Job Number @ Type here

Functional Specification Template

C7521 - Options Analysis

* To be used as a guide when compiling project‑specific specifications.
* @ = project‑specific detail required.
* For clauses / items not required – insert text 'Not Required' in clause heading, do not delete clause.
* Delete this table when document finalised.

Contents

[1 General 1](#_Toc146528647)

[1.1 Definitions / abbreviations / acronyms 1](#_Toc146528648)

[1.2 Purpose of Options Analysis 3](#_Toc146528649)

[1.3 Scope of Options Analysis 3](#_Toc146528650)

[2 Summary of Consultant services (Options Analysis stage) 3](#_Toc146528651)

[2.1 Liaison with the Principal (Item No. OA 01) 3](#_Toc146528652)

[2.2 Consultant’s Internal Project Management (Item No. OA 02) 3](#_Toc146528653)

[2.3 Environment and Cultural Heritage Management (Item No. OA 03) 4](#_Toc146528654)

[2.3.1 General 4](#_Toc146528655)

[2.3.2 Environmental and cultural heritage assessment 4](#_Toc146528656)

[2.3.3 Preliminary Environmental Assessment (PEA) 5](#_Toc146528657)

[2.3.4 Cultural Heritage Risk Assessment (CHRA) 5](#_Toc146528658)

[2.3.5 @ Type here Environmental Management Plan (Site Investigations) (EMP(SI)) 5](#_Toc146528659)

[2.3.6 Consultation with local interest groups 6](#_Toc146528660)

[2.3.7 Landscape assessment 6](#_Toc146528661)

[2.3.8 Noise and Vibration Impact Comparison (NVIC) Report 7](#_Toc146528662)

[2.3.9 Payment 7](#_Toc146528663)

[2.4 Targeted / Public Consultation (Item No. OA 04  and OA 05) 7](#_Toc146528664)

[2.4.1 Consultation planner 7](#_Toc146528665)

[2.4.2 Aims of targeted / public consultation 8](#_Toc146528666)

[2.4.3 Consultant's performance 8](#_Toc146528667)

[2.4.4 Consultation with contiguous property owners and lessees 9](#_Toc146528668)

[2.4.5 Consultation with Aboriginal or Torres Strait Islander Parties (if ordered) 9](#_Toc146528669)

[2.4.6 Project stages 10](#_Toc146528670)

[2.4.7 Queensland Rail 10](#_Toc146528671)

[2.4.8 Monitoring 11](#_Toc146528672)

[2.4.9 Public consultation report 11](#_Toc146528673)

[2.4.10 Payment 11](#_Toc146528674)

[2.5 Traffic Counting and Analysis (Item No. OA 06) 11](#_Toc146528675)

[2.5.1 Traffic analysis 12](#_Toc146528676)

[2.5.2 Traffic report 12](#_Toc146528677)

[2.5.3 Payment 13](#_Toc146528678)

[2.6 Property Access (included in Item Nos. OA 04, OA 05 and OA 12) 13](#_Toc146528679)

[2.6.1 Property owners 13](#_Toc146528680)

[2.6.2 Existing accesses and consultation with property owners and lessees concerning access 13](#_Toc146528681)

[2.6.3 Advice to the Project Manager 13](#_Toc146528682)

[2.6.4 Property Access Report 14](#_Toc146528683)

[2.6.5 Payment 14](#_Toc146528684)

[2.7 Hydraulic Analysis (Item No. OA 07) 14](#_Toc146528685)

[2.7.1 Bridge 15](#_Toc146528686)

[2.7.2 Reporting 16](#_Toc146528687)

[2.7.3 Payment 16](#_Toc146528688)

[2.8 Geotechnical Investigation (Item No. OA 08) 16](#_Toc146528689)

[2.8.1 Payment 17](#_Toc146528690)

[2.9 Preliminary Pavement Design (Item No. OA 09) 17](#_Toc146528691)

[2.9.1 Payment 17](#_Toc146528692)

[2.10 Preliminary Bridge Foundation Design (Item No. OA 10) 17](#_Toc146528693)

[2.11 Preliminary Geotechnical Analysis (Item No. OA 11) 18](#_Toc146528694)

[2.12 Options Analysis and Report (Item No. OA 12) 18](#_Toc146528695)

[2.12.1 General 18](#_Toc146528696)

[2.12.2 Service roads 19](#_Toc146528697)

[2.12.3 Resumption requirements 19](#_Toc146528698)

[2.12.4 Public Utility Plant (PUP) 20](#_Toc146528699)

[2.12.5 Options Analysis layouts 20](#_Toc146528700)

[2.12.6 Recommended option 21](#_Toc146528701)

[2.12.7 Payment 21](#_Toc146528702)

[2.13 Risk Analysis and Record (Item No. OA 13) 21](#_Toc146528703)

[2.13.1 Reporting 22](#_Toc146528704)

[2.13.2 Payment 22](#_Toc146528705)

[2.14 Value Management and Report (Item OA 14) 22](#_Toc146528706)

[2.15 Comparative Cost Estimates (Item No. OA 15) 23](#_Toc146528707)

[2.16 Road Safety Audit (Item No. OA 16) 23](#_Toc146528708)

[2.17 Additional Options Analysis Requirements (Item No. OA 17) (if ordered) 23](#_Toc146528709)

[3 Deliverables 24](#_Toc146528710)

# General

## Definitions / abbreviations / acronyms

The most common definitions / abbreviation / acronyms that relate to the delivery of road infrastructure projects, are contained in the various relevant Department of Transport and Main Roads (department) manuals, such as:

* Road Planning and Design
* Road Drainage
* Drafting and Design Presentation Standards
* Queensland Manual of Uniform Traffic Control Devices
* Road Landscape
* Pavement Rehabilitation
* Pavement Design Supplement
* Design Criteria for Bridges and Other Structures
* Geotechnical Design Standards
* Standard Drawings Roads
* Transport and Main Roads Technical Specifications
* Road Traffic Air Quality Management
* Transport Noise Management Code of Practice
* Transport Infrastructure Project Delivery System
* Project Cost Estimating
* Sustainability Framework
* Cultural Heritage Process Manual, and
* Environmental manuals and guidelines.

