

# SDAP Supporting Information

## Filling, excavation and retaining structures in a state-controlled road environment

### Purpose

This document provides explanatory guidance to support the state's requirements to mitigate filling and excavation impacts on a state-controlled road, as stated in *State Code 1: Development in a state-controlled road environment* of the State Development Assessment Provisions (SDAP).

The content in this section supports the performance outcomes outlined in:

*State code 1: Development in a state-controlled road environment:*

- Table 1.2.1: Development in a state-controlled road environment
  - Filling, excavation and retaining structures (**PO4-PO11**)
- Table 1.2.3: Development in a future state-controlled road environment
  - Filling excavation and retaining structures (**PO34-PO35**).

### What is the issue?

Filling, excavation and retaining structures in a state-controlled road environment can impact the safety and structural integrity of road transport infrastructure and land located in an existing or future state-controlled road. Specifically, works involving ground disturbance can de-stabilise or undermine road transport infrastructure and the land supporting this infrastructure through vibration impacts, ground movement, subsidence and groundwater impacts.

Earthworks can also result in the removal of forces supporting or keeping road transport infrastructure in place, or the addition of forces that the infrastructure is not designed to withstand. In both instances, works may cause damage to road transport infrastructure.

In terms of future state-controlled roads, earthworks can compromise the state's ability to cost effectively construct infrastructure on the land, for example, if considerable works need to be undertaken to re-stabilise land so that it can support road transport infrastructure.

Filling and excavation may be associated with creating a level building pad, excavation for basement car parking, the installation or insertion of temporary and permanent retention systems, constructing footings for fences and building foundation structures, amongst other forms of ground disturbance.

### What is the objective?

The objective of the provisions is to ensure that any filling, excavation and ground disturbance does not adversely impact on the safety and operational integrity of an existing or future state-controlled road or road transport infrastructure. In particular, development must ensure that filling, excavation and ground works do not:

- de-stabilise road transport infrastructure or an existing or future state-controlled road
- interfere with, or result in damage to, an existing or future state-controlled road or road transport infrastructure
- adversely impact on a state-controlled road through the addition or removal of loading
- cause, or result in, any change in groundwater level and/or seepage

- compromise the state's ability to construct or upgrade road transport infrastructure.

## How to achieve the performance outcome

It may be necessary to undertake surveying and geotechnical investigations to ensure that development or works will not adversely impact on an existing or future state-controlled road or road transport infrastructure.

### Performance outcome 4

No acceptable outcome has been provided. Therefore, an application must demonstrate compliance with the performance outcome. Demonstrating compliance with the performance outcome may include, but is not limited to, the following actions:

- provide site plans showing the location of services and public utility plants in a state-controlled road, relative to the development site. Information on the location of services and public utilities in a state-controlled road can be obtained from the Dial Before You Dig service.
- provide a geotechnical assessment certified by a Registered Professional Engineer of Queensland (RPEQ) and prepared in accordance with the *Road Planning and Design Manual* demonstrating that the filling and excavation associated with the development will not interfere with, or result in damage to, infrastructure or services in a state-controlled road. Guidance on preparing a geotechnical assessment is provided in Appendix 1.

Where development will impact on a service or public utility plant in a state-controlled road, such that the service or plant will need to be relocated, the applicant will need to contact the relevant service or plant provider for standards and design specifications for the alternative alignment. Any costs of relocation are to be borne by the developer.

### Performance outcome 5 and performance outcome 34

No acceptable outcome has been provided. Therefore, an application must demonstrate compliance with the performance outcome. Demonstrating compliance with the performance outcome may include, but is not limited to, the following actions:

- provide a geotechnical assessment certified by a RPEQ and prepared in accordance with the *Road Planning and Design Manual* demonstrating that filling, excavation, building foundations and retaining structures will not undermine, or cause subsidence of, an existing or future state-controlled road. Guidance on preparing a geotechnical assessment is provided in Appendix 1
- provide supporting earthworks drawings prepared and certified by a RPEQ. Guidance on preparing earthworks drawings is provided in Appendix 2
- provide supporting structural engineering drawings prepared and certified by a RPEQ. Guidance on preparing structural engineering drawings is provided in Appendix 3.

