3. Description of the proposal

3.1 The proposal

The proposal involves widening Alfords Point Road for 2.1 kilometres from Alfords Point Bridge to Brushwood Drive. Key features of the proposal are illustrated in Figure 1-2 and include:

- Upgrade about 2.1 kilometres of Alfords Point Road from a four lane undivided carriageway to a six lane divided carriageway. Alfords Point Road would be widened on the eastern side to accommodate three lanes in each direction
- Install a continuous concrete type F median barrier from the southern abutment of Alfords Point Bridge to about 1.8 kilometres south to separate the northbound and southbound lanes
- Provide emergency vehicle access via an opening in the central median barrier at the southern abutment to Alfords Point Bridge
- Widen the Brushwood Drive northbound on ramp to accommodate the relocated bus bay
- Relocate the existing bus stop on the Brushwood Drive on ramp to about 80 metres south of the existing location
- Realign and extend the existing footpath to the new bus stop location. To provide pedestrian access to the realigned footpath the existing noise wall opening at Eucalyptus Street would be reorientated from its current north facing direction to a south facing direction (ie the opening would be repositioned seven metres south and current opening closed)
- Widen the single lane section of the Illawong/Alfords Point southbound off ramp to two lanes for a length of about 300 metres. This would provide additional vehicle storage capacity on approach to the roundabout intersection and prevent queuing onto Alfords Point Road southbound lanes
- Replace the temporary bitumen shared path with a permanent off-road shared path on the eastern side of Alfords Point Road. The shared path would extend the length of the proposal from Alfords Point Bridge to the roundabout at the end of the Illawong/Alfords Point off ramp. Where the grades are steep the shared path would be converted into separate cyclist and pedestrian paths for safety reasons. A concrete type F barrier would be installed along the western side of the shared path to separate it from the southbound carriageway
- Relocate and reinstate the existing pedestrian path between Maxwell Close and the shared path on the eastern side of Alfords Point Road
- Relocate the existing heavy vehicle inspection bay to a permanent location beneath Old Illawarra Road overbridge (900 metres south of Brushwood Drive on the southbound side of Alfords Point Road). This would include permanent boundary fencing, lockable gates and lighting
- Provide a vehicle breakdown bay on the southbound carriageway at the location of the existing heavy vehicle inspection bay. The breakdown bay would be an extension of the road pavement and be about 20 metres long and five metres wide
- Subject to assessment of feasible and reasonable noise mitigation options:
  - Potentially provide a noise barrier on the western roadside edge of Alfords Point Road for about 700 metres to the north of the existing noise wall
  - Potentially provide a noise barrier on the eastern side of Alfords Point Road for one about kilometre between Maxwell Close and Brushwood Drive

- Relocate the existing variable message sign located at the existing heavy vehicle inspection bay to about 500 metres south of the existing location
- Adjust the pavement drainage along the eastern side of Alfords Point Road and within the median
- Construct a permanent swale drain and rock check dam at culvert outlets (300 metres and 1620 metres south of Alfords Point Bridge)and a permanent water quality basin 870 metres south of Alfords Point Bridge
- Relocate the optic fibre cables, light poles and underground electricity on the eastern and western sides of Alfords Point Road to the outside edge of the widened Alfords Point Road. Provide a new utility installation to supply power from Old Illawarra Road to the proposed heavy vehicle inspection bay.

Construction of the proposal would require two temporary construction site compounds and a stockpile site. The main construction site compound would be located on the triangle piece of land adjacent to the Illawong/Alfords Point off ramp (refer Figure 1-2). This site would be about 2500 square metres and accessed from the Illawong/Alford Point Road off ramp. The secondary site compound would be located 400 metres south of Old Illawarra Road overbridge (refer Figure 1-2). This site would be about 6000 square metres and accessed from Old Illawarra Road. Construction site compounds would be used to stockpile materials, store plant and equipment, provide construction staff parking, toilets and amenities. An additional stockpile and equipment storage area would also be required on the eastern side of Alfords Point Road underneath the Old Illawarra Road overbridge.

Temporary construction sedimentation basins, if required, would be located within the road pavement corridor. Refer to Section 3.5.2 for detail on construction basins. Construction of the proposal is anticipated to take about 24 months to complete (weather permitting.

3.2 Design

A detailed description of the concept design is provided below and concept design plans are included in Appendix A. The concept design would be further refined during the detailed design phase.

3.2.1 Design criteria

The concept design was prepared in accordance with published NSW Austroads Guides including:

- *Austroads Guides and RMS supplements to Austroads Guides*
- *Beyond the Pavement - Roads and Traffic Authority of NSW urban design policy, procedure and design principles 2009*.

Specific design criteria that have been developed for the proposal are summarised in Table 3-1. Typical cross sections are provided in Figure 3-1 to Figure 3-4.

Table 3-1 Specific design criteria for the proposal

Criteria	Requirement
Signposted speed	80 km/h
Number of lanes	Minimum two lanes in each direction
Stopping sight distances	Reaction time 1.5 seconds Horizontal 126 metres

Criteria	Requirement
	Vertical 126 metres
Grade	Desirable maximum seven per cent Absolute maximum nine per cent
Lane width	3.3 metres
Shoulder width	2.5 metres
Median width	1.6 metres including concrete type F barrier
Ramp lane width	3.3 metres
Shared path	3 metres (3.5 metres paved concrete) separated from the road by a concrete type F barrier
Separate pedestrian and cyclist path	4 metres (4.5 metres paved concrete)
Bus bay	15 metres long and 3.5 metres wide
Heavy vehicle inspection bay	60 metres long (minimum) and 8.5 metres wide
Clear zone	Minimum four metres
Batters	4:1 maximum where feasible
Design vehicle	25 metre B-Double 12.5 metre single unit truck 19 metre semi-trailer

3.2.2 Engineering constraints

Engineering constraints identified for design and construction of the proposal include:

- The Georges River National Park which is located immediately adjacent to the Alfords Point Road corridor (refer Figure 1-1)
- Aboriginal heritage items in the vicinity of Marlock Place
- The steep grade of Alfords Point Road south of Alfords Point bridge
- Existing overhead transmission lines that cross Alfords Point Road 300 metres and 725 metres south of Alfords Point Bridge. The minimum required vertical clearance from the roadway to the transmission lines is 7.5 metres (this is at full sag ie maximum operating load and temperature). Horizontally, the minimum clearance is four metres from the conductors
- Maintaining access for maintenance of the existing rock cuttings, variable message sign and drainage structures
- Maintaining traffic flow on Alfords Point Road during construction while providing the safe separation of construction activities from traffic flow and safe access to the site for construction vehicles
- Potential vibration generating works adjacent to rock cuttings.

3.3 Major design features

The major design features of the proposal are described below.

3.3.1 Alfords Point Road widening

The proposal involves widening the existing four lane undivided carriageway to a six lane divided carriageway, resulting in three lanes in each direction.

The horizontal alignment of the proposal would follow the existing road alignment with widening on the eastern side of Alfords Point Road varying between zero and 13.5 metres depending on the section of the proposal.

On the western side of Alfords Point Road, the road shoulder from the end of the Brushwood Drive on ramp to about 170 metres south would be widened by between 1.3 and 4.4 metres. From the Brushwood Drive on ramp to about 40 metres north of Water Gum Place, the western shoulder would be widened by between 0.5 and 2.8 metres.

The vertical profile of the proposal would follow the existing vertical profile of Alfords Point Road. The finished road surface would be about 150 millimetres higher than the existing road surface as the existing road pavement requires additional layers of asphalt for strengthening.

Typical cross section

The traffic lanes would be 3.3 metres wide, with 2.5 metre wide road shoulders. The central median would be about 1.6 metres wide and include a type F concrete barrier. A path for pedestrians and cyclists would be provided along the eastern side of Alfords Point Road, separated from the southbound carriageway by a second type F concrete barrier (refer Section 3.3.5 for design detail).

The type F barrier in the central median would be 0.82 metres high, 0.6 metres wide and 1.8 kilometres long. There would be an opening in the central median at the southern abutment to Alfords Point Bridge to allow emergency vehicles to cross between carriageways. The type F barrier separating the southbound lanes and the shared path would be 1.1 metres high with a rail on top to extend the height to 1.4 metres. The total length of this barrier would be about two kilometres and openings would be provided at various locations for access purposes including maintenance vehicles. Indicative road cross sections for the proposal are provided in Figure 3-1 to Figure 3-4.

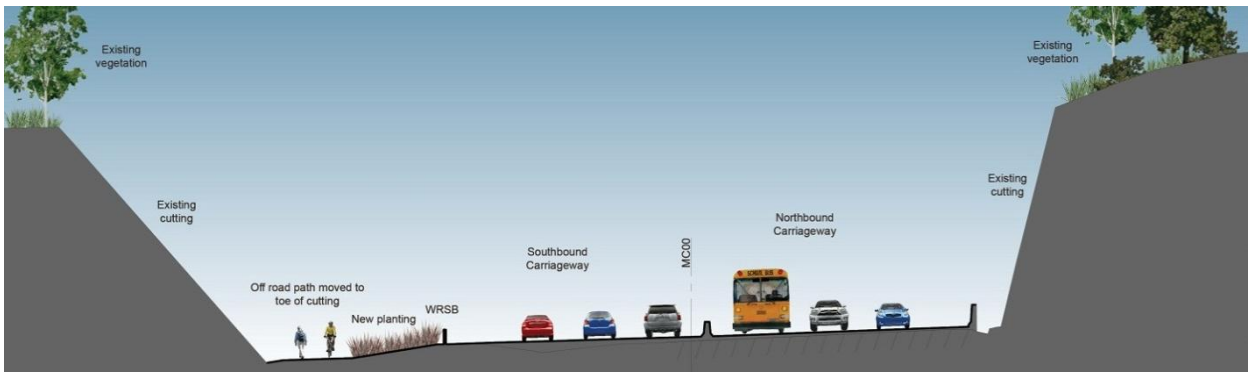


Figure 3-1 Indicative road cross section 600 metres south of Alfords Point Bridge

Nallada Place is located to the west above the rock cutting (beyond the right of the image). The Georges River National Park is to the east.

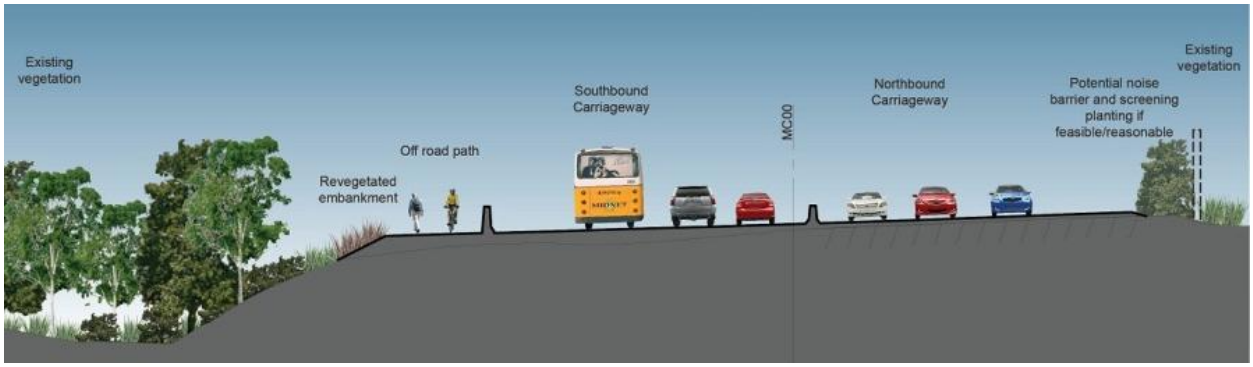


Figure 3-2 Indicative road cross section 800 metres south of Alfords Point Bridge

Tallowwood Close is located to the west (beyond the right of the image). The Georges River National Park is to the east.

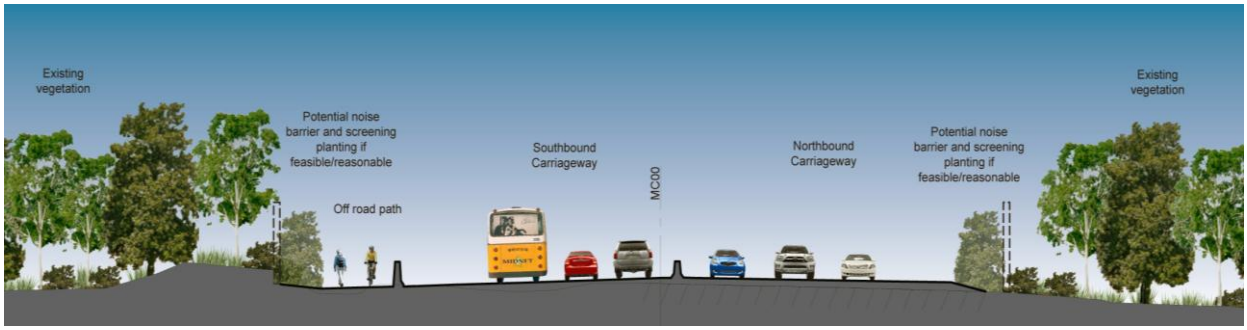


Figure 3-3 Indicative road cross section 1400 metres south of Alfords Point Bridge

Jarrah Close is located to the west (beyond the right of the image). Sylvan Ridge Drive is to the east.

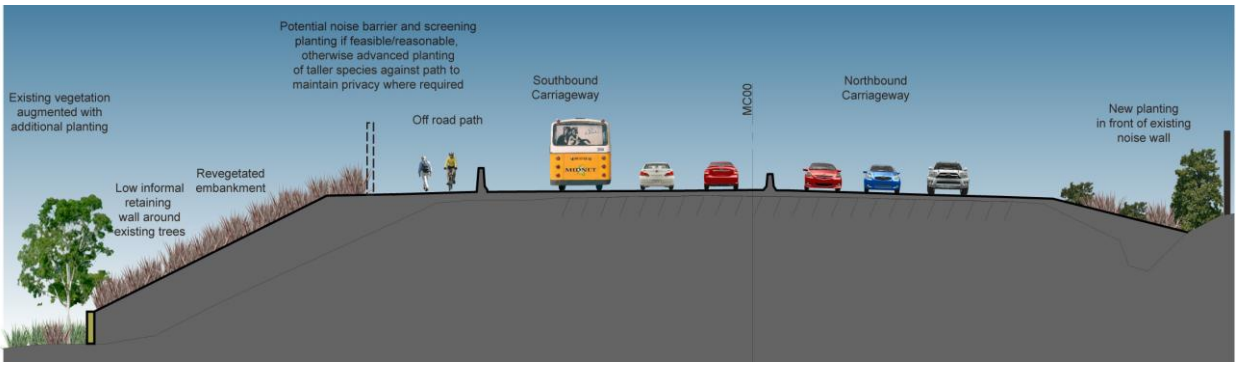


Figure 3-4 Indicative road cross section 1600 metres south of Alfords Point Bridge

Lemongum Place is located to the west (beyond the right of the image). The existing noise wall is shown. Sylvan Ridge Drive is to the east.

Tie-ins

At the start and end point of the proposal, the works would be tied in to the existing alignment of Alfords Point Road. Activities to tie the proposal into the existing alignment of Alfords Point Road would potentially include pavement works to create consistent levels between existing and new surfaces. The extent of tie-in works would be determined during detailed design.