Link: Technical Publications webpage ([*https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx*](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx))

In addition, throughout the Functional Specifications the following are used:

| Terms, abbreviations and acronyms | Meaning |
| --- | --- |
| ASD | Approach Sight Distance |
| BC | Business Case |
| BCR | Benefit Cost Ratio |
| CBR | California Bearing Ratio |
| CH | Cultural Heritage |
| CHFA | Cultural Heritage Field Agreement |
| CHMA | Cultural Heritage Management Agreement |
| CHRA | Cultural Heritage Risk Assessment |
| CMP | Compliance Management Plan |
| Consultant | Concept and or Development phase Consultant (this Contract) |
| Contract Administrator | Department Administrator, referred to as Administrator in a typical Construct Only Contract |
| Contractor | Construction Contractor |
| DBYD | Dial Before You Dig |
| DCP | Dynamic Cone Penetrometer |
| DD | Detailed Design stage |
| Department | Department of Transport and Main Roads |
| EMP(SI) | Environmental Management Plan (Site Investigations) |
| EPM | Environmental Processes Manual |
| ESD | Entering Sight Distance |
| ESR | Environmental Scoping Report |
| GIS | Geographic Information System |
| HADR | Hydraulic Analysis and Design Report |
| IAS | Impact Assessment Study |
| MGSD | Minimum Gap Sight Distance |
| NT | Native Title |
| OA | Options Analysis stage (also referred to as Preliminary Evaluation stage) |
| PD | Preliminary Design stage |
| Principal | The State of Queensland acting through the Department of Transport and Main Roads |
| Project Manager | Department Project Manager |
| PUP | Public Utility Plant |
| RDM | Road Drainage Manual |
| REF | Review of Environmental Factors |
| ROW | Right of Way |
| RPDM | Road Planning and Design Manual |
| SEO | Senior Environment Officer |
| SISD | Safe Intersection Sight Distance |
| TRACS | Traffic Responsive Adaptive Control System |

## Purpose of Options Analysis

The completed Options Analysis is about:

* reviewing the need for the project (proposal review)
* developing options that satisfy the need and functional outcomes
* ranking options
* reviewing link to strategic / business plans
* identifying probable delivery methods (for specialist Consultant services and construction methods)
* recommending preferred options, and
* seeking approval to proceed to the Business Case.

The Consultant shall ensure that the Options Analysis addresses all issues, to the extent needed to allow the preferred option, established from the partially developed options developed, to progress to the Business Case phase.

## Scope of Options Analysis

The scope of this activity covers the work necessary to:

* develop a clear understanding of the department’s requirements
* identify all plausible options that could satisfy the requirements, and
* develop and cost those options to a level that enables a comparative evaluation to clearly determine the preferred option. The level of detail required in this phase is governed by the need to define the preferred option.

# Summary of Consultant services (Options Analysis stage)

## Liaison with the Principal (Item No. OA 01)

This item shall be limited to the prestart conference, meetings and all liaison with the Principal and its Project Manager, including issue of minutes. Each meeting shall be attended by at least the Consultant's Project Director and Project Manager.

## Consultant’s Internal Project Management (Item No. OA 02)

This item shall be limited to the Consultant’s Internal Project Management including quality control, administration, non‑project deliverables (such as printing reports) and so on.

## Environment and Cultural Heritage Management (Item No. OA 03)

|  |
| --- |
| Project Manager: the Environment and Cultural Heritage deliverables for Options Analysis depend on the scale and risk of the project. Please liaise with your District Environmental Officer and Cultural Heritage Officer for advice. Typically, Cultural Heritage services are delivered internally and should only be outsourced after consultation with the District Cultural Heritage Officer. |

### General

Works shall be undertaken in accordance with the department’s current Environmental Processes Manual[[1]](#footnote-1) and Cultural Heritage Process Manual.

The Consultant is advised to review all documentation relevant to the project and any previous environmental and cultural heritage reports produced as part of related projects (as determined by Principal).

### Environmental and cultural heritage assessment

The purpose of the environment and cultural heritage management component of an Options Analysis is to:

* identify the potential significant[[2]](#footnote-2) environmental and cultural heritage impacts of the various project options (that is, impacts to the environment and heritage values)
* identify the potential significant impacts on the project options from environmental and cultural heritage factors (that is, impacts to the project), including issues associated with land that may be acquired by the project that may present a delivery risk and/or ongoing maintenance burden, for example, land contaminated with PFAS, bushfire[[3]](#footnote-3)
* identify significant environment and cultural heritage legislative requirements associated with project that will have financial or delivery program impacts
* make preliminary recommendations for mitigation options for potential significant environment and cultural heritage impacts
* identify further studies required to assess impacts, mitigation options, or as necessary, to meet legislative requirements
* evaluate the various project options with respect to environment and cultural heritage considerations
* assess and determine the environmental risk associated with the project and the level of further assessments required as part of future work
* assess the likely cultural heritage risk classification, and
* enable cost estimation in the Business Case phase for major environmental and cultural heritage management items, including potential offsets.

The output shall be a Cultural Heritage Risk Assessment (CHRA) and a Preliminary Environmental Assessment (PEA). These are separate documents.

Note: Where the Principal has elected to deliver environmental land cultural heritage assessments external to the engineering Contract, the Principal shall ensure that the Consultants receive the assessment reports for consideration as part of the options analysis deliverables. Consultants are required to review the environmental and cultural heritage assessments and consider identified risks, legislative requirements and recommended management strategies and measures.

### Preliminary Environmental Assessment (PEA)

|  |
| --- |
| @ Type here Project Manager: delete section if not applicable to options analysis scope. |

The Consultant shall prepare a PEA for the project in accordance with the department's current Environmental Processes Manual and C7557 Terms of Reference for Preliminary Environmental Assessment.

A draft PEA shall be forwarded to the Principal by the date specified in the Contract Program. This draft shall be subject to review by the Principal and will form the basis for the final PEA. The Contract Program shall allow a minimum 28 days for the Principal's review.

