Job Number @ Type here

Functional Specification Template

C7522 - Business Case

* 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.

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# General

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| Project Manager: this specification has been prepared for use regardless of whether an Options Analysis has been carried out or is to be undertaken as part of this Business Case. Please read this document carefully and delete parts not appropriate. |

## Definitions / abbreviations / acronyms

The most common definitions / abbreviations / acronyms that relate to the delivery of road infrastructure projects, are contained in the various relevant Department of Transport and Main Roads (the department) [Technical Publications](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx) manuals, and include:

* Road Planning and Design
* Road Drainage
* Drafting and Design Presentation Standards
* Queensland Manual of Uniform Traffic Control Devices
* Road Landscape
* Soil Management
* 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 – Volumes 1 and 2
* Interim Guideline – Operational Railway Noise and Vibration
* Transport Infrastructure Project Delivery System
* Project Cost Estimating
* Sustainability Framework
* Cultural Heritage Process Manual, and
* Environmental manuals and guidelines.

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 |
| BIM | Building Information Modelling |
| 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 |
| EDR | Environmental Design Report |
| EMP(P) | Environmental Management Plan (Planning) |
| 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 |
| ISC | Infrastructure Sustainability Council |
| MGSD | Minimum Gap Sight Distance |
| NT | Native Title |
| OA | Options Analysis Stage (also referred to as Preliminary Evaluation Stage) |
| PD | Preliminary Design Stage |
| PEA | Preliminary Environmental Assessment |
| 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 Business Case

The Business Case is about:

* finalising Scope Definition
* finalising Project Budget
* finalising Project BCR
* preparing Preliminary Business Requirements Specification (brief)
* preparing a draft Project Plan
* preparing a Concept Estimate (Project Budget), and
* justifying inclusion of the project in the Queensland Transport and Road Investment Program (QTRIP).

## Objectives of the Business Case

The objectives of the Business Case are:

* developing a justification for including the project in the QTRIP
* assembling a handover package to facilitate the transition to the Development phase
* developing a draft project plan for directing and controlling project activities after the Business Case has been accepted, and
* developing a plan for the orderly termination of the project if the Business Case is not accepted.

## Scope of Business Case

The scope of this activity covers the work necessary to:

* develop a clear understanding of the customer requirement
* identify all plausible options that could satisfy the requirement, and
* develop and cost the Approved Recommended Option to a level that enables a comparative evaluation against non‑preferred options. The level of detail required in this phase is governed by the need to define the Approved Recommended Option.

# Summary of Consultant services (Business Case stage)

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

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

## Consultant’s Internal Project Management (Item No. BC 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. BC 03)

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| @ Type here Project Manager: this item will need careful consideration. Is it highly recommended that the departmental Environmental Officer and District Cultural Heritage Officer for the project is consulted to gain an understanding of the relative importance of environmental and cultural heritage management, to the successful delivery of the Business Case. The Department of Transport and Main Roads (department) conducts most Cultural Heritage work internally and should only be outsourced after discussing with the District Cultural Heritage Officer.  Delete / modify the following relevant Clauses if applicable, including the situation heading.  The PEA may have been undertaken as part of the Options Analysis phase. If so, the Consultant may need to revise the PEA for the Approved Recommended Option.  Where the PEA identifies that the environmental constraints have a high impact on project delivery, a REF must be completed with the Business Case.  Where the PEA identifies that the environmental constraints have a medium impact on project delivery, a REF may be completed with the Business Case or with the Preliminary Design. |

### **General**

Works undertaken by the Consultant shall be undertaken in accordance with the department’s current [*Environmental Processes Manual*](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Environmental-processes-manual.aspx) and Cultural Heritage Process Manual.

The Consultant shall ensure they are familiar with any previously completed environment and cultural heritage assessments relating to the project. The Consultant is advised to review any relevant environment and cultural heritage reports produced during the previous related projects (as determined by the Principal).

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), environmental and cultural heritage management shall incorporate the Env-1, Env-2, Env-3, Eco-1, Pla-2, and Her-1 credits into the methodology and deliverables where they are additional to those outlined for deliverables in this specification. Additional considerations may also need to be addressed for the Res-1, Sta-1, Sta-2 and Leg-1 credits as identified. The credit requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum. Requirements to interface with specific scope elements and deliverables are reiterated in the ensuing Clauses as applicable.

### Environmental and cultural heritage assessment process

The purposes of the environmental and cultural heritage assessment component of the Business Case are to:

1. complete an adequate PEA and CHRA
2. determine the impact of the environmental constraints to project delivery and cultural heritage risk classification for the project
3. for projects classified as high environmental risk projects, an REF and Environmental Management Plan (Planning) (EMP(P)) is prepared, and
4. for all projects, that significant environmental and cultural heritage management costs are incorporated into the project's Business Case.

Note: Where the Principal has elected to deliver environmental and 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)

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| Project Manager: delete / modify the following relevant Clauses as applicable, including the situation heading. |

**S**ituation 1: A PEA has not been prepared for the project, but a PEA is required.

A PEA shall be prepared for the project in accordance with the department’s current *Environmental Processes Manual*.

The purpose of the PEA is to determine the impact on project delivery of the environmental constraints and what level of environmental assessment is required for the project.

The ESR shall be carried out by appropriately qualified and experienced persons. The scope for the PEA is described in Clause 5 of the Functional Specification Annexure.