3.3.2 Illawong/Alfords Point off ramp and Brushwood Drive on ramp

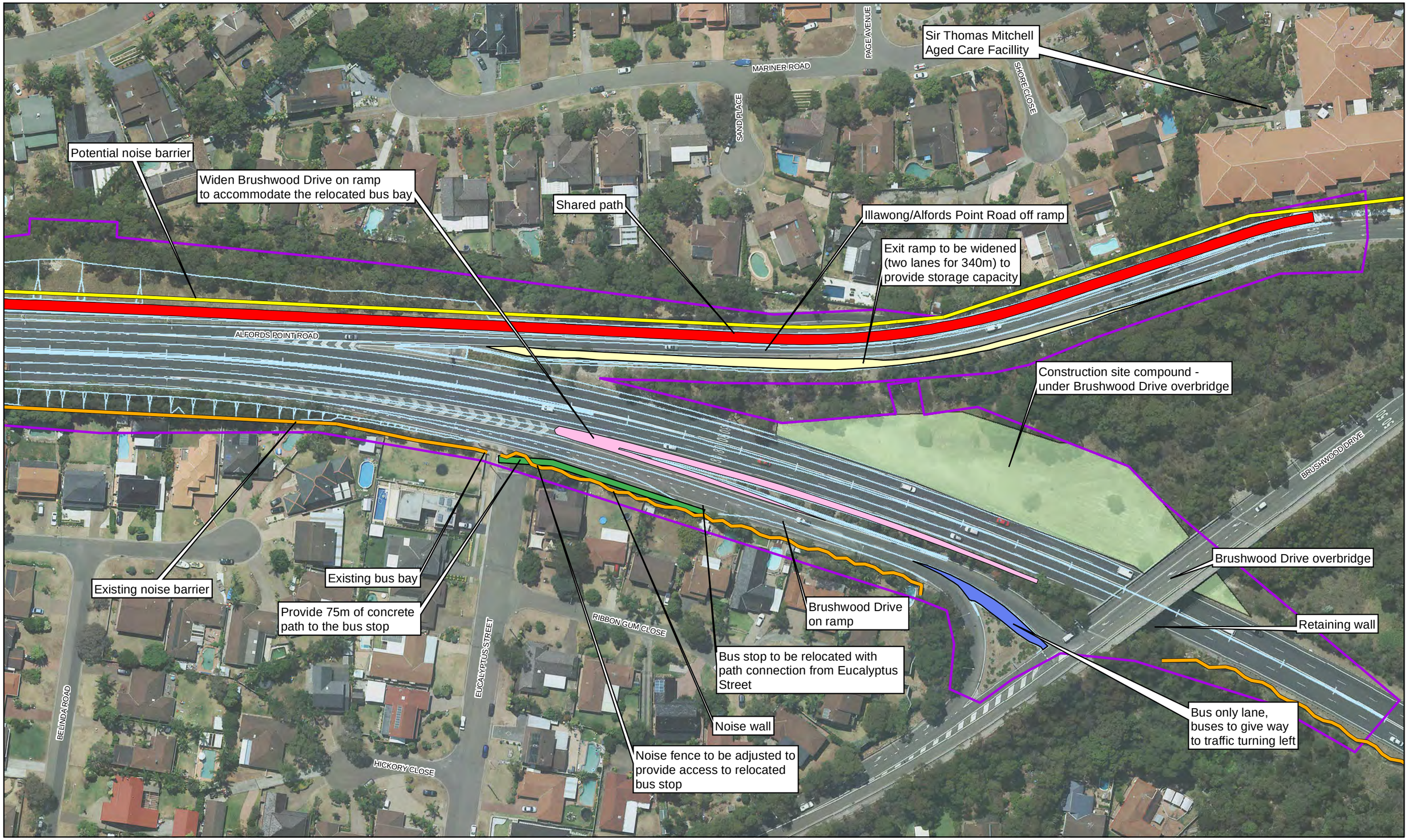
The additional southbound lane on Alfords Point Road would lead directly into the Illawong/Alfords Point off ramp. The Illawong/Alfords Point off ramp would be widened by up to four metres to allow two lanes for a length of about 300 metres, extending the off ramp dual lanes to a length of 340 metres. This extension of the dual lanes would provide additional storage capacity for vehicles approaching the Fowler Road, Old Illawarra Road and Brushwood Drive roundabout. The roundabout would not require upgrading to compensate for the proposal as the existing configuration provides two lanes for vehicles entering the roundabout from the Illawong/Alfords Point off ramp direction.

The Brushwood Drive on ramp would lead directly into the additional northbound lane on Alfords Point Road eliminating the existing merge arrangement. As is currently the situation, vehicles turning left and right from Brushwood Drive onto the on ramp would still be required to merge about 60 metres down the on ramp. The widening of the Brushwood Drive on ramp by up to 1.6 metres would allow the relocation of the bus bay.

The layout of the Illawong/Alfords Point off ramp and Brushwood Drive on ramp is provided in Figure 3-5.

3.3.3 Heavy vehicle inspection bay

The heavy vehicle inspection bay would be located on the eastern side of Alfords Point Road under the Old Illawarra Road overbridge. The road corridor at this location is sufficiently wide to cater for the heavy vehicle inspection bay and no works are required to the Old Illawarra Road overbridge. The heavy vehicle inspection bay would be about 60 metres long and 8.5 metres wide. A 100 to 150 metre, left turn deceleration lane would be provided within the existing road shoulder for vehicles to enter the bay during operation. A kerb and gutter drainage system would be provided. No stopping signage would prohibit parking in the inspection bay when it is not in operation. Fencing and gates would restrict vehicle access from Old Illawarra Road and lighting would be provided for use during hours of operation. Refer to Section 6.1.4 for detail regarding potential noise impacts during operation of the heavy vehicle inspection bay. The layout of the inspection bay is provided in Figure 3-6.



1:1,200 (at A3)

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

N

LEGEND

- Existing noise barrier
- Potential noise barrier
- Shared path
- Brushwood Drive on ramp
- Footpath to bus stop
- Bus only lane
- Illawong/Alford Point Road Off Ramp
- Proposal site
- The proposal
- Construction compound
- Existing noise wall

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Illawong/Alfords Point off ramp, Brushwood Drive on ramp and construction site compound

Figure 3.5

G:\21\21268\GIS\Maps\MXD\21_21268_Z008_REF_IllawongAlfordsPointRampBrushwoodDriveRamp_RevB.mxd

Data Source: NSW Department of Lands: Cadastre - Jan 2011; Geoscience Australia: 250k Data - Jan 2011. Created by: sdwoodger

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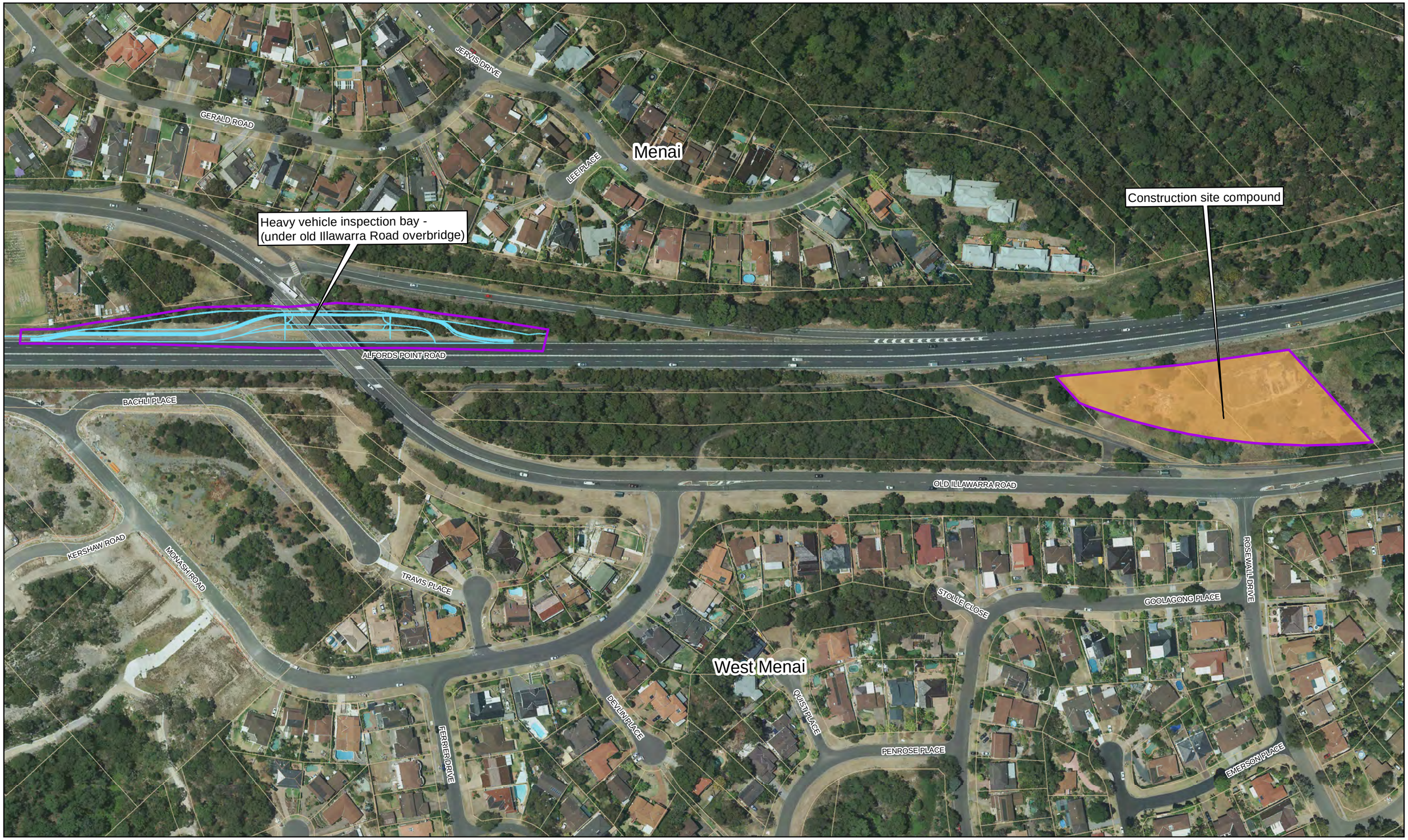

1:2,000 (at A3)

0 12.5 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

LEGEND

- Proposal site
- Construction Site Compound
- The proposal
- Cadastre

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Alfords Point Road Upgrade

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Heavy vehicle inspection bay

Figure 3.6

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3.3.4 Drainage

The drainage design for the proposal utilises a combination of new and existing drainage infrastructure. The key drainage features of the proposal are shown in Figure 3-7 and summarised below.

Longitudinal drainage

From Alfords Point Bridge to about 300 metres south, road surface runoff drains in a northerly direction before flowing through an existing spill containment system at the southern abutment of Alfords Point Bridge. The proposal would retain the spill containment system and drainage pipes along this section of Alfords Point Road and road runoff would continue to be discharged towards the Georges River under Alfords Point Bridge. The existing pits would be adjusted to the new kerb line and surface level. The spill containment system is assumed to have a holding capacity of 25 kilolitres which would have more than sufficient capacity to adequately deal with the treatable and bypass flows resulting from the proposal.

From 300 metres to 850 metres south of Alfords Point Bridge, the road surface runoff drains in a northerly direction before discharging into an existing gully that drains in an easterly direction towards the Georges River National Park. This discharge point is about 300 metres south of Alfords Point Bridge. Minimal formal drainage infrastructure is currently present in this section of road. As part of the proposal, a carrier line (buried pipe) would be constructed along the type F barrier on the eastern side of the carriageway, ultimately discharging via a new head wall to a formed swale drain. The swale drain would contain a series of pervious rock check dams and connect to the existing gully that currently drains towards the Georges River National Park. The length of this rock check dam would be determined during detailed design.

From 850 metres to 1600 metres south of Alfords Point Bridge, the road surface runoff currently drains in a northerly direction before discharging towards the Georges River about 800 metres south of Alfords Point Bridge. Minimal formal drainage infrastructure is currently present in this section of road. As part of the proposal a carrier line (buried pipe) would be constructed along the eastern side of the carriageway, ultimately discharging via a new head wall to a proposed operational water quality basin 850 metres south of Alfords Point Bridge. This water quality basin is proposed to have a volume of about 25 cubic metres to cater for a contributing catchment of about 1.8 hectares. The basin capacity is small as the construction area is very narrow and constrained by the adjacent Georges River National Park and utility easements. The basin would outlet to the east, towards the Georges River and be wholly located within the road corridor. The water quality basin would serve the dual purpose of sediment and gross pollutant capture as well as spill control of insoluble pollutants. This would be achieved by a negatively graded discharge pipe (also known as an ‘ellis arrangement') to allow insoluble pollutants (that can be heavier or lighter than water) to be retained in the basin. The basin would also provide some attenuation of flows. The need for and sizing of the basin would be refined during detailed design.

A high point exists on Alfords Point Road about 1775 metres south of Alfords Point Bridge. Runoff from the northbound carriageway at this location flows to the existing drainage swale to the west of the road. This existing swale would be retained as part of the proposal. Runoff from the southbound carriageway is collected at the central median barrier and then discharges to an existing collection point 1620 metres south of the Alfords Point Bridge. This road drainage arrangement would be maintained as part of the proposal.

Runoff from the shared path would be collected in a newly constructed table drain on the eastern side of the shared path. In sections were the fall is towards the type F barrier, several pits would be constructed to collect the runoff.

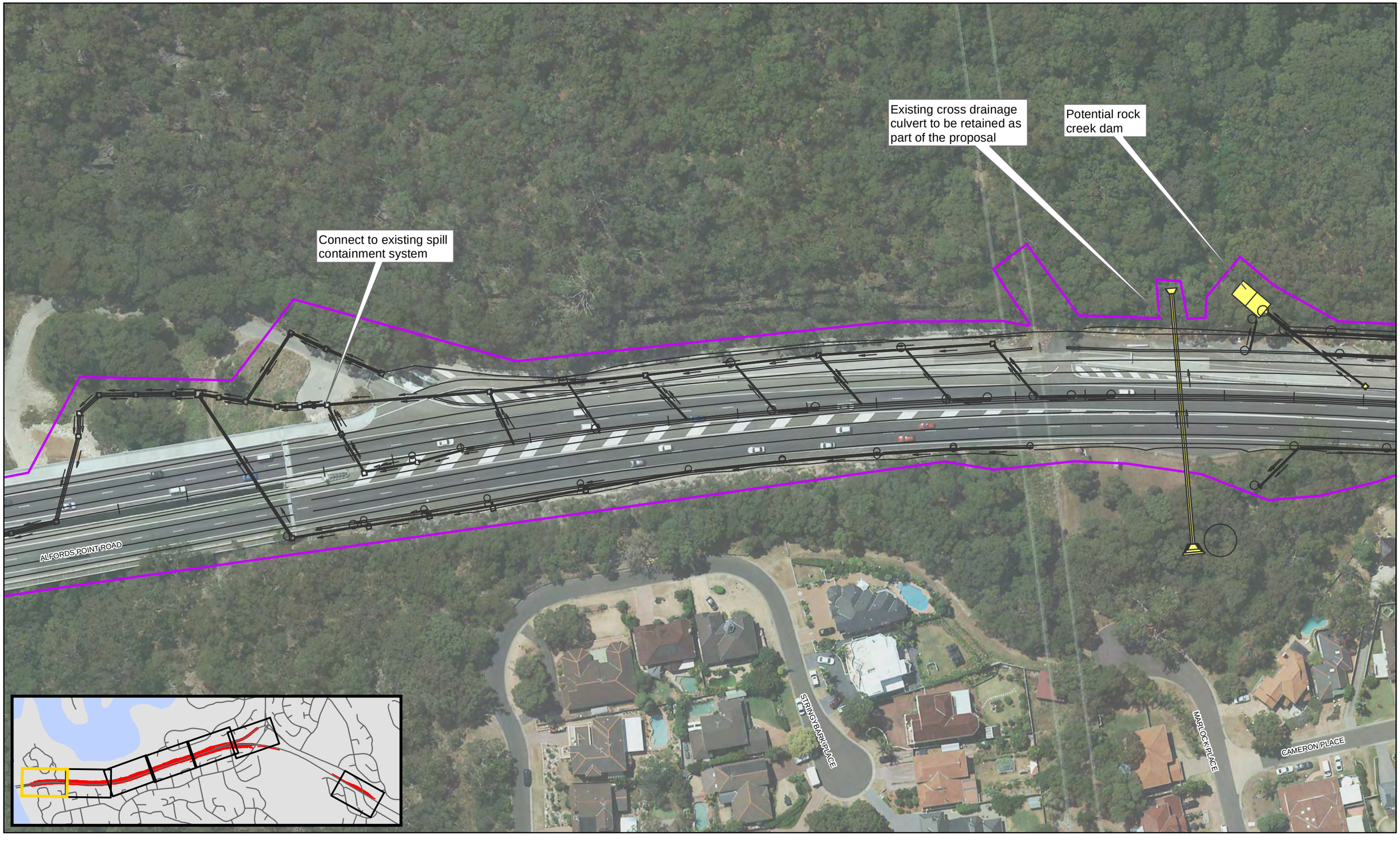
At the Brushwood Drive on ramp all existing pits would be adjusted to the new kerb line. No additional drainage works at the on ramp are proposed however this would be confirmed during detailed design. At the Illawong/Alfords Point off ramp the existing drainage lines would be retained, the carrier drainage line extended and a number of new pits constructed.

