Design Development Report (Large Projects)

The purpose of this form is to progressively document design inputs and details as they become available and are approved. The form is an attachment to the Options Analysis, Business Case, Preliminary Design and Scheme Prototype at their current state of completion. Please select which stage of completion this form is at below.

This form is applicable to high risk or complex projects.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Options Analysis | Business Case | Preliminary Design | Detailed Design | Scheme Prototype |
| (Please select one above) |
| Project nameRoad infrastructureThe Design Development Report is a companion form to the approval templates Options Analysis/Business Case, Preliminary Design and Scheme Prototype, as relevant. The form must be progressively completed for approval purposes at the appropriate project development stage. |
| **District / Region** |  | **Local government** |  |
| **Road name** |  |
| **Location** |  |
| **Project number** |  |
| **Project / DMS No** |  |
| **Program** |  |
| **Work description** |  |
| **Document control sheet – contact for enquiries and proposed changes**  |
| If you have any questions regarding this document or if you have a suggestion for improvements, please contact: |
| **Project Manager** |  |
| **Phone number** |  |

|  |
| --- |
| **Version history** |
| **Version no.** | **Date** | **Changed by** | **Nature of amendment** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Design Development Report**

**Establishing design input details**



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# Introduction

All sections are to be completed or noted not applicable (N/A). Any additional information is to be included as an attachment.

## Purpose

The purpose of this document is to progressively document design inputs and details as they become available and are approved. The form is an attachment to each of the phase stages, e.g. Options Analysis, Business Case, Preliminary Design and Detailed Design, including any design variations during the construction period. At the end of each phase stage the Design Development Report is to be electronically stored in the job folder, e.g. Design Development Report – Business Case. This records the status of the information at the time of completion of the phase stage concerned.

## References

### Standard Transport and Main Roads references

This item lists reference documents including reports on previous investigations, studies, consultations and data gathering processes, e.g. brief, geotechnical, environmental, hydraulic, Native Title, property details, etc.

|  |
| --- |
| Insert Transport and Main Road references |

### Other references

This item lists reference documents including reports on previous investigations, studies, consultations and data gathering processes, e.g. brief, geotechnical, environmental, hydraulic, Native Title, property details, etc.

|  |
| --- |
| Insert references |

## Definitions

Define in the table below any term which the target audience may not understand, including specific terms, abbreviations and acronyms not covered in the standard Transport and Main Roads manuals, listed in section 1.2.

|  |  |
| --- | --- |
| Terms, abbreviations and acronyms | Meaning  |
| Constructability | Ensuring the infrastructure can be constructed using the available level of technology (knowledge, skills, materials and equipment) at the site concerned and within specified constraints, e.g. maintaining specified traffic requirements during the construction period. |
| Deliverable | A deliverable is the physical outcome of a task resulting from applying defined processes to a set of inputs. A deliverable is a measurable, tangible, verifiable item produced as part of a project. |
| Context Sensitive Design | Context Sensitive Design is described in the *Road Planning and Design Manual Volume 1 – Legislation and Design Philosophy* and the *Austroads Guide to Road Design – Part 2.* |
| Corporate objectives (strategic fit) | The corporate strategy adopted to maintain / upgrade the link concerned. |
| Notional pavement design | An initial pavement design based on appropriate investigations and testing of available materials for the purpose of developing a reliable pavement cost estimate for the concept estimate. |
| Project | A project is defined as "a temporary endeavour undertaken to create a unique product, service or result". |
| Project management | The planning, organising, monitoring and controlling of all aspects of a project in a continuous process to achieve its objectives, both internal and external. It is a discipline requiring the application of skills, tools and techniques and the balancing of competing demands of product or service specification, time and cost, within prescribed constraints. |
| Work activities | Work components of a project that are necessary to deliver a unique product, service or result. |
| Work management | The management of project deliverables in order to meet stakeholder needs and expectations from a project. |
| Work package | A clearly identifiable individual element of work identified in a project Work Breakdown Structure (WBS), e.g. geotechnical investigation. |
| Design review | An activity undertaken to ensure that each phase step of the design is aligned to the specified project outcomes so that overall fitness for purpose is achieved. The review should focus on those issues that are necessary to achieve project objectives, e.g.:* Corporate objectives (strategic)
* Required functionality (integration with other activities within and adjacent to the road reserve)
* Traffic operations (functionality and traffic operational efficiency)
* Technical standards (safety, economical solution, environmental sustainability)
 |

# Project requirements

The implementation of a project will deliver a range of outcomes varying from satisfying environmental considerations to operational performance of the completed infrastructure. It is very important that all required outcomes are achieved and in this respect this section describes and articulates these requirements to ensure the designer develops the 'right' solution.