The final PEA shall be forwarded to the Principal by the date specified in the Contract Program referred to in Clause 6.2.3 of Supplementary Conditions of Contract – Prequalified Consultants (Form C7554).[[4]](#footnote-4)

### Cultural Heritage Risk Assessment (CHRA)

|  |
| --- |
| @ Type here Project Manager: delete if not applicable to options analysis. |

The Consultant is required to undertake a CHRA in accordance with the department’s Cultural Heritage Process Manual and the CHRA requirements outlined in C7559 Terms of Reference for Cultural Heritage Assessment, using the standard departmental CHRA template. At the Options Analysis stage, the Consultant's CHRA should separately assess each option and compare the risk level of each.

### @ Type here Environmental Management Plan (Site Investigations) (EMP(SI))

If Site investigations are required during the Options Analysis stage such as geotechnical investigations, soil sampling, or vegetation clearing, the Consultant shall develop and implement a suitable EMP(SI) prior to undertaking the Works.

The Consultant shall notify the department's District Cultural Heritage Officer, in the event Site investigations are required to ensure the necessary heritage approvals and agreements are in place prior to commencing Works.

The Consultant shall be responsible for identifying and obtaining any environmental approvals related to the Site investigations. Any negotiations with Administrating Authorities or acceptance of draft conditions, shall be done with the Principal's involvement.

The EMP(SI) shall be submitted to the Principal for acceptance five business days prior to commencing operations. Site investigations cannot commence unless agreed to by the Principal.

### Consultation with local interest groups

Any consultation with local interest groups shall be done in accordance with the approved Community Engagement Plan and Clause 2.4 Targeted / Public Consultation of this Function Specification.

### Landscape assessment

|  |
| --- |
| @ Type here Project Manager: delete this section if not required. |

|  |
| --- |
| An Integrated Landscape Assessment Report is required for all major or significant Works (motorway, multi‑modal corridor, deviation, bypass, connector, major interchange or major bridge, Type 1 and major projects).  An Integrated Landscape Assessment Opinion is required for all moderate Works (minor realignment, intersection, roundabout, overpass or bridge, Type 2 projects).  A Landscape Site Analysis Assessment is required for minor Works (surface upgrading or maintenance, Type 3 projects).  Refer to the matrix in Part B Chapter 3 Assessment and Planning of the *Road Landscape Manual*. |

In accordance with the department’s current Road Landscape Manual*[[5]](#footnote-5)* Part B Chapter 3 Assessment and Planning, the Consultant shall undertake the following assessment as part of the Options Analysis.

* @ Type here Integrated Landscape Assessment Report and include a Landscape Master Plan in accordance with Road Landscape Manual Part B Chapter 2 at a scale no smaller than 1:4000@A3.
* @ Type here Integrated Landscape Assessment Opinion
* @ Type here Landscape Site Analysis Assessment.

For major projects applying the Infrastructure Sustainability Council of Australia (ISCA) rating scheme, the landscape assessment shall consider and address requirements under Urb‑1 credit.

A principal objective of the landscape assessment shall be to provide assessment of each alignment option, their impacts, opportunities and constraints. The assessment shall identify, for each alignment option, what design considerations and mitigation measures are required to integrate the project harmoniously into the surrounding context through which the road passes.

### Noise and Vibration Impact Comparison (NVIC) Report

|  |
| --- |
| @ Type here Project Manager: delete this section if not required. |

The Consultant is required to undertake a high level of the noise and vibration impacts for the project options. Noise and vibration modelling is not expected at this stage; however the Consultant shall nominate an expected zone of noise and vibration impact for each option and document the number of potential receivers affected by each option. A memorandum format, with suitable figures, is acceptable for this report.

The NVIC Report must include, but need not be limited to:

* mapping showing the location of existing sensitive receivers, options and the potential zones of impact
* mapping showing areas where future development of sensitive receivers may occur based on local government land zoning
* discussion and comparison of the different options. This shall include likely treatment options and note any limitations for each option, and
* nominate a preferred option based on the impact comparison.

### Payment

The Lump Sum for Item No. OA3 Environmental Management, shall include all Works necessary to complete the deliverables as specified in Clause 2.3 of this Functional Specification - Options Analysis. This includes the consultation specified in this Clause 2.3, to be carried out as part of the Environmental Scoping Report process.

Note: Locating Potential Acid Sulphate Soils and other problem soils, including dispersive and slaking soils, shall be paid for in the item for Geotechnical Investigation.

|  |
| --- |
| Project Manager: Check to ensure that, what has been specified in Clause 2.3 Environment and Cultural Heritage Management, aligns with deliverables listed in Clause 3 of this Functional Specification – Options Analysis. |

## Targeted / Public Consultation (Item No. OA 04  and OA 05)

### Consultation planner

|  |
| --- |
| Project Manager: major projects will most likely need consultation with the wider community. Smaller or less complex projects may only need targeted consultation (key stakeholders, community reference groups, government departments, local government and so on). |

The consultation planner for this project has been completed but not signed off:

* the Consultant shall review the planner and submit for approval at the Milestone reference point (Review of Proposed Public Consultation Process), and
* the Consultant shall carry out the targeted / public consultation in accordance with the approved consultation planner and complete the consultation planner for the project. Where a sign‑off is required, the Consultant shall forward the consultation planner to the Project Manager before proceeding to the next stage.

### Aims of targeted / public consultation

The aims of the targeted / public consultation include:

* adding value to the decision‑making process by seeking input into a wide range of issues, including but not limited to, environmental issues, social issues, traffic operations, access, potential effect of resumptions, potential effect on business operations and local residents, road safety, traffic operations and so on, that specifically relate to this project
* obtaining specific information for input into the Options Analysis. This is defined in the following Clauses of this Functional Specification (where applicable):
* Clause 2.3 Environmental Management
* Clause 2.12.3 Resumption Requirements
* Clause 2.12.4 Public Utility Plant (PUP) Conflicts, and
* Clause 2.8 Geotechnical Investigation:
* reducing the risk to the Principal by identifying constraints to the successful implementation of the project as early as possible and recommending appropriate courses of action
* keeping the agenda relevant to the project
* gauging opinion (polling is not acceptable)
* seeking comment on all issues relevant to the project, and
* keeping the consulted informed of the project’s progress, conclusions and decisions.

