Appendix J: Bushfire Vehicular Assess Review

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METRONET – BYFORD RAIL EXTENSION
ELEVENTH ROAD MODIFICATIONS – BUSHFIRE VEHICULAR ACCESS REVIEW

1.0 Introduction

The Byford Rail Extension (BRE) Project has been identified as an essential component of the METRONET program, and seeks to extend the electrified passenger rail service from Armadale to Byford, providing a strong transport connection between these two centres.

Transport infrastructure works for the BRE Project include:

- Construction of stations, parking areas and bus interchanges at Armadale and Byford
- Construction of approximately 8km of dual track narrow gauge electrified passenger railway line extending from Armadale station to the newly created Byford station, with a dedicated platform for the Australind line
- Removal of level crossings between the Byford and Armadale stations
- Construction of Principal Shared Paths (PSPs) and associated infrastructure
- Upgrade of local roads surrounding both Armadale and Byford stations
- New road works, modifications to existing roads and signalised intersections, utilities (diversion, protection, and new installation) and any other ancillary works to enable the BRE Project.

As part of the BRE project, significant road modifications are proposed along a section of Eleventh Road in Wugong, to accommodate the proposed Eleventh Road bridge. Linfire Consultancy (Linfire) have been engaged by MetCONNX to provide bushfire consulting support for various infrastructure and road modifications associated with the BRE project, including the Eleventh Road modifications which are broadly as follows, with further detail in Section 7.0 (and Attachment 5):

- Construction of new bridge crossing over the existing railway line, and resultant elevation of Eleventh Road to the new bridge height
- Relocation of Bruns Drive connection to Eleventh Road further to the east and reconfiguration as a one-way access or egress to Eleventh Road (currently under review), and construction of new cul-de-sac road to south-east of bridge, on southern side of Eleventh Road
    - It is noted that based on recent community engagement, the preferred arrangement is for an egress only arrangement from Bruns Drive to Eleventh Road, rather than entrance only from Eleventh Road. From a bushfire emergency response perspective, an egress only arrangement is also preferred as it ensures the residents are able to egress to Eleventh Road as per normal traffic flow arrangement, with emergency services the only vehicles potentially travelling from Eleventh Road to Bruns Drive (if required).
- Construction of new drainage basin and private driveway to north-east of new bridge
- Construction of a new drainage basin to west of new bridge, and extension of Keenan Street further to the east and north, terminating immediately south of Eleventh Road
- Construction of an Emergency Access Way (EAW) from the existing termination of Keenan Street, further east within the road reserve to connect to the existing EAW from Rivose Crescent
- Construction of a new Fire Service Access Way (FSAR)/Emergency Access Way (EAW) along the railway and underneath Eleventh Road, from Rivose Crescent to the existing Wilson Street cul-de-sac 250 m to the north.
- Construction of a new PSP south of, and underneath, Eleventh Road.
- Realignment of existing driveways from various lots, to accommodate new road layout.
- Realignment of services to accommodate the proposed modifications

2.0 Bushfire Compliance Requirements

Where a planning application is proposed in a designated bushfire prone area, as per the WA Map of Bush Fire Prone Areas (the Map), it triggers a need to assess the proposal against *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7; WAPC 2015) and the associated *Guidelines for Planning Bushfire Prone Areas* (the Guidelines; WAPC 2021). The trigger to consider bushfire risk to proposed developments is from Part 10A of the *Planning and Development (Local Planning Schemes) Regulations 2015* (LPS Regulations), and is intended to be applied where either a habitable building (fully or partially enclosed with one solid wall and roof, and used for living, work, study or entertainment) or a specified building (building specified in the Scheme in addition to habitable buildings) is proposed as part of the development.

While application of SPP 3.7 and the Guidelines to planning applications almost always occurs where habitable or specified buildings are proposed, it can also be considered by decision-makers where there is otherwise and intensification of land-use or onsite occupation.

In the case of subdivision or development applications, responding to the requirements SPP 3.7 (namely Policy Measures 6.4 and 6.5) and the Guidelines usually involves preparation of a Bushfire Management Plan (BMP) to accompany the application.