## The need for the project

|  |
| --- |
| Describe the problem that this project is expected to fix. |

## The corporate objective (strategic fit)

|  |
| --- |
| Describe the corporate objective of the link this project needs to satisfy. |

## The required functional (operational) outcomes

|  |
| --- |
| The functional outcomes will normally be expressed in terms of capacity, delays, functionality of the network, safety, etc. For this project the required outcomes are: |
| Copy from project proposal and insert here. |

## Design intent (objectives)

|  |
| --- |
| The design intent for this project is to provide an economical solution that meets corporate objectives (strategic fit see clause 2.2), delivers the specified functional (operational) outcomes (see clause 2.3), and satisfies environmental requirements and community concerns. |
| Insert requirements not covered by sections 2.2 and 2.3. |

## Project description

|  |
| --- |
| Insert description of the project. |

# Existing conditions

## General details

|  |  |  |
| --- | --- | --- |
| Divided road | □ Yes  | □ No  |
| Surface type | □ Asphalt | □ Bitumen seal | □ Gravel  |
| Number of lanes |  |
| Lane width |  |
| Roughness |  |
| Speed environment |  |
| Shoulder width |  |
| Sealed shoulder width |  |
| Median width and type (depressed or raised) |  |
| Auxiliary lane details |  |
| Floodway details |  |
| Terrain type | □ Flat | □ Undulating | □ Hilly | □ Floodplain |

## Traffic details

|  |  |
| --- | --- |
| AADT (current) | (Type current vpd) |
| Traffic type/mix (%) | Cars \_\_\_\_\_\_%Trucks-SU \_\_\_\_\_\_%Semi-trailers \_\_\_\_\_\_%B-Doubles \_\_\_\_\_\_%and others \_\_\_\_\_\_% |
| Growth (%) |  |
| Commercial vehicles (%) |  |

## Flooding details

|  |
| --- |
| Insert flooding details. |

## Accidents (rates/type/severity)

|  |  |  |
| --- | --- | --- |
| Accidents summary attached: | □ Yes | □ No |
| *(Year/period)*  to *(Year/period)* |
| *(Actual rate type)* | *(Critical rate type)* |
| **Predominant type** *(numbers)* |
| Cross |  | Head on / rear |  | Fatigue related |  | Other |  |
| Comments |
| **Injuries / damage** *(numbers)* |
| Fatal |  | Hospitalised |  | Medical treatment |  |
| Minor injury |  | Property only |  | Total |  |

## Maintenance history (details of $/km ad recent work types)

|  |
| --- |
| Identify issues (hot spots) arising from maintenance operations/programs, for example, springs, unstable cuts, etc. |

## Road Safety Audit Report (existing road)

|  |
| --- |
| Has a Road Safety Audit Report been completed on the existing road over this section? |
| □ No  | □ Yes  |   | refer attachment  |
| Audit summary |
| Comments |

## Associated bicycle paths

|  |
| --- |
|  |

## Associated pedestrian paths

|  |
| --- |
|  |

## Wheelchair provisions

|  |
| --- |
|  |

## Other

|  |
| --- |
|  |

# Developing scope and identifying design inputs

The identification of relevant project impact areas is required to help define specific work packages necessary to draw out issues that may impact on the scope of the project. In many cases preliminary studies are the forerunner of future detail studies that will be identified and commissioned in subsequent phases / phase stages.

Information gathering in many cases will require a two-stage approach to reduce unnecessary work and to minimise overall project cost.

Any additional information should be incorporated into the relevant section and where necessary reference to the source document or included as an attachment.

This list of proforma considerations can be used as a checklist to help in the identification of potential work packages required for planning the delivery and/or for input into this project.

|  |
| --- |
| Insert details. |

## Preliminary studies (work packages)

Preliminary studies will generally cover a broad area to provide sufficient information for all of the likely project solution options. Identification at the proposal stage is necessary in order to estimate the cost of the planning budget. Once the preferred option has been selected and approved additional and more intense information should be gathered over the preferred option footprint.