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| Appropriately qualified and experienced person: the department considers a person to be appropriately qualified and experienced if they have qualifications and experience relevant to the function they have been engaged to undertake. Generally, environmental science, environmental engineering and environmental management degrees are considered appropriate for general environmental assessments. If applicable, legislation is specific about qualifications necessary for some components of environmental survey (for example, flora survey guideline requirement of botanical qualification), these will apply. |

The final PEA shall be forwarded to the Project Manager by the date specified in the Contract Program referred to in the Clause 6.2.3 of [*Supplementary Conditions of Contract – Prequalified Consultants* (Form C75540)](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Consultants-for-engineering-projects.aspx).

Situation 2: A PEA has been prepared for the project. Update required to PEA to address new information or legislation updates.

The Principal has had a PEA prepared as part of the Options Analysis phase and this is included with the Options Analysis Report. The Consultant shall review the PEA and update to address changes in the scope or design, legislation and/or new project information.

The Principal shall provide a comprehensive list of additional issues to be assessed and considered as part of an update to the PEA.

The additional requirements to complete the PEA shall be forwarded to the Project Manager by the date specified in the Contract Program referred to in the Clause 6.2.3 of *Supplementary Conditions of Contract – Prequalified Consultants* (Form C7554).

### @ Type here Review of Environmental Factors (REF) (During BC where environmental constraints have high impact on project delivery, Major Projects > $100M or projects likely to be Design and Construction Contracts)

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| @ Type here Project Manager: delete / modify the following relevant Clauses as applicable, including the situation heading.  For projects where environmental constraints have high impact on project delivery, major projects, or projects likely to be D&C – Design and Construct, detailed environmental assessments, in the form of a Review of Environmental Factors, are required to be undertaken prior to the Business Case to identify, scope and estimate environmental management measures for the project. The scope of the Review of Environmental Factors is dictated by the risks identified in the Preliminary Environmental Assessment and the scope of the project. |

The purpose of the REF is to:

1. identify and assess existing environmental values within the footprint and impact area of the project
2. assess the potential impacts of the project on these values during the construction phase of the project and the ongoing operation of the infrastructure after construction
3. assess the potential impacts or constraints on the project from the existing environment, and
4. consider applicable legislative requirements and potential approval requirements triggered by the Works.

The Consultant shall undertake and document an REF in accordance with the *Environmental Processes Manual*, C7522 Business Case annexure and C7558 Terms of Reference for Review of Environmental Factors. Where the Consultant proposes to use an alternative methodology or assessment, the Consultant shall make submission to the Principal for deemed suitability before proceeding with the alternative methodology. The Consultant shall, where possible, undertake assessments at appropriate times to ensure opportunities for identifying environmental values are optimised. The Consultant shall be responsible for ensuring that staff undertaking assessments, undertake appropriate safety assessments and practices.

The REF shall use terminology that is readily understandable by the target audience which includes environmental experts, engineers, road designers, road construction Contractor’s employees, maintenance Contractor’s employees and the public.

The REF shall consider impacts on and influences of the environment and cultural heritage values on the footprint of the project, as well as areas likely to be used for construction (for example: sidetracks, stockpile Sites, sediment basins and so on) and impacted upon by the project.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the REF shall incorporate assessment requirements for the Eco-1, Env-1, Env-2, and Env-3 credits into the methodology and deliverables where they are additional to those outlined in the REF. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

The environmental data collected during the environmental assessment, shall be made available to the Principal with the final REF report.

#### Review of REF

The Consultant shall provide a draft of the REF with submission of the draft Business Case to the Principal for review. At least 10 business days shall be allowed for departmental officers to undertake a review of the REF in the Consultant’s program. The department’s Environmental Officer may meet with the Consultant to request amendments to the documents.

The Consultant shall update the draft EDR in accordance with departmental advice and submit the final documentation to the Principal. This may require multiple revisions of the draft EDR, until the Principal deems that the EDR has satisfactorily addressed departmental advice.

### Environmental Management Plan (Planning) (EMP(P))

The outcomes of the REF shall be used to prepare an EMP(P). The EMP(P) provides recommendations for the project planning, design and Contract documentation that will avoid and mitigate the various environmental and cultural heritage impacts identified in the REF.

The Consultant shall prepare an EMP(P) in accordance with the *Environmental Processes Manual* and Clause 5 of the Functional Specification Annexure.

The Consultant must take a multi‑disciplinary consideration to outcomes of the REF and recommendations made in the EMP(P) shall be integrated with other components of the Business Case services.

The Consultant shall also meet the specific objectives and guidelines various departmental policies / manuals available from the department’s [Technical Publications](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx) webpage that include:

* *Road Landscape Manual*
* *Road Traffic Noise Code of Practice Manual Volume 1 and 2*
* *Cultural Heritage Requirements*
* *Fauna Sensitive Road Design Manual Volume 2,* and
* *Road Traffic Air Quality Management Manual.*

Maintenance requirements for all permanent environmental control devices designed into the project shall be included in the EMP(P).

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the EMP(P) shall incorporate recommendations relating to the Eco-1, Env-1, Env-2, and Env-3 credits into the methodology and deliverables where they are additional to those outlined in the EMP(P). These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

#### Review of EMP(P)

The Consultant shall provide a draft of the EMP(P) along with the REF to the Principal for review prior to finalisation. At least 10 business days shall be allowed for department officers to undertake a review of EMP(P) in the Consultant's program. The department's Environmental Officer may meet with the Consultant to request amendments to the documents.

