening with improved pedestrian and cyclist crossing facilities at signalised intersections*** • ***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*** • ***Service relocations to allow kerb relocation and lane widening***

Refer PS301: Professional Services for Detailed Design Scope and Requirements, Annexure PS301/A1 for project details

A2 PROPOSED WORKS

A topographical survey and a 2D and 3D utility survey have been complete for the Stage 1 works. Refer UT4950 RMS Utility Survey including potholing for the utilities survey. The consultant is required to under all works detailed in this specification except for:

- ***Additional topographical survey and 3D utility survey identified by the PSC shall be conducted by RMS or be procured by RMS and provided to the PSC.***
- ***Additional ITS survey shall be conducted by RMS or be procured by RMS and provided to the PSC.***

The following table indicates the proposed Survey and Utility works required for the project.

Table PS321.A2 – Proposed Works

Proposed Works	Y/N	Proposed Works	Required Y/N
Survey information provided by RMS Survey Section and assessed by PSC, to determine if additional survey is required. (refer to Clause 2)	Y	~~RMS survey section will develop a project specific G73 for utility investigations which conforms to AS 5488, which the PSC must use to procure the survey.~~	N
~~RMS Survey Section will develop a project specific G73 which the PSC must use to procure the survey. (refer to Clause 2)~~	N	Condition survey of existing corridor ITS Infrastructure	*N*
~~PSC to develop a project specific G73 document for each site. RMS Survey Section will provide advice on developing the site specific G73 document prior to procurement.~~	N	~~Utility Locations Quality Level. (refer to Clause 3.3.1 for ICU classifications)~~	N ~~To level B classification generally and level A for conflicted utilities requiring adjustment.~~

Catchment details and contours are to be determined by publicly available sources and or from information provided by RMS.

RMS Survey Sections must be contacted or met to provide the following throughout the survey project lifecycle:

(i) Advice on developing a site-specific survey brief and RMS G73 specification (if applicable) to suit the project requirements (e.g. survey control, cadastral overlays, Utility investigations to Australian Standard AS-5488, drainage etc.);

(ii) Advice on the assessment of Tender/Proposal submissions for survey work;

(iii) Involvement in a pre-start survey meeting;

(iv) Engaged with the RMS Representative for the release of hold points under RMS G73; and

(v) Quality Assurance of the survey deliverables and data exchange protocols.

A3 DETAILED DESIGN DRAWING AND MODEL REQUIREMENTS

Table PS281.A3 – Detailed Design Requirements

Element	Depicted on the drawings Y/N	Included in the Model Y/N	Element	Depicted on the drawings Y/N	Included in the Model Y/N
Utility Locations					

Element	Depicted on the drawings Y/N	Included in the Model Y/N	Element	Depicted on the drawings Y/N	Included in the Model Y/N
3D Utility Survey (non-invasive)	Y	Y			
Survey	Y	Y			
Utility Services Design, program and cost estimate	Y	Y			
Utility/ ITS Communications services Design	Y	Y			

A4 DETAILED DESIGN DRAWINGS AND MODEL REQUIREMENTS

Cadastral Surveying

Description of the services: Identification surveys, digital cadastral models, marking existing property boundaries, surveys to define boundaries of land and stratum to facilitate land acquisition, disposal, access control, definition of easements and restrictions, and other statutory requirements.

~~Companies~~

Geospatial Surveys (Detail Surveys) **Victor Carnuccio**
Manager Geospatial Technologies
Victor.carnuccio@rms.nsw.gov.au
02 8837 0430 0418476413

If required, additional survey shall be conducted by RMS or be procured by RMS and provided to the PSC.

Description of the services: Produce digital terrain models for road design and bridge design in accordance with RMS QA Specification G73 and the CADD Manual. May involve production of separate ground, utility, drainage and environmental models.

~~Companies~~

Control Surveys

If required, additional survey shall be conducted by RMS or be procured by RMS and provided to the PSC.

Description of the services: Placement and survey of control marks, involving, for example, the use of GNSS and/or precise survey equipment. Calculation of three dimensional coordinates, to control survey accuracy generally on the Geocentric Datum of Australia, Australian Height Datum, and transformation between coordinate systems.

~~Companies~~

Utility Location and Subsurface Mapping

Two Dimensional Utility Surveys

If required, additional survey shall be conducted by RMS or be procured by RMS and provided to the PSC.

Description of the services: Utility services location, including "dial before you dig" (DBYD) enquiry, using electronic detection methods, ground penetrating radar, hand pot-holing and non-destructive digging

~~Companies~~

Three Dimensional Utility Surveys

If required, additional survey shall be conducted by RMS or be procured by RMS and provided to the PSC.

Description of the services: Utility services location, including surveying of underground services using electronic detection methods, ground penetrating radar, pot-holing and non-destructive digging.

~~Companies~~

A5 DETAILED SCOPE FOR UTILITIES INVESTIGATION

Prepared by PSC. Refer PS321.2 and PS321.3

ANNEXURE PS321/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 work.

ANNEXURE PS321/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 PS321.C1 – Hold Point Requirements

Clause	Type	Description	Required
2	Hold	Any additional surveys related to any stage of design	Y
3.3.2	Hold	Any additional utility surveys related to any stage of design	Y
3.3.6	Hold	Additional field surveys and investigations regarding condition and location of existing ITS communications infrastructure.	Y
3.3.7	Hold	Utility services program and cost estimate	Y

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 a **Y** are required for this project.