The Consultant shall ensure the public understands that:

* the decision‑making shall not be handed over to the public
* decision making processes will take public concerns, information and submissions into account, and
* decisions will be made by the department.

The Consultant's staff involved in the targeted / public consultation process, shall not convey the impression that they are employees of the department.

### Consultant's performance

The Consultant shall demonstrate:

* the ability to work as part of a project team, within specified times and with specific goals
* the ability to adapt the targeted / public consultation strategy to meet changed circumstances and project needs
* an appreciation of the sensitive nature of issues
* a proactive approach
* the ability to monitor the process as it occurs, and
* the ability to consult with people from diverse backgrounds.

### Consultation with contiguous property owners and lessees

The Project Manager will supply title searches for all properties that are contiguous with the project.

The Consultant shall be particularly sensitive to the impacts of the road project on owners, residents, organisations and so on, whose property is contiguous with the proposed project.

An overriding principle on consultation is that the Consultant shall not discuss any issues, layouts and so on, before people whose land is directly affected by possible land acquisition action have been consulted.

The Consultant shall identify the names and addresses of all lessees and all other persons or organisations with an interest in the property, including PUP authorities.

1. Access

The Consultant shall consult with property owners and lessees whose property abuts the project, or whose access is affected by the project as defined in Clause 2.6 of this Functional Specification.

1. Possible property acquisition impacts

When a proposal is likely to impact privately‑owned land, the Consultant shall consult with the potentially directly‑affected property owners and any lessees.

Through consultation, the Consultant shall seek to achieve practicable and economical solutions which will maintain the viability of existing businesses, agricultural land and other property. Normally the Consultant will be accompanied by departmental staff.

### Consultation with Aboriginal or Torres Strait Islander Parties (if ordered)

|  |
| --- |
| Project Manager: please ensure Aboriginal or Torres Strait Islander Parties are mentioned in the consultation planner. Depending on the project, responsibility will generally rest with the departmental District Cultural Heritage Officer. However, the Consultant's representatives may need to attend meetings or provide information. Allow for two, two-hour meetings with each party. Delete the following sentence and the Payment Clause if a CHFA or Cultural Heritage Management Agreement is not to be ordered.  @ Type here consultation with Aboriginal or Torres Strait Islander Parties is only to be undertaken by the department's District Cultural Heritage Officers. |

#### Payment

Payment for this part of the consultation process shall be made under the Fixed Fee Item No. OA 03 Environmental Management.

The Principal will undertake consultation directly with representatives of the Traditional Owners. The Project Manager will take minutes or notes of conversations for inclusion in the Consultation Report.

### Project stages

Public consultation must be structured to mesh with the various stages of the project implementation.

1. Options Analysis stage

Throughout the Options Analysis phase, targeted / public consultation shall focus on identifying stakeholders, obtaining input from targeted sources (such as Queensland Transport, local government and so on).

1. Business Case stage @ Type here (not in this Contract)

Throughout the Business Case stage, targeted / public consultation shall refine the consultation (if any), undertaken during the Options Analysis phase, focusing on issues relating to the preferred option. Possible mitigation measures may be discussed in general terms @ Type here. Where an IAS is necessary, seeking comment on the Terms of Reference should happen in this phase.

1. Preliminary Design stage @ Type here (not in this Contract)

Throughout the Planning phase, public consultation shall focus on identifying additional stakeholders, obtaining public input, identifying issues, identifying public perception of impacts. Public education will probably be most cost effective during this phase

1. Detailed Design stage @ Type here (not in this Contract)

A focus of the design phase will be to provide feedback and obtain public acceptance of decisions made during project planning and to provide general information to the public on the proposed Works.

This phase will also focus on liaison with the local government, PUP providers, contiguous and other affected property owners to achieve practicable solutions, particularly on access, construction impacts and accommodation Works issues.

1. Construction (not in this Contract)

The Construction Contractor will be responsible for public relations concerning the construction of the project.

|  |
| --- |
| Project Manager: generally the public consultation shall not extend past the Development phase, however public education may need to extend into this phase where unusual or different traffic operations are incorporated into the design (for example, some median closures removal or U‑turn facilities and roundabouts in towns without existing roundabouts). @ Add text if this applies |

### Queensland Rail

If this project is close to a Queensland rail line, the Consultant shall consult with the department’s @ Type here area (contact name is @ Type here) to determine if Queensland Rail has any requirements in the area.

### Monitoring

The Consultant shall monitor the effectiveness of the public consultation. The extent of monitoring shall reflect the size and importance of the project. Suitable methods may be:

* phone sampling of residents in the nearby area
* letter box drops, or
* as per Consultation Manager.

### Public consultation report

The Consultant shall produce a report on the target / public consultation undertaken during the Options Analysis stage detailing:

* an outline of the Public Consultation Model and Program
* information on how the model was implemented and amended throughout the process to address the stakeholder’s / public's needs
* details of stakeholder / public involvement, how input was considered
* details of specific issues raised and amount of interest in each issue, and
* details of the outcomes and conclusions.

(Tables may be an effective method of providing some of the information).

### Payment

The draft consultation planner identifies which aspects of targeted / public consultation shall be deemed to be covered in Item No. OA 04 Public Consultation (Fixed Fee), and which aspects are deemed to be covered in Item No. OA 05 Public Consultation (Time Rate).

The following Clause of the Functional Specification - Options Analysis include other consultation that is included in the Fixed Fee Item No. OA 04:

* Clause 2.6 Property Access

The following clauses of this Functional Specification Part 2 Planning and Preliminary Design may include other consultation that is to be included in the Time Rate Item No. OA 05:

* Clause 2.6 Property Access
* Clause 2.7 Hydraulic Analysis

#### Payment

All costs associated with the consultation shall be provided for in Item No. OA 04 or OA 05 Public Consultation as specified elsewhere.