The Consultant shall update the EMP(P) in accordance with the department's advice and submit the final documentation to the Project Manager.

### Consultation with local interest group

Consultation with local interest groups should be limited until a clear understanding of the likely issues has emerged.

The Consultant shall seek information from local environmental groups who shall be contacted through the Project Manager and the district’s Environment Unit.

The Consultant shall contact such groups by personal visitation. Two meetings per group with @ Type here groups shall be allowed in the offer. Consultation and engagement shall be in accordance with the project's Community Engagement Plan (CEP). Documented minutes of the consultations shall be provided to the Principal.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), consultation with local interest groups shall incorporate the relevant stakeholder engagement considerations from the Res-1, Env-1, Env-2, and Env-3 credits into the methodology and deliverables where they are additional to those outlined for the consultations. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

### Environmental Management Plan (Site Investigations) (EMP(SI))

If Site investigations are required during the Business Case 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 EMP(SI) shall identify potential impacts on matters of environmental and cultural heritage from the Site investigations and mitigation measures and strategies to be implemented.

The EMP(SI) shall be submitted to the Principal for acceptance seven days prior to commencing operations. Site investigations cannot commence unless agreed to by the Principal and with an approved EMP(SI).

In the event Site investigations are required, the Consultant shall notify the departmental District Cultural Heritage Officer, to ensure the necessary heritage approvals and Agreements are in place, prior to commencing Works.

The Consultant shall be responsible for ensuring that all necessary environmental approvals are identified and obtained prior to commencing Site investigations.

* + 1. **Cultural Heritage Risk Assessment (CHRA) (if ordered)**

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| @ Type here Project Manager: delete / modify the following relevant Clauses as applicable, including the situation heading. A CHRA should have been completed during Options Analysis. If so, it will need to be reviewed during Business Case phase (see Situations 2 and 3). If no CHRA has been completed, one will be required immediately (see Situation 1). Discuss with your District Cultural Heritage Officer before proceeding. |

**@ Type here Situation 1: CHRA required**

The Consultant is required to undertake a CHRA in accordance with the department’s current Cultural Heritage Process Manual and the CHRA requirements outlined in the C7559 Terms of Reference for Cultural Heritage Assessment.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the CHRA shall incorporate the Her-1 credit into the methodology and deliverables where they are additional to those outlined in the CHRA. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

**@ Type here** **Situation 2: CHRA previously completed. Review and update required**

The Consultant is required to undertake a review and update of the previous CHRA in accordance with the department’s current Cultural Heritage Process Manual.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the CHRA shall incorporate the Her-1 credit into the methodology and deliverables where they are additional to those outlined in the CHRA. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

**Situation 3: CHRA previously completed in‑house within the last 12 months, and not required from the consultant**

The Consultant may refer to the existing CHRA.

* + 1. **@ Type here** **Cultural Heritage Field Assessment (CHFA) (if ordered)**

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| --- |
| @ Type here Project Manager: delete / modify the following relevant Clauses as applicable, including the situation heading. Ensure that the departmental District Cultural Heritage Officer is informed that this is occurring. |

The Consultant shall undertake a cultural heritage field assessment in accordance with the department’s current Cultural Heritage Process Manual and the Aboriginal or Torres Strait Islander Heritage Field Assessment and/or Historical / European Heritage Field Assessment requirements outlined in the C7559 Terms of Reference for Cultural Heritage Assessment. The field assessment should cover the design footprint of the project and all areas likely to be used for ancillary Works for construction, including gravel pits and water sources.

If the Aboriginal or Torres Strait Island Heritage Field Assessment recommends an Agreement with the Aboriginal Party(ies), the Consultant shall advise the Project Manager. The Principal will manage the consultation and engagement with Aboriginal Party(ies) and negotiation of Agreements as required, unless requested from the Consultant.

If the Historical / European Heritage Field Assessment recommends an approval or notification to the Department of Environment and Science (DES), the Consultant shall advise the Project Manager. The Principal will manage these, unless requested from the Consultant.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the CHFA shall incorporate the Her-1, Sta-1 and Sta-2 credits into the methodology and deliverables where they are additional to those outlined in the CHFA. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

* + 1. **@ Type here Landscape assessment**

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| @ Type here Project Manager: delete / modify the following relevant Clauses as applicable, including the situation heading. |

The Consultant shall validate the landscape assessment conducted in the Options Analysis stage relative to the selected alignment, to confirm its accuracy and applicability relative to the Business Case. Where necessary, the Consultant shall include an addendum to the landscape assessment to update the document to ensure the content remains relevant / current.

Where a landscape assessment has not been previously prepared, the Consultant shall undertake the following assessment in accordance with the department's current [*Road Landscape Manual*](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-landscape-manual.aspx), Part B Chapter 3 Assessment and Planning, as part of the business case:

@ Type here Integrated Landscape Assessment Report.

@ Type here Integrated Landscape Assessment Opinion.

@ Type here Landscape Site Analysis Assessment.