Table PS321.C2 – Deliverables and Submission Details

Section	Description of Deliverable	Delivery timeframe	Required Y/N
3.3.2 ***and 3.3.3.***	Three-dimensional model and A3 Drawings showing the existing utility services and the proposed detailed design ***including identification of all services requiring relocations and protection***	To be included in the ~~80%~~ ***50%*** submission and onwards.	Y
3.3.7	Utility Services Strategy Report	To be included in the ~~80%~~ ***50%*** submission and onwards.	Y
3.3.5	Agenda and minutes of services co-ordination group meetings	3 days from the end of the working day that the meeting took place.	Y
3.3.8	Approved construction drawings of proposed utility services	At Issue for Tender Stage	Y
3.3.8	Utility Services Works Report as a component of design report	To be included in the ~~80%~~ ***50%*** submission and onwards.	Y
3.3.7	Utility Services Strategy Report	To be included in the ~~80%~~ ***50%*** submission and onwards.	Y
3.3.8	Detailed utility drawings showing design, existing utilities and proposed relocations	To be included in the ~~80%~~ **50%** submission and onwards.	Y

Table PS221.C2b – Survey Deliverables and Submission Details

Aspects of the Design to be Reviewed	When is Review required	Who undertakes the Review	What the Review involves
Assessment of additional surveys required. Data gap, analysis detailed survey proposals	Before detailed design starts	Regional Survey Manager or delegate	Assessment and sign off on the project specific data gap analysis and survey deliverables
Assessment of additional surveys required. Data gap, analysis detailed survey proposals	Before ~~80%~~ 50% detailed design starts	Regional Survey Manager or delegate	Assessment and sign off on the project specific data gap analysis and survey deliverables
~~Completed survey in accordance with RMS specification G73 – Detail Survey~~	~~Before 80% detailed design starts~~	~~Regional Survey Manager or delegate~~	~~Sign off on the project specific G73 Detail Survey deliverables~~

~~Completed Control survey in accordance with site specific RMS specification G73 – Detail Survey~~	~~Before Detail Survey Starts~~	~~Regional Survey Manager or delegate~~	~~Sign off on the project specific G73 Detail Survey deliverables~~
Completed calculated boundaries cadastral model and preservation of survey infrastructure drawings.	At 80% design Preferably in parallel with the Detail Survey but can be done as late as 80% design level. It is most practical, efficient and cost effective to do it in parallel with the Detail Survey	Regional Survey Manager, or delegate	Sign off on the project specific G73-Detail Survey deliverables
Property Works	At 80% Design	Regional Survey Manager, or delegate	Compilation of plans and strategies for the preservation of survey infrastructure in line with G73-Detail Survey, G71 – Construction Surveys, Surveyor General's Directions, and Legislation
Set-out requirements of ~~bridges~~, structures and retaining walls	Before Tender for construction is issued	Regional Survey Manager, or delegate	Sign off that the design and survey control from the plans and electronic model is suitable for set out and conformity purposes in accordance G71 Construction Surveys requirements.
~~Utilities and services in 2D and 3D investigation in accordance with specification G73 – Detail Survey (including survey of existing ITS Infrastructure)~~	~~At 80% or 20% Design~~	~~Regional Survey Manager, or delegate~~	~~Sign off on the project specific G73 Detail Survey deliverables including electronic model is suitable for specification G73 – Detail Survey and AS 5488 Subsurface Utility Information~~
Set out requirements for delineation, signposting and road furniture	Before Tender for construction is issued	Regional Survey Manager, or delegate	Sign off that the design from the plans and electronic model is suitable for set out and conformity purposes with specification G71 Construction Surveys.
Review of accuracy of cadastral overlay model	At 100% Design	Regional Survey Manager, or delegate	Sign off that the design from the plans and electronic model is suitable for set out within the existing road corridor or is adequately defined for starting the acquisition process.

Road ~~and bridge~~ construction plans.	Before Tender for construction is issued	Regional Survey Manager	Sign off that the design from the plans and electronic model is suitable for set out and conformity purposes with specification G71 Construction Surveys.

C3 SCHEDULE OF MEETINGS REQUIRED

Table PS321.C3 – Meeting Requirements

Clause	Description of Workshops	Required	Location	Expected Duration
	Meeting with RMS Survey Section	Y ~~Within ten (10) working days of award of contract~~	~~PSC or~~ RMS Offices	As Required
2	Joint working meetings and workshops with survey and project teams.	Y	~~PSC or~~ RMS Offices	As required

C4 SCHEDULE OF WORKSHOPS REQUIRED

Table PS321.C4 – Workshop Requirements

Clause	Description of Workshops	Required	Location	Expected Duration
2	Joint working meetings and workshops with survey and project teams.	Y	~~PSC or~~ RMS Offices	As required

ANNEXURE PS321/D - RMS QA SPECIFICATION G73 – DETAIL SURVEY IN CADD FORMAT

Detail Ground Survey has been completed by RMS Survey Section to G73 ***Stage 1and 2*** of this project, ***except for the areas within the private properties of the project.***

~~RMS Survey Section will develop a project specific G73 for this project as required (Clause 2).~~

ANNEXURES PS321/E TO PS321/L – NOT USED

ANNEXURE PS321/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

M2 NOT USED

Not used

M3 SUPPORTING INFORMATION

Refer to clause 1.4.2

1. ***Topographical survey***
2. ***2D and 3D utility survey:UT4950 RMS Utility Survey including potholing***