One aspect of demonstrating compliance with the Guidelines includes addressing the four Bushfire Protection Criteria, which are divided into four (4) Elements relate to Siting, Asset Protection Zones, Vehicular access and bushfire fighting water supply. Typically, this is achieved by demonstrating compliance with the prescriptive Acceptable Solutions for each of the four Bushfire Protection Criteria, which represent a single design approach to comply with each of the guiding Intent and Performance Principle statements that accompany each Element. Given these Acceptable Solutions need to be applicable to a variety of potential situations, they are not tailored to specific site conditions, anticipated bushfire behaviour, proposed development or occupant characteristics etc, and as such, they are a broad tool with which to manage bushfire risk, but sometimes don't lend themselves to balancing competing interests or resolving legacy scenarios.

Where the Acceptable Solutions cannot be complied with, or where it is inappropriate to do so, an alternative pathway is possible through the use of 'Performance-Principal Based Solutions' (PPBS's) which can provide some flexibility required to propose alternative design approaches to comply with the Bushfire Protection Criteria. The PPBS needs to detail how compliance with the relevant Performance Principles for the applicable Element is achieved, often guided by the Intent statement for that Element.

2.1 Exemption from SPP 3.7 and Legacy Approvals

Section 2.6 of the Guidelines notes that decision-makers may apply exemptions from the requirements of SPP 3.7, where there is:

- No intensification of land use
  - No increase in visitors, residents or employees
  - Doesn't involve occupation of employees onsite for extended periods
- No increase in bushfire threat

The Guidelines provides the following examples where exemption could be considered:

- *A subdivision application where there is no increase in the development potential and therefore no intensification of land use, such as a boundary realignment that does not restrict the ability to establish or maintain an asset protection zone; and does not restrict vehicular access/egress to any existing or future habitable building.*
- *A development application for an extension where the proposal does not result in an increase in residents or employees onsite, and where there is no increase in the bushfire risk. For example, an extension to an existing habitable building which does not result in the development being closer to the bushfire hazard and does not restrict or limit compliance with vehicular access or the provision of water.*

It is worth noting that a lack of intensification of occupation and not proposing habitable buildings are considerations for exemptions, however so too is the impact on vehicular access arrangements to existing buildings.

Section 2.6 of the Guidelines notes that *"subsequent planning applications for sites that received initial planning approval prior to the introduction of SPP 3.7 in 2015, are often unable to demonstrate compliance with SPP 3.7 or the Guidelines*". Applications for these legacy sites, which could include existing lots and/or existing habitable buildings created prior to SPP 3.7, need to demonstrate that the bushfire risk can be mitigated to an acceptable level, ideally by complying with Bushfire Protection Criteria in the Guidelines, however this may not always be possible and may need to consider additional bushfire mitigation measures such as:

- improvements to the local and broader road network to facilitate improved access to and within the site
- provision of additional emergency access ways
- provision of additional hazard separation.

2.2 Application to Eleventh Road Proposal

It is noted that the works proposed for the Eleventh Road modifications are:

- not proposing any new buildings
- not proposing intensification of land use, with no additional occupants being brought to the local area as part of this road modifications
- not increasing the bushfire risk to the area

Based on the above, the proposed road modifications could be considered exempt from addressing SPP 3.7 or the Guidelines, however given the modifications do change the existing public road network, the BRE Project have considered it prudent to review the current and proposed road network against the vehicular access requirements of past and current bushfire Guidelines to determine the level of compliance, and to demonstrate that the proposal ideally improves the existing arrangement. It is proposed that this is achieved as follows:

- Review the level of compliance of the existing public road network at the time of approval and as it currently stands (i.e. immediately prior to the proposed modifications)
- Review the level of compliance of the post-development road network against the current bushfire Guidelines as well as the compliance of the existing road network, and also consider the bushfire risk in the local area.
- Based on the outcomes of the above compliance and bushfire risk analysis, propose any additional risk management measures that will produce an acceptable vehicular access/egress outcome in a bushfire emergency, which is not worse than the current situation and is aligned with the Element 3 Intent and Performance Principles of the current bushfire Guidelines through compliance with the Acceptable Solutions or using a PPBS.

The intent of this bushfire vehicular access review letter is to detail the compliance review and assessment, and summarise the management measures required to produce an acceptable vehicular access network following the proposed Eleventh Road modifications in order to manage a bushfire emergency.

3.0 Current Public Road Network

The following summarises the existing public road network within the local area that will be affected by the Eleventh Road modifications (see Attachment 1 for overview). For ease of discussion, the area has been divided into four quadrants from the new bridge, using Eleventh Road and the existing railway as dividing lines.