## Traffic Counting and Analysis (Item No. OA 06)

The Principal has provided traffic counts as detailed on

|  |
| --- |
| Project Manager: include detailed references for any counts. |

and is currently obtaining traffic counts at:

* @ Type here, and
* @ Type here.

The Consultant is responsible for determining if any additional traffic information is required. The Principal will not unreasonably reject requests for additional traffic information.

When additional traffic counting is required, the Principal will generally supply such traffic information within two weeks. The Consultant is responsible for providing adequate and timely requests to the Principal, to ensure that the Contract can be completed on time.

Where the Principal considers that additional traffic counts are unwarranted or impracticable for any reason, the Consultant shall estimate the traffic volumes.

### Traffic analysis

|  |
| --- |
| Project Manager: the following is for a simple traffic analysis. A more rigorous approach is usually appropriate on major projects or projects that will significantly alter the traffic regime. These will require a detailed traffic model and so on and the following is not appropriate in such situations. |

The Consultant shall be responsible for all traffic analysis and interpretation of results.

The Consultant shall consult with and obtain from the local government, future traffic management proposals that may affect the project.

The Consultant shall predict growth rates and percentage of heavy vehicles by analysing historic traffic figures, Local Government's Strategic Plan and previous traffic studies of the area, where these are available. The traffic analysis shall make allowance for traffic likely to be generated by possible future developments and local government's future traffic management proposals.

The required design life is specified in Clause 3 of the Functional Specification Annexure.

SIDRA or a similar computer program shall be used to analyse intersections.

### Traffic report

The Consultant shall produce a traffic report that:

* details traffic issues raised during the public consultation
* justifies adopted growth rates and other assumptions
* includes all traffic calculations (degree of saturation, signal phasing and so on)
* details the outcomes of the investigation, and
* lists the advantages and disadvantages in terms of future traffic management, of the various options considered.

The Traffic Analysis Report shall be appended to the Planning and Preliminary Design Report.

### Payment

The Lump Sum for Item No. OA 06 Traffic Counting and Analysis shall include all Works necessary to complete the Traffic Analysis Report, as specified in Clause 2.5 of this Functional Specification - Options Analysis. This includes consultation with local government.

## Property Access (included in Item Nos. OA 04, OA 05 and OA 12)

|  |
| --- |
| Project Manager: only use this Clause in projects where access issues are likely to influence the viability of the options investigated. A shopping centre entrance / exit is an example of this. |

The Consultant must negotiate with property owners regarding access to @ Type here to ensure that property owner's needs are considered and can be incorporated in the Options Analysis.

The Consultant shall communicate to property owners that, upon completion of the Construction phase of the project, all legal property accesses shall be reinstated to a standard at least equivalent to that which existed prior to the commencement of construction.

Details of these communications shall form part of the Options Analysis Report.

### Property owners

The Principal will obtain, and supply to the Consultant, names and addresses of property owners and lessees unless these have been supplied with the Invitation Documents.

### Existing accesses and consultation with property owners and lessees concerning access

Should the Consultant find the need to modify or relocate an existing access remaining within the completed project, the Consultant shall evaluate the existing access and modify as practicable observing the following:

* available visibility to all existing accesses shall be determined (ASD, SISD and MGSD) and, where practicable, maximised or increased to meet minimum visibility standards or greater. Design for sight lines must address requirements of Austroads Guide to Road Design 4A – Chapter 3, (designs speeds where the, 85th percentile not known shall be taken as posted speed plus 10 km/h), and
* the Consultant shall determine the maximum sized vehicle that regularly uses the access requiring modification. Where this vehicle is larger than the design vehicle indicated in the department's current Road Planning and Design Manual,*[[6]](#footnote-6)* the larger vehicle shall be the design vehicle.

### Advice to the Project Manager

The Consultant shall advise the Project Manager at least two business days before any consultation with property owners occurs. The Project Manager may choose to attend any consultation meeting concerning access.

An interim written advice of the outcome shall be forwarded to the Project Manager within 24 hours of consultation with each property owner.

### Property Access Report

The results of the consultation on accesses (including any written Agreements) will be included in the Property Access Report that shall be appended to the Options Analysis Report. The Property Access Report shall include information on the maximum number of vehicles regularly using the access, available visibility distances, safety at all property accesses and the results of the consultation. A table with provision for comments may be a suitable presentation method.

### Payment

|  |
| --- |
| Project Manager: consider the impact of the proposed work on accesses before nominating the amount of consultation to be done as time rate work (suggest nil for an asphalt overlay or similar minor Works, but a major project that involves new service roads and so on, may require a substantial amount). Aim to get the maximum reasonable amount (but not all) of the consultation that can be defined locked in as fixed fee. |

The Consultant shall allow the cost of two, one‑hour meetings onsite with the owner of @ Type here property(ies) that may have an impact upon the viability of the options investigated. These costs shall be included in the Fixed Fee Item No. OA 04 Public Consultation and are deemed to include all travel and other expenses.

For the purpose of the Offer, the Consultant shall allow travel and other costs for an additional onsite meeting of one hour duration with the property owners, on access issues in the Time Rate Item No. OA 05 Public Consultation.

The costs associated with the layout development, preparation of letters and reporting on property access, shall be included in Item No. OA 12 Options Analysis.

## Hydraulic Analysis (Item No. OA 07)

|  |
| --- |
| Project Manager: this item is only needed where several different options may need to be considered, for example bridge versus culvert, or where the hydrology impacts on the viability of an option. |

Drainage shall meet the requirements of the department’s current Road Drainage Manual.*[[7]](#footnote-7)*

The Consultant shall consult with local property owners and local government, to discover all available information on flooding in the area including flow paths, dates of significant events and extent of flooding. Where property owners can define flood extents, the Consultant shall request the points be levelled through the Project Manager. Flood levels (if available) will be surveyed by the department at no cost to the Consultant.

If flooding is an issue or is raised as an issue during target / public consultation, the Consultant shall ensure that there is close liaison between staff performing the hydraulic assessment and consultation staff.