Only minor drainage works would be required at the heavy vehicle inspection bay. Surface runoff would be collected by a gutter on the south eastern side. Two existing pits would be converted into junction pits and new pits would be constructed in the adjacent new kerb. At the low point in the gutter at the southern edge runoff would discharge into an adjacent swale. The size of this swale would be confirmed during detailed design however it would be located wholly within the existing road corridor and would not encroach on the Georges River National Park.

Cross drainage

Existing cross drainage is provided through a 1050 millimetre diameter pipe about 300 metres south of Alfords Point Bridge and a 600 millimetre diameter pipe about 1620 metres south of Alfords Point Bridge. Both pipes discharge stormwater runoff in an easterly direction under the existing pavement. Both culverts convey runoff from the road pavement as well as external residential catchments on the western side of Alfords Point Road. The culvert located 1620 metres south of Alfords Point Bridge would be extended to the toe of the widened batter. The proposal is not anticipated to alter the flow regime for these culverts, and these pipes have sufficient capacity to cater for the 1 in 100 year rainfall event (refer Section 6.3 and Appendix G). The hydrology of the catchments is discussed further in Section 6.3.1.

An existing minor cross culvert underneath the footpath connection between Maxwell Close and Alfords Point Road would be replaced like for like as part of the proposal.



1:1,000 (at A3)

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

LEGEND

- Road drainage layout
- Cross drainage features
- Sedimentation basin
- Proposal site

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Key drainage features of the proposal

Figure 3.7(a)

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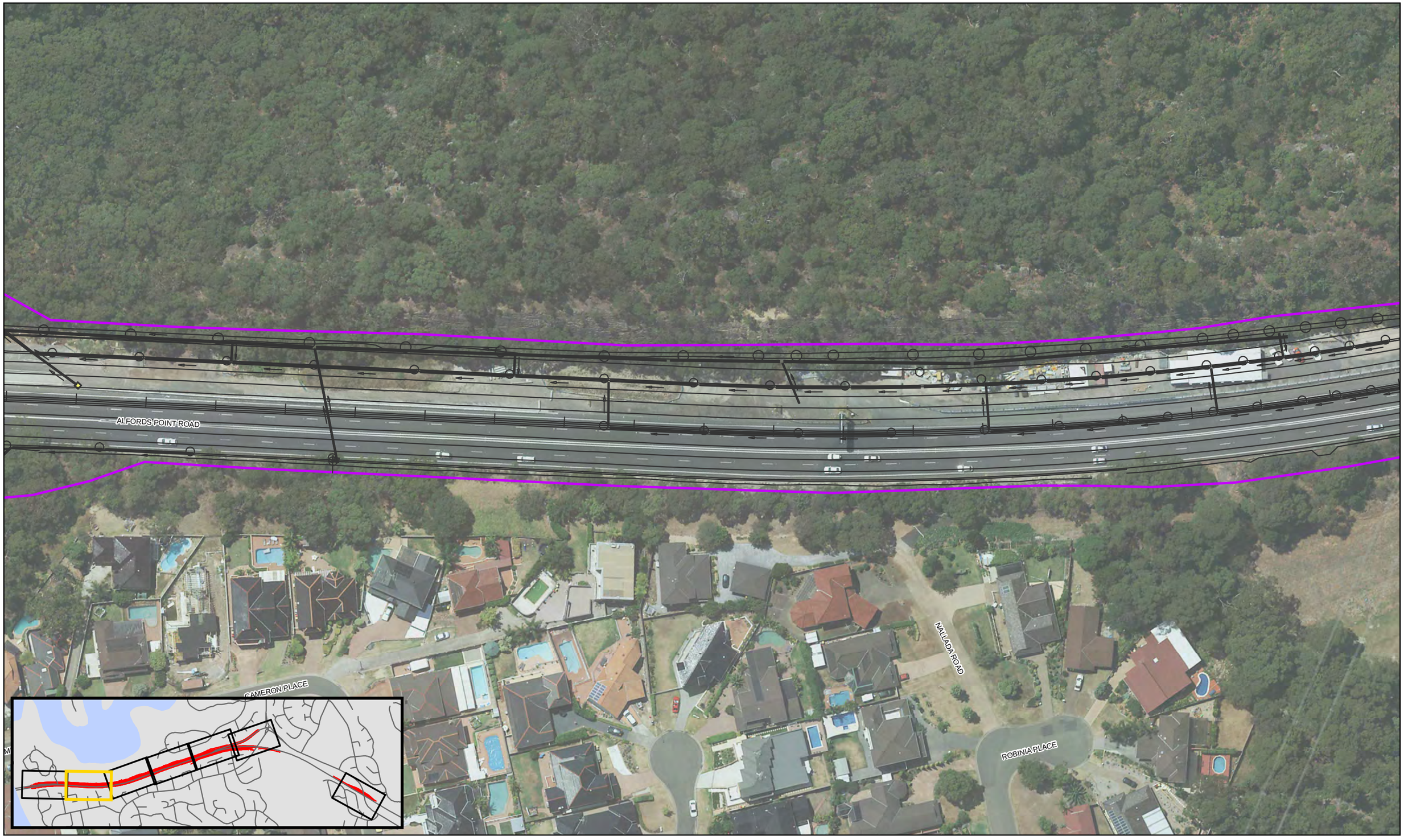

1:1,000 (at A3)

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

N

LEGEND

- Road drainage layout
- Cross drainage features
- Sedimentation basin
- Proposal site

Roads and Maritime Services
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Key drainage features of the proposal

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Figure 3.7(b)

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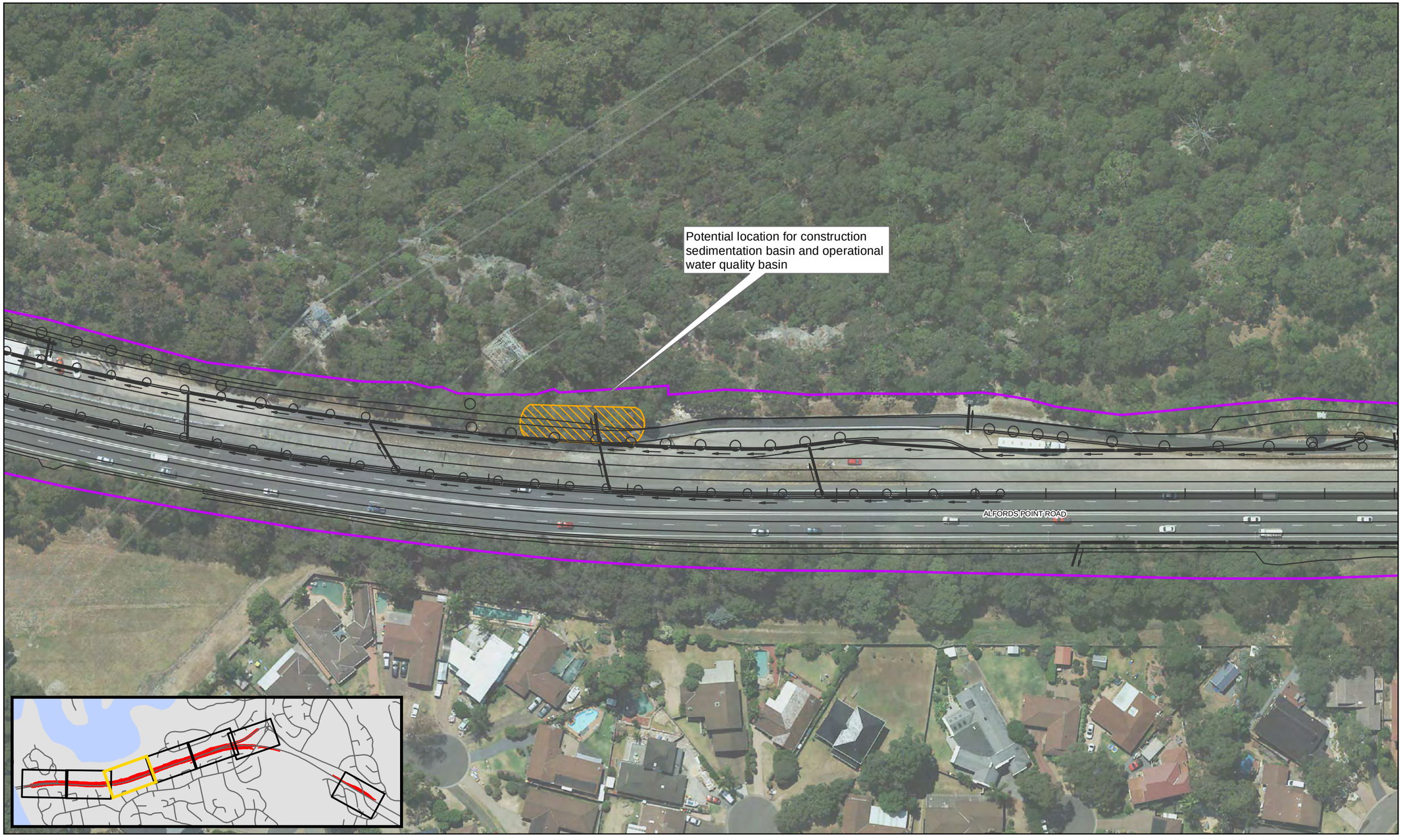

1:1,000 (at A3)

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

LEGEND

- Road drainage layout
- Cross drainage features
- Sedimentation basin
- Proposal site

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Key drainage features of the proposal

Figure 3.7(c)

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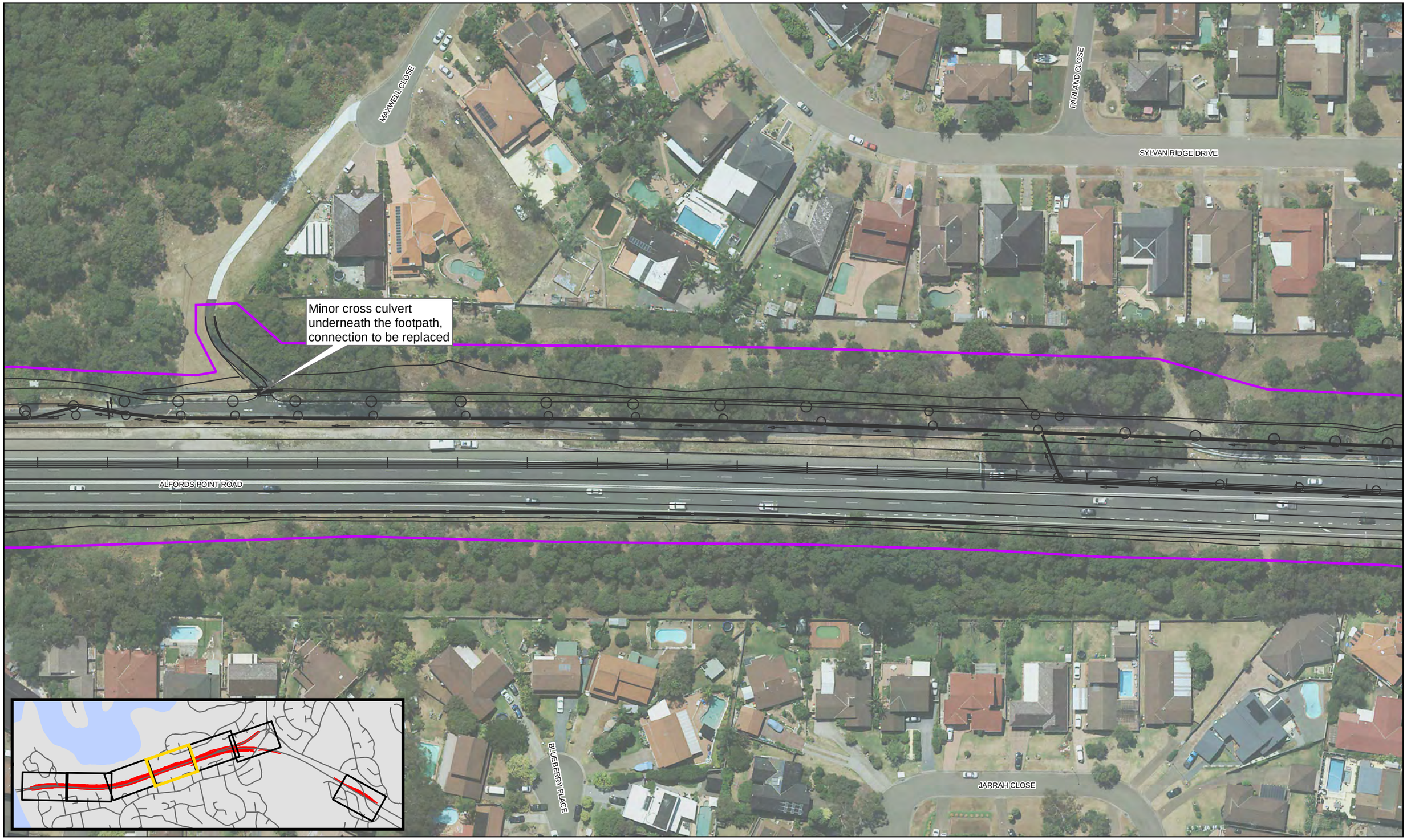

1:1,000 (at A3)

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

N

LEGEND

- Road drainage layout
- Cross drainage features
- Sedimentation basin
- Proposal site

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Key drainage features of the proposal

Figure 3.7(d)

G:\21\21268\GIS\Maps\MXD\21_21268_Z012_Drainage_RevC.mxd

Data Source: NSW Department of Lands: Cadastre - Jan 2011; Geoscience Australia: 250k Data - Jan 2011. Created by: SDWOODGER