- Eleventh Road currently crosses the existing rail via a grade crossing, where the road directly crosses the rail.
- Existing lots to the north-east of this crossing are provided with public road access via the following:

- No. 46 and 28 Eleventh Road have direct driveway access to Eleventh Road
- Lot 106 (on DP 27606) is a Crown Reserve (R 14217) located directly east of the railway extending from Eleventh Road in the south, approximately 1.2 km north to Stone Street. There appears to be no existing buildings in the southern part of Lot 106, however there is an existing building for a horse riders club in the north of the lot near Stone Street.

  There is no current access to this lot from Eleventh Road, however it appears public road access is possible via the following:
  - Via a locked gate from Mitchell Street, which is a 500 m long dead-end road located approximately 350 m north of Eleventh Road.
  - From Moore Street, which is a 460 m long dead-end road connecting in the east to SW Highway. An existing 350 m long internal driveway within Lot 106, extends from the termination of Moore Street to the existing building within the lot.
  - Potentially from Stone Street in the north, although there doesn't appear to be any internal driveways or well-used entrances along this lot boundary interface.

- Existing residential lots to the south-east of the crossing are provided with public road access via the following:
  - Direct frontage to Eleventh Road (i.e. No. 55 and 59 Eleventh Road)
  - Frontage to Bruns Drive (and Harewood Pass), which forms a loop road connecting at two locations along Eleventh Road (connections are 240 m apart) from where two-way travel is possible.
  - Frontage to Woodstock Place cul-de-sac (120 m long with 18 m diameter turning head) which connects to Bruns Drive
- Existing lots to the north-west of the crossing are provided with public road access via the following:
  - No. 110 Wilson Street has driveway access to Wilson Street, but has informal driveway access to Eleventh Road along its southern boundary
    - Wilson Street forms an 800 m long cul-de-sac road with Lambert Lane (which connects to Eleventh Road), and terminates with a 14 m wide turning head near 110 Wilson Street.
  - Lot 12 (on DP 223230) has direct driveway access to Eleventh Road
- Existing lots south-west of the crossing are provided with public road access via the following:
  - Direct frontage to Gull Street, Mill Street, Keenan Street, Todman Grove or Rivose Crescent
  - An existing 6 m wide Emergency Access Way (EAW) from the corner of Mill Street and Keenan Street (see red line on Attachment 1), connects to Phizam Place on the southern side of Wugong Creek via a small bridge crossing. This EAW connection between the two public roads is understood to have been recently constructed in 2021. There is an open gate at Mill Street and another at Phizam Place, however a lock has been placed on the Phizam Place gate although this doesn't appear to be a Shire lock. Photos of this EAW are provided in Plate 1.
  - Keenan Street currently terminates south of the existing dwelling on 28 Keenan Street, approximately 210 m from the intersection with Todman Grove, and has almost no turning head.
  - Todman Grove provides single road access to Rivose Crescent, and terminates with a small 90 m long cul-de-sac complete with 18 m diameter turning head
  - Rivose Crescent forms a loop road onto Todman Grove, which provides the only public road access back to Keenan Street.
  - An existing 6 m wide EAW extends from Rivose Crescent to the convergence of an unconstructed portion of Keenan Street and Eleventh Road reserves (see yellow line on Attachment 1) which provides emergency vehicular access to Eleventh Road.
    - The access to both ends of the EAW is gated (see green triangles on Attachment 1),

and both gates are locked (see Plate 2). While unconfirmed, it is presumed that the locking of the gates is to restrict the use of this EAW for emergencies only, and prevent every-day use of this road.

- All existing public roads and EAWs appear to be 6 m wide and relatively shallow grades. Other than the EAW's nominated above, the project is not aware of any Fire Service Access Routes (FSARs) being established specifically for fire appliance access between public roads.
- It is noted that the land and public road network detailed above is located in two local councils, with land south of Eleventh Road (east of the crossing) and Keenan Street (west of the crossing) is in the Shire of Serpentine-Jarrahdale (SSJ), whereas the land to the north is in the City of Armadale (CoA). The boundary is depicted by the blue line on Attachment 1.