The Consultant shall assess drainage requirements to the extent necessary to ensure that the proposed Works are feasible, and a reasonable estimate of the cost of structures can be made.

Where flooding of the road or adjacent properties is a significant issue (for example, road over a flood plain, road downstream of developed areas and so on) or a bridge is required, the Consultant shall notify the Project Manager and provide details of investigations.

The following solutions are normally not acceptable for any drainage structure:

* road approaches lower than the bridge deck
* bridges that do not meet environmental requirements (stream disturbance, fauna corridors and so on) either in their proposed final layout or during construction (temporary damming, bunding and so on)
* bridges that require significant excavation under the structure
* stream diversions
* designs that are likely to cause excessive afflux when floods greater than the design immunity occur. Allowable afflux will be determined by@ Type here shire requirements when the road is downstream of:
* a development
* an area which has development potential, or
* any other area sensitive to flooding.
* designs which are likely to:
* cause scouring and/or erosion during the life of the structure
* expose the road or bridge to potential damage during floods greater than the design immunity
* increase flooding frequency or severity in developed areas.
* designs that place piers in the low or normal stream flow, and
* designs that are predicted to change the stream flow characteristics.

### Bridge

|  |
| --- |
| Project Manager: consider the issue of flooding and whether a separate hydraulic study is required If required cross reference here.  For a wide, flat flood plain, a 1:2000 and a Probable Maximum Flood is normally not required. For a well‑defined channel that does not overtop, consider including both. |

This project requires cross drainage at @ Type here Creek which is expected to be a bridge. The Consultant shall undertake hydraulic investigations and calculations, sufficient to allow the bridge geometry (height, waterway area, spans, piers and so on) to be determined.

### Reporting

The results of the hydraulic analysis shall be appended to the Options Analysis Report.

### Payment

All costs associated with preparation of the report shall be provided for in Item No. OA 07 Hydraulic Analysis.

All public consultation costs associated with determining flood levels, shall be paid for under the Time Rate Item No. OA 05 Public Consultation. The Consultant should allow @ Type here onsite meetings in its offer.

## Geotechnical Investigation (Item No. OA 08)

|  |
| --- |
| Project Manager: depending on the nature of the project, the amount of geotechnical investigation and analysis required can vary from a simple desktop study to a requirement for undertaking testing. Specify testing requirements in the annexure to this Functional Specification. |

@ Type here It is expected that sufficient detail can be obtained from the Consultant undertaking a review of existing documentation and studies. No allowance has been made for undertaking testing during this phase.

@ Type here The Consultant shall consult with the property owners, local government and the road maintenance Contractor to assist in determining any areas where past Works or natural features may have an impact on the Options Analysis (for example, previous land use [rubbish dump, saw mill waste disposal areas, and so on] springs, landslides and so on).

@ Type here The Consultant shall carry out at least the testing defined in Clause 4 of this Functional Specification Annexure.

The Consultant's attention is drawn to Clause 12 of the Supplementary Conditions of Contract – Prequalified Consultants (Form C7554), and the following local standards:

|  |
| --- |
| Project Manager: include any relevant document reference, for example, Environmental Management Preconstruction Strategy. |

* @ Type here

Testing shall be in accordance with the department’s current Material Testing Manual.*[[8]](#footnote-8)*

### Payment

All costs associated with the geotechnical investigation shall be provided for in Item No. OA 08 Geotechnical Investigation.

Implementation of the Environmental Management Preconstruction Strategy, when relative to geotechnical investigation in accordance with Clause 12 of the Supplementary Conditions of Contract (C7554), shall also be included in Item No. OA 08 Geotechnical Investigation.

## Preliminary Pavement Design (Item No. OA 09)

The Consultant shall undertake Preliminary Pavement Design on the viable options identifying the following:

1. testing results if undertaken, or assumptions made during the desktop study
2. the various pavement configurations considered
3. cost comparison of the pavement options.

@ Type here The above is to be reported in tabular format suitable for inclusion in the Options Analysis Report.

The preliminary pavement design shall be a practical, economical pavement structure designed in accordance with Part 2: Pavement Structural Design of the Austroads Guide to Pavement Technology (Austroads 2019) and the department’s current Pavement Design Supplement*[[9]](#footnote-9)* and local requirements:

@ Type here

|  |
| --- |
| Project Manager: include reference to any local standards. |

### Payment

All costs associated with the Pavement Design Report, including consultation with the maintenance Contractor, shall be provided for in Item No. OA 09 Preliminary Pavement Design.

## Preliminary Bridge Foundation Design (Item No. OA 10)

|  |
| --- |
| Project Manager: it is expected that this item will be used on rare occasions. There may be cases where bridge foundations will impact on the viability of an option and need some detailed investigation. |

The Consultant shall conduct sufficient Preliminary Bridge Foundation Design to confirm the viability or otherwise of an option.

@ Type here Add specific requirements.

## Preliminary Geotechnical Analysis (Item No. OA 11)

|  |
| --- |
| Project Manager: depending upon the nature of the project the amount of geotechnical investigation and analysis required can vary from a simple desktop study to a requirement for undertaking testing. Specify testing requirements in the annexure to this Functional Specification. |

The aim of the Preliminary Geotechnical Analysis at the Options Analysis stage is to conduct sufficient analysis so that the options being evaluated will not present unacceptable geotechnical risks (also refer to Item No. OA 13 Risk Analysis and Record) and comparisons between options can be made.

Such issues as:

* indicative amount of unsuitable materials
* potential settlement areas
* batter slope requirements
* acid sulphate soils
* rippability and workability of any naturally occurring material, and
* any other issue including issues raised in the targeted / public consultation likely to have significant construction ramifications (for example, settlement, springs, rock, retaining structures and so on) may need to be considered further.

## Options Analysis and Report (Item No. OA 12)

|  |
| --- |
| Project Manager: this item is where the options are developed to the extent necessary to allow comparisons to be made. In some cases, this will need to be detailed to the point of assessing PUP requirements service roads and so on, which can vary considerably with the option being analysed. Delete clauses and items not required. |

### General

The Consultant shall investigate various layout options, which meet the requirements of this Functional Specification.