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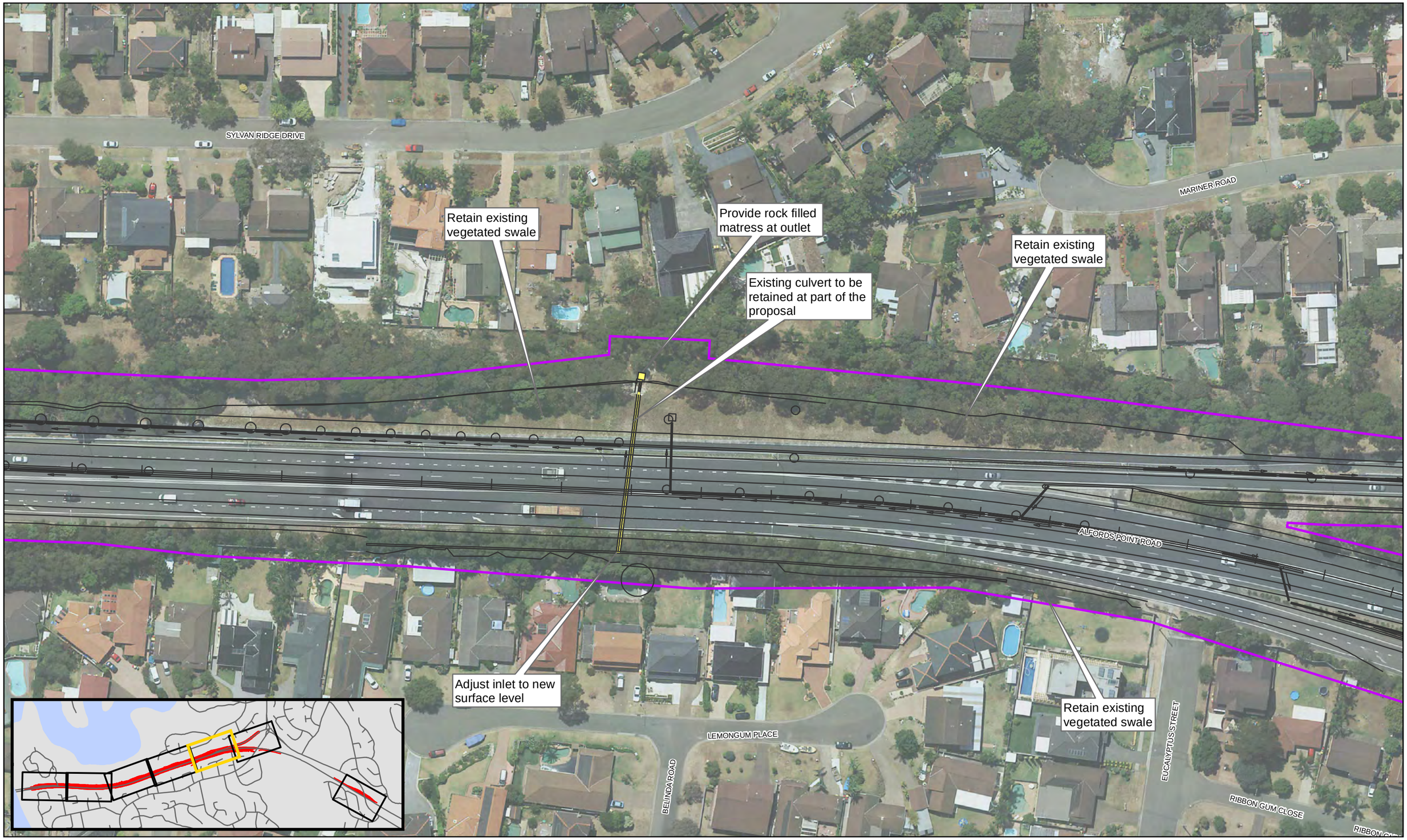

1:1,000 (at A3)

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

N

LEGEND

- Road drainage layout
- Cross drainage features
- Sedimentation basin
- Proposal site

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Key drainage features of the proposal

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Figure 3.7(e)

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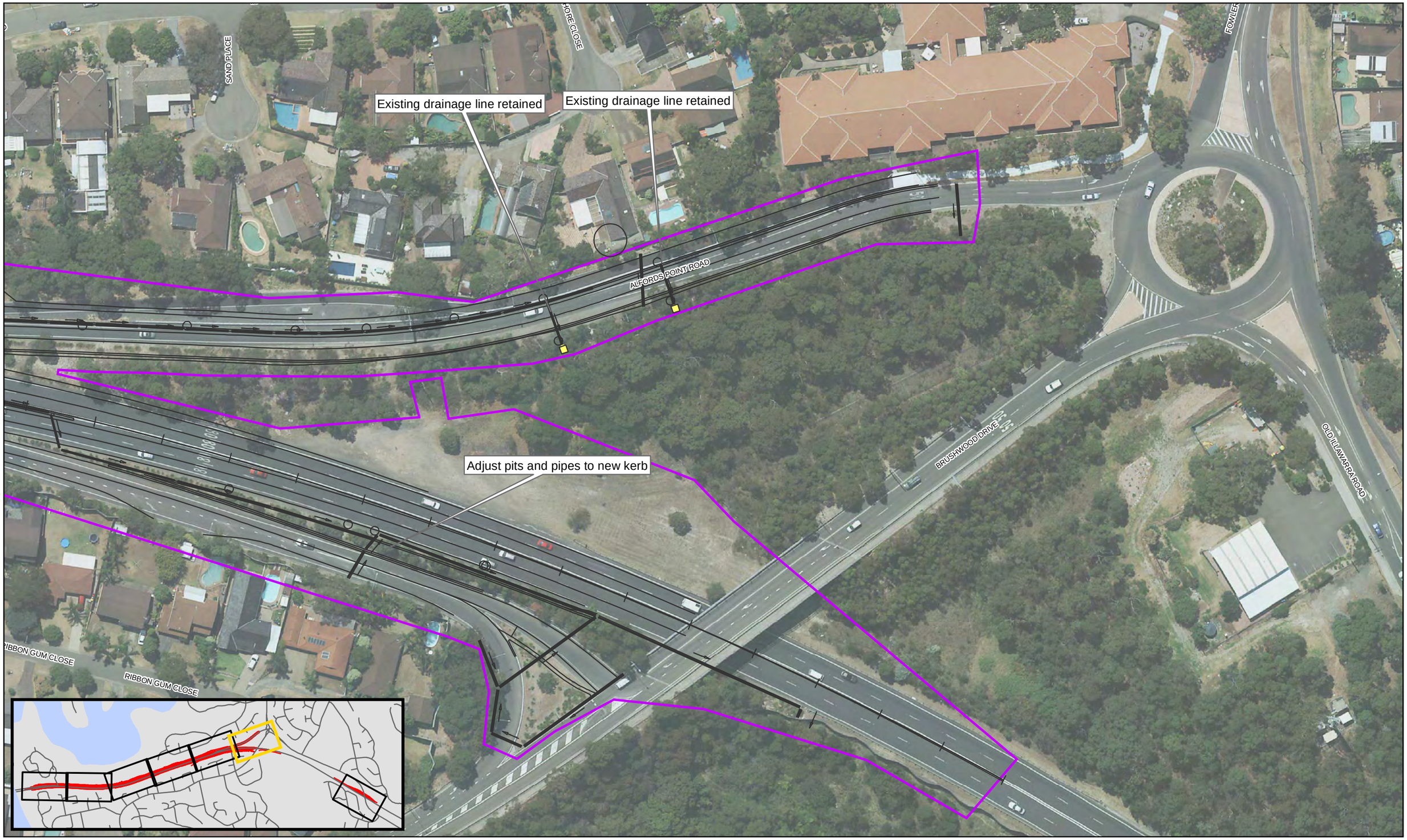

1:1,000 (at A3)

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

LEGEND

- Road drainage layout
- Cross drainage features
- Sedimentation basin
- Proposal site

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Key drainage features of the proposal

Figure 3.7(f)

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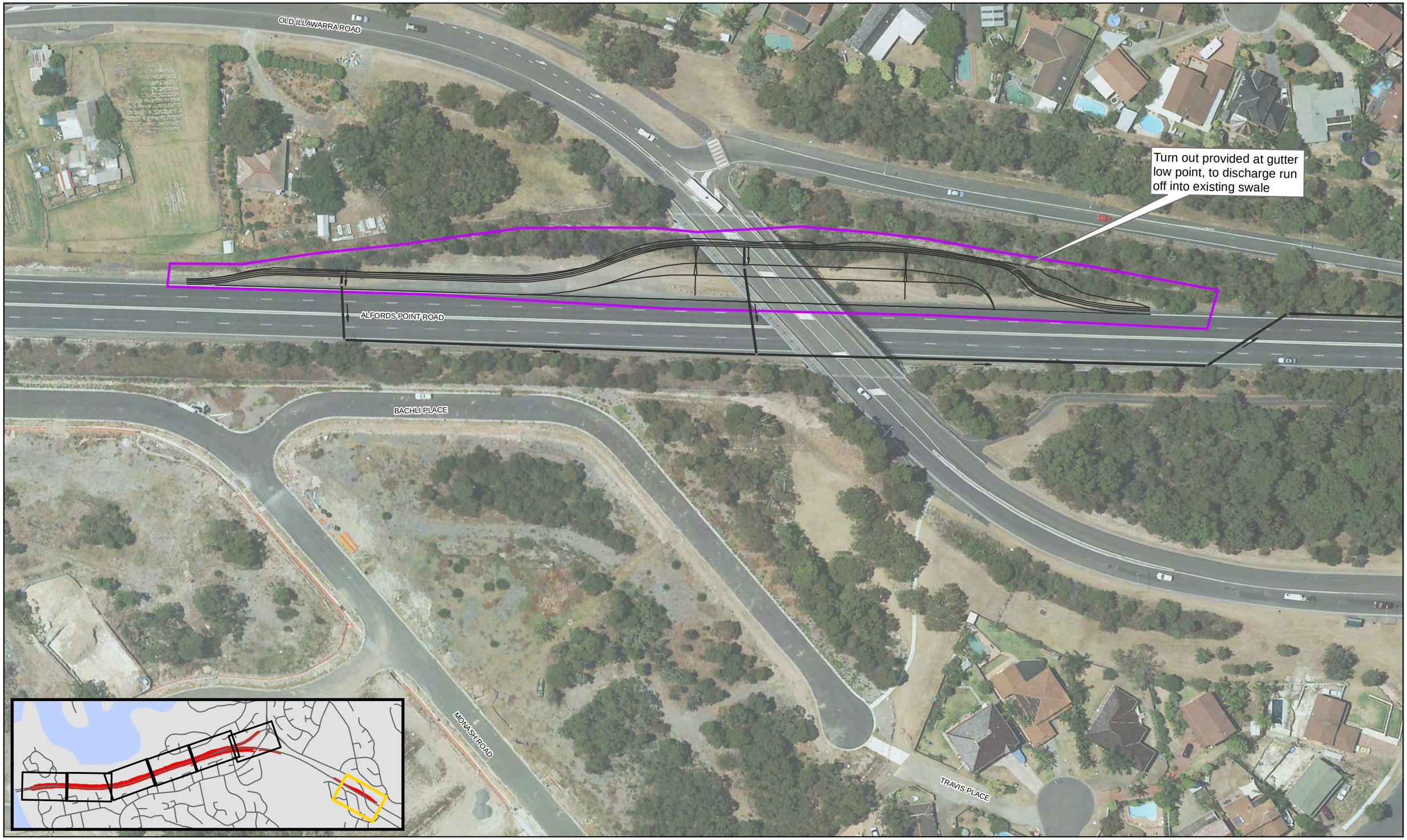
Data Source: NSW Department of Lands: Cadastre - Jan 2011; Geoscience Australia: 250k Data - Jan 2011. Created by: SDWOODGER

Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au



1:1,000 (at A3)

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

N

LEGEND

- Road drainage layout
- Cross drainage features
- Sedimentation basin
- Proposal site

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Key drainage features of the proposal

Figure 3.7(g)

G:\21\21268\GIS\Maps\MXD\21_21268_Z012_Drainage_RevC.mxd

Data Source: NSW Department of Lands: Cadastre - Jan 2011; Geoscience Australia: 250k Data - Jan 2011. Created by: SDWOODGER

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3.3.5 Shared path

A 1.9 kilometre permanent, concrete shared path for pedestrians and cyclists would be provided on the eastern side of Alfords Point Road to replace the existing temporary asphalt shared path (refer Figure 1-2). The shared path would start about 40 metres south of Alfords Point Bridge and connect with the existing shared path adjacent to the Illawong/Alfords Point off ramp. For relatively flat areas (less than three per cent grade) the shared path would be three metres wide with a concrete paved width of 3.5 metres. For steeper areas (greater than three per cent grade) the path would convert to separate pedestrian and cyclist paths and would be four metres wide with a concrete paved width of 4.5 metres. South of Brushwood Drive roundabout the shared path would be a separate pedestrian and cyclist path for 640 metres. The next 470 metres south would be a shared path. South of that would be another 350 metres of separate pedestrian and cyclists paths for the steep grade south of the existing heavy vehicle inspection bay. The southern section of the path would be a shared path for a length of 540 metres. A type F concrete barrier would be installed between the path and Alfords Point Road to separate pedestrians and cyclists from vehicle movements. On top of the barrier would be a guard rail about 1.4 metres in height (to be confirmed during detailed design).

3.3.6 Other design features

Bus stop relocation and footpath connection

The existing bus stop on the western side of Brushwood Drive on ramp would be relocated about 80 metres south of the existing location. A bus bay would also be provided at this location allowing a safer stopping location for buses than the existing situation (refer Figure 3-5). A new footpath would also be constructed to provide pedestrian access from Eucalyptus Street to the relocated bus stop. This footpath would be about two metres wide and extend about 75 metres. Currently a noise wall is located between Eucalypt Street and Brushwood Drive on ramp. An opening in the noise wall at the end of Eucalyptus Street currently provides pedestrian access to the bus stop. This opening in the noise wall would be moved seven metres south and reoriented to face south to provide better access to the new footpath. The existing north facing noise wall opening would be closed.

Bus only lane

A 30 metre long bus only lane would be provided at the commencement of Brushwood Drive on ramp (refer Figure 3-5). For buses turning right from Brushwood Drive onto the on ramp, the bus only lane would enable them to hold while waiting for a safe gap in the traffic to enter the bus bay further north on Brushwood Drive on ramp. Buses would be required to give way to vehicles turning left from Brushwood Drive onto the Brushwood Drive on ramp.

Break down bay

A vehicle break down bay about 20 metres long would be provided at the location of the existing heavy vehicle inspection bay 900 metres south of Alfords Point Bridge (refer Figure 1-2). A break in the type F concrete barrier separating the southbound lanes and shared path would be provided to allow a person from a broken down vehicle access to the shared path. The break down bay would be about five metres wide and a formalised extension of the road pavement. A kerb and guttering drainage system would be provided around the edge of the break down bay.

Urban and landscape design

A Landscape Character and Visual Impact Assessment and Urban Design Report has been prepared for the proposal (RMS, 2012). The methodology used to undertake the study is consistent with the RMS *Guidelines for Landscape Character and Visual Impact Assessment*. The report developed urban design principles and objectives to guide the design of the proposal and improve the urban design outcomes for

the community and road users. The urban design principles and objectives ensure the proposal fits into the natural, built and community setting, improves the travelling experience for road users, and minimises adverse visual impacts. The principles and objectives include:

- Fitting the upgrade into the existing road and landscape setting
- Fitting the upgrade into the adjacent road network
- Planting design
- Improvements to the shared path
- Design for the potential noise barriers.