|  |  |  |  |
| --- | --- | --- | --- |
| Clause | Information category and description | Need | Design requirements / other comments |
| Yes | No |
| Land survey |
|  | Terrain | □ | □ |  |
|  | Features | □ | □ |  |
|  | Property boundaries and titles | □ | □ |  |
|  | Flood records | □ | □ |  |
|  | Public Utility Plant | □ | □ |  |
| Geotechnical |
|  | Construction materials – availability and type | □ | □ |  |
|  | Subgrade strength | □ | □ |  |
| Environmental |
|  | Request for environmental factors (REF) | □ | □ |  |
| Cultural heritage |
|  | Search for cultural artefacts in the project site | □ | □ |  |
| Native Title |
|  | Search for Native Title in the area concerned | □ | □ |  |
|  | Physical details of any Native Title | □ | □ |  |
|  | Contact details of any Native Title | □ | □ |  |
| Targeted consultation (upper level) |
|  | Elected members (federal, state; LG) | □ | □ |  |
|  | Industry groups | □ | □ |  |
|  | Special interest groups (community/impaired) | □ | □ |  |
|  | Other government department requirements | □ | □ |  |
|  | Local government for development proposals | □ | □ |  |
| Type category and description |
|  |  | □ | □ |  |
|  |  | □ | □ |  |
|  |  | □ | □ |  |

## Preliminary studies (work packages)

Detail studies are generally built on (but not necessarily so) earlier studies tailored to increasing the information relating to the adopted preferred option, (e.g. earlier environmental studies may have identified endangered species that require further investigations).

The issues identified by these additional studies that need to be considered / incorporated in the design development process must be included in the following sections, as relevant. Action requiring design solutions are to be included in the Design Requirements and Design Details Reference column with a cross reference to the relevant part of section 6, as appropriate. These design development considerations requirements must be included in the following table format example:

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A | *EXAMPLE: Proposed Airport access road upgrade* | *Intersection to cater for upgrade* | *Section 6.6* |
| B |  |  |  |
| Comments |

### Site familiarisation

|  |  |
| --- | --- |
| Has a site familiarisation field check been performed by the designer? | □ Yes □ No |
| If no, please explain |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Additional survey information (over the footprint area of the preferred option)

Additional survey is generally necessary to provide greater detail about underground services (PUP), surface heights, potential conflict areas, etc.

|  |  |
| --- | --- |
| Survey file name and location |  |
| Comments |

### Geotechnical

|  |  |  |
| --- | --- | --- |
| Have any earlier investigations been carried out? | □ No | □ Yes  Refer attachment |
| If no, please explain |
|  |
| List reports/investigations |
|  |
| Has a geotechnical field assessment been performed by the designer? | □ No | □ Yes  |
| Comments |

#### Community consultation

Earlier work (including maintenance records) will generally identify areas for further investigations (e.g. unsuitable materials, lack of suitable natural materials). In addition, subsurface investigations may be necessary to establish material types, hardness and location, slip lines/zones, cut and fill slopes stability issues, strength of subgrade issues, etc.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Bridgeworks and other structures

Once bridges have been fixed, relevant testing for bridge foundations is a high priority and testing requirements should be detailed for drilling purposes. Also, structures such as large culverts and retaining walls require prompt attention in order that all testing can be carried out together thus avoiding the need for site revisits.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Community consultation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Have any earlier investigations been carried out? | □ No | □ Yes  |   | Refer attachment |
| Once all of the key stakeholders have been identified it is imperative to maintain a dialogue about the progress/impacts of the progress/impacts of the project that is continuous until finalisation of the construction project. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Land acquisition (including native title suppression)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Has a review of environment factors been completed? | □ No | □ Yes  |   | Refer attachment |
| Has an EMP (planning) been completed? | □ No | □ Yes  |   | Refer attachment |
| If no, please explain. |
| **What environmental reports have been prepared? List relevant reports below.**Earlier studies (e.g. REF) may have identified the need for further investigations (e.g. for endangered species, rare, and endangered fauna, etc.) |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Soil erosion

Many areas of the state have extensive erosion problems. It is essential that road works do not contribute / add to this problem.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Sediment prevention and control

It is critical that road works construction controls sediment runoff into waterway through good prevention techniques (temporary works).