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| An Integrated Landscape Assessment Report is required for all major projects (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. |

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the landscape assessment shall incorporate the Pla-2 credit, and consideration of Leg-1 and Sta-2 credits, into the methodology and deliverables where they are additional to those outlined in the landscape assessment. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

### Noise and Vibration Assessment

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| Project Manager: operational railway noise and vibration and/or operational car park / bus terminal noise will need additional requirements to those included below.  In some instances, the operational scope of the assessment may be reduced where all (or the majority of) sensitive receivers have direct access to the state‑controlled road corridor, or the project does not trigger Upgrading Existing Road or New Road in the *Transport Noise Management Code of Practice, Volume 1*.  Please contact Engineering and Technology's noise team to confirm project requirements. |

The Consultant shall produce a road traffic noise assessment report in accordance with the Transport Noise Management Code of Practice – Volume 1 (excluding noise measurement and model verification). The Consultant shall conduct all field Work required, to ensure that the noise model is an adequate representation of the project Site and surrounds, including field checking existing noise barriers and sensitive receivers (including tenancies).

The Consultant shall include all approved development (including unbuilt) in the assessment. The relevant conditions and application details are required to be summarised in the report, to ensure that all project obligations are considered.

The Consultant's report shall include all model scenarios required by the Transport Noise Management Code of Practice, including the existing year of opening and 10 year horizon. The minimum noise barrier height shall be 2.4 m. The Consultant shall determine the need for noise barriers and, where required, shall determine the length, height and offset from the road in consultation with the Project Manager. The Consultant shall present investigations in the report which have led to the final recommended noise treatment design (that is, review of different barrier heights).

The assessment shall be conducted and/or supervised by a Registered Professional Engineer of Queensland (RPEQ) with relevant experience in noise assessment for infrastructure projects.

The output of the noise assessment report should be sufficient to allow a cost estimate to be incorporated into the business case.

Vibration assessment, mitigation and management for Public Utility Plant (PUP) shall be as per Clause 2.12.5.

Construction vibration impacts may restrict piling method / roller selection (that is, static rolling) due to the proximity of structures and other assets. While an assessment of vibration in accordance with the Transport Noise Management Code of Practice – Volume 2 is not required in a business case, it shall be considered at a high level in the costings for the business case (for example, limitation of piling methods and/or additional time required for compaction). The Consultant shall document considerations in the Business Case Report.

Community consultation is not required. However, if any enquiries are received from the community by the Consultant while conducting the assessment, they shall be referred promptly to the Project Manager.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the Noise and Vibration Assessment shall incorporate the Env-2 and Env-3 credits into the methodology and deliverables where they are additional to those outlined in the Noise and Vibration Assessment. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

* + - 1. **@ Type here Landscape Master and Concept Plans**

The Consultant shall include a @ Type here Landscape Master Plan and Report @ Type here Landscape Concept Plan and Statement @ Type here Landscape Concept Plan and Notes in accordance with the Road Landscape Manual.

|  |
| --- |
| A Landscape Master Plan and Report is required for all major projects (motorway, multi‑modal corridor, deviation, bypass, connector, major interchange or major bridge, Type 1 and major projects).  A Landscape Concept Plan and Statement is required for all moderate Works (minor realignment, intersection, roundabout, overpass or bridge, Type 2 projects).  A Landscape Concept Plan and Notes 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. |

@ PM - Delete this paragraph if a Landscape Concept Plan and Statement or Landscape Concept Plan and Notes is required. The Landscape Master Plan and Report shall comply with Part B Chapter 2 (B2) of the Road Landscape Manual. The Landscape Master Plan shall be at a scale of not smaller than 1:4000@A3.

@ PM - Delete this paragraph if a Landscape Master Plan and Report or Landscape Concept Plan and Notes is required. The Landscape Concept Plan and Statement shall comply with Part B Chapter 2 (B2) of the Road Landscape Manual. The Landscape Concept Plan shall be at a scale of not smaller than 1:4000@A3.

@ PM - Delete this paragraph if an Integrated Landscape Assessment Report or Integrated Landscape Assessment Opinion is required. The Landscape Concept Plan and Notes shall comply with Part B Chapter 2 (B2) of the Road Landscape Manual. The Landscape Concept Plan shall be at a scale of not smaller than 1:4000@A3.

A principal objective of the Landscape Masterplan / Landscape Concept Plan, shall be to provide an integrated harmonious approach over long sections of road, with appropriate transitions between the various settings through which the road passes. The Landscape Masterplan / Landscape Concept Plan shall demonstrate Site analysis, opportunities and constraints, broad design intent / strategies, mitigation of impacts, urban design treatments and finishes, landscape treatments and species palettes are to be further developed in future design stages.

### Payment

The Lump Sum for Item No. BC 03 Environment and Cultural Heritage Management, shall include all Works necessary to complete all identified deliverables as specified in Clause 2.3 of this Functional Specification - Business Case.

Assessing Potential Acid Sulphate Soils, dispersive and slaking soils shall be paid for in the item for Geotechnical Investigation.

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| --- |
| Project Manager: Ensure environmental and cultural heritage deliverables match Clause 3 Deliverables of this Functional Specification Business Case . |

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

### Consultation planner

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

@ Type hereThe Consultation Planner for this phase has been completed but not signed off.

@ Type hereThe Consultant shall review the planner and submit for approval at the Milestone reference point (Review of Proposed Public Consultation Process).

@ Type hereThe 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 Business Case. This is defined in the following Clauses of this Functional Specification (where applicable):
* Clause 2.3 Environmental Cultural Heritage Management
* Clause 2.12.4 Resumption Requirements
* Clause 2.12.5 Public Utility Plant (PUP) Conflicts, and
* Clause 2.8 to 2.11 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.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), targeted / public consultation shall incorporate the Sta-1, Sta-2, Leg-1, and Her-1 credits, and relevant stakeholder engagement considerations from the Res-1, Env-1, Env-2, and Env-3 credits, into the methodology and deliverables where they are additional to those outlined for targeted / public consultation. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

### 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

|  |
| --- |
| Project Manager: depending on the project, contiguous property‑owners will need to be consulted if their access or resumption requirements could become show stoppers, for example, access to shopping centre. This element of the consultation process is usually carried out as part of the Options Analysis, however further information may need to be sought from stakeholders with regard the Approved Recommended Option. |

@ Type hereThe 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 department staff.