These options should be developed to the stage where comparisons between the options can confidently be made.

When evaluating the layout options, the Consultant shall ensure that environmental issues, constructability issues and issues raised during the targeted / public consultation, are fully considered and built into the evaluation process.

The Options Analysis should explain in full all options identified in response to the Project Proposal, including those not recommended.

Each option is to be analysed separately. The do‑nothing case should be one of the options examined. The following sub‑headings should be used for evaluation of each option. The information should be presented in order of ranking and should be in serial or table format comparing each option.

The basis for ranking options is to be included in this section, including:

* strategic fit
* feasibility
* costs
* benefits
* option specific risks
* impacts
* timing
* deliverables
* assumptions
* dependencies / constraints
* other issues.

The Options Analysis Report is to be compiled using OnQ templates[[10]](#footnote-10) or can be made available by the Project Manager.

|  |
| --- |
| Project Manager: kindly confirm the template to be used by the Consultant based on the size of the project or project requirements.  The 4 in 1 Template should be typically used. |

|  |
| --- |
| Project Manager: refer to any local considerations, for example, XYZ district's Preconstruction Administration Code of Practice contains guidance on many issues relating to design. The Consultant shall incorporate the districts' policies and preferred practices into the Options Analysis. Where the code indicates a preferred standard and a minimum standard, the preferred standard shall be used, unless the Project Manager approves the use of the minimum standard. Should the Code of Practice conflict with the department’s Road Planning and Design Manual the Consultant shall immediately notify the Project Manager for a clarification of the issue. |

### Service roads

During Options Analysis, the Consultant shall assess the service road requirements to determine:

* whether existing roads should become service roads, and
* where new service roads are required.

### Resumption requirements

The Consultant shall assess the resumption requirements of each option.

Resumption requirements shall be based on eight metres minimum clearance from the cut or fill toe, unless otherwise directed by the Project Manager. At interchanges, minimum clearance shall be 15 metres.

### Public Utility Plant (PUP)

|  |
| --- |
| This Clause has been replaced by Public Utility Plant (PUP) Addendum to C7521 Link: Engineering Consultants' webpage *(*[*https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Consultants-for-engineering-projects.aspx*](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Consultants-for-engineering-projects.aspx)*)* |

### Options Analysis layouts

The Consultant shall develop Options Analysis layouts for the options that consider and show where necessary the following:

* lane configurations (including shoulders, parking lanes and so on)
* median locations
* traffic islands
* auxiliary, climbing and overtaking lanes
* intersection layouts
* interchange layouts
* indicative noise barrier locations
* fauna sensitive road design elements such as fauna crossing locations and fauna exclusion fencing
* environmental management constraints
* safety barrier systems (including nominating type)
* allowance for information technologies (if any)
* pedestrian and cyclist facilities
* bus facilities
* existing feature and services plans detailing active and redundant utility assets (public and private)
* anticipated PUP relocations, including any additional land and clearing that may be required for PUP relocations
* major and critical drainage structures
* bridge configurations and approximate deck levels
* cross sections at critical locations
* cross sections at 50 metres maximum intervals at 1:100/1:100 scale (showing services and road boundary location)
* special features: innovative solutions; retaining wall locations
* vertical and horizontal geometry (including radii, superelevation), and
* construction of sidetracks (if any).

For simple rural projects, each option should be presented on the following A3 size plans:

* Type Cross Sections
* Working Plans
* Drainage Cross Sections, and
* Various Detail Plans.

For urban projects, the plans for each option should include:

* Type Cross Section Plans
* Layout Plans at a scale of 1:1000 on A3 sheets
* Grading Plans
* Cross Section Plans, and
* Intersection Plans at a scale of 1:500 A3 sheets.

@ Type here for more complex projects, additional plans may be required:

@ Type here

### Recommended option

The Options Analysis Report is to be compiled using OnQ template. Electronic copies of these templates are available from the Project Manager.

The report should recommend an option for further refinement during the Business Case stage. It must detail reasons for recommending the option. Where the option involves several steps or actions, each should be detailed in the report.

The option may recommend changing or redefining the project scope.

### Payment

All costs associated with the preparation of the Options Analysis and Report, shall be provided for in Item No. OA 12 Options Analysis Report.

## Risk Analysis and Record (Item No. OA 13)

Risk management shall be carried out in accordance with ISO 31000:2018.

The Consultant shall:

* review and update the risk record compiled as part of the Project Proposal phase. The review shall focus on what has changed in the timeframe since the preparation of the Proposal, including identifying issues that may have been overlooked at the time, and
* manage and protect the Principal's interest during the Options Analysis phase with regard to:
* targeted / public consultation including issues raised, or issues likely to be raised by the stakeholders / public
* environmental management including compliance with relevant sections of the various state and commonwealth environmental legislation
* local issues that could lead to delay
* PUP issues that could lead to delay
* safety conditions on the project Site so far as the Options Analysis is concerned, including compliance with the provisions of the relevant sections of the Work Health and Safety Act 2011 (Qld)
* conduct ongoing risk assessment analysis, paying specific attention to the constructability of the ultimate design. Risk analysis shall seek to minimise risk associated with construction safety, traffic, claims escalation due to latent conditions, variations, delay, public disquiet, sources of materials and so on
* conduct ongoing risk assessment analysis, paying specific attention to the road corridor user safety aspects of the ultimate design. Risk analysis shall seek to minimise risk associated with pedestrians, traffic, design life of the various elements that make up the ultimate product and so on
* make adequate allowance in the project comparative costings, and
* identify, analyse and respond to risk factors throughout the life of the Options Analysis to ensure that the project objectives are achieved.