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Sodic soils

Sodic soils commonly occur in the areas west of Toowoomba. Investigations must identify the occurrence and location of this material. The Southern Environmental Officer should be consulted when planning for the delivery of projects in this area of the state.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Acid sulphate soils/rock

Acid sulphate issues normally occur along the coastal strip. Investigations must identify the occurrence and location of acid sulphate materials.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Landscaping

Landscaping may be specified for a whole range of reasons, e.g. visual landscape, erosion protection, etc

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Road traffic noise impacts

Project traffic noise impacts assessments on the built environment / developments and the provision of attenuation measures.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Other sensitive environmental issues

Floodplains, biological, visual and water quality.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Environmental sustainability (viability of life)

Environmental sustainability is a requirement in the delivery of this project and proper attention to sustainability issues is essential, e.g. nature habitats, quality of air and water, etc.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Environmental preservation (national estates)

National estates areas of national environmental significance, world heritage listings (e.g. wet tropics), national parks, etc.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Cultural heritage

Earlier cultural heritage studies may have identified further investigations in consideration of the adopted preferred option.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Native Title

Earlier Native Title investigations may have identified further investigations in consideration of the adopted preferred option.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Public utility plant

Give details of major underground high band transmission equipment/plants, oil pipelines, gas pipelines, water trunk mains, water reticulation system, sewerage lines, etc.

The details of the major plant to be relocated are to be shown in section 6.20.

#### Electricity

High voltage transmission lines, equipment, distribution network, etc.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Water

Truck mains, reticulation lines etc.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Sewage

Rising mains, feeder

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Communication

Underground high band, high band equipment, distribution cables, etc.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Gas

Trunk and distribution lines

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Oil

Trunk lines (above and below surface)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Other

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Airport requirements

If there is an airport in the vicinity (within 3 kilometres), what are current and future requirements, e.g.:

* future runway extensions
* height restrictions on proposed infrastructure, e.g. light poles
* lighting conditions, e.g. light glare control
* operational restrictions of completed infrastructure, and
* future upgrade of intersection with airport access road.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Land acquisition, including Native Title suppression

Report on available right-of-way and proposed resumption requirement.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Provision for bicycles (existing and proposed)

|  |  |  |
| --- | --- | --- |
| Have the local authority requirements been confirmed by the designer? | □ No | □ Yes |
| Comments |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Provision for pedestrian / wheelchairs (existing and proposed)

|  |  |  |
| --- | --- | --- |
| Have the local authority requirements been confirmed by the designer? | □ No | □ Yes |
| Comments |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Provision for passenger transport facilities and priority measures

(existing and proposed)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Provision for enforcement activities

(e.g. weighing heavy vehicles, vehicle inspection sites, speed camera sites, breathalyser testing sites, etc.)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Provision for ITS technology

(e.g. ducting, video surveillance, variable message signs, special vehicle priority measures, etc.)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Provision for weigh-in motion technology

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Provision of roadside amenities

(e.g. rest areas, stopping places, etc.)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Special vehicle route requirement

(e.g. road train, high clearance or over dimensional vehicle route)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Interception site

(Include requirements for this project as detailed by regional interception site standards.)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Provision for local accesses

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Hydrology of major waterways requirement

(e.g. hydraulic modelling, upstream afflux impact studies, flood heights, etc.)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Traffic management during construction

(E.g. construct under traffic, use of side tracks, number of lanes to be kept open, design speed of traffic lanes through works, maintaining existing accesses, etc.)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Constructability issues

(E.g. traffic management, frequent updating of construction operations, etc.)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Road lighting

(E.g. intersection or route)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Traffic signals

(Intersection and/or coordination)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Public consultation status

(Including any infrastructure agreements or the like, where Main Roads has made certain financial or timing commitments for infrastructure to a developer or others in relation to this project)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Ministerial involvement / departmental commitments

(Include consultation plan summary as attachment)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Safety considerations

Hazardous goods

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Vulnerable groups

(E.g. aged people, physically impaired people, school children, ethnic groups, adjacent users of proposed facility, etc.)

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Roadside pullover safety

Long lengths of roads with narrow formation should provide cheap pullover opportunities at cut and fill interfaces that generally occur in low formation construction.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

#### Others

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Technical risks

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Specific stakeholder issues

Specific issues may be extremely important for the success of the project to be fully realised, e.g. transport industry input on emerging vehicle characteristics.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

### Any other considerations

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

# Design parameters and issues

## Target design speed for link

|  |
| --- |
| The target design speed for link is: km/h |
| Reasons for sections with design speed less than target speed are: |
| Adopted target speed for design: km/h |

## Design approach

This project will provide a design approach that is in accordance with traditional road design as detailed in Main Road’s standard documentation.