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

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| --- |
| 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 department's 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 Payment Clause and the following sentence 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 departmental District Cultural Heritage Officers. |

#### Payment

Payment for this part of the consultation process shall be made under the Fixed Fee Item BC 03 Environmental and Cultural Heritage 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's implementation.

1. Options Analysis stage @ Type here (not in this Contract)

Throughout the Options Analysis stage, targeted / public consultation shall focus on identifying stakeholders, obtaining input from targeted sources (such as the department, shire councils).

1. Business Case stage

Throughout the Business Case stage, targeted / public consultation shall refine the consultation (if any), undertaken during the Options Analysis stage, focusing on issues relating to the Approved Recommended 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 stage.

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

Throughout the Preliminary Design stage, public consultation shall focus on identifying additional stakeholders, obtaining public input, identifying issues and identifying public perception of impacts. Public education may be most cost effective during this stage.

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

A focus of the design stage 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 stage 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 @ Type here (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 Detailed Design stage, 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 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

@ Type hereThe Consultant shall review the report on the target / public consultation undertaken during the Options Analysis stage and update where necessary for the Approved Recommended Option.

@ Type hereThe Consultant shall produce a report on the target / public consultation undertaken during the Business Case 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 target / public consultation shall be deemed to be covered in Item No. BC 04 Public Consultation (Fixed Fee), and which aspects are deemed to be covered in Item No. BC 05 Public Consultation (Time Rate).

The following Clause of the Functional Specification - Business Case includes other consultation that is included in the Fixed Fee Item No. BC 04:

* Clause 2.6 Property Access

The following clauses of this Functional Specification - Business Case may include other consultation that is to be included in the Time Rate Item No BC 05:

* Clause 2.6 Property Access
* Clause 2.7 Hydraulic Analysis

#### Payment

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

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

The Principal has provided traffic counts as detailed on:

|  |
| --- |
| Project Manager: include references to 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

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| 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 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 this 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 Business Case.

### Payment

The Lump Sum for Item No. BC 05 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 - Business Case. This includes consultation with the local government.

## Property Access (included in Item No. BC 04, BC 05 and BC 12)

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| --- |
| Project Manager: only use this Clause in projects where access issues are likely to influence the viability of the option(s) 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 owners' needs are considered and can be incorporated in the Approved Recommended Option.

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 Business Case.

### 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, (design speeds where the, 85th percentile is not known shall be taken as posted speed plus 10 km/h).
* This may involve shifting access locations, gates, and so on and connecting to the existing access, either within the property, or within the road reserve. Any other safety issues concerning accesses will also be considered. Note the requirements of Clause 2.6.4 below.
* 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 Road Planning and Design Manual, the larger vehicle shall be the design vehicle.

### Advice to 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 Business Case. 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

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| --- |
| 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 recorded as fixed fee. |

The Consultant shall allow the cost of two, one-hour meetings on Site 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 BC 04 Public Consultation and are deemed to include all travel and other expenses.

For 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. BC 05 Public Consultation.

The costs associated with the layout development, preparation of letters and reporting on property access, shall be included in Item No. BC 12 Progressing Approved Recommended Option.

## Hydraulic Analysis (Item No. BC 07)

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| --- |
| 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. This item may be required to increase the certainty of the cost of the Approved Recommended Option presented in the Business Case. |

Drainage shall meet the requirements of the department’s current Road Planning Design Manual 2nd edition.

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 @ 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, and
* 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.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the hydraulic analysis shall incorporate the Env-1, and hydraulic-related elements of Res-1 and Res-2 credits, credit into the methodology and deliverables where they are additional to those outlined in the hydraulic analysis. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

### Bridge

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| --- |
| 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 and so on) to be determined.

### Reporting

The results of the hydraulic analysis shall be appended to the Business Case.

### Payment

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

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

## Geotechnical Investigation (Item No. BC 08)

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| --- |
| 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 Business Case (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 Supplementary Conditions of Contract – Prequalified Consultants (Form C7554) and the following local standards:

|  |
| --- |
| Project Manager: include any local references, for example Environmental Management Preconstruction Strategy. |

Testing shall be in accordance with the department’s current [*Material Testing Manual*](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Materials-testing-manual.aspx).

### Payment

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

Implementing the Environmental Management Preconstruction Strategy, so far as it relates to geotechnical investigation in accordance with Clause 12 of the Supplementary Conditions of Contract – Prequalified Consultants (Form C7554), shall also be included in Item No. BC 08 Geotechnical Investigation.

## Pavement Design Report (Item No. BC 09)

The Consultant shall undertake pavement design for the Approved Recommended Option identifying the following:

1. testing results if undertaken, or assumptions made during the desktop study
2. the various pavement configurations considered (minimum of three pavement configurations are to be evaluated), and
3. cost comparison of the pavement options.

The above is to be reported in tabular format suitable for inclusion in the Business Case.

