Job Number @ Type here

Functional Specification Template

C7524 - Detailed Design

* 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

## 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
* 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

Link: Technical Publications ([*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 |
| BIM | Building Information Modelling |
| CBR | California Bearing Ratio |
| CH | Cultural Heritage |
| CHFA | Cultural Heritage Field Agreement |
| CHMP | Cultural Heritage Management Plan |
| 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 |
| 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 |
| 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 |
| RLM | Road Landscape Manual |
| 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 the Detailed Design stage

The Detailed Design stage is the final element in the Preconstruction phase, and results in a design solution in the form of a set of construction Contract documents to establish the Construction Contract.

It delivers a final design solution that will:

* reflect the requirements of the project customer
* accommodate predicted road user types and volumes
* reduce traffic congestion
* improve amenity, including access
* improve or maximise flood immunity
* provide a comfortable ride for road users
* incorporate the requirements of the Environmental Management Plan
* incorporate the requirements of any Cultural Heritage Agreements and Historical Approvals
* minimise or reduce nuisance to contiguous land owners
* be aesthetically pleasing
* complement existing land use
* incorporate innovative techniques and solutions where practicable
* reflect the purpose of the Works defined in the Business Case and the Invitation Documents
* reflect the government's policies
* meet legislative requirements
* meet departmental standards
* maintain an optimum balance of total construction and maintenance costs to quality
* produce clear, easily understood documents that will enable construction of the Works to proceed smoothly, with minimum supervision costs
* protect the Principal's interests, particularly with regard to:

1. cultural heritage and environmental management
2. safety, including construction safety, and
3. claims escalation due to latent conditions, variations, delay.

@ Type here for National Highway project(s) the design shall also reflect the relevant standards and guidelines as required by Australian Government’s Department of Infrastructure and Regional Development.[[1]](#footnote-1)

## Scope of the Detailed Design stage

The Detailed Design will include the following activities:

* finalising the technical solution developed during the Preliminary Design stage
* finalising the design of miscellaneous items (such as gully pits, signs and so on)
* producing engineering drawings
* producing electronic 3D string‑based and 3D object‑based models of the final Design
* producing final project estimates, schedules and construction Contract documentation and specifications
* establishing the Construction Contract, and
* finalising the Project Plan for the Implementation phase.

## Transport Infrastructure Contract philosophy and guiding principles

The Consultant shall prepare prototype Transport Infrastructure Contract – Construct Only (TIC‑CO) documents that promote the following principals:

* apportion risk to the party (Principal or Contractor) who can best manage the risk
* allow the Contractor to determine the method of construction commensurate with managing safety, compliance with regulations and policy. The Consultant shall not specify the construction sequence unless necessary, to obtain a required outcome (for example, there are usually several methods to control erosion and sedimentation. Each method will affect the various Construction Contractors in different ways. Therefore, the TIC‑CO documentation must specify the outcomes and allow the Contractor to select the methodology to achieve that outcome), and
* provide a method whereby the Administrator of the TIC‑CO can measure compliance wherever practicable - for example, specify limits, tolerances, and so on.

Transport Infrastructure Contract – Construct Only details are as follows:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Construction Contract No. | @ Type here | | | Job No. | @ Type here | | | |
| District | | | | Local Government | | | | |
| @ Type here | | | | @ Type here | | | | |
| Method of Construction | | | | | | | | |
| Open Market Contract | |  | | Sole Invitation Contract | |  | | |
| Type of Construction Contract | | | | | | | | |
| TIC‑CO |  | | TIC‑D&C |  | TIC‑SI | |  | |
| Schedule of Rates\* |  | | Lump Sum |  | Separable Portion for: | | |  |
| \*Where Reinforced Soil Structures (RSS) are necessary, the RSS shall be Lump Sum. Remaining Work shall be Schedule of Rates or Lump Sum as specified above. | | | | | | | | |

# Summary of design / work elements in the Contract (Detailed Design stage)

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

This item shall be limited to the Detailed Design stage prestart meeting (if scheduled), meetings and all liaison with the departmental Project Manager including issue of agendas, minutes, and so on and the prestart meeting with the Construction Contractor.

Excluding the prestart meeting with the Construction Contractor, allow a duration of three hours per meeting and all meetings shall be attended by at least the Project Director and Consultant's Project Manager.

### Prestart meeting with the Construction Contractor

The prestart meeting with the Construction Contractor shall be attended by the Project Manager. Allow a duration of a full day including travel to the job Site for the meeting.

### Payment

Payment for attending the construction prestart meeting is limited to the above items in Clause 2.1.1. The Consultant's attention is drawn to the requirements of Clause 3 Special Conditions of Contract for Prequalified Consultants for Transport and Main Road's Planning and Design Contracts).

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

This item shall be limited to the Consultant’s Internal Project Management including quality control, administration and non‑project deliverables, including printing of reports.

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

|  |
| --- |
| Project Manager: the project Environment and District Cultural Heritage Officers should be consulted to gain an understanding of the status of environmental and cultural heritage issues, outstanding requirements and deliverables for the detailed design Contract.  Delete / modify the following relevant Clauses as applicable (including the situation heading).  The REF, CHRA and EMP(P) should have been completed by this stage. If there has been more than 12 months since the REF or CHRA was completed, or if there has been change in the project scope, then the REF, CHRA and EMP(P) should be reviewed and updated.  Obtaining relevant permits and incorporation of management and mitigation measures into the Contract documents, is the key task of the Detailed Design stage. |

### General

Works undertaken by the Consultant shall be undertaken in accordance with the department’s current versions of the Environmental Processes Manual and Cultural Heritage Process Manual.

Prior to the Detailed Design, the Principal has undertaken / engaged the Consultant to undertake several environment and cultural heritage assessment and management processes, these include:

|  |
| --- |
| @ Type here Project Manager to delete the outputs not applicable. |

* @ Type here Preliminary Environmental Assessment (PEA)
* @ Type here Review of Environmental Factors (REF)
* @ Type here Environmental Management Plan (Planning) (EMP(P))
* @ Type here Concept Erosion and Sedimentation Control Plan
* @ Type here Road Traffic Noise Assessment Report
* @ Type here Construction Vibration Assessment Report
* @ Type here Cultural Heritage Risk Assessment (CHRA)
* @ Type here Cultural Heritage Field Assessment for Aboriginal or Torres Strait Islander Parties and/or Historical / European Heritage
* @ Type here Cultural Heritage Management Agreement (CHMA)
* @ Type here Cultural Heritage Field Agreement (CHFA)
* @ Type here Cultural Heritage Management Plan (CHMP)
* @ Type here Historical / European Heritage Approvals

The Consultant shall ensure that they are familiar with the existing environment and cultural heritage documentation 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).

#### Environmental and Cultural Heritage Management during Detailed Design

The purpose of the Environmental and Cultural Heritage Management item of Detailed Design is to:

* ensure that the mitigation measures documented in the EMP(P) have been incorporated into the Detailed Design and Contract documentation
* incorporate environment and cultural heritage approval conditions obtained after the Preliminary Design phase into the design and Contract documentation where applicable
* ensure all relevant environment and cultural heritage approvals have been obtained for the project
* complete the Environmental Design Report
* ensure that the Contract can be administered effectively for environment and cultural heritage management, and
* ensure that the final Detailed Design and Contract documentation will provide outcomes that minimise and mitigate environmental and cultural heritage risks and constraints, so that the construction and operation of the infrastructure shall comply with environment and cultural heritage legislation and approval conditions.

The outputs of the Detailed Design environmental management item are:

|  |
| --- |
| @ Type here Project Manager to delete the outputs not applicable. |

* @ Type here Review of Environmental Factors (REF)
* @ Type here Environmental Management Plan (Planning) (EMP(P))
* @ Type here Environmental Design Report (EDR)
* @ Type here Road Traffic Noise Assessment Report
* @ Type here Construction Vibration Assessment
* @ Type here Finalise any Cultural Heritage Agreements (CHFA, CHMA or CHMP) (if outstanding from Preliminary Design phase)
* @ Type here Finalise any Historical / European Heritage Approvals (if outstanding from Preliminary Design phase)
* @ Type here necessary environmental approvals
* @ Type here Construction Contract documentation – cultural heritage and environment component.