Plate 1: Mill St/Phizam Place EAW (and Locked Gate at Phizam Place)

Plate 2: Rivose Crescent EAW (and Locked Gates)

3.1 Relevant Bushfire Approvals for Public Road Network

Linfire understand that the following planning applications in the local area, relevant to bushfire compliance, are as follows:

- Approval of the Rivose Crescent residential subdivision was supported by a BMP prepared by Civil Technology in June 2014.
    - The BMP was produced prior to the introduction of SPP 3.7 and the Guidelines (which were originally released in 2015), and was assessed against the *Planning for Bushfire Protection Guidelines* released in 2010 produced by WAPC, Department of Planning and FESA (predecessor to DFES)..
    - This BMP required that the EAW from Rivose Crescent to Eleventh Road be constructed to provide two egress/access routes, complete with 6 m wide gravel surface, locked gates at either side (with key held by Shire) and Emergency Access signage on both gates.
- Approval of Phizam Place subdivision is understood to be supported by a BMP, however this BMP has not been available for review, so the following is based on desktop review:
    - The EAW has been recently constructed to connect the turning head on Phizam Place with the Mill Street to the north, which was gazetted in 2021.
    - The current EAW has been inspected recently, and is 6 m wide, including the bridge, and other than the padlock at Phizam Place (see Plate 1) preventing public use, would be considered compliant with current EAW specifications under the bushfire Guidelines.
    - The status of this subdivision and the EAW is unclear at this stage, including whether the subdivision conditions have been cleared and lots titled, however while may not be currently

available for public use in an emergency, it is constructed and the expectation is it will be available for use in the future.

4.0 Bushfire Guidance on Vehicular Access Specifications

Based on the previous bushfire approvals, it is appropriate to review the vehicular access specifications from the current Guidelines (as Element 3 in the Bushfire Protection Criteria), as well as those in the 2010 *Planning for Bushfire Protection Guidelines*, which are detailed in Attachments 2 and 3 respectively. The relevant aspects of both are summarised below:

4.1 2021 Guidelines for Planning in Bushfire Prone Areas

The Element 3 Intent is stated as follows:

To ensure that the vehicular access serving a subdivision/ development is available and safe

The key requirements for the applicable Acceptable Solutions for Element 3 (Vehicular Access) are broadly summarised below:

- Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access).
    - If the public road access is via a no-through road which cannot be avoided due to site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided.
    - No-through roads must have a compliant turnaround area (typically an 18 m diameter turning head, but can be hammerhead arrangements).
- The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met:
    - the no-through road travels towards a suitable destination (area of BAL-Low or not designated bushfire prone, or location that can provide shelter during a bushfire event); and
    - the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area
- EAWs can be considered for through connection to a public road, where no alternative exists, provided it is:
    - 6 m wide and no more than 500 metres in length; and
    - must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.
- Fire Service Access Routes (FSAR's)
    - Similar specifications to EAW, however gates may be locked provided keys are provided to local government and/or emergency services.
- Public roads (including no-through road), EAWs, FSARs and Private Driveways are to comply with the technical specifications of Table 6 of the Guidelines (see Attachment 2) with respect to width, clearances, weight capacity, grade etc.

Relevant Performance Principles include the following

- ***Performance Principle P3i*** (applicable to A3.1, A3.2a, A3.2b, A3.3)
    - The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.
- ***Performance Principle P3ii*** (A3.4a)
    - The internal layout, design and construction of public and private vehicular access and egress

in the subdivision / development allow emergency and other vehicles to move through it safely and easily.

- The design of vehicular access and egress provides:
  - access and egress for emergency service vehicles while allowing the community to evacuate;
  - a defendable space for emergency services personnel on the interface between classified vegetation and development site; and
  - hazard separation between classified vegetation and the subject site to reduce the potential radiant heat that may impact a lot(s).

- ***Performance Principle P3iii*** (A3,4b)
  - Vehicular access is provided which allows:
    - access and egress for emergency service vehicles;
    - defendable space for emergency services personnel on the interface between classified vegetation and development; and
    - hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s).
- ***Performance Principle P3iv*** (A3.6)
  - Vehicular access is provided which allows emergency service vehicles to directly access all habitable buildings and water supplies and exit the lot without entrapment

4.2 2010 Planning for Bushfire Protection Guidelines

The Element 3 Intent is stated as follows:

> *To ensure that the vehicular access serving a subdivision/development is safe in the event of a bush fire occurring.*

The key requirements for the applicable Acceptable Solutions for Element 3 (Vehicular Access) are broadly summarised below:

- Two different vehicular access routes, both of which connect to the public road network, are always available to all residents/the public.
- Cul-de-sac's (no-through roads) are to be avoided where possible, but if required are to comply with the following:
  - 200 m maximum length but can be increased to 600m if emergency access is provided between cul-de-sac heads provided no more than 8 lots are serviced
  - Turnaround head to be 21 m diameter
- EAWs need to meet similar standards to public roads and must be signposted
- Where gates are used to restrict traffic for EAW or FSARs, they must be:
  - A minimum of 3.6 m wide,
  - <u>For EAW gates, they must not be locked</u>
  - For FSARs, they may be locked with a common key available to local fire service personnel.
- Where signs are required, they shall comply with the nominated specifications and state either "Fire Service Access – No Public Access" (for FSAR) or "Emergency Access Only" (for EAW).
- Public roads (including cul-de-sacs) and EAWs are to comply with the nominated technical specifications.