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 [*Pavement Design Supplement*](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Pavement-design-supplement.aspx) and local requirements:

@ Type here

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

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the Pavement Design Report shall incorporate the feasibility assessment requirements of the Rso-1 and Ecn-1 credits into the options assessment methodology and deliverables where they are additional to those outlined in the Pavement Design Report. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

### Payment

All costs associated with the Pavement Design Report, including consultation with the maintenance contractor, shall be allowed for in Item No. BC 09 Pavement Design Report.

## Bridge Foundation Design (Item No. BC 10)

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| 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 bridge foundation design to confirm the viability or otherwise of the Approved Recommended Option.

@ Type here Add specific requirements.

## Geotechnical Analysis and Report (Item No. BC 11)

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| --- |
| 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 The aim of the geotechnical analysis at the Business Case stage, is to conduct sufficient analysis so that the options being evaluated will not present unacceptable geotechnical risks (also refer Item No. BC 13 Risk Analysis and Record), and comparisons between options can be made.

@ Type here The Geotechnical Analysis and Report shall expand upon the preliminary geotechnical analysis undertaken during the Options Analysis to the extent necessary, to reduce the geotechnical uncertainty relating to the Approved Recommended Option.

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.

## Progressing Approved Recommended Option (Item No. BC 12)

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| --- |
| Project Manager: this item is where the Approved Recommended Option is developed to the extent necessary, to give the accuracy required for the estimate of cost. In some cases, this will need to be detailed to the point of assessing PUP requirements service roads and so on, which can impact considerably on the final cost of the project. Delete Clauses and items not required. |

### General

The Business Case phase develops the Approved Recommended Option to the extent that it can be accurately costed. Also refer Clause 2.14 following.

When developing the layout, 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.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the development of the Approved Recommended Option shall incorporate the Ecn-1 credit into the methodology and deliverables where they are additional to those outlined for Progressing Approved Recommended Option. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum.

### Bridge

The location, abutment and pier locations, span types, sub and superstructure details for major structures are to be fixed.

### Service roads

During the Business Case, 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 the Approved Recommended Option.

Resumption requirements shall be based on eight‑metre minimum clearance from the cut or fill toe and account for any additional PUP requirement, unless otherwise directed by the Project Manager. At interchanges, minimum clearance shall be 15 metres.

Refer also to local requirements in:

|  |
| --- |
| Project Manager: refer to local standards for example, Grade Separated Interchanges - A Design Guide. |

### Public Utility Plant (PUP)

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| --- |
| This Clause has been replaced by Public Utility Plant (PUP) Addendum to C7522 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)*)* |

### Approved Recommended Option layouts

The Consultant shall develop the Approved Recommended Option layouts 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
* noise barriers
* environmental and cultural heritage constraints (constraints with high and severe risk, including offset trigger)
* environmental management mitigation measures, including fauna crossings and fauna exclusion fencing
* erosion and sediment control (planning)
* soil management plan (planning)
* safety barrier systems (including nominating type)
* allowance for information technologies (if any)
* pedestrian and cyclist facilities
* bus facilities
* landscape and revegetation treatments
* 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 side tracks (if any).

For simple rural projects, the Approved Recommended 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 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

### Standards

In addition to the department’s standards, the following local standards shall apply:

|  |
| --- |
| Project Manager: refer to local standards, for example, the 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 Business Case.  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 current Road Planning and Design Manual, the Consultant shall immediately notify the Project Manager for a clarification of the issue. |

## Risk Analysis and Record (Item No. BC 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 Options Analysis phase. The review shall focus on what has changed in the timeframe since the preparation of the Options Analysis Report, including identifying issues that may have been overlooked at the time.
* Manage and protect the Principal's interest during the Business Case phase with regard to:
* Targeted / public consultation, including issues raised, or issues likely to be raised by the stakeholders / public.
* Environmental and Cultural Heritage Management, including compliance with relevant sections of the various state and commonwealth cultural heritage and environmental legislation. Risk analysis should consider environmental issues associated with land acquired by the project that may present a delivery risk and / or ongoing maintenance burden, for example, contaminated land, and associated costs must be included in estimates.
* Local issues that could lead to delay.
* PUP issues that could lead to delay, including but not limited to materials, resourcing and so on.
* Safety conditions on the project Site so far as the Approved Recommended Option is concerned, including compliance with the provisions of the relevant sections of the Queensland 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 Business Case to ensure that the project objectives are achieved.

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the risk analysis shall incorporate the risk assessment requirements of the Lea-2 credit, and interfaces with Res-1 and Res-2 credits, into the methodology and deliverables where they are additional to those outlined in the risk analysis. These requirements are addressed in the C7522 Infrastructure Sustainability Business Case Requirements Addendum. It is emphasised that risk assessment in the Lea-2 credit context requires consideration of outward risks as a result of the project (e.g., to local businesses and the community), rather than just risks to the project.

### Reporting

The Consultant shall prepare a report on the issues mentioned above, including the department’s current 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 Business Case and will form the basis for risk management in the future phases of the project lifecycle.

### Payment

All costs associated with risk analysis and record shall be allowed for in Item No. BC 13 Risk Analysis and Record.

## Business Case Estimate of Cost (Item No. BC 14)

The Consultant shall prepare a business case estimate of cost (total project cost) for the Approved Recommended Option, using estimated quantities and historical rates, in accordance with the department’s current [*Project Cost Estimating Manual*](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Project-cost-estimating-manual.aspx).