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.

### Review of Environmental Factors (REF)

|  |
| --- |
| Project Manager: delete / modify the following relevant Clauses as applicable (including the situation heading).  Review of REF is only required if it has been more than 12 months since it was completed, or if there has been a change in the project scope since it was completed. |

Review of Environmental Factors completed previously [delete if not applicable]

Where the REF has been completed during a previous phase, the Consultant shall undertake a review of the REF to ensure currency, in particular in relation to legislation, scope and design elements that may have changed since the previous phase.

Where the review identifies amendments and additional assessments are warranted, a proposal may be made to the Principal for direction. The Consultant shall provide the Principal with a comprehensive list of additional assessments required to update the environment assessment document. Based on the list provided, the Principal, shall provide instruction as to which updates shall be undertaken.

The additional requirements to complete the REF and EMP(P) shall be forwarded to the Project Manager by the date specified in the Contract Program referred to in Clause 6.2.3 of Supplementary Conditions of Contract – Engineering Consultancy Scheme (Form C7554S).[[2]](#footnote-2)

#### Review of REF

The Consultant shall provide a draft of the REF to the Principal for review prior to finalisation. The Consultant shall ensure the draft REF is completed prior to @ Type here 30% design review and submitted to the department as part of the @ Type here 30% design package.

At least 20 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 REF in accordance with departmental advice and submit the final documentation to the Project Manager.

The final REF shall be forwarded to the Project Manager, as per the program mentioned in Clause 6.2.3 of Supplementary Conditions of Contract – Engineering Consultancy Scheme (Form C7554S),[[3]](#footnote-3) or with the @ Type here 80% design package if not stated elsewhere.

### @ Type here Review of Environmental Management Plan (Planning) (EMP(P))

|  |
| --- |
| @ Type here Project Manager: The EMP(P) should be reviewed when any approvals are received to ensure that the design and Contract documentation requirements of the approval are recorded. |

The outcomes of the REF and any project approvals are used to prepare an Environmental Management Plan (Planning). The EMP(P) provides recommendations for the project planning, design and Contract documentation that will avoid and mitigate the various environment and cultural heritage impacts identified in the REF.

The Consultant shall update the EMP(P) (that should have been prepared in previous stages) 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 of various departmental policies / manuals[[4]](#footnote-4) 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).

#### Review of EMP(P)

The Consultant shall ensure the EMP(P) is completed and provided in parallel with the Detailed Design deliverables. The Consultant shall ensure the EMP(P) is completed prior to @ Type here 30% design review and submitted to the Principal as part of the @ Type here 30% design package.

At least 20 business days shall be allowed for departmental officers to undertake a review of EMP(P) in the Consultant's program. The departmental Environmental Officer may meet with the Consultant to request amendments to the documents. The Consultant shall update the EMP(P) in accordance with departmental advice and submit the final documentation to the Project Manager.

The final EMP(P) shall be forwarded to the Project Manager as per the program mentioned in Clause 6.2.3 of Supplementary Conditions of Contract – Engineering Consultancy Scheme (Form C7554S)[[5]](#footnote-5) or with the @ Type here 80% design package if not stated elsewhere.

### @ Type here Concept Erosion and Sediment Control Plan (Concept ESCP)

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

For high erosion risk projects, the Consultant shall develop a Concept ESCP. The Concept ESCP shall:

* sufficiently identify and allow for cost of construction, maintenance and decommissioning of erosion and sediment controls within project cost estimate
* identify disturbed area and catchment area at clearing stage, at cut and fill, and final design formation
* calculate estimate soil loss for each catchment using RUSLE (Revised Universal Soil Loss Equation) for each stage
* determine the type of controls (Type 1, 2 or 3) for each catchment at each stage
* determine the number and approximate size of Type 1 controls for each catchment
* determine if additional land is likely to be resumed or negotiated for use in order for the Principal to have shown due diligence
* plan and design erosion and sediment controls that may have a dual function of Construction phase control and be permanent control during operation, and
* provide an estimate of costs for construction phase erosion and sediment control.

The Consultant shall prepare a Concept ESCP in accordance with International Erosion Control Associated Australasia Best Practice Sediment and Erosion Control Manual. The Consultant shall also consider the requirements of the department’s technical specification MRTS52 Erosion and Sediment Control to ensure suitability and applicability to the Construction phase.

The concept ESCP may be provided to the tenderers as part of the Construction Contract documentation. The Consultant shall ensure that sufficient information is provided within the Contract documentation, for the Contractor to be able to develop ESCPs in accordance with MRTS52 Erosion and Sediment Control.

#### Review of Concept ESCP

The Consultant shall provide a draft of the Concept ESCP to the Principal for review prior to finalisation. The draft Concept ESCP shall be provided with the @ Type here 80% design package if not specified otherwise. At least 10 business days shall be allowed for departmental officers to undertake a review of Concept ESCP in the Consultant's program. The department may meet with the Consultant to request amendments to the documents.

The Consultant shall update the Concept ESCP in accordance with departmental advice and submit the final documentation to the Project Manager.

### Legislative approvals and offsets

The Consultant will advise the Principal of the environmental and cultural heritage approvals required for the project. The Principal shall instruct the Consultant on which approvals to obtain on behalf of the project. The Consultant will consult with the other disciplines and Project Manager, as required, to obtain the necessary information for the approval applications.

Prior to submission to the administering authorities, the Consultant shall submit the approval applications to the departmental Project Environmental Officer and/or Cultural Heritage Officer and Project Manager for review and acceptance.

In drafting permit submission documents and the Contract, the Consultant shall ensure that the responsibility for all conditions and actions to be undertaken by the Contractor are clearly transferred to the Contractor. The Consultant shall seek advice from the Principal as to the devolution of responsibility when uncertain and add to the report for the Contract Administrator of the Construction Contract (see Clause 2.24).

Where offsets are determined or likely to be triggered, the Consultant shall inform the Project Manager. The Consultant will then be advised by the Project Manager whether they will be required to negotiate offset arrangements on behalf of the department. The Consultant shall develop strategies for offsets and submit these to the Project Manager to obtain approval. The Consultant must have offset plan signed‑off, or direct offsets paid prior to awarding of tender.

Design‑related approvals shall be obtained prior to the @ Type here 80% design package. The Consultant shall then be responsible for incorporating design‑related conditions into the design and Contract documentation prototype submitted as part of the @ Type here 100% design package.

### Environmental Design Report (EDR)

An EDR is required for all projects. The purpose of the EDR is to confirm the implementation of the recommended actions in the EMP(P). The EDR shall provide an audit trail that details how the requirements of the EMP(P) have been incorporated into the design and Contract documents through the relevant standard specification annexure and design drawings.

The Consultant shall prepare an EDR in accordance with the Environmental Processes Manual and Clause 6 of the Functional Specification Annexure.

The format of the EDR shall be as follows:

**Purpose**

* Provide a very brief description of the purpose of the document.

**Response to recommendations**

* Reference Number (taken from the EMP(P)) or MRTS Clause – this is to cross reference the recommended actions from the EMP(P) to the actions taken in the design.
* Design recommendations.
* Designer / Project Manager response.

The EDR shall be signed off by the Project Manager.

#### EDR Review

The Consultant shall prepare and submit a draft EDR as part of the @ Type here 80% design package to the Principal for review. At least 10 business days shall be allowed for departmental officers to undertake a review of the EDR in the Consultant's program. The department 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 the EDR has satisfactorily addressed departmental advice.

### Cultural Heritage

#### Cultural Heritage Agreements (CHFA, CHMA or CHMP)

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

The Consultant shall finalise any Cultural Heritage Agreements commenced during Preliminary Design in accordance with the department’s current Cultural Heritage Process Manual and the Cultural Heritage Agreements required, as outlined in C7559 Terms of Reference for Cultural Heritage Assessment.

If required Agreements have not yet commenced, liaise with the departmental District Cultural Heritage Officer and Project Manager to discuss and expedite this process.

#### Historical / European Heritage Approvals

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

The Consultant shall finalise any Historical / European Heritage Approvals commenced during Preliminary Design in accordance with the department's current Cultural Heritage Process Manualand the Historical / European Heritage Approval requirements as outlined in C7559 Terms of Reference for Cultural Heritage Assessment.