The Landscape Character, Visual Impact Assessment and Urban Design Report is provided in Appendix K and provides a landscape strategy for the proposal.

Noise mitigation measures

During the detailed design stage of the proposal, further investigation of all feasible and reasonable noise mitigation options would be undertaken for the receivers identified in as requiring mitigation (refer Section 6.1.4). All feasible and reasonable noise mitigation treatments would be considered for the affected receivers, in consultation with their respective landowners to reduce operational road noise. One option is a potential roadside noise barrier on the western side of Alfords Point Road from where the existing noise wall ends at the rear of Jarrah Close to about 700 metres north. Potential acoustic treatment of some properties on Nallada Road is another option that would be investigated further. In addition, a potential one kilometre length noise barrier would be investigated along the eastern side of Alfords Point Road between Maxwell Close and Brushwood Drive. A detailed noise and vibration assessment is provided within Section 6.1 and Appendix F.

Lighting

Street lighting would be provided at the Brushwood Drive on ramp and where the Illawong/Alfords Point off ramp diverges from Alfords Point Road. Lighting would also be provided at the proposed heavy vehicle inspection bay and the new bus stop location. Lighting for the inspection bay would only be operational when the bay is in use. No lighting is proposed for the shared path. Trenching would be required to connect new lighting to existing power sources.

All lighting for the proposal would be in accordance with *Australian Standard 1158 Road Lighting*.

Relocation of the variable message sign

The existing variable message sign for southbound traffic, located about 530 metres south of Alfords Point Bridge, would be relocated to allow widening of Alfords Point Road. The new location for the variable message sign would be approximately 500 metres south of its current location and would require trenching to connect to existing power and communication utilities in Maxwell Close. The sign would be about 1.5 metres high, 10 metres wide and mounted on a single, eight metre high support column. The sign would be located behind the proposed concrete type F barrier separating the southbound lanes of Alfords Point Road and the shared path. Access for maintenance would be provided to the sign.

Parking restrictions and general road signage

Fencing and no parking signs would be installed adjacent to the southbound lanes of Alfords Point Road between the Illawong/Alfords Point off ramp and Brushwood Drive to prevent vehicles parking, including heavy vehicles, in open spaces adjacent to Alfords Point Road. Fencing, no parking signs and gates would also be installed at the proposed heavy vehicle inspection bay to prevent vehicles parking at the bay and surrounding area when the heavy vehicle inspection bay is not in use.

All road side signage would be in accordance with *Australian Standard 1743 Road Sign Specification* and developed further during detailed design.

Ausgrid easement access

The existing access to Ausgrid's easements about 300 and 720 metres south of Alfords Point Bridge would be maintained as part of the proposal.

3.4 Construction activities

3.4.1 Work methodology

Construction activities would be guided by a construction environmental management plan (CEMP) to ensure works are carried out to RMS specifications within the specified works area and are completed to incorporate all safeguards described in this REF. Detailed work methodologies would be determined during construction planning and detailed design. An indicative construction methodology for the proposal is provided below:

- Pre-construction activities including notifying relevant authorities and the community of works commencing
- Site establishment and preliminary works including:
  - Commencing pre-construction mitigation measures outlined in the CEMP, such as installing erosion, sediment and water quality controls including the sedimentation basin
  - Establish permanent and temporary fencing, work compounds and stockpile sites
  - Establish site access
  - Implement temporary traffic controls including construction speed limits and variable message signs
  - Relocate and/or adjust affected utilities, services and signage (as required throughout construction staging)
- Clearing activities including removal of vegetation and demolishing existing pavement and road structures
- Earthworks including:
  - Remove and stockpile and/or spoil topsoil
  - Excavate and spoil unsuitable material
  - Excavate to subgrade level and compact
  - Rock hammer and demolish pavement
  - Recycle excess site material where possible including the use of crushing and screening plant and equipment
  - Haul, spread and compact earthworks materials that would be predominantly sourced from quarries off site
  - Progressively widen and stabilise the existing fill batter on the eastern side of Alfords Point Road
- Construct pavement drainage using precast pipe culverts and cast in-situ concrete drains. Connect new pavement drainage to existing spill containment system
- Construct kerbs and medians
- Construct new road pavement

- Construct pavement for the shared path on the eastern side of Alfords Point Road between Alfords Point Bridge and Brushwood Drive
- Construct roadside furniture including guardrail, type F concrete barrier, potential noise barrier and guideposts
- Install street lighting including trenching and utility connections
- Install signs and line marking
- Decommission stockpile and compound sites and site clean up
- Topsoiling and landscaping.

Construction would not require dredging or reclamation of any watercourses as defined under the *Fisheries Management Act 1994*.

3.4.2 Construction staging

The proposal would be constructed in five stages to ensure traffic flow along Alfords Point Road is maintained at all times to minimise traffic delays. The proposed stages for construction are outlined below however this would be confirmed during detailed design. An indicative staging plan is provided in Appendix A. The need for basin structures and noise barriers would be confirmed during detailed design. If confirmed, the works would be coordinated into the construction staging of the adjacent carriageway.

Stage 1

- Relocate and reinstate the existing temporary path from Alfords Point Bridge to Maxwell Close. Reduce the width of the path to a maximum of two metres. Undertake early landscaping works along the eastern side of Alfords Point Road
- Construct the bus only lane on Brushwood Drive on ramp
- Reduce the Brushwood Drive on ramp to one lane with left turn from Brushwood Drive to give way to right turn from Brushwood Drive. The right turn from Brushwood Drive would use the newly constructed bus lane
- Shift Alfords Point Road traffic to the eastern side of the carriageway between 1780 metres and 2000 metres south of Alfords Point Bridge
- Shift the Illawong/Alfords Point off ramp traffic to the eastern side of off ramp pavement
- Construct pavement widening on the eastern side of Alfords Point Road between 150 metres and 1360 metres south of Alfords Point Bridge
- Construct pavement widening on the western side of the Illawong/Alfords Point off ramp
- Construct pavement widening on western side of Alfords Point Road between 1800 metres and 1970 metres south of Alfords Point Bridge
- Construct pavement widening on eastern side of the Brushwood drive on ramp
- Remove the existing island at the end of the Illawong/Alfords Points off ramp and construct a temporary pavement in its place.

Stage 2

- Shift Alfords Point Road traffic to the western side of the widened carriageway between 1700 metres and 2000 metres south of Alfords Point Bridge

- Shift traffic on the Illawong/Alfords Point off ramp to the newly constructed ramp widening on the western side
- Establish two lanes on the Brushwood Drive on ramp to allow right turn and left turn traffic from Brushwood Drive to turn into their own lane
- Close the existing shared path between Maxwell Close and Fowler Road and divert pedestrian and cyclists onto Fowlers Road via Maxwell Close, Sylvan Ridge Drive and Heritage Drive
- Construct the pavement widening on eastern side of Alfords Point Road between 1360 metres and 1760 metres south of Alfords Point Bridge (including pavement for shared path)
- Construct the pavement widening on eastern side of Alfords Point Road between 1760 metres and 1920 metres south of Alfords Point Bridge
- Construct fill batter on the eastern side of Alfords Point Road about 1600 metres south of Alfords Point Bridge
- Reconstruct the pavement on the eastern side of the Illawong/Alfords Point off ramp.

Stage 3

- Construct asphalt/concrete overlay on the existing pavement of Alfords Point Road southbound lanes between 50 metres and 300 metres south of Alfords Point Bridge (potentially during out of hours)
- Construct asphalt/concrete overlay on the existing pavement of Alfords Point Road southbound lanes between 1410 metres and 1770 metres south of Alfords Point Bridge (potentially during out of hours)
- Construct asphalt/concrete overlay on the existing pavement of Alfords Point Road (full width) and Brushwood Drive on ramp between 1770 metres and 1990 metres south of Alfords Point Bridge (potentially during out of hours)
- Switch southbound traffic on Alfords Point Road to the newly constructed pavement widening on the eastern side of Alfords Point Road for the full length of the proposal
- Establish two lanes on the Illawong/Alfords Point off ramp
- Construct pavement widening infill between the newly constructed southbound carriageway and existing pavement on Alfords Point Road between 560 metres and 1410 metre south of Alfords Point Bridge
- Construct the breakdown bay in the location of the existing heavy vehicle inspection bay
- Construct asphalt/concrete overlay on the existing pavement between the northbound and southbound lanes of Alfords Point Road between 300 metres and 1410 metres south of Alfords Point Bridge.

Stage 4

- Construct asphalt/concrete overlay on the existing pavement of Alfords Point Road northbound lanes between 50 metres and 300 metres south of Alfords Point Bridge (potentially during out of hours)
- Construct asphalt/concrete overlay on the existing pavement of Alfords Point Road northbound lanes between 1550 metres and 1770 metres south of Alfords Point Bridge (potentially during out of hours)
- Switch northbound lanes of Alfords Point Road so they are adjacent to the southbound lanes

- Construct pavement widening on the western side of Alfords Point Road between 1430 metres and 1770 metres south of Alfords Point Bridge
- Construct the type F concrete barrier and drainage adjacent to the western edge of Alfords Point Road between 50 metres and 1430 metres south of Alfords Point Bridge
- Construct asphalt/concrete overlay on the existing pavement of Alfords Point Road northbound lanes between 300 metres and 1550 metres south of Alfords Point Bridge.

Stage 5

- Switch northbound traffic on Alfords Point Road to the western side of the northbound carriageway
- Construct the type F concrete barrier and drainage within the median of Alfords Point Road between 100 metres and 1810 metres south of Alfords Point Bridge
- Construct the asphalt/concrete wearing surface for the entire length of the proposal
- Construct the heavy vehicle inspection bay.

3.4.3 Workforce and working hours

Construction is anticipated to take about 24 months to complete (weather permitting).

It is estimated that up to 50 construction and site management personnel would be required on site each day. This number is indicative and would be confirmed by the appointed construction contractor during construction planning.

It is anticipated that the majority of construction works for the proposal would be undertaken during recommended standard hours as outlined in the *Interim Construction Noise Guideline* (DECC, 2009). The recommended standard hours for construction are:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- No work on Sundays and public holidays.

Some construction works may also be required outside of standard working hours to minimise traffic impacts. These works would include:

- Traffic control switches
- Pavement reconstruction
- Heavy patching.

It is anticipated that the total duration of works outside of standard working hours would be about four months (not continuous) over the entire 24 month construction period

Work undertaken outside of standard construction hours (if required) would be in accordance with the Office of Environment and Heritage *Interim Construction Noise Guideline* (DECC, 2009) and the RMS' *Environmental Noise Management Manual 2001 - Practice Note 7.* This would include notifying the local community in advance of any works planned to be undertaken outside of standard construction hours.

3.4.4 Plant and equipment

The plant and equipment required for construction of the proposal would be determined during construction phase planning. Roadwork, including drainage works, construction of the heavy vehicle

inspection bay and construction of the shared path, would be undertaken using the equipment outlined in Table 3-2.

Table 3-2 Construction plant and equipment

Plant and equipment	Plant and equipment
Excavator	Crane
Front-end loader	Chainsaws
Grader and roller	Backhoes
Crushing and screening plant	Trenching machines
Bulldozer	Milling machine
Concrete vibrator	Hand tools
Jack hammer	Welding equipment
Bitumen and asphalt paving machine	Air compressor
Concrete truck	Water trucks
Concrete pump	Road sweepers
Line-marking plant	Generators and lights
Semi-trailers and large haulage trucks	Light commercial and passenger vehicles
Truck and dog tippers	Rock screening unit (recycling)
Compactor	Drilling and pilling rigs
Concrete saw	

3.4.5 Earthworks

Table 3-3 outlines the indicative quantities of material associated with earthworks for the proposal.

Table 3-3 Indicative earthwork quantities

Material	Cubic metres
Cut	13,525
Fill	1215
Milled asphalt	1825
Cut to spoil	19,720
Unsuitable material	225
Top soil (removal)	5625

3.4.6 Source and quantity of materials

The majority of fill material would be sourced from a licensed supplier within or near the Sydney region. Exact material quantities are unknown at this stage but would include sand, select material, road base,

backfill, asphalt, topsoil, surplus pavement and concrete. These materials would be sourced from local quarries and commercial suppliers. Initial estimates of the material quantities required are outlined in Table 3-4.

Table 3-4 Approximate quantity of materials required

Material type	Appropriate volume required (m^3)
Select material	4440
Road base	850
Drainage backfill	410
Asphalt	10,915
Topsoil	265
Lean concrete	2810
Path concrete paving	1150

Construction water required for earthworks would be sourced from the temporary construction sediment basin. If water recovered from the temporary sedimentation basin is insufficient for construction works, water would be sourced from local supplies. In instances where clean water is required, this would be sourced from the potable mains system operated by Sydney Water.

3.4.7 Traffic management and access

Vehicle movements

Construction of the proposal would require heavy vehicle movements for the transport of construction machinery and equipment, and the import and movement of fill material. Table 3-5 outlines the indicative heavy vehicle movements that would be required during the major aspects of construction.

Table 3-5 Indicative heavy vehicles

Work activity	Heavy vehicle movements per day shift
Import and deliver materials, plant and equipment.	15
Remove spoil and waste material from site including plant and equipment during demobilization	15
Total heavy vehicle movements per day	**30**

Further minor vehicle movements not identified in Table 3-5 would also be required for the movement of workers, supervisors, general materials and small plant. Minor vehicle movements are estimated to generate a maximum of 20 to 30 small vehicles accessing the site daily resulting in 40 to 60 smaller vehicle movements per day.

Traffic management

A traffic management plan would be prepared in accordance with RMS' *Traffic Control at Work Sites* (RTA, 2010a) and RMS' Specification G10 - Control of Traffic (RTA, 2006). The traffic management plan

would provide details of the traffic management to be implemented during construction to ensure that traffic flow on the surrounding network is maintained where possible. The traffic management plan would also ensure the safe separation of workers on site from vehicles on Alfords Point Road.

The speed limit on Alfords Point Road would be reduced to 60 km/h for the duration of construction. Two lanes in each direction would be operating during all peak periods for the duration of construction. Traffic would be reduced to one lane in each direction during off peak periods and the speed limit reduced to 40km/h for high risk works to ensure the safe separation of workers from passing vehicles. During works on Illawong/Alfords Point off ramp and Brushwood Drive on ramp, overnight closures of the ramps may be required and alternate routes would be provided. Parking for construction workers would be provided at the main construction site compound.

The traffic management plan would also detail specific haulage routes that construction traffic would follow throughout the construction phase. The traffic management measures outlined in Section 6.7 would be implemented and the traffic management plan would be reviewed by RMS prior to implementation.

Access management

Access to the main construction site compound between the Illawong/Alfords Point off ramp and the Brushwood Drive overbridge would be from the Illawong/Alfords Point off ramp. Access would be restricted to vehicles and trucks travelling in a south bound direction via right turn only. Access would be prohibited for northbound vehicles for safety reasons. To access the site, northbound vehicles would need to travel north to Clancy Street, turn onto Henry Lawson Drive, then use the Alfords Point Road southbound on ramp (about an eight kilometre detour). When exiting the site, vehicles would only be allowed to turn right onto the Illawong/Alfords Point off ramp and then either continue south or turn right onto Brushwood Drive overbridge and take the northbound Brushwood Drive on ramp. Left turn movements would be prohibited for all vehicles exiting the construction site compound as this would be against the off ramp traffic flow. Construction and delivery vehicles entering or leaving the site compound would be under traffic control.

Access to the secondary site compound located 500 metres south of the Old Illawarra Road overbridge would be via Old Illawarra Road and would be unrestricted for right and left turn movements. Vehicles and trucks would exit the site via a left or right turn onto Old Illawarra Road.