The estimates must consider the following:

* Preconstruction cost:
* Concept phase
* Business Case phase
* Design Development phase, and
* Detail Design phase
* Construction phase Costs
* Principals materials and management reserve:
* the requirement for concept estimate of cost to have an accuracy of +/- 20%, and
* the department’s estimating policy of preparation of unlikely to be exceeded but excessively conservative estimates. The estimate has a low probability (15%) of being exceeded by the actual cost of the project.

The estimate shall be presented in accordance with the requirements of the local standard as follows:

|  |
| --- |
| Project Manager: refer to local standards for example the district's Design Guide – Estimate and Schedule. |

For major projects undertaking a sustainability assessment (using the Infrastructure Sustainability Council (ISC) rating scheme), the Business Case Estimate of Cost shall incorporate the Inputs to project cost estimate requirements from the C7522 Infrastructure Sustainability Business Case Requirements Addendum, where they are additional to those outlined in the Business Case Estimate of Cost.

## Calculation of Benefit Cost Ratio (BCR) (Item No. BC 15)

The Consultant shall complete the activities and deliverables included in the scope of the engagement, using the recommended reference material and principles, as indicated in Functional Specification Economic Analysis (Development and Reporting) (Form C7526). Link: Publications 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)*)*

## Road Safety Audit (Item No. BC 16)

The Consultant shall undertake a Road Safety Audit (Stage 2), in accordance with the Austroads Guide to Road Safety AGRS06‑19 Part 6: Road Safety Audit, of the Business Case.

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 Business Case, are the plans that were audited. The auditor must also be registered as Senior Safety Auditor on the department’s [registration system](https://www.tmr.qld.gov.au/Safety/Road-safety/Road-safety-auditors).

## Compiling Business Case (Item No. BC 17)

The Consultant shall compile the Business Case and all relevant attachments, in accordance with Clause 3 of this Functional Specification. The Business Case Report is to be compiled using [OnQ templates](https://www.tmr.qld.gov.au/business-industry/OnQ-Project-Management-Framework/Templates.aspx), 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 Proposal Report (Item No. BC 18) (if ordered)

This is a National Highway Project. The Consultant shall prepare a Project Proposal Report (PPR) which meets the requirements of the Australian Land Transport Development Program Administrative Procedures published by the Federal Department of Transport and Communication during the Business Case Stage of the project.

## Draft Project Plan (Item No. BC 19)

The Consultant shall compile a draft project plan as part of the handover package. The project plan is to be compiled using OnQ templates. Electronic copies of these templates are available from the Project Manager. Refer to the following document for the requirements of the draft project plan.

|  |
| --- |
| Project Manager: refer to local standards for example the district's Project Plan Standards. |

## Building Information Modelling (BIM) (Item No. BC 20)

|  |
| --- |
| Project Manager: this item is required where the Business Case meets the criteria set down by the Queensland Government that states all major government construction projects >=$50M which commenced with a detailed Business Case from 1 July 2019, are required to use BIM processes in line with the BIM Principles outlined in the Queensland Government’s Digital enablement for Queensland infrastructure – principles for BIM implementation, the Building Information Modelling for Transport and Main Roads Guideline and the department's BIM for Bridges Design Manual. |

### General

The department has adopted the Building Information Modelling processes outlined in ISO19650 Part 1: Concepts and principles and Part 2: Delivery Phase of the assets and the NATSPEC National BIM Guide, for managing information captured throughout the project's design development phases, including the Business Case phase.

Building Information Modelling processes must be implemented during the business case development phase of the project including:

* creating, managing, and implementing a BIM Execution Plan that meets the requirements outlined in the department's BIM Exchange Information Requirements (EIR), and
* using BIM technology and processes to create and manage a Common Data Environment (CDE) that provides a single source of truth for all project information. The CDE is to be used to collect, manage, and disseminate all relevant project information in a managed process that allows information to be shared between all members of the project team.

### BIM Execution Plan

To meet this requirement, the Consultant must create, implement and manage the ongoing development of a Business Case BIM Execution Plan that includes the elements outlined below.

General requirements to be covered in the BIM Execution Plan include:

* Purpose of BIM Execution Plan, Project Background and BIM objectives and goals.
* Building Information Management protocols outlining project team structure, roles, responsibilities and obligations including appointment of a BIM Manager.
* Project Standards – Relevant industry and departmental standards which will be applied in the development and execution of BIM for the project.

### Collaboration / model management

Collaboration / model management to include:

* Procedures, resources, meeting schedules, BIM co‑ordination meetings.
* Hardware requirements and software platforms, including software versions, file formats and agreed file exchange requirements.
* CDE as the agreed source of information for the project in collecting, managing and disseminating information and data through a managed process.
* Outline solution (technology) to support workflow (process) and management of the federated model – aligned to ISO19650 Part 1.
* Communication and collaboration strategies among the Consultant’s design team and with the Consultant’s Building Information Modelling Manager and departmental representatives.
* Design Model authoring software and purpose.
* Modelling sharing, discipline and inter discipline model sharing.
* Process to communicate the design to project key stakeholders.
* Plan for file sharing, storage and retrieval, and data security.
* File folder structure and file naming conventions.
* Methodology for ensuring the validation of BIM and CAD files, project‑wide.
* Required elements and outcomes for clash detection.