If required Approvals have not yet commenced, liaise with the departmental District Cultural Heritage Officer and Project Manager to discuss and expedite the process.

#### Cultural Heritage Inclusion in Construction Contract Documents

The Consultant shall ensure that cultural heritage requirements from the CHRA, CHFA, CHMA, CHMP, Historical / European Heritage Approvals and any other known requirements, are incorporated into the Construction Contract Documents (see section 2.16) as per C7559 Terms of Reference for Cultural Heritage Assessment.

### Environmental Management Plan (Site Investigations) (EMP(SI)) (Provisional Item, if ordered)

The Consultant will advise the Principal of the Site investigations, such as geotechnical investigations, soil sampling, or vegetation clearing, to inform project design. The Principal shall instruct the Consultant if an EMP(SI) is required for these activities. If instructed by the Principal, the Consultant shall develop and implement a suitable EMP(SI) prior to undertaking the Works. The EMP(SI) shall identify the potential environmental and cultural heritage impacts from Site investigations and mitigation measures and strategies to be implemented.

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.

Prior to commencing 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.

### Noise and Vibration Assessment

#### Operational Noise Assessment

|  |
| --- |
| Project Manager: delete if road traffic noise assessment is deemed unnecessary. |

The Consultant shall undertake a road traffic noise assessment in accordance with the Transport Noise Management Code of Practice – Volume*1.[[6]](#footnote-6)* The road traffic noise assessment from preliminary design shall be updated to be based on the detailed design.

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 design team and shall produce a Road Traffic Noise Assessment Report that complies with the requirements of the Transport Noise Management Code of Practice – Volume 1. An additional Road Traffic Noise Assessment Report shall be produced for public release (general overview with no references to addresses).

The minimum noise barrier height shall be 2.4 m. 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 noise barriers shall cover a reasonable angle of view from the receiver perspective, for example, does not terminate mid property boundary and extended for equity for a row of sensitive receivers in accordance with the requirements of Transport Noise Management Code of Practice – Volume 1.

The Consultant shall not advise any residents that noise barriers or any other noise amelioration measures are to be incorporated into the project, until advised in writing by the Project Manager that such measures are to be included in the project. All project communications shall be carried out via the Project Manager.

Once the Project Manager has accepted the noise amelioration measures to be incorporated into the project, community engagement shall be undertaken as per the Transport Noise Management Code of Practice – Volume 1, Road Traffic Noise. Where a noise fence is to be placed on the property boundary, the Consultant shall discuss the issue with the property owner.

If noise barriers are to be constructed on property boundaries (that is, all elements outside the property owner's land), the Consultant shall obtain a Permit to Enter and Construct Noise Barriers from each property owner (Refer to Appendix 8 the Transport Noise Management Code of Practice – Volume 1). The Project Manager will supply proforma permit documents. (This work will be treated as a variation to the Contract).

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 report shall be submitted to the Principal by the signing RPEQ and not the report author, unless they are the signing RPEQ.

|  |
| --- |
| Project Manager: may include reference to additional documents. For example Design Guide – Safety Barriers Sign Supports and Noise Barriers. |

The design shall include full construction details for all noise barriers.

#### Construction Vibration Assessment

|  |
| --- |
| Project Manager: delete if construction vibration assessment is deemed unnecessary. |

The Consultant shall undertake a construction Vibration Assessment in accordance with the department’s current Transport Noise Management Code of Practice*[[7]](#footnote-7)*– Volume 2. The Consultant shall also meet the requirements specified in applicable industry standards. The construction vibration assessment from preliminary design, shall be updated to be based on the detailed design.

The assessment shall be conducted and/or supervised by an RPEQ with relevant experience in vibration assessment for infrastructure projects. The report shall be submitted to the department by the signing RPEQ and not the report author, unless they are the signing RPEQ.

Vibration assessment, mitigation and management for Public Utility Plant (PUP) shall be as per Clause 2.6 and shall be excluded from the Transport Noise Management Code of Practice – Volume 2 assessment.

The Consultant's RPEQ (conducting the vibration assessment) shall consult with the design team to obtain expected details of construction. The Consultant will assess a range of different equipment sizes and methods (for example, different piling methods, multiple roller sizes, multiple hammer sizes, and so on) to determine if there are any restrictions / limitations to equipment selection to maintain safe working distances.

While vibration issues should be resolved in Preliminary Design, where a vibration issue arises, it is expected that the Consultant's RPEQ (conducting the vibration assessment) shall develop a solution to vibration issues in consultation with the design team and revise the vibration assessment to resolve any issues (for example, initial piling method is not suitable due to potential for damage to structures, etc and an alternative piling method is required).

It is the responsibility of the assessing Consultant's RPEQ (conducting the vibration assessment) to contact relevant asset owners and obtain their vibration criteria and other requirements. Vibration limits and requirements shall be requested by the Consultant's RPEQ (conducting the vibration assessment) in writing and all correspondence to and from the asset owner shall be appended to the report.

The Consultant's RPEQ (conducting the vibration assessment) will need to source information (via written correspondence) on the type, location, condition, and so on, of assets and summarise the information in their report. The information obtained by the Consultant's RPEQ (conducting the vibration assessment) shall be clearly documented in the assessment report.

The Consultant's RPEQ (conducting the vibration assessment) shall provide project specific vibration mitigation. Vibration mitigation shall be provided to ensure that safe working distances are maintained.

The Consultant's RPEQ (conducting the vibration assessment) shall prepare a Construction Noise and Vibration Assessment Report in accordance with Transport Noise Management Code of Practice – Volume 2. The Consultant's RPEQ (conducting the vibration assessment) shall summarise vibration issues, equipment restrictions, and so on, and ensure that they are included in the Constructability Audit.

Any enquiries received from the community by the Consultant, while conducting the assessment, shall be referred promptly to the Project Manager. All project communications shall be carried out via the Principal.

### Payment

The Lump Sum for Item No. DD 03 Environment and Cultural Heritage Management shall include all Works necessary to complete the EDR, obtain environmental approvals and offsets, the environmental design and all specifications, annexures, plans and so on, to manage environmental issues and associated consultation as specified in Clause 2.3 of this Functional Specification - Detailed Design.

## Public Consultation (Item No. DD 04 and DD 05)

The aims of the public consultation include:

* adding value to the decision‑making process by seeking public input into a wide range of issues, including but not limited to, environmental issues, social issues, traffic operations, and access that specifically relate to the project
* obtaining specific information for input into the design as defined in this Functional Specification - Detailed Design and in the following sections of the district's Code of Practice (where applicable):

|  |
| --- |
| Project Manager: include reference to relevant local documents. For example, Design Guide – Noise, Design Guide Design Vehicles and Curve Widening. |

* determining and reaching agreement with the local government on their contributions (refer Clause 2.4.1)
* 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
* liaison with property owners and others affected by resumption and limited access issues, as requested by the Principal
* keeping the agenda relevant to the project
* gauging public opinion (polling is not acceptable)
* seeking public comment on all issues relevant to the project, and
* keeping the public 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
* the 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 public consultation process, shall not convey the impression that they are employees of the department.

The Consultant shall continue with the public consultation based on the Public Consultation Model and Program (including public education and monitoring) developed and amended during the previous stages.

A focus during the Detailed Design stage is to provide general information to the public on the proposed Works.

Another focus will be on liaison with contiguous and other affected property owners to achieve practicable solutions, particularly on access, construction and accommodation Works issues.

### Local government contributions

The Consultant shall estimate and recommend local government contributions in accordance with the agreement Cost Sharing Based on Responsibilities within State‑controlled Roads[[8]](#footnote-8) 2000 version (included in Chapter 1 of the department’s current Roads Policy Manual).

The department's Project Manager will undertake most of the consultation with the local government about contributions. However, the Consultant will be required to:

* arrange appropriate meetings to meet the Consultant’s timing
* provide all necessary information including plans, estimates and so on, as required, to enable these discussions to occur, and
* accompany the Project Manager to meetings and so on, when requested (allow @ Type here visits in the offer).

### Permits

The Consultant shall obtain all necessary written agreements for:

* @ Type here Permit to Enter and Construct Noise Barrier on the shared property boundary (if applicable proforma permits can be provided through the Project Manager), and
* @ Type here Permit to Enter and Construct access or other facilities within properties (if applicable proforma permits can be provided through the Project Manager).