Access to the stockpile site under Old Illawarra Road overbridge would be directly from Alfords Point Road and would be managed under traffic control. Access to the site would be restricted to left in and left out movements only. Right turn movements would be prohibited for all vehicles exiting this site. Vehicles exiting the site and wanting to travel north would have to take a two kilometre detour by travelling south to Old Illawarra Road, turning right and using the Old Illawarra Road/Hall Road roundabout before accessing the Alfords Point Road northbound lanes. Vehicles wanting to access the site travelling in a north direction would need to travel north to Clancy Street, turn onto Henry Lawson Drive, then use the Alfords Point Road southbound on ramp (about a 10 kilometre detour).

All property accesses would be maintained throughout construction and there would be no disruption to current bus services. Access to the Ausgrid easements and Alfords Point Bridge maintenance access would be maintained at all times throughout construction.

3.5 Ancillary facilities

3.5.1 Construction site compound and stockpile site

The main construction site compound would be located on the triangle piece of land adjacent to the Illawong/Alfords Point off ramp (refer Figure 1-2). Access and egress to the site compound is discussed in Section 3.4.7. Minimal vegetation clearing and earthworks would be required to provide access/egress and to create a level working area as the site has previously been cleared and leveled. The main site compound would be about 2500 square metres and used to stockpile materials, store plant and equipment, provide construction staff parking, toilets and amenities. The closest sensitive receivers are residential dwellings and Sir Thomas Mitchell Aged Care Facility on the eastern side of the Illawong/Alfords Point off ramp, about 50 metres to the east.

A secondary site compound would be located 400 metres south of Old Illawarra Road overbridge (refer Figure 1-2). This site has also been previously cleared and leveled and therefore would require minimal vegetation clearing or earthworks. This secondary site compound would be about 6000 square metres and used to stockpile materials, store plant and equipment, provide construction staff parking, toilets and amenities. Access and egress to the site is discussed in Section 3.4.7. The closest sensitive receivers to the site are the row of residential dwellings on the western side of Old Illawarra Road about 75 metres to the west.

Construction of the proposal would also require a minor stockpile site at the proposed heavy vehicle inspection bay beneath Old Illawarra Road. This stockpile site would be about 800 square metres and used to stockpile material and equipment.

As discussed in Section 6.4, contamination or acid sulfate soils are not likely occur within the proposal site and therefore the stockpiling of these materials is not likely to be required.

The final location of the compound and stockpile sites would be determined during the detailed design phase in accordance with RMS' *Stockpile Site Management Procedures* (RTA 2011). Once the contractor has a preferred location for the stockpile and storage areas, consultation with RMS' Senior Environmental Officer (Sydney Region) would be undertaken prior to any works in those locations to determine if any additional environmental assessment is required.

The hours of operation of the construction site compounds would be in accordance with the working hours discussed in Section 3.4.3. Compound sites would have security fencing. Chemicals and fuels for construction would be stored in bunded storage areas in the compound sites. Upon completion of the construction works, the temporary site compounds, work area and stockpiles would be removed, the site cleared of all rubbish and materials, and rehabilitated.

3.5.2 Sedimentation basins

During construction, one temporary sedimentation basin is proposed within the road pavement formation about 870 metres south of Alfords Point Bridge. The location of this basin is shown in Figure 3-7a. The site is relatively flat, has sufficient access to allow construction and maintenance and does not encroach on the Georges River National Park boundary. The basin would collect construction water from an upstream catchment area of about 1.8 hectares and therefore would require a capacity of about 135 cubic metres.

There are a number of constraints that have limited the available areas where a basin could be installed. Locating the basin within the road formation avoids disturbance to steep terrain and the Georges River National Park to the east. Although this creates restrictions on the road construction, it minimises the risk of a potential scouring event by reducing the amount of area exposed at any one time.

The location and sizing of basins would be further refined during detailed design. Any sedimentation basins required would form part of a comprehensive erosion and sedimentation control strategy during construction of the proposal and would be in accordance with *Managing Urban Stormwater: Soils and Construction (The Blue Book)* (Landcom, 2004).

3.6 Public utility adjustment

3.6.1 Existing utilities

A Dial-Before-You–Dig search was undertaken in May 2012 to determine public utility providers with assets in the proposal site. The following utility providers were identified and consulted:

- Telstra
- Ausgrid
- Sydney Water.

A summary of the consultation undertaken with utility owners is provided in Section 5. During detailed design, further consultation would be undertaken.

Telecommunications

Two Telstra optic fibre cables are located within the proposal site at the following locations:

- Within the fill batter on the eastern side of Alfords Point Road and continuing up Illawong/Alfords Point off ramp
- Immediately south of Brushwood Drive.

Electricity

Ausgrid underground power cables run along the eastern and western sides of Alfords Point Road at the southern end of the proposal site. Underground power cables also feed the variable message sign located 530 metres south of Alfords Point Bridge and power cables are within the Brushwood Drive overbridge. Ausgrid also has overhead power transmission lines that cross Alfords Point Road 300 metres and 725 metres south of Alfords Point Bridge.

Water

A Sydney Water main runs along the Illawong/Alfords Point off ramp and continues across Alfords Point Road to approximately Eucalyptus Street. This pipe is currently unused. A water main is also located within the area of the proposed heavy vehicle inspection bay under Old Illawarra Road overbridge.

Sewer

A sewer main runs across Alfords Point Road just south of the existing heavy vehicle inspection bay. A second sewer main runs across Alfords Point Road just south of Old Illawarra Road.

Street lighting

Light poles run from Illawong/Alfords Point off ramp to about 700 metres north on the eastern side of Alfords Point Road and from Brushwood Drive on ramp to about 900 metres north on the western side. Currently no lighting is provided for the shared path.

3.6.2 Public utility adjustments or protection

The following existing utilities would need relocation or adjustment during construction of the proposal:

- The optic fibre cable on the east side of the Illawong/Alfords Point off ramp would require relocation from Brushwood Drive roundabout to about 600 metres north
- The light poles and underground electricity on the eastern side of Alfords Point Road would require relocation from Illawong/Alfords Point off ramp to about 700 metres north. The light poles and underground electricity on the western side of Alfords Point Road from Brushwood Drive on ramp to about 700 metres north
- The electricity and communication cables for the variable message sign 530 metres south of Alfords Point Bridge would require relocation to the new variable message sign location.

The following existing utilities would require protection during construction:

- The sewer main crossing under Alfords Point Road about 700 metres north of Brushwood Drive
- The water main (disused) crossing under Alfords Point Road immediately north of the Illawong/Alfords Point off ramp.

The following existing utilities within the proposal site would not be impacted during construction:

- The overhead power transmission lines that cross Alfords Point Road about 300 metres and 750 metres south of Alfords Point Bridge and the required vertical and horizontal clearance would be maintained
- The underground electricity cables in the Brushwood Drive overbridge
- The water main crossing under Alfords Point Road under the Brushwood Drive overbridge
- The optical fibre cables crossing under Alfords Point Road under the Brushwood Drive overbridge.

The following new utility installations would be required for the proposal:

- Supply of power to the new heavy vehicle inspection bay on the eastern side of Alfords Point Road under Old Illawarra Road overbridge. This would be via a connection to the existing underground cables on Old Illawarra Road (to be confirmed during detailed design). Providing this connection would require trenching from Old Illawarra Road to the new heavy vehicle inspection bay and may include a potential cable trough down the sandstone cutting.
- Intelligent transport system cables (electricity and communications) would be installed along the length of the proposal site on the eastern side of Alfords Point Road, under the shared path.

3.7 Property acquisition

The proposal would be undertaken within the existing road corridor and would not require the acquisition of any land.

4. Statutory and planning framework

4.1 State Environmental Planning Policies

4.1.1 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across NSW.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for a road and is to the carried out by or on behalf of RMS, it can be assessed under Part 5 of the *Environmental Planning and Assessment Act 1979*. Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not affect land or development regulated by State Environmental Planning Policy No. 14 - Coastal Wetlands, State Environmental Planning Policy No. 26 - Littoral Rainforests, State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (Transitional Major Projects) 2005.

Part 2 of ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, as required by ISEPP (where applicable), is discussed in Section 5.4 of this REF.

4.1.2 Greater Metropolitan Regional Environmental Plan No 2—Georges River Catchment

The general aims and objectives of the *Greater Metropolitan Regional Environmental Plan No 2 – Georges River Catchment* (GMREP) are as follows:

(a) to maintain and improve the water quality and river flows of the Georges River and its tributaries and ensure that development is managed in a manner that is in keeping with the national, State, regional and local significance of the Catchment

(b) to protect and enhance the environmental quality of the Catchment for the benefit of all users through the management and use of the resources in the Catchment in an ecologically sustainable manner

(c) to ensure consistency with local environmental plans and also in the delivery of the principles of ecologically sustainable development in the assessment of development within the Catchment where there is potential to impact adversely on groundwater and on the water quality and river flows within the Georges River or its tributaries

(d) to establish a consistent and coordinated approach to environmental planning and assessment for land along the Georges River and its tributaries and to promote integrated catchment management policies and programs in the planning and management of the Catchment

(e) (Repealed)

(f) to provide a mechanism that assists in achieving the water quality objectives and river flow objectives agreed under the Water Reform Package.

The proposal site falls within the Georges River catchment. Clause 7 of the GMREP No 2 outlines that the planning principles of this REP must be applied when:

'a public authority or another person proposes to carry out development or an activity which does not require development consent but which has the potential to adversely affect the water quality, river flows, flood regime or ecosystems within the Catchment.'

As discussed in Section 6.4, the implementation of water quality management measures during construction and operation of the proposal would ensure that water quality within the Georges River is not adversely affected. However, as the proposal is upslope and within the vicinity of the Georges River, the general specific planning principles described in Clause 8 and 9 of the GMREP No.2 are considered in Table 4-1.

Table 4-1 Application of the GMREP No 2 planning principles

Planning principle	Comment
General	
The aims, objectives and planning principles of GMREP No 2.	The general aims, objectives and planning principles of GMREP No 2 were considered throughout the preparation of this REF. Section 6.4.3 provides a number of site specific safeguards that would minimise the potential impacts of the proposal on water quality in the Georges River and its catchment.
The likely effect of the proposed plan, development or activity on adjacent or downstream local government areas.	The potential impacts of the proposal are limited to within the proposal site or immediately adjacent (refer Section 6). However, the proposal is upslope and immediately adjacent to the Georges River and therefore has the potential to indirectly impact water quality in the Georges River that flows through adjacent downstream local government areas. Indirect impacts to water quality may include sedimentation through erosion or contamination through spills. Potential impacts to water quality would be minimised through the implementation of erosion, sedimentation and water quality management measures as outlined in Sections 6.4.3 and Appendix G.

Planning principle	Comment
The cumulative impact of the proposed development or activity on the Georges River or its tributaries.	Cumulative impacts on the Georges River are unlikely to arise from the interaction and additive effect of individual elements of the proposal. The potential direct impacts of the proposal are limited to within the proposal site or immediately adjacent. The proposal would not require works to occur on the banks of the Georges River or remove vegetation along its foreshore. The proposal would upgrade the existing road drainage system and the existing spill containment devices and gross pollutant traps have sufficient capacity to cater for the additional surface water runoff generated by the proposal. A water quality basin would also be constructed to improve stormwater runoff from Alfords Point Road. During construction, the potential for erosion and sedimentation of adjacent drainage lines would be minimised through the implementation of erosion and sedimentation control measures (refer Section 6.3.3).
Any relevant plans of management including any River and Water Management Plans approved by the Minister for Environment and the Minister for Land and Water Conservation and best practice guidelines approved by the Department of Urban Affairs and Planning (all of which are available from the respective offices of those Departments).	The design of the proposal and development of the environmental safeguards and management measures has been undertaken with consideration of any relevant plans of management or best practice guidelines.

Planning principle	Comment
The *Georges River Catchment Regional Planning Strategy* (prepared by, and available from the offices of, the Department of Urban Affairs and Planning).	The design of the proposal and development of the environmental safeguards and management measures has been undertaken with consideration of action plans that have been developed to achieve the Georges River Catchment Regional Planning Strategy (refer Section 2.1.1). The proposal would upgrade the existing road drainage system and the existing spill containment devices and gross pollutant traps have sufficient capacity to cater for the additional surface water runoff generated by the proposal. The proposal would also include implementation of the safeguards and management measures that aim to protect water quality of the adjacent Georges River.
All relevant State Government policies, manuals and guidelines of which the council, consent authority, public authority or person has notice.	The design of the proposal and development of the environmental safeguards and management measures has been undertaken with consideration of relevant State government policies, manuals and guidelines (refer Section 2.1.1).
Whether there are any feasible alternatives to the development or other proposal concerned.	Section 2.4 assesses feasible alternatives for the proposal and summarises the selection process undertaken for the preferred option.
Specific	
Disturbance of acid sulfate soil areas is to be avoided or minimised and those areas are to be protected in accordance with the requirements set out in the *Acid Sulfate Soils Assessment and Management Guidelines* prepared by the Acid Sulfate Soils Management Advisory Committee.	The potential for acid sulphate soil to occur within the proposal site is considered unlikely (refer Section 6.4).
Disturbance of the bank or foreshore along the Georges River and its tributaries is to be avoided and those areas and any adjoining open space or vegetated buffer area must be protected from degradation.	The proposal would not require works to occur on the banks of the Georges River.

Planning principle	Comment
The following are to be recognised: • The benefits of periodic flooding to wetland and other riverine ecosystems • The pollution hazard posed by development on flood liable land in the event of a flood • The cumulative environmental effect of development on the behaviour of flood water and the importance of not filling flood prone land.	The 1 in 100 year flood level at the Georges River is 2.6 metres Australian Height Datum (Lyall and Associates 2006). The proposal is located well above the 100 year flood level and would therefore not have an effect on flooding in the Georges River (refer Section 6.3).
The discharging of industrial waste into the Georges River or its tributaries must be avoided and the requirements of the relevant consent authority and licensing authority must be met in those instances where industrial discharges into the river and its tributaries occur.	The proposal would not involve the discharge of industrial waste into the Georges River or its tributaries.
Land degradation processes, such as: • Erosion • Sedimentation • Deterioration of soil structure • Significant loss of native vegetation • Pollution of ground or surface water • Soil salinity and acidity • Adverse effects on habitats and sensitive natural environments (aquatic and terrestrial) within the catchment must be avoided where possible, and minimised where avoidance is not possible.	Construction of the proposal would expose large areas of soil which may result in erosion and sedimentation of adjacent drainage lines. Erosion and sedimentation may also result in the deterioration of soil structure. These potential impacts would be minimised through the implementation of safeguards and management measures outlined in Section 6.4.3. Approximately 2.71 hectares of native vegetation would be removed for the proposal. The potential impacts of this clearing as well as the potential adverse effects on habitats and sensitive natural environments (aquatic and terrestrial) within the catchment are considered in Section 6.2. The potential impacts of the proposal on ground and surface water, soil salinity and acidity are considered in Section 6.4.
The potential adverse environmental and health impact associated with effluent disposal is to be recognised and guarded against.	The construction site compounds include portable toilet facilities for construction workers. The toilet facilities would be managed by the service provider and include the appropriate disposal of sewage.