|  |
| --- |
| Comments |

## Any constraints to achieving project objectives

Political issues, e.g. social impacts

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

## Exclusions

What the project will not be doing

|  |  |
| --- | --- |
| No. | Description of exclusions |
| A |  |
| B |  |

## Assumptions

Articulate the key assumptions adopted during the design process, e.g. design vehicles, traffic composition, bridge loadings, etc.

|  |  |
| --- | --- |
| No. | Description of assumptions |
| A |  |
| B |  |

## Connectivity to related projects

List related projects or proposals affecting the project (past, current or planned) and the relationship to the project. Such projects may pose significant risks to the overall project if not done at all by others or completed in time. This may create risks for the overall project that need to be recognised and managed.

|  |
| --- |
| *Insert list related projects or proposals* |

## Constraints

Restrictions that limit the way the objective's to be achieved (describe what might impact on successful development/implementation of the project e.g. environmental, geotechnical, property acquisitions, hydrology effects, community and stakeholder impacts, and the strategic fit. See section 4 Developing scope and identifying design inputs. This may include restrictions on budget/funding, political issues, limited resources to work on the project, constraints to do with timing and implementation of project outcomes.

|  |
| --- |
| *Insert constraints* |

## Potential impacts

This can be completed in narrative or table format. Apart from the above, identify other areas of potential impact, the nature of impact and who will be impacted (internal and external). Include impacts during the project's life (that is, costs, disruptions, temporary arrangements, etc.) and ongoing impacts resulting from the project's product/deliverables, e.g. an inadequate project budget may cause an increase in lifecycle costs by the reduction in pavement thickness. Where the 'Quantum Software' is used any areas excluded from alignment considerations requires impact assessments.

|  |
| --- |
| *Insert potential impacts* |

## Risks

The department's risk management framework is aligned to the international risk management standard, AS/NZS ISO 31000:2009. If you are a applying for a tender and would like to know further information about the risk management requirements, please enquire through the specified tender process.

Within the department, risk management practice guides, tools and techniques are available through the *inside*TMR intranet in the ‘Policies and procedures’ section, under ‘Risk management’. For more information about risk management in TMR please email the Risk Advisory Team mailbox (Risk\_Advisory\_Team\_Mailbox@tmr.qld.gov.au).

|  |
| --- |
| *Insert risks* |

## Design constraints

Anything that may impact on the design and future operation of the infrastructure

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

## Existing road alignment, restrictions

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

## Major controls on alignment, grade and layouts

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

## Road use permits and leases

Report on any other issues that affect right-of-way and proposed closure/acquisition requirements.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

## Anything else that will put a boundary around the project

Detail anything else that will put a boundary around the project that may impact on the project team to achieve the project objective.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

# Design details

## Basic design features

|  |  |  |  |
| --- | --- | --- | --- |
| Feature | Section adjoining start of project | Proposed project being considered | Section adjoining end of project |
| Name of adjoining section or job number |  |  |  |
| Year of construction |  |  |  |
| Speed environment |  |  |  |
| Number of traffic lanes |  |  |  |
| Nominal width of traffic lanes | Road |  |  |  |
| Nominal width of shoulders | Road |  |  |  |
| Width and type of surfacing - traffic lanes | Road |  |  |  |
| Width and type of surfacing - shoulders | Road |  |  |  |
| Auxiliary lanes |  |  |  |
| Floodway details |  |  |  |
| Table drain detailA B1 on1 on C  | A=B=C= | A=B=C= | A=B=C= |
| Median width between traffic lane edges |  |  |  |
| Right of way width |  |  |  |
| Limited access |  |  |  |
| Intersection lighting |  |  |  |
| Route lighting |  |  |  |
| Frequencyof flood immunity | Crossdrainage | Immunity |  |  |  |
| Trafficability |  |  |  |
| Pavement drainage |  |  |  |
| Time of submergence |  |  |  |
| Average of submergence |  |  |  |
| Average annual time of closure |  |  |  |
| AATOC |  |  |  |
| Additional remarks |
| Consistency with investment/link strategy and Integrated Regional Transport Plan (IRTP) requirements.  |
| Comments |

## Permits and other clearances

Permits and other clearances must be obtained on a progressive basis throughout the design development process, as appropriate.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Project / design considerations | Design requirements | Details included in section 6.x |
| A |  |  |  |
| B |  |  |  |
| Comments |

## Type cross sections

Formation width, pavement width, carriageway widths, and cut and fill slopes, etc.