### Reporting

The Consultant shall update the Public Consultation Report produced during the Detailed Design stage by means of an appendix tabulating:

* an outline of the Public Consultation Model and Program (including public education and monitoring)
* effectiveness of the process and methods of monitoring used
* information on how the model (including public education and monitoring) was implemented and amended throughout the process to address the public's needs
* details of public involvement, how public input was considered
* details of specific issues raised and amount of interest in each issue
* details of the outcomes and conclusions
* information gathered to address the requirements defined throughout this Functional Specification, and
* details of public acceptance of the process adopted.

Any sensitive issues raised during the public consultation that may affect the implementation of the project, shall be highlighted in the Report for Construction Contract Administrator. This includes identifying properties whose owners may have specific concerns.

### Payment

The Draft Consultation Model included in the planner, identifies which aspects of public consultation shall be deemed to be covered in Item No. DD 04 Public Consultation (Fixed Fee), and which aspects are deemed to be covered in Item No. DD 05 Public Consultation (Time Rate).

The following Clauses of this Functional Specification - Detailed Design, include other consultation that is included in the Fixed Fee Item No. DD 04:

* Clause 2.4.5 Property Access
* Clause @ Type here @ Type here

The following Clauses of this Functional Specification - Detailed Design may include other consultation that is to be included in the Time Rate Item No. DD 05:

* Clause @ Type here @ Type here
* Clause @ Type here @ Type here

### Property access, fencing and other existing infrastructure property access

The Detailed Design stage allows for the design of routine property accesses not undertaken during the Preliminary Design stage. These should be of a simple nature (for example, providing a kerb cross‑over). All access work is detailed during this stage.

Unless determined otherwise during consultation with property owners, the design vehicle for property access is specified in the following:

|  |
| --- |
| Project Manager: include reference to local documents as relevant. |

Accesses should be designed to allow the design vehicle to enter the property without any part of the vehicle crossing the centre line of a single‑lane declared road, or the kerb lane of a multi‑lane declared road.

During the Preliminary Design stage, visibility to all existing accesses was examined, maximised and, where practicable, increased to meet minimum visibility standards or greater. This may have included shifting access locations, gates, and connecting to the existing access either within the property or within the road reserve.

#### Existing access limitation

Existing illegal accesses shall not be included in the design. Where access limited plans exist, the Consultant shall modify the plans to comply with the negotiated arrangements.

#### Existing gates and access

|  |
| --- |
| Project Manager: use the following Clause with caution. The department may not have the power to remove a gate because the property owner usually owns the gate. If in doubt, seek legal advice. Similar circumstances may apply to Clauses 2.4.5.3 and 2.4.5.4 below. |

Where no access is to be allowed after construction of a project and a gate or other access currently exists, the construction Contract shall provide for complete removal of such gate, and access, and so on.

#### Fencing

Where fencing is required (normally because of property resumption), the Consultant shall negotiate with the property owner on the type of fence required. Generally the department will only replace fences to a type equal to the existing fence type. A written agreement is required for the standard of replacement fencing.

#### Existing infrastructure

Where existing infrastructure in resumed areas or on the existing road reserve (for example, letter boxes, pumps, sheds) is to be relocated, the property owner shall be consulted, and a written agreement prepared for the relocation Works.

#### Consultation

Where it is proposed to alter the location, under drainage or existing grading style of accesses, or other infrastructure mentioned above, the Consultant shall discuss the proposed details with the property owner. Where it is necessary to construct within the property, the Consultant shall negotiate a written agreement to enter the property and construct the access with the affected property owner.

### Reporting

Any sensitive issues raised during these discussions or agreements (including Permits to Enter and Construct) with property owners that may affect the implementation of the project, shall be highlighted in the Report for Construction Contract Administrator on the form attached to PA041CP. This includes identifying properties whose owners may have specific concerns.

A copy of all Agreements will be included in the Report for Construction Administrator.

The Consultant shall also update the Property Access Report attached to the Planning Report and append the report to the Project Plan.

### Payment

All costs associated with consultation shall be paid for under Item No. DD 05 Public Consultation, with design, reporting and plan preparation paid for under Item No. DD 15 Road Design and Drawings.

## Hydraulic Analysis and Design (Item No. DD 06)

In this stage of the preconstruction process, hydraulic analysis and design is a continuation and finalisation of the work started in Preliminary Design. In addition, the Consultant is required to assess and design routine drainage structures and requirements, to meet the standards detailed in Clause 2 of the Annexure to this Functional Specification. This includes assessing hydraulic adequacy of all existing culverts to remain, including culverts under accesses.

Drainage shall meet the requirements of the department’s current Road Drainage Manual (2nd Edition).

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 flooding is affected by backwater, the Consultant shall undertake detailed hydraulic calculations for floods larger than the design flood and shall ensure that the proposed design does not worsen the existing situation.

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

* structures that do not meet environmental requirements (stream disturbance, fauna corridors) either in their proposed final layout or during construction (temporary damming, bunding, and so on)
* stream diversions
* designs that are calculated to cause excessive afflux when floods greater than the design immunity occurs (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 to potential damage during floods greater than the design immunity
* increase flooding frequency or severity in developed areas, and
* designs that are predicted to change the stream flow characteristics.

### Consultation

Where flooding or the environmental impact is considered a significant issue by the public or local residents, the Consultant shall display the proposed solutions for public comment or consult with local residents as applicable. This shall be carried out in close liaison with the Project Manager.

### Road surface drainage

Road surface drainage shall meet the requirements of Chapter 6, Approach to Drainage Design of the department’s current Road Drainage Manual.[[9]](#footnote-9)

### Reporting

The Consultant shall prepare a Hydraulic Analysis and Design Report. The design flow calculations, and culvert hydraulic calculations, shall be reported and appended to the Design Development Report (template available through the Project Manager). A tabular format may be acceptable for minor or simple culvert hydraulics. More detail shall be supplied for complex hydraulic problems.

|  |
| --- |
| Project Manager: include small project or large project Design Development Report as per the project requirements, available through, search on link: [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx) |

Where gullies or manholes are required, gully calculation results shall be summarised into a table that details at least catchment areas, arrival flows, capacities, bypass flows, grate level and water level in gully or manhole. The summary shall be included in the Hydraulic Analysis and Design Report (HADR).

Where kerbing or kerb and channel is used, a table of maximum flow widths shall be included in the HADR.

Aquaplaning calculations and flow paths shall be included in the HADR.

Any drainage issues that may affect the implementation of the project shall be highlighted in the Report for Construction Contract Administrator.

### Payment

All costs associated with consultation, hydraulic analysis and design, and plan preparation shall be paid for under the Fixed Fee Items:

* DD 05 Public Consultation
* DD 06 Hydraulic Analysis and Design
* DD 15 Road Design and Drawings

respectively.

## Public Utility Plant (PUP) (Item No. DD 07)

|  |
| --- |
| This Clause has been replaced by Public Utility Plant (PUP) Addendum to C7523 / C7524. 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)*)* |

All costs associated with consultation, assessment, design and documentation shall be paid for under the Fixed Fee Item No. DD 07 PUP.

## Lighting (Item No. DD 08)

Lighting designs shall be carried out by suitably qualified and experienced personnel who have been approved by Energex. To assist the Project Manager's design audit, the lighting contours shall be forwarded with the certified design. However, lighting contours will not appear on the final scheme plans.

All work associated with lighting installation shall be scheduled as part of the Construction Contract.

Where lighting is required, the Consultant shall provide both the Lighting Design and the Electrical Layout Design.

The Consultant's attention is also drawn to the requirements of local documents:

|  |
| --- |
| Project Manager: include reference to local documents. |

Lighting requirements are specified in Clause 3 of the Annexure to this Functional Specification.

### Future lighting

Where future lighting may be required within 15 years of construction (generally only painted Type B or C intersections), two ducts across the major road (one each side of the intersection) and one duct across the side road and associated pits shall be provided. These ducts and pits should be much further away from the intersection than future traffic signal ducts.

### Report for Contract Administrator

The Consultant shall include Energex's approval for point of supply with the Report for Construction Contract Administrator.