### Performance outcome 6

No acceptable outcome has been provided. Therefore, an application must demonstrate compliance with the performance outcome. Demonstrating compliance with the performance outcome may include, but is not limited to, the following action:

- provide a geotechnical assessment certified by a RPEQ and prepared in accordance with the *Road Planning and Design Manual* demonstrating that filling, excavation, building foundations and retaining structures will not cause ground water disturbance in a state-controlled road. Guidance on preparing a geotechnical assessment is provided in Appendix 1.

### Performance outcome 7

No acceptable outcome has been provided. An application must demonstrate compliance with the performance outcome. Demonstrating compliance with the performance outcome may include, but is not limited to, the following action:

- provide a geotechnical assessment certified by a RPEQ and prepared in accordance with the *Road Planning and Design Manual* demonstrating that excavation, boring, piling, blasting and fill compaction will not result in ground movement or vibration impacts that would cause damage or nuisance to road transport infrastructure. Guidance on preparing a geotechnical assessment is provided in Appendix 1.

### **Performance outcome 8**

An acceptable outcome has been provided for this performance outcome. An application can demonstrate compliance with the acceptable outcome by providing:

- supporting information demonstrating that fill, extracted material or spoil material will not be transported to or from the development site on a state-controlled road.

Alternatively, the application must demonstrate compliance with the performance outcome. Demonstrating compliance with the performance outcome may include, but is not limited to providing:

- supporting information demonstrating that the development will not involve the haulage of fill, extracted material or excavated spoil material exceeding 10,000 tonnes per year, or
- a pavement impact assessment certified by a RPEQ and prepared in accordance with the *Guide to Traffic Impact Assessment* that demonstrates that the development will not damage the pavement of a state-controlled road. Guidance on preparing a pavement impact assessment is provided in Appendix 4.

### **Performance outcome 9**

No acceptable outcome has been provided. Therefore, an application must demonstrate compliance with the performance outcome. Demonstrating compliance with the performance outcome may include, but is not limited to, the following actions:

- provide scaled and sufficiently detailed plans which clearly identify:
  - any vehicular access(es) to the development site
  - any existing drainage infrastructure for a state-controlled road
- provide supporting information about any filling and excavation activities associated with the construction of a vehicular access, including any works or activities that have the potential to adversely impact on a state-controlled road.

### **Performance outcome 10 and performance outcome 35**

Acceptable outcomes have been provided for this performance outcome. An application can demonstrate it has complied with the acceptable outcomes by providing the following information as part of the application:

- supporting information demonstrating that fill material from the development is free of contaminants. This includes demonstrating that the testing of soil or rocks has been undertaken in accordance with *AS1289 – Methods of testing soils for engineering purposes* and *AS 4133-2005 – Methods of testing rocks for engineering purposes*
- supporting information demonstrating that fill compaction methods will be undertaken in accordance with *AS 1289.0 2000 – Methods of testing soils for engineering purposes*.

### **Performance outcome 11**

Acceptable outcomes have been provided for this performance outcome. An application can demonstrate it has complied with the acceptable outcomes by providing the following information as part of the application:

- supporting technical information demonstrating that fill compaction methods will be undertaken in accordance with *AS 1289.0 2000 – Methods of testing soils for engineering purposes*
- supporting technical information demonstrating that adequate dust suppression measures will be used during filling and excavation to prevent wind-blown dust nuisance in a state-controlled road corridor.

## Contact details

Please contact your local Transport and Main Roads office for more information. The contact details for your local Transport and Main Roads office are listed at [www.tmr.qld.gov.au/About-us/Contact-us/In-person/Roads-offices](http://www.tmr.qld.gov.au/About-us/Contact-us/In-person/Roads-offices).