Consider also: transition slopes from cut to bank, safety barrier provision, sub-soil drainage (type and location, blending cross-section to landscape, alternative cross-sections, limits of responsibility, method of future widening, relationship to future development, minimum distance from batter points to road boundary, noise attenuation devices.

|  |
| --- |
| *Insert type cross sections* |

## Constructability

### Outcomes (issues/strategy)

|  |
| --- |
| *Insert construction outcomes (issues/strategy)* |

### Construction strategy (e.g. sequencing of works)

|  |
| --- |
| *Insert construction outcomes strategy* |

### Provision for traffic during construction

Also refer to section 4.2.30

|  |  |  |  |
| --- | --- | --- | --- |
| Type(side track, detour etc.) | Location / details(refer to traffic management plans, if relevant) | Design life | Remarks |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Side track requirements |
|  |
| Assumptions |
| Formation width |  m |  | Pavement thickness and description |
|  |
| Pavement width |  m |  |
|  |
| Priming coat material |  |  | Seal coat material |  |
|  |
| Spray rate |  |  | Width |  |  | Spray rate |  |
|  |
| Cover material |  |  | Rate |  |  | Aggregate |  |
|  |
|  | Aggregate spreading rate |  |
|  |
| Drainage treatment |
|  |

## Major intersection details

Major intersection, including cross intersections:

|  |  |  |  |
| --- | --- | --- | --- |
| Intersecting road name | Location | TrafficAnalysisAttachment | Comments |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Has a layout type been created? | □ No | □ Yes  Refer attachment: |

## Standard intersections

Standard (types BAL, BAR, AUL, AUR, CHL, CHR)

|  |  |  |
| --- | --- | --- |
| Location | Type | Traffic |
| Approach volumes | Turning volumes |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Non-standard (attach sketch of layout, location traffic volumes, signalised or non-signalised etc.) |
| Has a layout type been created? | □ No | □ Yes  Refer attachment: |

## Local accesses (specific details)

Also refer to section 5.14

|  |  |  |  |
| --- | --- | --- | --- |
| Location | Width | Paving details | Remarks |
|  |  |  |  |
|  |  |  |  |

## Earthworks

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Material | Location | Type of material | Depth | Bulking factor % | Compaction factor % |
| Topsoil |  |  |  |  |  |
| Cut and Fill |  |  |  |  |  |
| Nonrippable |  |  |  |  |  |
| Unsuitable |  |  | Spoil or method of utilising material: |
| Borrow |  |  | Source of borrow and/or spoil: |
| Spoil |  | Variable |
| Geotechnical report - Attachment  | Mass haul diagram - Attachment  |
| Comments |

##  Report on existing cross drainage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Location | Size & type | Length | Outletcondition | Inletcondition | Hydraulic adequacy | Structure condition | Recommendationreuse, remove etc. |
|  |  |  |  |  |  | Culvert | End. Wall and wing |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | Grassed, silted, scoured etc.Where only portion of existing to remain, specify that portion. |
|  |  |  |  |  |  |  |  |
| **Additional remarks**  |

## Major drainage installations proposed

(i.e. river and creek crossings and floodway) Also refer to section 4.2.30.

|  |  |  |  |
| --- | --- | --- | --- |
| Proposedlocation | CatchmentArea (ha) | Proposed waterway structure (size and type) | Proposed waterway structure (size and type) |
| Q frequency | Rainfall intensity mm/hr | Run off coefficient (c)  | Design discharge Q (m>/sec) |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

## Bridge requirements

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Bridge location | Bridgetype | Widthbetweenkerbs | No. ofspans | Skewno. | Chainages of abutments and piers | Pedestrianwalkway | Other / comments |
| LHS | RHS |
|  |  |  |  |  |  | □ | □ |  |
|  |  |  |  |  |  | □ | □ |  |
|  |  |  |  |  |  | □ | □ |  |
|  |  |  |  |  |  | □ | □ |  |
|  |  |  |  |  |  | □ | □ |  |