## Traffic Signals (Item No. DD 09)

When traffic signals are required, the Consultant shall supply full design details (including electrical design).

When steel poles are used for traffic signals, they shall be base mounted.

The Consultant's attention is drawn to local requirements:

|  |
| --- |
| Project Manager: include reference to local documents. |

### Red‑light camera

An existing red‑light camera is located at the intersection of @ Type here Street and @ Type here Street. The Consultant shall @ Type here (describe what is to happen - remove, retain and so on).

Where modification Works on red‑light cameras are required, such Work shall be scheduled as detailed in Clause 2.8.

Design of the amended requirements for Red‑Light Cameras shall @ Type here not be included in the design.

The Consultant's attention is drawn to local requirements:

|  |
| --- |
| Project Manager: include reference to local documents. |

|  |
| --- |
| Project Manager: a separate design brief and Construction Contract is normally required for a new installation at another Site. |

### Future traffic signals

|  |
| --- |
| Project Manager: nominate intersections that will require provision for future traffic signals likely to be required within 15 years. |

Traffic signals are likely to be required in the future at the following intersections:

@ Type here

The design shall provide adequate widths, median widths and so on, for future traffic signals with minimal reconstruction Works at such future time. Ducting and pits for future traffic signals shall be included in this Construction Contract.

### Payment

All costs associated with this Clause 2.8 shall be paid for under Item No. DD 09 Traffic Signals.

## Intelligent Transport Systems (ITS) (Item No. DD 10)

The Consultant shall finalise the design of IT requirements determined in consultation with Traffic Operations section of the district during the Detailed Design. In general, the following local requirements should be considered as the minimum:

|  |
| --- |
| Project Manager: include reference to local requirements. |

Table 2.9 – Local requirements

|  |  |
| --- | --- |
| Intelligent Transport | Consultation body |
| * Connection of all traffic signals into the department’s TRACS system. * CCTV. | * Traffic Operations section of North Coast Region Maroochydore * Traffic Operations section of North Coast Region Maroochydore |
| * Emergency phones. | * Traffic Operations section of North Coast Region Maroochydore |
| On the Sunshine Motorway and multi‑lane Bruce Highway projects, installation of or provision for:   * vehicle detector loops at 500 m centres * cameras at appropriate locations, and * electronic message‑boards at appropriate locations. | * Traffic Operations section of North Coast Region Maroochydore |
| * Weight‑in‑motion Site. * Heavy vehicle enforcement areas. | * Principal Engineer (Asset Management) in the planning section of North Coast Region at Maroochydore |

|  |
| --- |
| Project Manager: on projects with congested urban intersections, CCTVs are usually warranted to monitor and/or assist traffic control during construction. In many cases, CCTVs already exist. |

### Reporting

Any IT issues that may affect the implementation of the project, shall be highlighted in the Report for Construction Contract Administrator.

### Payment

All costs associated with the design of and associated plan work for IT devices shall be paid for under the time rate Item No. DD 10 Information Technologies.

## Signs (Item No. DD 11)

Proposed legends for all signs shall be forwarded to the Project Manager or at his / her direction to Traffic Operations section for approval at least 21 calendar days before approval is required.

All non‑standard road sign faces and footings for all road signs (including standard signs) shall be designed and included in the Construction Contract. They shall be presented in a format similar to that produced by the computer programs TraSiCad (for sign faces) and TraSiS (for sign footings).

### Construction sequence plans

Construction sequence plans are not required. Where the Consultant elects to prepare construction sequence plans, they shall not be included in the prototype documents.

### Payment

All costs associated with this Clause 2.10 shall be paid for under Item No. DD 11 Signs.

## Provision for Traffic and Sidetracks (Item No. DD 12)

|  |
| --- |
| Project Manager: evaluate what level of traffic control is necessary and modify if required. |

The district's requirements for provision of traffic and sidetracks is specified in:

|  |
| --- |
| Project Manager: include reference to local documents. |

When additional traffic counts, speed surveys and so on are needed, the Consultant shall request them in writing from the Project Manager, allowing at least four weeks for supply of data from date of request. Such request shall specify the location, acceptable days, times and duration of count and the type of information needed (traffic composition, pedestrians and so on).

### Construct under traffic (preferred where practicable)

Traffic control requirements shall be specified in accordance with local requirements:

|  |
| --- |
| Project Manager: include reference to local documents. For example, Proforma Provision for Traffic Annexure. |

Should the existing carriageway need any temporary widening to enable the road to be constructed under traffic, full details as defined in Clause 2.14.2 following shall be provided.

### Construct sidetracks

Where sidetracks are required, the Consultant shall fully design and specify the sidetracks as detailed in:

|  |
| --- |
| Project Manager: include reference to local documents. |

### Report for Contract Administrator

A Construction Traffic Management Report detailing provisions for traffic (lane closures, sidetracks, and so on), reasons for limitations on lane closures, working hours, assumptions for the design of sidetracks (flood immunity, alternate routes, traffic loadings, and so on), and others shall be attached to the Report for Construction Contract Administrator.

### Payment

All costs associated with preparing the report shall be provided for in the Fixed Fee Item No. DD 12 Provision for Traffic and Side Tracks.

All costs associated with the design and preparation of plans details shall be provided for in the Fixed Fee Item No. DD 15 Road Design and Drawings.

## Landscaping (Item No. DD 13)

### Landscape assessment

The Consultant shall validate the landscape assessment conducted in the previous stages, to confirm its accuracy and applicability relative to the Detailed Design. Where necessary, the Consultant shall include an addendum to the landscape assessment to update the document to ensure the content remains relevant / current.

A principle objective of the landscape assessment 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 Consultant shall consider, reflect and enhance the existing landscape context along adjacent road sections.

### Landscape design and drawings

The Consultant shall prepare detailed landscape and urban design plans in accordance with the Drafting and Design Presentation Standards Manual, Volume 2 and Part B2 and Part C of the department’s current Road Landscape Manual.[[10]](#footnote-10) The absolute minimum scale shall be typically identical to civil design layout plans. Plans will clearly illustrate design constraints which impact on the design, such as clear zones, sight visibility, retained and new services.

The Consultant shall make provision for revegetation of all exposed batters, drainage devices and areas of anticipated disturbance beyond the road formation. The Consultant shall also make provision for the urban design treatment of structures (overpasses, noise barriers, retaining walls for instance) relative to project scale, budget and Site context. A ‘whole of life’ outcome should be considered in determining landscape and urban design treatments. Higher capital costs may be justified in some areas to minimise the risk of environmental nuisance or harm and reduce future maintenance costs / traffic control. The Consultant shall recommend the most appropriate method for the Project Manager's approval.

In addition, special beautification landscaping of specific areas (local roads, pocket parks on departmental land for example) may be required by the local government. This, however, will be at the local government's expense and/or maintenance responsibility. The issue of landscaping shall be raised with local government as part of the negotiations for Local Government Contribution and shall be covered in a cost share agreement with local government.

The Consultant shall prepare all final Contract documents, including annexures related to MRTS16 Landscape and Revegetation Works(MRTS16.1) and identification of materials to be retained during stripping and grubbing operations, if applicable, MRTS04 General Earthworks (MRTS04.1, topsoil and mulch).

The Consultant shall include a Landscape Assessment @ Type here Opinion @ Type here Report in accordance with the department’s current Road Landscape Manual with the REF. The assessment shall include a Landscape Integration Strategy and be set out in the format as required by the department’s current Road Landscape Manual.

The Consultant shall also make provision of the following preliminary management plans in accordance with Part B2 of the Road Landscape Manual:

|  |
| --- |
| Project Manager: for remote and large‑scale projects (particularly at Sites with known high‑risk soils), and if one was not developed at Preliminary Design, consideration should be given to requiring the Consultant to make provision for a Preliminary Soil Management Plan. This will assist in the early identification of associated soil risks, mitigation strategies and ensure allowances are made for supply of ameliorants under the design and cost estimates. |

|  |
| --- |
| Where the project value is > $100M, the project will be required to undertake an Infrastructure Sustainability Council of Australia (ISCA) rating. The Consultant shall incorporate the Infrastructure Sustainability Rating Scheme requirements of urban design credits and others where applicable, into the methodology and deliverables for the landscape and urban design deliverables. |

### Consultation

The Consultant shall discuss landscaping with the local authority, environmental authorities, land care groups, local conservation groups and interested local residents.