## Appendix 1: Geotechnical assessment

A geotechnical assessment must be certified by a RPEQ and prepared in accordance with the *Road Planning and Design Manual*. A preliminary geotechnical assessment should provide preliminary geotechnical design information on the following, amongst other relevant considerations, to inform the structural engineering design and construction management of the development:

- earthworks, including methods for excavation, the excavation and drilling of rock, the stability of open excavations and filling/back filling and compaction
- permanent and temporary basement retention options, design loads and geotechnical design parameters
- suitable options for foundation structures, design loads and geotechnical design parameters
- vibration impacts from drilling, boring and excavation
- groundwater management
- scaled cross sections and elevations that clearly show the interface with the state-controlled road corridor, including road transport infrastructure, as a result of the proposed earthworks. The difference between existing site levels and finished/design levels should be clearly shown
- advice on effects on the existing road transport infrastructure, including the tunnel, and relevant construction issues.

Alternatively, copies of any existing geotechnical investigations previously undertaken for the site should be provided.

## Appendix 2: Earthworks drawings

Earthworks drawings prepared and certified by a RPEQ should be provided demonstrating that any excavation or filling/backfilling works and retaining structures will be located outside the state-controlled road.

The earthworks drawings should include scaled, cross sections/elevations and any required supporting technical details clearly showing:

- the location/setback and extent of proposed excavation and filling works including likely volumes of cut and fill adjacent to the state-controlled road
- the maximum depth of any excavation in relation to the existing ground level on the site and the level of road transport infrastructure
- the maximum height of any proposed filling and the gradient and height of any proposed batters adjacent to the state-controlled road
- the maximum height and intended form/design of any proposed retaining walls or structures adjacent to the state-controlled road
- the outermost projections of road transport infrastructure such as soil nails and other retaining and footing structures
- the interface with the state-controlled road as a result of the proposed earthworks, including the difference between existing site levels and finished/design levels.

## Appendix 3: Structural engineering drawings for retaining structures

Where development includes retaining structures, such as a basement or retaining wall adjacent to the state-controlled road that exceeds a height or depth of 1m, and/or involves temporary and permanent retention systems, it is recommended that the applicant provide RPEQ certified preliminary structural engineering design plans for the development, including cross sections/elevations and any required supporting technical details showing the following in relation to the state-controlled road:

- the type, spacing, location and depth of building foundation structures (including any structures such as footings, and bored piles/piers and associated columns)
- the temporary and permanent retention system for the development, including the location, length, depth and angle of insertion of any proposed shoring, rock anchors and/or soil nails. The application should demonstrate that any proposed temporary retention will not compromise the state-controlled road both during construction and on-going operation, including any structural or geotechnical impacts
- demonstrate that the loading implications of the proposed development will not compromise the safety and operational integrity of the state-controlled road. The loading configuration of the proposed development should be provided
- provide preliminary plans, sections and details showing the design, location, length, depth and angle of insertion of any proposed rock anchors and/or soil nails
- ensure temporary rock anchors and/or soil nails that are intended to remain in place after construction are de-stressed and released
- ensure slope stability requirement of state-controlled roads is consistent with the requirements stipulated in the Department of Transport and Main Road's *Geotechnical design standard*
- demonstrate that any basement retention system is robust and sufficient to prevent any movements on road transport infrastructure. This may require finite element and seepage modelling to demonstrate that any retaining structures, excavation, and filling/backfilling will be located outside the state-controlled road.

## Appendix 4: Pavement impact assessment

A pavement impact assessment must be certified by a RPEQ and prepared in accordance with *Guide to Traffic Impact Assessment*. This should include:

- identifying the expected pavement life of each impacted section of the state-controlled road network
- identifying the number of types of vehicles that will be generated by the development during both construction and operational phases
- identifying the sections of the state-controlled road network where pavement assessment is required based on the Standard Axle Repetitions (SAR) thresholds
- where the development-generated construction or operations SARs will consume the remaining pavement capacity of a state-controlled road, provide pavement designs for that section of pavement to return the pavement to its pre-development SAR capacity at the end of the impact mitigation period.