Planning principle	Comment
Uses located on immediate foreshore land on the Georges River and its tributaries must be water-related and public access to the foreshore of the river and its tributaries must be provided in order to enhance the environment of the Catchment.	The proposal is not located on the immediate foreshore of the Georges River or its tributaries and existing access to the foreshore would not be impacted by the proposal.
The adverse impact of sewer overflows, including exfiltration, on the environment within the Catchment, and specifically on the water quality of the river and its tributaries, is to be recognised and that issue is to be addressed through appropriate planning and management of development within the Catchment.	The proposal does not require the construction of sewer infrastructure however construction would occur in close proximity to existing sewer mains. Utility providers would be consulted prior to construction commencing and appropriate safeguards would be implemented to ensure sewer overflows are avoided.
The impacts of stormwater runoff, including sewage contaminated runoff into or near streams within the Catchment, is to be minimised and mitigation measures that address urban stormwater runoff are to be implemented in accordance with the local council requirements and the Managing Urban Stormwater series of documents. Development is also to be in accordance with the NSW State Rivers and Estuaries Policy available from offices of the Department of Urban Affairs and Planning. Stormwater management must be integrated so that quality, quantity and land use aspects are all encompassed	The impacts of the proposal on stormwater runoff are discussed in Section 6.4 and Appendix G. Impacts associated with stormwater runoff would be minimised by upgrading the existing drainage network on Alfords Point Road and utilising the existing spill containment system that currently manages stormwater south of Alfords Point Bridge that would otherwise discharge directly into the Georges River. The proposal is in accordance with the NSW State Rivers and Estuaries Policy as it would not degrade the Georges River system or impact long-term sustainability of its biophysical function. The proposal would also maintain the beneficial use of the Georges River resources.
The environment within the Catchment is to be protected by ensuring that new or expanding urban development areas are developed in accordance with the Urban Development Program and the Metropolitan Strategy and that the requirements of the NSW Floodplain Development Policy and Manual.	The proposal does not involve urban development.

Planning principle	Comment
Appropriate buffer widths (as identified in item 21 relating to Development in Vegetated Buffer Areas in the Planning Control Table in Part 3) must be retained as a means of improving surface runoff entering into the Georges River or its tributaries.	The proposal would not remove vegetated buffer areas along the foreshore of the Georges River.
Water quality and river flows within the Catchment are to be improved through the implementation of environmental objectives for water quality and river flows agreed between the Minister for Environment and the Minister for Land and Water Conservation and by the application of consistent decisions affecting the use and management of land.	The proposal includes the implementation of erosion and sedimentation control devices during construction as discussed in Section 6.4. During operation, surface water runoff from the proposal would be diverted through the existing spill containment system immediately south of Alfords Point Bridge.
Wetlands must be protected through the application of consistent land use and management decisions that take into account the potential impact of surrounding land uses, incorporate measures to mitigate adverse effects and are in accordance with the NSW Wetlands Management Policy. Wetlands must also be protected by requiring adequate provisions where clearing, construction of a levee, draining or landscaping is to be undertaken.	No mangroves or wetlands would be directly impacted by the proposal. The closest mangrove area is located along the shores of the Georges River, more than 100 metres from the proposal. Indirect impacts may occur as the wetlands are downstream of the proposal however these would be minimised through the implementation of erosion, sedimentation and water quality management measures as outlined in Section 6.4.3 and Appendix G.

4.2 Local Environmental Plans

4.2.1 Sutherland Shire Local Environmental Plan 2006

Under the *Sutherland Shire Local Environmental Plan 2006*, the proposal is located within Zone 22 – Arterial Road. The objectives of this zone are:

- To provide for an arterial road network to serve Sutherland Shire and the Sydney region
- To provide for sustainable transport modes.

As the proposal is a road upgrade, it is considered consistent with the objectives of this zone.

However, Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. Therefore, the proposal is permitted without consent from Council.

4.3 Other relevant legislation

4.3.1 NSW State legislation

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (PoEO Act) aims to protect, restore and enhance the environment within NSW, and through the use of various mechanisms, reduce potential risk to human health and the environment.

The PoEO Act also identifies a number of pollution offences, including the following:

- The wilful or negligent disposal of waste in a manner that harms or is likely to harm the environment
- The wilful or negligent causing of a substance to leak, spill or otherwise escape in a manner that harms or is likely to harm the environment
- The pollution of water.

Under the POEO Act the construction contractor and RMS are obliged to notify the NSW Environment Protection Authority if a 'pollution incident' occurs that causes or threatens 'material harm' to the environment.

Environment protection licences are issued under the PoEO Act for various scheduled developments and activities. The proposal would not involve undertaking activities listed in Schedule 3 of the PoEO Act, therefore an environment protection licence is not required.

Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) lists a number of threatened species, populations or ecological communities to be considered in deciding whether there is likely to be a significant impact on threatened biota, or their habitats. If any of these listed species, populations or communities could be impacted by the proposal, an assessment of significance that addresses the requirements of section 5A of the EP&A Act must be completed to determine the significance of the impact. If a significant impact is determined then a species impact statement would be prepared in accordance with the TSC Act.

Seventeen threatened ecological communities, one endangered ecological community, 31 threatened flora species, one endangered ecological community and 50 threatened fauna species listed under the TSC Act have been recorded or have potential to occur in the vicinity of the proposal. Assessments of

significance for threatened biota and communities concluded that no significant impacts are anticipated from the proposal (refer Section 6.2). Therefore the impacts of the proposal would not trigger the need for a Species Impact Statement.

Noxious Weeds Act 1993

The *Noxious Weeds Act 1993* (NW Act) provides for the declaration of noxious weeds by the Minister for Primary Industries. Noxious weeds may be considered noxious on a National, State, Regional or Local level. All private landowners, occupiers, public authorities and Councils are required to control noxious weeds on their land under Part 3 Division 1 of the NW Act. As such, if present, noxious weeds on site should be assessed and controlled.

There are six noxious weed species present within the proposal site, all of which would require control during construction (refer to Section 6.2).

4.4 Commonwealth legislation

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land.

Five threatened ecological communities, 25 threatened flora species, 19 threatened fauna species and 13 migratory species listed under the EPBC Act were recorded as potentially occurring in the vicinity of the proposal. Two additional matters of national environmental significance, a National Heritage Place and a Ramsar wetland, were also identified as occurring within 10 kilometres of the proposal. No World Heritage Properties or Commonwealth Marine Areas were identified.

The assessment of the proposal's impact on matters of national environmental significance and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance. Accordingly, a referred to the Australian Government Department of Sustainability, Environment, Water, Population and Communities would not be required.

The potential impacts of the proposal on matters of national environmental significance or Commonwealth land are discussed further in Appendix B and Section 6.2.

4.5 Confirmation of statutory position

RMS is the proponent and determining authority for the proposal. ISEPP provides that the proposal may be carried out without the need for development consent and is therefore subject to assessment under Part 5 of the EP&A Act. Consent is not required from Council.

5. Stakeholder and community consultation

5.1 Consultation strategy

During development of the proposal, consultation has been undertaken with the community and relevant Government agencies. The purpose of consultation has been to:

- Inform the community of the proposal
- Involve relevant government agencies, road users, local residents and landowners in concept design development
- Canvas comments and issues about the proposal and concept design from those who may be affected
- Seek community ideas to be considered in finalising the design
- Advise potentially directly affected stakeholders of the proposal and its possible impacts
- Advise stakeholders on how they may obtain further information or communicate concerns, complaints or suggestions.

RMS will continue to undertake community and stakeholder consultation throughout development of the proposal. In particular, the REF is placed on public display and comments invited. Submissions received as a result of the REF public display will be addressed in a formal submissions report and, if appropriate, considered when finalising the concept design and during development of the detailed design.

5.2 Community involvement

In July 2012, a community update brochure was delivered to residents in Alfords Point, Menai and Illawong. An additional 300 brochures were delivered to residents on the Illawong peninsula in August 2012. The brochure outlined the key features of the preliminary concept design and advertised the community information session and shopping centre displays. The brochure also outlined how the community can comment on the preliminary concept design or obtain further information.

A community information session regarding the proposal was held on 4 August 2012 at the Menai Community Centre. The purpose of the session was to display the preliminary concept design, allow local residents and road users to provide feedback and to discuss any concerns with the RMS project team. Two shopping centre displays attended by RMS representatives were also held at Menai Marketplace Shopping Centre on 26 July and 2 August 2012.

The preliminary concept design was displayed from 3 August until 24 August 2012 at Sutherland Library, Menai Library and Padstow Motor Registry. During this display period, feedback was invited via written comment, fax or email. A project web page www.rms.nsw.gov.au/roadprojects was also uploaded with information about the proposal and continues to be regularly updated as new information becomes available.

Feedback received from the community during consultation has been used to refine the concept design. The issues raised by the community during consultation are summarised in Table 5-1. A summary of how each issue has been considered is also provided.

Table 5-1 Summary of issues raised by the local community

Issue	Response and where addressed in this REF
Traffic congestion	
Widening would only move the bottle neck south where Alfords Point Road will still have two lanes.	Widening Alfords Point Road to three lanes northbound would allow traffic to flow more smoothly as there would be a longer area for traffic entering the road to merge. Three southbound lanes would provide a dedicated exit ramp to Brushwood Drive, allowing the other two lanes on Alfords Point Road to flow freely past the exit. For these reasons, the bottle neck is anticipated to be reduced. Traffic modelling shows that less vehicles use Alfords Point Road south of Brushwood Drive and therefore the existing two lanes in this location would provide sufficient capacity. Therefore, the proposal is not expected to move the bottle neck south (refer Section 6.7).
Road safety	
New central barrier would be a good safety measure given the road width and the speed limit.	Noted.
Noise	
Request a noise barrier on the eastern side of Alfords Point Road between the existing heavy vehicle inspection bay and Menai Road. Natural vegetation and noise reduction mounds should be used and noise impacts on double storey houses should be considered. A noise wall is a must for homes level with the road. Homes below the road level would require double glazing as noise echoes. Trees removed from Brushwood Drive off ramp would create noise impacts at Sir Thomas Mitchell nursing home.	A noise and vibration impact assessment for the proposal is provided in Appendix F and summarised in Section 6.1. The noise modelling undertaken for the proposal (refer Section 6.1) considered both single and double storey homes. During detailed design of the proposal, further investigation of all feasible and reasonable noise mitigation options would be undertaken for the receivers affected by the proposal (refer Section 6.1 and Appendix F). Options include quieter pavement, noise barriers and at-property treatment. Final selection of noise mitigation options would be undertaken in consultation with affected landowners. This would include investigation of the Sir Thomas Mitchell Aged Care Facility. The current landscape character and visual impact assessment report (Appendix K) identifies proposed planting at this location. This would also be refined during detailed design as noise mitigation options are investigated.

Issue	Response and where addressed in this REF
Architectural treatment is not suitable as homes would have no fresh air.	For architectural treatments, RMS is required to provide fresh air ventilation systems that meet the Building Code of Australia requirements for windows and doors shut.
Noise walls would leave gaps for fire access and therefore would not stop noise.	Further consultation with Fire and Rescue NSW and NSW Rural Fire Brigade would be undertaken during detailed design to determine the need for noise barrier gaps for fire services. Any receivers affected by gaps in the noise barrier would be taken into consideration during the assessment of feasible and reasonable noise mitigation options.
Trucks accelerating up the hills and using exhaust brakes either side of Alfords Point Bridge during night is loud and warning signs should be installed.	Heavy vehicle operations along Alfords Point Road are important freight movements for Sydney. Noise reduction signs like 'limit compression braking in residential areas' are not always effective in reducing truck noise but RMS would consider sign installation as part of the proposal.
Drainage	
Ensure the noise barrier construction and design doesn't interfere with drainage behind homes.	A drainage investigation has been undertaken for the proposal and is included in Section 6.3 and Appendix G. This investigation considered potential drainage impacts of the proposal including the potential noise barrier.
Visual	
Trees/shrubs should be planted along the corridor (especially between Maxwell Close and Fowler Road) to prevent graffiti on private fences. Trees should be 15 metres high and dense species. Trees also need to camouflage the noise wall on the residential side. Noise walls must be graffiti proof. A noise mound or wall would block city views and shadow homes and gardens from sunshine.	A landscaping design for the proposal would be developed during detailed design and would consider the use of planting to prevent graffiti (refer Section 6.8.4). The landscape design would consider the use of planting to reduce the visual impacts of the proposal on adjacent residential properties including the planting of trees to camouflage the potential noise barrier on the residential side. The urban design principles outlined in Section 3.3.6 would be considered in the design of any required noise barrier and the potential for shadowing of houses and gardens would be considered. This is discussed further in Section 6.8.3.

Issue	Response and where addressed in this REF
Road maintenance	
Regular trimming of trees at the Brushwood Drive off ramp and roundabout is important for clear sightlines and safety. Why wasn't the asphalt on the 1950s Alfords Point Bridge replaced with the rest of the work? Will this proposal replace the old asphalt.	Comments about tree trimming are noted and have been forwarded to RMS maintenance teams. Road work like the replacement of asphalt on state roads is scheduled with funding allocations on a priority needs basis across NSW. It is based on road strength and condition of the road pavement surface. The proposal would provide new asphalt pavement surface between the southern abutment of Alfords Point Bridge and Brushwood Drive (including the on and off ramps, refer Section 3).

5.3 Aboriginal community involvement

In February 2012, the RMS Aboriginal Cultural Heritage Advisor (Sydney region) consulted the Gandangara Local Aboriginal Land Council in accordance with the RMS Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI). The Land Council was briefed about the proposal and an archaeological survey arranged for 7 March 2012. However, on the scheduled day of the survey Gandangara Local Aboriginal Land Council was unable to participate and only Kelleher Nightingale Heritage Consultants undertook the site survey.

Gandangara Local Aboriginal Land Council were provided with a copy of the draft Aboriginal Archaeological Survey Report and invited to comment however, to date no response has been received. The outcomes of the Aboriginal archaeological assessment are discussed further in Section 6.5.

No Native Title claimants are currently registered for the proposal site.

5.4 ISEPP consultation

Clauses 13, 14, 15 and 16 of the ISEPP require public authorities to undertake consultation with councils and other agencies when proposing to carry out development without consent. Table 5-2 lists the clauses relevant to the proposal and identifies any requirements for ISEPP consultation.

Table 5-2 Assessment of relevant items in Clause 13 and 16 of ISEPP

Item	Response
Clause 13	
Involves excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a council is the roads authority under the Roads Act 1993 (if the public authority that is carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath).	The proposal may have minor impacts on Fowler Road or Brushwood Drive and the existing footpath which are managed by Sutherland Shire Council. Formal consultation with Sutherland Shire Council is not required under ISEPP. However, as a key stakeholder Council has been consulted throughout the concept development including a meeting held in June 2012 (refer 5.5).

Item	Response
Clause 16	
A consent authority must not carry out any of the following development without giving written notice to the specified authority and taken their responses into consideration: *(a) development adjacent to land reserved under the National Parks and Wildlife Act 1974 - Office of Environment and Heritage* *(b) development adjacent to a marine park declared under the Marine Parks Act 1997 - Marine Parks Authority* *(c) development adjacent to an aquatic reserve declared under the Fisheries Management Act 1994 - Office of Environment and Heritage* *(d) development in the foreshore area within the meaning of the Sydney Harbour Foreshore Authority Act 1998 - the Sydney Harbour Foreshore Authority* *(e) development comprising a fixed or floating structure in or over navigable waters – Roads and Maritime Authority* *(f) development for the purposes of an educational establishment, health services facility, correctional centre or group home, or for residential purposes, in an area that is bush fire prone land (as defined by the Act) - NSW Rural Fire Service.*	The proposal is located adjacent to the Georges River National Park. Consultation with the Office of Environment and Heritage is therefore required under Clause 16(a) of ISEPP. A summary of consultation undertaken to address Clause 16(a) of ISEPP is provided in Table 5-3. No part of the proposal is located adjacent to a declared marine park or declared aquatic reserve or foreshore area. The proposal would not involve development over navigable waters and the proposal is not for the purpose of an educational establishment, health services facility, correctional centre, group home or residential use. Consultation with a public authority under Clause 16(b) – (f) of ISEPP is not required.