### Reporting

Where landscaping and urban design differs from the preferred treatment detailed in local documents:

@ Type here

@ Type here

|  |
| --- |
| Project Manager: include reference to local documents. |

The Consultant shall attach a justification for such treatment to the Design Development Report. Link to [*Design Development Reports (Large Projects, Small Projects) – Road Planning and Design Manual*](https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-planning-and-design-manual-2nd-edition.aspx).

Any landscaping and urban issues that may affect the implementation of the project shall be highlighted in the Report for Construction Contract Administrator.

### Payment

All costs associated with this Clause 2.12 shall be paid for under Item No. DD 13 Landscaping.

## Geotechnical Investigation, Analysis and Reports (Item No. DD 14)

The Consultant shall review the various geotechnical reports provided with the Planning Report and any perceived deficiencies shall be raised with the Project Manager.

At the completion of geotechnical Works or by the time that the final design is handed over, the Consultant shall:

* deliver, properly labelled, all samples and drill core associated with their Works to the department's Project Manager for its assessment by the department’s Materials Laboratory Services.

If requested, the Consultant shall provide an officer with in depth project knowledge, to be present during the core inspection and Construction Contract tendering process. This will be paid for as a variation.

### Reporting

Supplementary reports shall be produced to address any changes to the original:

* Pavement Design Report
* Bridge Foundation Report, and
* General Geotechnical Report

prepared for the Planning Report.

### Payment

Additional geotechnical investigation will be paid as a variation. Additional analysis and reporting will be carried out as part of Item No. DD 14.

## Road Design and Drawings (Item No. DD 15)

The Consultant shall design the road (including any temporary connections) in accordance with current departmental manuals and engineering notes, Manual of Uniform Traffic Control Devices, Austroads Standards and the district's local requirements:

|  |
| --- |
| Project Manager: include reference to local documents for example Preconstruction Administration Code of Practice. |

Temporary connections shall be provided outside the job extents specified in the project Business Case and shall be designed to suit construction of future adjacent Works and minimise waste. Design speed of temporary connections shall match adjacent sections of road. The design life of temporary connections is specified in Clause 4 of the Annexure to this Functional Specification.

All drawings shall meet the drafting standards contained in the department’s current Drafting and Design Presentation Standards.*[[11]](#footnote-11)* To assist the Project Manager's design audit, intersection pavement contours and lighting contours shall be forwarded with the certified design. However, lighting contours will not appear on the final scheme plans.

The Fixed Fee Item No. DD 15 Road Design and Drawing covers the cost for preparation of all plans in the final Contract documents.

### Safety barriers

Evaluate the need for safety barriers based on the department’s current Road Planning and Design Manual*[[12]](#footnote-12)* using the department’s Roadside Impact Severity Calculator (RISC) software. A report justifying the need for omission of guardrail, shall be attached to the Design Development Report template.

The Consultant’s attention is drawn to the analysis and reporting requirements as noted in Volume 3, Part 6: Roadside Design, Safety and Barriers available as a part of the Road Planning and Design Manual.

### If ordered items (delete Clause content if not used)

Where quantities are scheduled as 'if ordered', the designer shall indicate in the schedule and on the plans the predicted locations of the 'if ordered' items and the treatment allowed for each location.

### Specifications and annexures

The district has proforma Supplementary Specifications and annexures to the department’s current Specification (Measurement) (MRS) which indicate the district’s normal responses to some issues, which often arise throughout a project.

As these proforma documents are regularly updated to reflect current best practice, it is imperative the Consultant requests the current version of the documents immediately before they are required for the Construction Contract documentation.

The Consultant shall edit the proforma documents for incorporation into the Certified Project Documents.

### Reporting

The Consultant shall include unusual or unique design aspects in the Report for Construction Contract Administrator.

### Consultation

The Consultant shall display and consult with the public, various aspects of the design throughout the development phase. This includes but is not limited to access details, intersection details, noise barriers, batter protection treatment, environmental treatments, bridge proposals and so on.

### Electronic design models

The Consultant shall develop electronic models of the approved design that meets the requirements of Clause 10.3 of the Supplementary Conditions of Contract – Prequalified Consultants (Form C7554) and the BIM Exchange Information Requirements (EIR).

The electronic models shall be supplied to the department via a digital data transfer methodology as agreed with the Principal and defined in the Design BIM Execution Plan.

### Payment

All costs associated with this Clause 2.14 shall be paid for under Item No. DD 15 Road Design and Drawings.

## Bridge Design Models and Drawings (Item No. DD 16)

This item continues the Work undertaken during Preliminary Design, finalising the design plan presentation of the design. The Consultant shall design all bridges to meet the department’s Design Criteria for Bridges and Other Structures*[[13]](#footnote-13)* and to meet the requirements of local standards:

|  |
| --- |
| Project Manager: include reference to local documents. |

Steel schedules shall be provided.

### Bridge Design Models

Bridge Design Models are to be developed in line with the department's BIM for Bridges Design Manual to provide an Asset Model of the Structure, containing relevant information and data captured throughout the delivery stages, allowing the department to manage the asset efficiently and effectively. The preparation of the BIM model will also assist the department in construction planning, design verification and coordination, throughout delivery of the project. The BIM model aids in the collaboration and interface management between the road design and other technical disciplines.

### Payment

All costs associated with this Clause 2.15 shall be paid for under Item No. DD 16 Bridge Design Models and Drawings.

## Contract Documents (Item No. DD 17)

Where these documents refer to a Transport Infrastructure Contract – Construct Only, this shall be deemed to include a Construction Contract for both the road and any associated bridge structures.

The Principal shall provide the Consultant with electronic copies in MS Word format of the following departmental and proforma district documents:

* Transport Infrastructure Contract – Construct Only Annexures
* Specification Annexures, and
* Supplementary Specifications.

These are supplied for the Consultant's assistance and will require careful editing by the Consultant to ensure they are job specific and suitable for a Construction Contract. Superfluous text shall be removed.

The Consultant shall prepare final documents based on the above for the type of Contract specified in Clause 1 of the Annexure to this Functional Specification.

Prequalification levels for Construction Contractors shall be determined from the current Transport Infrastructure Project Delivery System*[[14]](#footnote-14)* Volume 1. Consultants who do not have access to a copy of this document must contact the Project Manager.

A separable portion shall be included if specified in Clause 1 of the Annexure to this Functional Specification. The Consultant shall prepare and attach to the construction Contract documents, the factors considered to arrive at the prequalification level.

### Reporting

The Consultant shall highlight any unusual specifications and the reasons for them in the Report for Construction Contract Administrator.

### Payment

All costs associated with this Clause 2.16 shall be paid for under Item No DD 17 Contract Documents.

## Risk Mitigation and Record (Item No. DD 18)

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

### Detailed risk identification

The Consultant shall:

* review and confirm the risk factors identified in the Risk Management Plan compiled as part of the Preliminary Design stage
* identify other risk factors that may have arisen because of:
* further refinement of project planning
* changes to the scope of the project
* discussions / negotiations with the customer, and
* delays or issues when obtaining environmental and cultural heritage approvals or agreements.
* access the probability of occurrence of each of the risk factors now identified
* delete previously identified risk factors which are no longer relevant. This may occur because of an event happening, which makes the risk factor a constraint, or as a result of events being overcome by the passage of time, and
* assign a likelihood of occurrence against each risk factor.

### Detailed assessment of impact

During the previous stages of this project, detailed assessment of the impact on the project was conducted in conjunction with the Detailed Risk Identification considering the following:

* how the project would be affected should the risk arise, in the areas of:
* time
* cost
* quality, and
* customer perception.

The Consultant is required to review Preliminary Design Assessment and shall assess the impact of new (if any) risks identified during the Detailed Design.

### Risk response options

The Consultant shall identify or review options for particular courses of action that may minimise, transfer, or negate either the occurrence or the impact of the identified risk factors by addressing the following for each:

* when is the risk situation likely to occur?
* what can be done if it does occur?
* what are the possible courses of action available if it does occur?
* what pre-planning can be undertaken ahead of the risk occurring?
* develop contingency plans to address the risk, and
* develop a schedule for monitoring and control of each risk factor.