## Structures (other than bridges)

|  |  |
| --- | --- |
| Description | Location |
|  |  |

## Cross drainage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Culvert no./chainage** | **Catchment** | **Inlet/outlet details** | **Adopted culvert** | **Adopted inlet/outlet** |
| **Method****(Note 1)** | **Area****(ha)** | **Slope****(%)** | **Designfrequency****(years)** | **RAFTS****Critical Storm Event****(mins)** | **Rainfallintensity****(mm/h)** | **RAFTS Loss Parameters** | **Manning’s (n)** | **Design discharge****(m3/s)** | **Headwater constraints****(if any)****(Note 2)** | **Tail waterdepth/channel shape****(Note 3)** | **Size and type** | **Skew number** | **Headwater depth****(m)** | **Outlet velocity****(m/s)** | **Special foundation required****(if any see Note 4)** | **Endwall****(Note 5)** | **Wing wall****(Note 6)** | **Apron** | **Cutoff wall****(Note 9)** |
| **Initial****(mm)** | **Continuing****(mm/hr)** | **Type****(Note 7)** | **Extent of Apron****(Note 8)** | **1 and/or 0** | **A or C** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Notes:\* peak flow though the culvert is indicated in () the remaining discharge weirs over school road which has Q10 immunity. 1. Rational, unit hydrograph, etc.
2. Property, roads, weir, etc.
3. Channel shape, trapezoidal, etc.
4. 150mm type 2.5, etc.
5. Concrete, grouted rubble, rubble masonry or preset
6. Unreinforced type 1, 2, or 3, reinforced
7. Type 1, 2 or 3
8. Std. (as per Std Dwg.) or e.g. 2. OD
9. (I or O) inlet or outlet (A or C) end of Apron or end of Culvert)
 |

## Urban drainage

(include catchment plan, profiles and hydraulic grade lines, sub-catchment. T of C, runoff, inlet design drain design, head losses etc.)

An example calculation sheet from QUDM is shown below.

|  |
| --- |
| **Urban drainage:** (include catchment plan, profiles and hydraulic grade lines, sub-catchment. T of C, runoff, inlet design drain design, head losses etc.).  |
| **Design comments***Enter design comments here* |

## Road traffic noise (attenuation measures)

Provide details of noise attenuation measures required.

Also refer to section 4.2.11

|  |  |  |  |
| --- | --- | --- | --- |
| Location | Type | Height | Remarks |
|  |  |  |  |
|  |  |  |  |

## Environmental treatments (specific details)

Provide details of specific treatments required.

Also refer section 4.2.5

|  |  |  |
| --- | --- | --- |
| Location | Type | Remarks |
|  |  |  |
|  |  |  |

## Bicycles / pedestrians (specific details)

Describe any bicycle and/or pedestrian provisions that need to be made.

Also refer section 4.2.20 and 4.2.21

|  |  |  |
| --- | --- | --- |
| Location | Type | Remarks |
|  |  |  |
|  |  |  |

## Fencing details

Describe any fencing requirements that need to be incorporated or considered in the design process.

|  |  |  |
| --- | --- | --- |
| Location | Type | Remarks |
|  |  |  |
|  |  |  |

## Special road crossing (machinery, railway, fauna, cattle)

Describe any special crossings that need to be incorporated or considered in the design process.

|  |  |  |  |
| --- | --- | --- | --- |
| Location | Type | Size | Remarks |
|  |  |  |  |
|  |  |  |  |

## Public utility plant (major relocations only)

Describe the major installations of public utility plant that need to be considered in the design and any that require relocation. Also refer to section 4.2.17

|  |  |  |  |
| --- | --- | --- | --- |
| Location | Type | Size | Remarks |
|  |  |  |  |
|  |  |  |  |

## Barrier treatment (flex beam, wire rope, concrete)

|  |  |
| --- | --- |
| Location | Details |
|  |  |
|  |  |

## Other issues identified/raised in sections 4, 5, 7 and 8

|  |
| --- |
| Requirements  |

## Other requirements

Include provisions that need to be incorporated onto the design as a result of establishing ROW agreements.

|  |
| --- |
|  |

## Pavement details

|  |
| --- |
|  |

### Existing pavement

|  |  |
| --- | --- |
| Is existing pavement to be considered for reuse? | □ No □ Yes ► If yes, complete the following table: |
| Section | Pavement |  |
| From | To | Widthm | Thicknessmm | Effectiveness thickness for reuse mm | Remarks including roughness, rutting etc. and work proposed (e.g. scarify, widen, resurface, stockpile etc.) |
|  |  |  |  |  |  |
| Is a summary of the pavement analysis test result attached? | □ No □ Yes ► If yes, see attachment |

### Pavement proposals

|  |  |
| --- | --- |
| Pavement report completed? | □ No □ Yes ► If yes, see attachment |