Formal ISEPP consultation was undertaken with Office of Environment and Heritage (OEH) and Sutherland Shire Council via letters sent on 26 April and 1 June 2012 respectively. A meeting was also held between RMS and Sutherland Shire Council on 5 June 2012. The issues raised by Sutherland Shire Council during this consultation are summarised in Table 5-3. A summary of how the issues have been addressed is also provided. No issues were raised by OEH during this consultation and they were informed the REF would be put on public display.

Table 5-3 Summary of ISEPP consultation undertaken

Issue	Response
NSW Department of Premier and Cabinet - Office of Environment and Heritage National Parks and Wildlife Branch	
To date no response has been received.	n/a

Issue	Response
Sutherland Shire Council	
Sutherland Council has consulted RMS regarding the current informal truck parking arrangements along Alfords Point Road. Whilst the implementation of the proposal would prevent parking from occurring, Council do not want to move the problem to another location. A likely place for trucks to park in future would be in the vacant land beneath Brushwood Drive.	Fencing and no parking signs would be installed adjacent to the southbound lanes between the Illawong/Alfords Point off ramp exit and Brushwood Drive, and along the off ramp. This is to prevent vehicle parking (including heavy vehicles) in open spaces adjacent to Alfords Point Road. Fencing, no parking signs and gates would also be installed at the proposed heavy vehicle inspection bay to prevent vehicles parking at the bay and surrounding area when the heavy vehicle inspection bay is not in use.
Council has been asked to change the double right lane movement from Fowlers Road to Brushwood Drive. This is largely due to drivers in the nearside lane performing dangerous manoeuvres in order to queue jump on Brushwood Drive during the morning peak. Statistics confirm there is a higher rate of accidents at this location.	Traffic modelling for the proposal shows the Brushwood Drive/Fowlers Road/Old Illawarra Road roundabout would clear under peak conditions and operate at a level of service B or better during the morning and afternoon peak periods (refer Section 6.7.2). This may reduce the need for drivers to perform this manoeuvre after the proposal is completed. The performance of the roundabout would be reviewed post construction to identify any further investigation that may be required.
Council asked if RMS is aware of the proposal of state significance at West Menai involving the construction of 6000 residential lots and commercial areas. Traffic modelling on the Department of Planning and Infrastructure website indicates substantial road upgrading would be required including the construction of additional lanes to the existing local road network.	RMS is aware of the residential development proposed for West Menai. The proponent of this development has submitted an application with NSW Planning and Infrastructure to have the site listed as a State Significant Site which would facilitate the rezoning of land and development. Potential cumulative impacts associated with this development are considered in Section 6.16.

5.5 Government agency and stakeholder involvement

In April 2012 and June 2012, a number of government agencies and stakeholders were contacted by letter and provided with preliminary details of the proposal. Government authorities and agencies were consulted to help identify key issues and opportunities as part of the concept design, and to discuss assessment requirements and potential management options for environmental issues. The agencies and stakeholders contacted included:

- Sutherland Shire Council
- NSW Department of Premier and Cabinet - Office of Environment and Heritage National Parks and Wildlife Branch
- NSW Department of Premier and Cabinet – Office of Environment - Heritage Branch

- NSW Department of Planning and Infrastructure
- NSW Department of Primary Industries – Fishing and aquaculture NSW
- Heritage Council of NSW
- Commonwealth Department of Sustainability, Environment, Water, Population and Communities
- Veolia
- Sydney Water
- Telstra
- Ausgrid
- Bicycle NSW.

The issues raised during this process and RMS' responses are summarised in Table 5-4. Copies of the responses received from government agencies and stakeholders are provided in Appendix C. Responses from Sutherland Shire Council and Office of Environment and Heritage National Parks and Wildlife Branch are provided in Table 5-3.

Table 5-4 Summary of government agency and stakeholder issues

Issue	Response
NSW Department of Primary Industries – Fishing and aquaculture NSW	
The works do not trigger the environmental protection measures under the Fisheries Management Act 1994, and no formal consultation or permit under this Act would be required for the works.	Noted.
The works should be conducted with adequate soils and erosion control measures in accordance with the Blue Book.	Erosion and sediment control measures would be implemented during construction in accordance with the Blue Book (refer Section 6.4).
NSW Department of Premier and Cabinet – Office of Environment and Heritage - Heritage Branch	
The proposed development should not impair the significant natural and cultural heritage values of the Georges River National Park.	The mitigation measures outlined in Section 6.2, 6.4, 6.5 and 6.6 would be implemented to minimise impacts to the natural and cultural heritage values of the Georges River National Park.
The REF should consider the Guidelines for Developments adjoining Department of Environmental and Climate Change Land, in particular in relation to the following matters: boundary encroachments, management implications, pests, weed, edge effects, erosion and sediment control and stormwater runoff.	The proposal would not encroach on the Georges River National Park. The potential impacts of pest and weed introduction, edge effects, erosion and sedimentation and stormwater runoff are discussed in Section 6.2 and Section 6.4.

Issue	Response
The requirements in relation to stormwater runoff are: • Development proposals for areas adjacent to OEH land should incorporate stormwater detention and water quality systems (with appropriate managed buffer areas) within the development site • Stormwater should be diverted to council stormwater systems or to infiltration subsurface discharge systems within the development site • The discharge of stormwater to OEH land, where the quantity and quality of stormwater differs from natural levels, must be avoided.	A construction sedimentation basin and operational water quality basin, swales and rock check dams are proposed to manage runoff water quality with details to be confirmed during detailed design. The quality and quantity of stormwater discharged from Alfords Point Road is not anticipated to substantially change as a result of the proposal (refer Section 6.3 and Section 6.4).
Infrastructure associated with stormwater treatment must not be located on OEH land and any stormwater outlets should disperse the flow at pre-development levels. Landowners and development proponents are responsible for ensuring that all tanks, storage areas and associated infrastructure are appropriately sized and maintained to ensure that there is no unauthorised overflow onto OEH land.	No infrastructure associated with stormwater treatment would be located within the Georges River National Park. Flow rates at stormwater outlets are not anticipated to substantially differ from existing flow rates (refer Section 6.3 and Appendix G). Drainage design for the proposal has taken into consideration the surface water catchment and the capacity requirements of drainage infrastructure to cater for this stormwater runoff (refer Section 6.3 and Appendix G).
Heritage Council of NSW	
The heritage significance of the site and any impacts the development may have upon the significance should be assessed. The assessment should include natural areas and places of Aboriginal, historic or archaeological significance. It should also include a consideration of wider heritage impacts in the area surrounding the site.	Aboriginal and non-Aboriginal heritage impact assessments have been undertaken for the proposal and are provided in Appendix H and Appendix I. Both these reports are summarised in Section 6.5 and 6.6 respectively.
The Heritage Council maintains the State Heritage Inventory which lists some items protected under the Heritage Act 1977 and other statutory instruments. This register can be accessed through the Heritage Branch home page on the internet.	A search of the Sate Heritage Inventory was undertaken for the proposal (refer Appendix I).
It should be noted that the legal standing of items listed on the State Heritage Register can also be provided by applying for a section 167 Certificate through the Heritage Branch home page.	Noted.

Issue	Response
In addition, you should consult lists maintained by the National Trust, any heritage listed under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* and the local council in order to identify any identified items of heritage significance in the area affected by the proposal.	A search of the Australian Heritage Database, NSW Heritage Database, Sutherland Shire LEP and the RMS Section 170 register has been undertaken for the proposal (refer Section 6.6).
Non-Aboriginal heritage items within the area affected by the proposal should be identified by the field survey. This should include any buildings, works, relics (including relics underwater), gardens, landscapes, views, trees or places of non-Aboriginal heritage significance. A statement of significance and an assessment of the impact of the proposal on the heritage significance of these items should be undertaken. Any policies/measures to conserve their heritage significance should be identified. This assessment should be undertaken in accordance with the guidelines in the NSW Heritage Manual. The field survey and assessment should be undertaken by a qualified practitioner/consultant with historic sites experience.	A non-Aboriginal heritage assessment was undertaken for the proposal and is provided in Appendix I. No non-Aboriginal heritage items where identified within the proposal site and therefore a statement of significance is not required (refer Section 6.6).
The proposal should have regard to any impacts on places, items or relics of significance to Aboriginal people. Where it is likely that the project will impact on Aboriginal heritage, adequate community consultation should take place regarding the assessment of significance, likely impacts and management/mitigation measures.	The proposal is not anticipated to impact any known places, items or relics of Aboriginal significance (refer Section 6.5 and Appendix H).
The 'relics' provisions in the Heritage Act require an excavation permit to be obtained from the Heritage Council, or an exception to the endorsed by the Heritage Council, prior to the commencement of works if disturbance to a site with known or potential archaeological relics is proposed. Where possible refer to archaeological zoning plans or archaeological management plans held by local councils. If any unexpected archaeological relics are uncovered during the course of works excavation should cease and an excavation permit, or an exception notification endorsement obtained.	Noted.

Issue	Response
If approval is required under the Heritage Act due to the listing of an item or place on the State Heritage Register, or being subject to an Interim Heritage Order, the Heritage Council's approval must be sought prior to an approval being issued by the consent authority under the EP&A Act. In accordance with section 67 of the Heritage Act, an approval given by a consent authority in these cases before the Heritage Council's determination of the application has been notified to the consent authority, is void.	No approval under the Act is required.
NSW Department of Planning and Infrastructure	
No comment on the proposal.	Noted.
Department of Sustainability, Environment, Water, Population & Communities	
There does not seem to be much in the information that the department can comment on regarding potential impacts on matters of national environmental significance at this time and it cannot be determined whether or not a referral may be required under the EPBC Act.	RMS considers that there would be no significant impacts to matters of national environmental significance or Commonwealth land as a result of this proposal (refer Appendix B). A copy of the REF will be provided to the Department of Sustainability, Environment, Water, Populations and Communities.
Sydney Water	
Sydney Water infrastructure that should be considered included: • A 150 mm sewer at chainage 1100 • A 600 mm water main located in Old Illawarra Rd at Alfords Point Rd at the proposed Truck Inspection Bay. You are required to engage the services of a water servicing coordinator to assess the impact of the proposal on Sydney Water assets and if required an application for adjustments to be submitted to Sydney Water. Sydney Water would review the application and provide further requirements at that stage.	The 600 mm water main is in the Old Illawarra Road overbridge and therefore would not be impacted by the heavy vehicle inspection bay. Other Sydney Water infrastructure within the study area would not be impacted by the proposal (refer Section 3.6). A Sydney Water servicing coordinator would be engaged prior to construction commencing to assess the impact of the proposal on Sydney Water assets. If required, an application for adjustments would be submitted to Sydney Water.

Issue	Response
Telstra	
Impacts to the Telstra network due to the proposed road upgrade include possible relocation or protection measures to two optic fibre cables within the proposal site. When RMS is ready to start utility relocations works please contact Telstra to arrange the required relocation.	Noted.
Veolia	
Suitable pathway should be installed for passengers walking to the relocated bus stop.	A new footpath would be constructed to provide pedestrian access from Eucalyptus Street to the relocated bus stop. This footpath would be about two metres wide and extend about 80 metres.
Weather protection and lighting should be provided at the new bus stop.	Weather protection and lighting at the bus stop would be considered during detailed design.
The concrete bus stop base should be relocated.	The existing concrete base would be demolished and removed and a new concrete base constructed at the new bus stop location.
Bus zone signage should be provided during construction.	Appropriate signage would be provided for the temporary bus stop during construction.
Construction of the new bus stop should not disadvantage passengers.	During works on the Brushwood Drive on ramp, the existing bus stop would be closed and an interim bus stop provided. Pedestrian access to the interim bus stop would be maintained at all times during construction. The location of the interim bus stop would be determined during detailed design in consultation with the bus service provider.
A ‘give way to bus’ sign should be installed to assist buses changing lanes from the bus only lane into the new bus stop.	A ‘give way to bus’ sign would be considered during detailed design.
Sufficient letter box drops should be distributed to local passengers outlining the proposed changes.	The public would be notified of the interim bus stop location, lane closures and pedestrian detours via variable message signs, regular construction updates, local newspaper articles and the RMS project website.

Issue	Response
Ausgrid	
Ausgrid have no record of Ausgrid owned underground cables within the project area. There is a transmission line and overhead service line to the variable message sign. If during construction Ausgrid assets are found, they will need to be relocated. Relocated work is regarded as 'contestable projects' and would generally take a minimum of six months to complete. Please note the Ausgrid have an asset relocation policy that can be found on our website.	Noted.
Ausgrid require access to Ausgrid transmission tower during and after construction.	RMS had meetings with Ausgrid on the 16 August 2012 and 24 October 2012 to understand Ausgrid access requirements to the transmission towers during construction and after construction. RMS will have ongoing consultation with Ausgrid during development and construction of the proposal.
Bicycle NSW	
Due to the long, gradual descent on the shared path, northbound bicycle users will travel at higher than normal speeds. Therefore, the shared path should be designed with corner radii, sight lines and path widths at the higher end of the spectrum recommended by Austroads.	Design of the shared path has taken into consideration the steep grade of some sections and the potential conflict between cyclists travelling at high speed and pedestrians. For steeper areas (greater than three per cent grade) the path would convert to separate pedestrian and cyclist paths and would be four metres wide with a concrete paved width of 4.5 metres.

Issue	Response
Currently, pedestrians and bicycle users from the Casuarina Oval area are required to travel long distances (four kilometres) to access Alfords Point Bridge. Direct pedestrian and cyclist access should be provided from Marlock Place to the shared path.	Options were explored to provide access from the western side of Alfords Point Road to the pedestrian path on the eastern side. However, the narrow width between the carriageway and the cliff makes provision of a pathway dangerous and difficult. Furthermore, access under Alfords Point Bridge is not suitable for disabled access and would create security risks for pedestrians. A pedestrian bridge from Marlock Place to the eastern pedestrian path was considered. Construction of a pedestrian bridge would be expensive due to the topography of the area, the need to provide lengthy disabled access ramps on the eastern side, and the need to avoid the Georges River National Park. In addition, there is no significant pedestrian attractor or source in the vicinity and usage is expected to be low and would not justify the cost of building the bridge. Alternative safe access to the pedestrian path on the eastern side is available via Brushwood Drive.

To date no other submissions from government agencies or stakeholders have been received.

5.6 Ongoing or future consultation

This REF will be placed on public display during March 2013 to provide the community with the opportunity to comment. Information days will also be held during the display period. The dates and locations of information days will be advertised prior to the events via an RMS community update and through the local media.

Following public display of the REF, submissions will be collated and a submissions report prepared which addresses any issues raised by stakeholders. The submissions report will be made available to the public via the RMS website. The community will be informed of any major design changes that are required to address community concerns. In addition, the following ongoing consultation will be undertaken:

- Ongoing meetings with Sutherland Shire Council, government agencies, utility providers, bus operators, adjacent landowners and community stakeholders as required
- Ongoing meetings with NSW Rural Fire Service and Fire Rescue
- Ongoing updates throughout the construction planning phase and construction period for immediately affected community and users of Alfords Point Road
- Ongoing updates of the RMS project webpage as required.