### Risk Management Plan

The Consultant shall update the Risk Management Plan on the issues mentioned above, including the department’s template for Risk Record (the Project Manager is to provide the template). This report shall be a living document and issues will be discussed and updated at progress meetings when necessary. The Risk Management Plan will be appended to the Project Plan and will form the basis for ongoing project risk management.

### Payment

All costs associated with risk mitigation and record shall be allowed for in Item No. DD 18 Risk Mitigation and Record.

## Calculation of Benefit Cost Ratio (BCR) (Item No. DD 19) (if ordered)

There are two scenarios:

1. Benefits unchanged and cost refined

* The consultant shall recalculate the BCR based on the original benefits and the revised cost.

1. Benefits significantly altered and cost refined

* The Consultant shall seek the Project Manager's approval to recalculate the BCR. If ordered, the Consultant shall recalculate the benefits and the BCR 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)*)*

For scenario (i), the cost of recalculating the BCR using the original benefits, shall be included in the cost of the compilation of the Design Development Report template. (Item No. DD 20).

For scenario (ii), where the Project Manager orders the BCR to be recalculated, recalculation of the BCR shall be paid for under the 'if ordered' Calculation of BCR (Item No. DD 19).

## Detailed Estimate of Cost (Item No. DD 20)

The Consultant shall prepare a detailed estimate for the recommended option (+/-10%) using estimated quantities and basic cost estimating, in accordance with the department’s current Project Cost Estimating Manual[[15]](#footnote-15) and local requirements:

|  |
| --- |
| Project Manager: include reference to local documents, for example, Code of Practice Design Guide – Estimate and Schedule. |

The estimate shall include:

* Preconstruction Cost, including:
* Concept phase, and
* Development phase
* Implementation (Construction) phase Costs
* Principals Materials, and
* Contingencies Allowance.

### Principal's materials / works

The Consultant's attention is drawn to local requirements:

|  |
| --- |
| Project Manager: include reference to local documents. |

Unless advised otherwise by the Project Officer, Principal's materials / Works normally only include the following:

* supply of bitumen excluding any modified bitumen product
* relocation of PUP (unless otherwise approved by the Project Manager, only one relocation of each service is to be undertaken)
* line marking
* removal of existing traffic signal and red‑light camera above ground Works
* installation of traffic signals and red‑light camera above ground Works
* rate 2 lighting, and
* fees that must be paid by the department.

An appropriate Supplementary Specification for Co‑ordination of Works shall be drafted for all relocation of public utility work that is scheduled as Principal's Materials.

### Excess materials

The department does not wish to retain excess materials from construction projects. Where existing signs, culverts and so on are to be removed, they shall be disposed of by the Contractor.

This does not apply to excess topsoil, chip mulch, and other items that can be used within the project to enhance the final product. Excess topsoil and chip mulch shall be used to uniformly increase the depth of these materials throughout the project.

### Reporting

#### Project plan

The estimate for the local government's contribution shall be attached to the Project Plan.

#### Design Development Report

The Consultant shall attach to the Design Development Report:

* estimates of cost (including any cost sharing arrangements), and
* risk analysis calculations supporting the contingencies allowance.

### Payment

All costs associated with providing the estimate of cost on an ongoing updated basis, shall be provided for in Item No. DD 20 Detailed Estimate of Cost.

## Reporting

A copy of all statutory approvals (identified under Item No. DD 03 Environmental Management) shall be attached to the Project Plan and the Report for Construction Contract Administrator.

## Design Development Report (Item No. DD 22)

The Consultant shall finalise the Design Development Report. It is intended this report presents the technical aspects of the project. The Consultant shall use the Design Development Report template for this purpose.

### Payment

All costs associated with this Clause 2.21 shall be paid for under Item No. DD 22 Design Development Report.

## Project Plan (Item No. DD 23)

The Consultant shall prepare the Project Plan, using the department's current OnQ Project Plan template. Electronic copies of the Project Plan template are available from the department's Project Manager.

In addition to the above requirements, the Project Plan shall be compiled in accordance with this Functional Specification - Detailed Design, Clause 3, Deliverables.

### Payment

Payment for Works associated with the finalisation of the Project Plan template and the correlation of the various reports / attachments, shall be made under Item No. DD 23 Project Plan. Payment for the compilation of the various reports / attachments shall be made under their respective item.

## Road Safety Audit (Item No. DD 24)

### Road safety audit of design

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

The audit shall be carried out on the initial Certified Prototype Design and Contract documents. Should the initial Certified Prototype Design require amendment, a further audit shall be carried out on the final prototype scheme plans and Contract documents. The auditor must also be registered as Senior Safety Auditor on the department’s registration system[[16]](#footnote-16).

### Certification

In addition to the requirements of the above documents, the road safety audit must include a statement certifying that the final prototype scheme plans, and Contract documents are the plans and documents that were audited.

### Payment

All costs associated with this Clause 2.23 shall be paid for under Item No. DD 24 Road Safety Audit (Detailed Design stage).

## Report for Construction Contract Administrator (Item No. DD 25)

The Consultant shall prepare an appropriate handover report for the Construction Contract Administrator addressing the following:

* sensitive cultural heritage and environmental issues
* sensitive public consultation issues
* negotiations with adjacent property owners plus cross reference to any agreements
* sensitive drainage issues
* justification for construction sequence plans (if required)
* justification for provision of traffic requirements
* sensitive landscaping issues
* methodology used to calculate the scheduled quantities (or the actual calculations) including assumptions made to assist the Contract Administrator certify quantities for payment - refer to MRS01 Specification (Measurement)
* calculations for topsoil quantities including basis of assumptions
* unusual design aspects or unique design aspects not to be amended in the field
* cross reference geotechnical reports and highlight potential problem areas
* unusual specifications and the reasons for them
* all statutory approvals
* any other issues which should be brought to the attention of the construction Contract Administrator
* other issues
* scheduled items, including 'if ordered' items and unusual items
* annotated cross sections (if not included in the Contract documents)
* data on Principal's materials or Works including PUP Works, traffic signals and red‑light cameras and so on
* copy of estimate for the Local Government's Contribution and correspondence with the local government, and
* issues to be discussed at the prestart meeting.

The following reports, permits, and so on shall be appended to, or cross referenced by the report:

* all addendums prepared or finalised since the planning report was completed (addendums to REF, EMP, Public Consultation Report, Geotechnical Reports and other reports as applicable)
* CHRA, Cultural Heritage Agreements and Historical / European Approvals
* EDR
* agreements with property owners to construct accesses
* agreements with property owners on types of fences along resumption boundaries
* any other agreements with property owners
* construction sequence plans (if any)
* copy of all statutory approvals
* report on status of PUP relocations including drawings, specifications alignment approvals, indicative timeframes, cost estimates as required
* offers for relocation of PUP
* Energex's agreement for point of supply for lighting, signals and other electrical Works
* written offer for installation of traffic signals
* Construction Traffic Management Report
* Risk Management Plan
* Construction Program, and
* copy of Resumption and Limitation of Access Plans.

The Consultant's attention is drawn to local requirements:

|  |
| --- |
| Project Manager: include reference to local documents. |

for more detail on the requirements for the Report for the Construction Contract Administrator.

The report shall be attached to the Project Plan in a form suitable for easy removal / copying for handover to the Construction Contract Administrator.

### Payment

Payment for Works associated with preparing the report and the correlation of the various reports / attachments shall be made under Item DD 25 Report for Construction Contract Administrator. Payment for the compilation of the various reports / attachments shall be made under their respective item.

## Project Construction Considerations (Item No. DD 26)

### Constructability audit

The Consultant shall conduct a constructability audit of the preferred option.

The review shall include detailed analyses of:

* provision for traffic (including sidetracking, detours and so on)
* provision for pedestrians
* evaluation of the impact of PUP relocation (including impact of delays)
* construction safety (road users and construction workers)
* the feasibility of the proposal (can it be constructed), and
* can the project to be economically constructed

The Auditor shall be an RPEQ Registered Professional Engineer Queensland) with over 10 years’ experience in road construction of projects of similar scope to this project. The Auditor shall be independent from the design team.