Relevant Performance Principles include the following

- ***Performance Principle P2*** (All Acceptable Solutions)
  - The internal layout, design and construction of public and private vehicular access in the

subdivision/development allows emergency and other vehicles to move through it easily and safely at all times.

4.3 Compliance Comparison

The Element 3 Intent statements has not changed much since 2010, with the focus on access availability and safety. While the Acceptable Solutions and Performance Principles have evolved since 2010, the broad objective of the vehicular access provisions for both Guidelines is to ensure residents, public and emergency services vehicles which is safe to use in a bushfire emergency, including limitation of becoming trapped by ensuring sufficient egress options to limit the amount of travel along a single access routes (cul-de-sacs, no-through roads) to reach a point of choice on the public road network.

The Acceptable Solutions of the 2010 Guidelines stipulate this as being 200 m regardless of the bushfire hazard people will be exposed to (other than if an EAW is provided with less than 8 lots), however the 2021 Guidelines provide more contextual flexibility, with greater consideration given to the surrounding bushfire hazard that evacuees will be exposed to along the road. These same provisions are also relevant to emergency services access and egress.

EAWs are typically provided when public roads are not appropriate, with limitations on length and access. Both Guidelines stipulate that signage is required to indicate the EAW intent for emergency use, with gates also permitted provided they are unlocked. The risk of having locked gates over access routes for public use, is that in a bushfire emergency the relevant emergency personnel may not arrive to unlock the gates, potentially due to lack of knowledge of the gates or due to competing priorities in such an emergency. Locked gates are permitted for FSARs as these are for fire appliance use only, and not intended for public use in emergencies.

The Performance Principle in the 2010 Guidelines focussed more on internal layout design, however these have evolved in the 2021 Guidelines with the following key themes, which are an extension of Element 3 Intent statement:

- The design and capacity of vehicular access and egress is to provide for:
  - the community to evacuate to a suitable destination before a bushfire arrives at the site
  - emergency services personnel to attend the site and/or hazard vegetation
  - community and emergency services to move safely and easily throughout the development

5.0 Existing Road Network Compliance

A review of the existing public road network compliance with the Acceptable Solutions from the bushfire Guidelines is provided in Attachment 4 for the various areas around the Eleventh Road crossing, and summarised below.

5.1 Areas north-west, north-east and south-east of the railway crossing

- 110 Wilson Street (north-west of crossing)
  - Public road access is non-compliant given travel is via no-through roads with combined length of 800 m (namely Lambert Lane and Wilson Street), complete with non-compliant turning head (<18 m diameter).
  - Non-compliant access to 110 Wilson Street has been informally addressed by having private driveway access from the rear boundary, directly to Eleventh Road, which provides a point of choice.
- Existing vehicular access for all properties north-east and south-east of the crossing is compliant with the current bushfire 2021 and 2010 Guidelines, other than Lot 106, with access provided either directly to Eleventh Road, or to Bruns Drive, which discharges onto Eleventh Road at two locations.
  - Access to Lot 106 is currently via Mitchell Street and Moore Street to the north, with no existing driveway access in place to Eleventh Road. On this basis, the existing access is currently non-compliant due to Mitchell Street and Moore Street being an overlength dead-end roads,

with the balance of the road exceeding 200 m not being through a residential built-up or BAL-Low area.

5.2 Area south-west of the railway crossing

The current road network is assessed against current bushfire Guidelines in Attachment 4, however given the approval history of the site, the compliance of the existing public road network to the south-west of the crossing needs to be reviewed at two times; prior to creation of the Mill Street / Phizam Place EAW, and following its recent construction.

5.2.1 Road network compliance prior to Mill Street/Phizam Place EAW

Without the Mill Street / Phizam Place EAW established, the compliance of the existing road network is largely dependent on the level of compliance of the Rivose Crescent EAW, which would provide the second access route to Eleventh Road, where there is a point of choice to travel in two directions.