Pavement design basis

|  |  |  |
| --- | --- | --- |
| Type of construction(tick if applicable) | Design standardnormal / second | Design life |
| New construction | □ |  |  |
| Widening | □ |  |  |
| Widening/overlay | □ |  |  |
| A.C. overlay | □ |  |  |

|  |  |
| --- | --- |
| Details | Section |
| 1. Subgrade:
 |  |
|  Material type: |
|  Presumptive CBR: |
|  Tested CBR: |
| 1. Pavement/subgrade drainage
 |
| 1. Design traffic adopted – ESAs
 |  |  |  |
| 1. Pavement type and depth
 |  |  |  |
| 1. Surfacing treatment details
 |  |  |  |

## Bitumen surfacing

|  |
| --- |
| Primer |
| Section | Area sprayed e.g. shoulders, running lanes | Widthm | Material | Spray rateslitre/m*"* | Cover material |
| Type | Grade | Type | Ratem>/m*"* |
|  |  |  |  |  |  |  |  |
| Primer seal |
| Section | Area sprayed e.g. shoulders, running lanes | Widthm | Material | Spray rateslitre/m*"* | Cover material |
| Type | Grade | Type | Ratem>/m*"* |
|  |  |  |  |  |  |  |  |
| Seal coat A |
| Section | Area sprayed e.g. shoulders, running lanes | Widthm | Material | Spray rateslitre/m*"* | Cover material |
| Type | Grade | Type | Ratem>/m*"* |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Seal coat B |
| Section | Area sprayed e.g. shoulders, running lanes | Widthm | Material | Spray rateslitre/m*"* | Cover material |
| Type | Grade | Type | Ratem>/m*"* |
|  |  |  |  |  |  |  |  |
| Mode of supply |  |
|  |
| Mode of delivery |  |
|  |
| Precoated cover aggregate |
| Aggregate size mm | Precoating agent \* | Rate litres / m3 |
|  |  |  |
|  |
| \*Precoating agent to be in accordance with approved list |

## Asphalt pavement

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Section | Tack coat | Base course | Binder course | Wearing course |
| Material | Sprayrate l/m*"* | \*mix | Thicknessmm | \*mix | Thicknessmm | \*mix | Thicknessmm |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| \*mixDG – Dense gradedSM – Stone masticOG – Open gradedFG – Fine gap |

## Concrete pavement

|  |
| --- |
| *Supply details* |

# Record of design issues arising from process activities

## Design verification

Describe the design verifications performed at the various stages of this project.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Design verification details | Verifier | Actions required | Actual actions taken (include requirements in section 6) |
| A |  |  |  |  |
| B |  |  |  |  |
| Comments |

## Project meeting minutes

Describe the design issues arising from project minutes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Meeting details | Verifier | Actions required | Actual actions taken (include requirements in section 6) |
| A |  |  |  |  |
| B |  |  |  |  |
| Comments |

## Safety in design

Describe the major issues arising from the safety in design risk review. Alternatively, you may reference the location of the Safety in Design report.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Risk description | Existing controls | Treatment required |
| A |  |  |  |
| B |  |  |  |
| Comments |

## Road safety audit(s)

What audits are proposed for the various stages of this project?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Audit type | Auditor | Actions required | Actual actions taken (include requirements in section 6) |
| A |  |  |  |  |
| B |  |  |  |  |
| Comments |

## Reviews conducted

A range of reviews may be required during the delivery process for a range of reasons. Reviews may be internally or externally generated. They will range from quality system requirements (e.g. design reviews) to corporate requirements (e.g. peer reviews).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Review Type | By whom | Satisfactory? | Actual Actions taken (include requirements in section 6) | Action by |
| Yes | No |
| A |  |  |  |  |  |
| B |  |  |  |  |  |

# Road safety audits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Audit type | Auditor | Actions required | Actual actions taken (include requirements in section 6) |
| A |  |  |  |  |
| Comments |

# Actions

**Stages of approvals:**

|  |  |  |  |
| --- | --- | --- | --- |
| **OA =** Options Analysis | **BC =** Business Case | **PD =** Preliminary Design | **DD =** Detail Design |

## Design intent certification

|  |
| --- |
| * Satisfies the problem in accordance with the corporate objective for the link.
 |
| * Delivers required outcomes.
 |
| * Inputs are appropriate and addressed satisfactorily.
 |
| * Satisfies corporate design standards.
 |
| Stage | Signatory | Position | Date |
| *Stage* |  | *Insert position* | *Insert date* |
| Comments |

## Regional review and acceptance

Regional Office stage review and acceptance, as relevant.

|  |  |  |  |
| --- | --- | --- | --- |
| Stage | Signatory | Position | Date |
| *Stage* |  | *Insert position* | *Insert date* |
| Comments |