### Reporting

The review shall be presented in a similar format to a road safety audit and shall identify the schedule item, the issues to be examined, the project, the reviewer, the date of review and shall have a section to identify that the issue has been checked and another section for comments. The Constructability Audit Report shall be appended to the Project Plan.

### Construction program

The Consultant shall produce a construction program (in Primavera P6 format and provide a copy to the departmental Project Manager) and determine a realistic 'Time for Practical Completion' (Refer interpretation and so on, in the General Conditions of Contract for a Transport Infrastructure Contract – Construct Only). The Program shall be sufficiently detailed to cover the major construction aspects and critical path. The Construction Program shall include notes, typical production rates and so on, justifying the 'Time for Practical Completion'.

### Reporting

The construction program shall be appended to the Project Plan.

### Submit Certified Prototype Design for Audit

The Consultant shall forward the deliverables specified in Clause 3 of this Functional Specification - Detailed Design at the Submit Certified Prototype Design for Audit (including the Project Plan and the Design Development Report) Milestone (Form C7561).

The plans should be A3 or half size (whichever is the larger) and on white paper for this initial submission. Plans shall be entirely printed in black, excluding property boundaries and property descriptions which shall be in red.

After the Project Manager has completed an audit on the Certified Prototype Design, a meeting shall be arranged to discuss the results of the audit.

The Performance Report - Finalisation of Service (Form C7561.3) shall be partly based on this audit as well as performance during the execution of the Contract.

### Submit Certified Final Design and Accompanying Documentation Milestone

Following the audit meeting, the Consultant shall modify and resubmit the deliverables specified in Clause 3 of this Functional Specification - Detailed Design at the Submit Certified Final Design and Accompanying Documentation Milestone.

The Consultant shall confirm in the covering letter that all statutory approvals necessary to permit construction of the project have been obtained (excluding permits that must be obtained by the Contractor) and that the design satisfies the requirements of the Invitation for Offer amended as necessary in consultation with the Project Manager.

Three sets of plans are required:

* one signed and certified A3 or half size (whichever is the larger) and on polyester film or rag‑based tracing paper. Plans shall be entirely printed in black, excluding property boundaries and property descriptions which shall be in red
* one full size set of plans A1, A2 or larger on white cartridge paper. Plans shall be entirely printed in black, excluding property boundaries and property descriptions, which shall be in red.
* One electronic copy to be supplied via a digital data transfer methodology, as agreed with the Principal.

## Building Information Modelling (BIM) (Item No. DD 27)

|  |
| --- |
| Project Manager: this item is required where the Project Business Case meets the criteria set down by the Queensland Government that states all major government construction projects >=$50M, which commenced 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 Building Information Modelling (BIM) for Bridges Design Manual. |

### General

The department has adopted the BIM 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 the information captured throughout the project's design development phases, including the Preliminary Design phase.

BIM processes must be implemented during the Detailed Design development phase of the project including:

* create, manage and implement a BIM Execution Plan that meets the requirements outlined in the department's BIM Exchange Information Requirements (EIR), and
* use 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 Design BIM Execution Plan addressing the following:

* project objectives and goals
* BIM protocols (roles, responsibilities and obligations)
* Experience of BIM leadership staff
* outline the Common Data Environment systems used to manage the capture of Project Information Requirements and the collaboration protocols put in place to ensure data integrity during project delivery
* hardware requirements and software selections, file format, file exchange requirements
* relevant industry standards applied in developing and executing BIM for the project
* schedule of BIM activities including milestones and submittals
* process to communicate the design to project key stakeholders
* file folder structure and file naming conventions
* plan for file sharing, storage, retrieval and data security
* methodology for ensuring the validation of BIM and CAD files, project‑wide.
* communication and collaboration strategies among the Consultant’s design team and with the Consultant’s BIM Manager and Administrator
* specific uses of BIM
* Model Level of Development Matrix requirements (LOD), and
* 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 BIM applied to the project
* schedule of BIM 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 having 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).
* 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
  + 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.

### Payment

All costs associated with consultation and preparation of the BIM Execution Plan and its deliverables shall be allowed for in Item No. DD 27 Building Information Modelling (BIM).

## Additional Detailed Design Requirements (Item No. DD 28) (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 Project Manager.

The Offeror 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.

|  |  |
| --- | --- |
| DD 28 – Additional Detailed Design Requirements (if ordered) | @ hours |

The Consultant shall determine an appropriate split of the hours between their staff and shall nominate such allocation in its Fee Basis Statement – refer to Clause 3 of Supplementary Conditions of Offer.

# Deliverables

The Consultant shall produce one original and two copies of the following deliverables to complete the Detailed Design stage.

Project Plan and attachments:

|  |  |
| --- | --- |
| Review of Environmental Factors | (Refer Clause 2.3.2) |
| Environmental Management Plan (Planning) | (Refer Clause 2.3.3) |
| Environmental Design Report | (Refer Clause 2.3.6) |
| Cultural Heritage Agreements  Historical / European Heritage Approvals | (Refer Clause 2.3.7.1)  (Refer Clause 2.3.7.2) |
| Road Traffic Noise Assessment Report | (Refer Clause 2.3.9.1) |
| Construction Vibration Assessment Report | (Refer Clause 2.3.9.2) |
| Public Consultation Report | (Refer Clause 2.4.3) |
| Property Access, Fencing and so on including written agreements | (Refer Clause 2.4.5) |
| Hydraulic Analysis | (Refer Clause 2.5) |
| Public Utility Plant | (Refer Clause 2.6) |
| Landscaping | (Refer Clause 2.12) |
| Pavement Design Report | (Refer Clause 2.13.1) |
| General Geotechnical Report | (Refer Clause 2.13.1) |
| Safety Barrier Report | (Refer Clause 2.14) |
| Risk Management Plan | (Refer Clause 2.17) |
| BCR analysis | (Refer Clause 2.18) |
| Basic Cost Estimating | (Refer Clause 2.19) |
| Estimate of Cost | (Refer Clause 2.19) |
| Local Government Contribution | (Refer Clause 2.19) |
| Road Safety Audit (Detailed Design Stage) | (Refer Clause 2.23) |
| Constructability Audit | (Refer Clause 2.25.1) |
| Relevant Correspondence | |
| Other pertinent Data | |
| Bridge Foundation Report | (Refer Clause 2.13.1) |
| Bridge Site Report | |
| Report for the Construction Contract Administrator | (Refer Clause 2.24) |
| BIM Execution Plan | (Refer Clause 2.26) |
| 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 2.26) |

Certified Scheme Prototype including Transport Infrastructure Contract – Construct Only Documents and attachments:

|  |
| --- |
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| Supplementary Conditions of Contract - Annexure |
| Standard Documents List |
| Project Specific Documents (Supplementary Specifications) |
| Other Documents |
| Specification Addenda |
| Material Lists |
| Modified Standard Drawings and Specifications |
| Engineering Drawings as per the Drafting and Design Presentation Standards Manual |
| Annotated Cross Sections (where requested) |

In addition to the hard copy of all prototype 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.

1. [*https://infrastructure.gov.au/roads/publications/index.aspx*](https://infrastructure.gov.au/roads/publications/index.aspx) [↑](#footnote-ref-1)
2. [*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-2)
3. [*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-3)
4. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx) [↑](#footnote-ref-4)
5. [*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-5)
6. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Transport-noise-management-code-of-practice.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Transport-noise-management-code-of-practice.aspx) [↑](#footnote-ref-6)
7. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Transport-noise-management-code-of-practice.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Transport-noise-management-code-of-practice.aspx) [↑](#footnote-ref-7)
8. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Cost-sharing-based-on-responsibilities-within-state-controlled-roads.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Cost-sharing-based-on-responsibilities-within-state-controlled-roads.aspx) [↑](#footnote-ref-8)
9. [*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-9)
10. [*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-10)
11. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Drafting-and-design-presentation-standards.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Drafting-and-design-presentation-standards.aspx) [↑](#footnote-ref-11)
12. [*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-12)
13. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Bridge-design-and-assessment-criteria.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Bridge-design-and-assessment-criteria.aspx) [↑](#footnote-ref-13)
14. [*http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/TIPDS.aspx*](http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/TIPDS.aspx) [↑](#footnote-ref-14)
15. [*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-15)
16. [*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-16)