### BIM Deliverables in the BIM Execution Plan

BIM deliverables in the BIM Execution Plan are to include:

* Specific uses of Building Information Modelling applied to the project as listed in Table 2.20.4 BIM Uses.
* Schedule of Building Information Modelling activities, including milestones and submittals including:
  + Design Model delivered at the 15%, 50%, 85% and 100% milestones (or other milestone submission timeframe as agreed with the Principal to suit the Consultant's delivery programme), with client review at these key milestones.
  + the department has access to all digital content at agreed timeframes as the model progresses through the lifecycle of the project. (Note: Additional monthly data‑drops may be required with an understanding that the model is a 'work in progress' non‑verified data).
* Model Level of Development for Business Case phase is LOD200, described as a dimensionally‑correct and coordinated model which communicates the response to the brief, aesthetic intent and some performance information that can be used for analysis and early Contractor engagement.
* The Consultant must define how they will provide the agreed BIM uses in the BIM Execution Plan
* The Consultant shall provide a copy of the following electronic files:
  + BIM Execution Plan in PDF format
  + updated electronic model(s) provided at key milestones for review
  + work in progress electronic model(s) provided each month or as requested, and
  + electronic drawings to be provided in accordance with the department's Drafting and Design Presentation Standards Manual.
* The final report(s) and electronic files are to be supplied in accordance with Clause 3 Deliverables.

Table 2.20.4 – BIM Uses

| Model Use | Description |
| --- | --- |
| Modelling existing conditions | Define the extent of existing conditions to be modelled under the project. |
| Civil / Structural Design – spatial and object‑based design models | A process in which 3D software is used to develop a model based on design criteria for transport infrastructure design. Two groups of applications, at the core of BIM based design processes, are design‑authoring tools and audit and analysis tools. |
| Design visualisation for functional analysis | A process in which a 3D model is used to showcase the design to the stakeholders and design reviewers to evaluate the compliance of the design to the relevant design standards, while meeting the initial project scope requirements. |
| Engineering modelling and analysis | A process in which intelligent modelling software uses the 3D model to determine the most effective engineering solution / method based on design specifications. These analysis tools and performance simulations can significantly improve the design of infrastructure. |
| Quantity take‑off and cost planning | A process in which a 3D model can be used to assist in the generation of accurate quantities of materials and cost estimates early in the design process and provide cost effects of various design options, with the potential to save time and money and avoid budget overruns. Cost estimation will occur throughout each phase of the project development, allowing financial management tracking against budget allocation. |
| Clash detection / coordination | A process in which clash detection is used during the coordination process of design elements to determine field conflicts, by comparing roadway components including subsurface elements. The goal of clash detection, is to eliminate the major system conflicts prior to construction. |
| 2D Drawing production | The primary purpose of project drawings is to clearly represent the design that is required to be constructed. 2D drawing information for the purposes of assembling a printed set of plans shall be derived from the 3D model(s) to the fullest extent possible. |

### Payment

All costs associated with consultation and preparation of the BIM Execution Plan and its deliverables shall be allowed for in Item No. BC 20 Building Information Modelling (BIM).

## Additional Business Case requirements (Item No. BC 21) (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 departmental 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 Schedule of Fees.

|  |  |
| --- | --- |
| BC 21 – Additional Business Case 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

The Consultant shall produce the following deliverables (as applicable) to complete the Business Case stage for the Approved Recommended Option. Note that the Options Analysis Report becomes an attachment for the Business Case.

Table 3 – Business Case and attachments

| Deliverable | Clause |
| --- | --- |
| Preliminary Environmental Assessment | (Refer Clause 2.3.3) |
| Review of Environmental Factors | (Refer Clause 2.3.4) |
| Cultural Heritage Risk Assessment | (Refer Clause 2.3.9) |
| Cultural Heritage Field Assessment | (Refer Clause 2.3.10) |
| Environmental Management Plan (Planning) | (Refer Clause 2.3.5) |
| Environmental Management Plan (Site Investigation) | (Refer Clause 2.3.7) |
| Road Traffic Noise Assessment Report | (Refer Clause 2.3.12) |
| Public Consultation Report | (Refer Clause 2.4) |
| Traffic Report | (Refer Clause 2.5) |
| Property Access Report | (Refer Clause 2.6) |
| Hydraulic Analysis | (Refer Clause 2.7) |
| Pavement Design Report | (Refer Clause 2.9) |
| Geotechnical Report (inc. Bridge Foundation Report) | (Refer Clauses 2.10 and 2.11) |
| PUP Report | (Refer Clause 2.12.5) |
| BIM Execution Plan | (Refer Clause 2.20) |
| Electronic models, including Survey and Design files, and the IFC federated object‑based models, are to be supplied to the department via a digital data transfer methodology as agreed with the Principal and defined in the Design BIM Execution Plan | (Refer Clause 2.20) |
| Risk Analysis and Record | (Refer Clause 2.13) |
| Comparative Cost Estimates / Concept Estimate of Cost | (Refer Clause 2.14) |
| BCR Analysis | (Refer Clause 2.15) |
| Road Safety Audit | (Refer Clause 2.16) |
| Draft Project Plan | (Refer Clause 2.19) |
| Relevant Correspondence, and |  |
| Other pertinent Data |  |
| Options Analysis Report (see above) |  |
| Project Proposal Report (Stage 2 approval for Federally Funded Jobs) |  |

In addition to the hard copy of all required documents the Consultant shall also supply an electronic copy of all project files, prototype drawings and supplementary specifications and contract conditions (in MS Word) and schedules, and all estimates shall be provided in a 3PCM (.csv file) estimating import template format supplied to the department via a digital data transfer methodology as agreed with the Principal.