### Reporting

The Consultant shall prepare a report on the issues mentioned above, including the department’s OnQ risk template available at [*https://www.tmr.qld.gov.au/business-industry/OnQ-Project-Management-Framework/OnQ-tools-and-techniques/OnQ-project-management-proformas-and-worksheets.aspx*](https://www.tmr.qld.gov.au/business-industry/OnQ-Project-Management-Framework/OnQ-tools-and-techniques/OnQ-project-management-proformas-and-worksheets.aspx) (refer Risk Management Plan, Risk Register, and Risk Grid templates). This report shall be a living document and issues will be discussed and updated at progress meetings when necessary. The final risk assessment will be appended to the Options Analysis and will form the basis for risk management in the future phases of the project's lifecycle.

### Payment

All costs associated with risk management and analysis, shall be provided for in Item No. OA 13 Risk Analysis and Record.

## Value Management and Report (Item OA 14)

The Consultant shall, through a structured and analytical process, seek to achieve:

* the best option by the collective assessment of all stakeholders, and
* value for money by providing all the necessary functions at the lowest total cost consistent with required levels of quality and performance.

|  |
| --- |
| Project Manager: this will only occur on major projects. More detail will need to be added to define the work necessary. Seek advice from the Project Development Office. |

## Comparative Cost Estimates (Item No. OA 15)

The Consultant shall prepare comparative cost estimates for the options using estimated quantities and historical rates, in accordance with the department’s current Project Cost Estimating Manual*[[11]](#footnote-11)* and local standard:

|  |
| --- |
| Project Manager: include local requirements: for example Design Guide – Estimate and Schedule. |

It is expected that enough estimating will be carried out during the Options Analysis phase, to produce schedules sufficient to provide a sound base for comparisons to be made.

The estimates may need to consider:

* Preconstruction Cost Concept stage
* Business Case stage
* Design Development stage, and
* Detailed Design stage
* Construction stage Costs, and
* Principals Materials and Management Reserve.

## Road Safety Audit (Item No. OA 16)

The Consultant shall undertake a Road Safety Audit (stages 1 and 6 as applicable), in accordance with the Austroads Guide to Road Safety (AGRS06‑19) Part 6: Road Safety Audit, of the Preliminary Design.

@ Type here In addition to the requirements of the above documents, the Road Safety Audit must include a statement certifying that the layout plans forwarded with the Options Analysis are the plans that were audited. The auditor must also be registered as Senior Safety Auditor on the department’s registration system.[[12]](#footnote-12)

## Additional Options Analysis Requirements (Item No. OA 17) (if ordered)

This item is to provide for issues that are nominated throughout the Functional Specification to be paid as a variation, plus other possible changes in scope which may or may not occur throughout the project.

The Consultant shall not undertake Works under this item without the written approval of the department’s Project Manager.

The Consultant shall allow the number of hours of work detailed in the following table and include the estimated cost of these hours in the Fee Schedule.

|  |  |
| --- | --- |
| Item No. OA 17 –  Additional Options Analysis Requirements (if ordered) | @ hours |

The Consultant shall determine an appropriate split of the hours between its staff and shall nominate such allocation in its offer.

# Deliverables

To complete the Options Analysis stage, the Consultant shall produce the following deliverables (as applicable). One original and two copies of all information, reports, plans and so on, is required.

* Options Analysis Report, and attachments:

|  |  |
| --- | --- |
| * Preliminary Environmental Assessment | (Refer Clause 2.3.3) |
| * Cultural Heritage Risk Assessment | (Refer Clause 2.3.4) |
| * Environmental Management Plan (Site Investigation) | (Refer Clause 2.3.5) |
| * Landscape Assessment | (Refer Clause 2.3.7) |
| * Noise and Vibration Impact Comparison Report | (Refer Clause 2.3.8) |
| * Public Consultation Report | (Refer Clause 2.4) |
| * Traffic Report | (Refer Clause 2.5.2) |
| * Property Access Report | (Refer Clause 2.6.4) |
| * Hydraulic Analysis | (Refer Clause 2.7) |
| * Preliminary Pavement Design Report | (Refer Clause 2.9) |
| * Preliminary Geotechnical Report | (Refer Clauses 2.10 and 2.11) (inc. Preliminary Bridge Foundation Report) |
| * Preliminary PUP Report | (Refer Clause 2.12.4) |
| * Risk Analysis and Record | (Refer Clause 2.13) |
| * Value Management Report | (Refer Clause 2.14) |
| * Comparative Cost Estimates | (Refer Clause 2.15) |
| * Road Safety Audit | (Refer Clause 2.16) |
| * Relevant Correspondence; and |  |
| * Other pertinent Data. |  |

1. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Environmental-processes-manual.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Environmental-processes-manual.aspx) [↑](#footnote-ref-1)
2. Note: At options analysis, the scope of environmental and heritage assessment should be strategic, and only identify major show‑stoppers and those that will have significant impact to budget or timeframes. [↑](#footnote-ref-2)
3. Costs must be considered in project estimates. [↑](#footnote-ref-3)
4. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Consultants-for-engineering-projects.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Consultants-for-engineering-projects.aspx) [↑](#footnote-ref-4)
5. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-landscape-manual.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-landscape-manual.aspx) [↑](#footnote-ref-5)
6. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-planning-and-design-manual-2nd-edition.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-planning-and-design-manual-2nd-edition.aspx) [↑](#footnote-ref-6)
7. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-drainage-manual.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-drainage-manual.aspx) [↑](#footnote-ref-7)
8. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Materials-testing-manual.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Materials-testing-manual.aspx) [↑](#footnote-ref-8)
9. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Pavement-design-supplement.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Pavement-design-supplement.aspx) [↑](#footnote-ref-9)
10. [*http://www.tmr.qld.gov.au/business-industry/OnQ-Project-Management-Framework/Templates.aspx*](http://www.tmr.qld.gov.au/business-industry/OnQ-Project-Management-Framework/Templates.aspx) [↑](#footnote-ref-10)
11. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Project-cost-estimating-manual.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Project-cost-estimating-manual.aspx) [↑](#footnote-ref-11)
12. [*https://www.tmr.qld.gov.au/Safety/Road-safety/Road-safety-auditors*](https://www.tmr.qld.gov.au/Safety/Road-safety/Road-safety-auditors) [↑](#footnote-ref-12)