- The existing Rivose Crescent EAW is gated, an arrangement which is compliant with both the 2010 and 2021 Guidelines, however neither Guidelines permit the locking of gates where for public use in accordance with the Acceptable Solutions. The potential issue is that if there are no authorised personnel (local government or firefighters) onsite to unlock the gates, there is a risk that residents/public would have to travel a longer distance to a point of choice, or could be impacted by fire or become trapped.
- The BMP does state that the gates are to be locked with keys held by the Shire, with endorsement of the BMP representing approval of this deviation from the Acceptable Solutions of the 2010 Guidelines to provide a managed access arrangement rather than unlocked gates that are always available for public use. The reasoning for the locking of the gates is not clearly detailed in the BMP, but is presumably to avoid having normal everyday access to Eleventh Road. Additionally, it is noted that neither gates are signposted as an EAW either as required by both Guidelines and the endorsed BMP
- Given the BMP was endorsed by the decision-maker with the locked gates, there would have been two likely scenarios in a bushfire emergency:
    - Ideally local firefighters attend the area early to open the EAW gates and permit early egress to a point of choice on Eleventh Road, in addition to use of egress via Keenan Street, Mill Street and Gull Street back to Eleventh Road, or
    - If local firefighters weren't able to arrive early to open the EAW gates, egress would have needed to travel up to 1.5 km along a single route to a point of choice, namely via Keenan Street, Mill Street and Gull Street back to Eleventh Road.
        - Given this is greater than 200 m and provides access to more than 8 lots, this arrangement is non-compliant with the 2010 Guidelines.
        - Given the travel is further than 200 m and passes by unmanaged vegetation along parts of Todman Grove and Keenan Street, but especially along Mills Street and Gull Street, there is no opportunity to consider this compliant with the 2021 Guidelines either.
        - In this scenario, only the lots on Gull Street, within 200 m of Eleventh Road, would be considered to have compliant vehicular access.
- Given the current arrangement is stated within an endorsed BMP, it is not the contention that this is non-compliant, rather simply a deviation from the Acceptable Solutions as the performance-based access arrangement has been approved by the decision-maker.
    - The reasoning for the deviation from the Acceptable Solutions is not clearly stated in the BMP, however it is presumably to restrict daily entrance/exit onto Eleventh Road.
    - It is acknowledged that the use of locked gates on EAWs is not ideal from the perspective of having access routes remain available at all times for the community, however it is necessary in some instances to restrict daily use of these roads, especially where there may be other considerations (ongoing maintenance, safety, security etc).

- It is the noted that at the time of BMP approval in 2014, it accepted that egress could be up to 1.5 km to a point of choice at Eleventh Road, until the gates were unlocked by local firefighters, however this has been recently improved by the construction of the new Mill Street / Phizam Place EAW as detailed below in Section 5.2.2.

5.2.2 Road network compliance following to Mill Street/Phizam Place EAW

The new Mill Street / Phizam Place EAW, recently constructed in 2021, and while the status of the subdivision is not currently known, it appears fully compliant with current bushfire Guidelines other than a lack of signage and a padlock that has been placed on the Phizam Place gates. The lock doesn't appear to be a Shire lock, and is likely put there by a local resident.

Once available for use, if it isnt already, the impact on local road network compliance from the introduction of the Mill Street / Phizam Place EAW, is that if the Rivose Crescent EAW remains locked in a bushfire emergency, the point of choice for evacuees is much closer to the farthest lots on Rivose Crescent or Todman Grove, where one-way travel to a point of choice reduced by approximately 650 m. This drastically reduces the amount of single road travel to a point of choice, which reduces the chance of being impacted by fire or being trapped.

Notwithstanding, this arrangement is still non-compliant with the 2010 Guidelines as the cul-de-sac road still exceeds 200 m to a point of choice, however the level of compliance with 2021 Guidelines is less clear. While the overall road to a point of choice is greater than 200 m, a reasonable portion of this road is through a residential area (Rivose Crescent), with bushfire impact to evacuees occurring from a narrow band of vegetation within Wugong Creek (noting that the grassland fringing appearing to be historically well-managed by local government). Notwithstanding, there is still a 500 m long section of road from the Rivose Crescent/Todman Grove intersection to the Mill Street/Phizam Place EAW entrance, that is a single path of travel, that is not entirely protected from bushfire impact, and as such, this should be considered non-compliant with the 2021 Guidelines, assuming the Rivose Crescent EAW is not opened in a bushfire emergency.

6.0 Bushfire Risk in the Local Area

The affected area around the proposed road modifications is designated bushfire prone as per the Map (see Plate 3) which depicts designated bushfire prone land as pink.

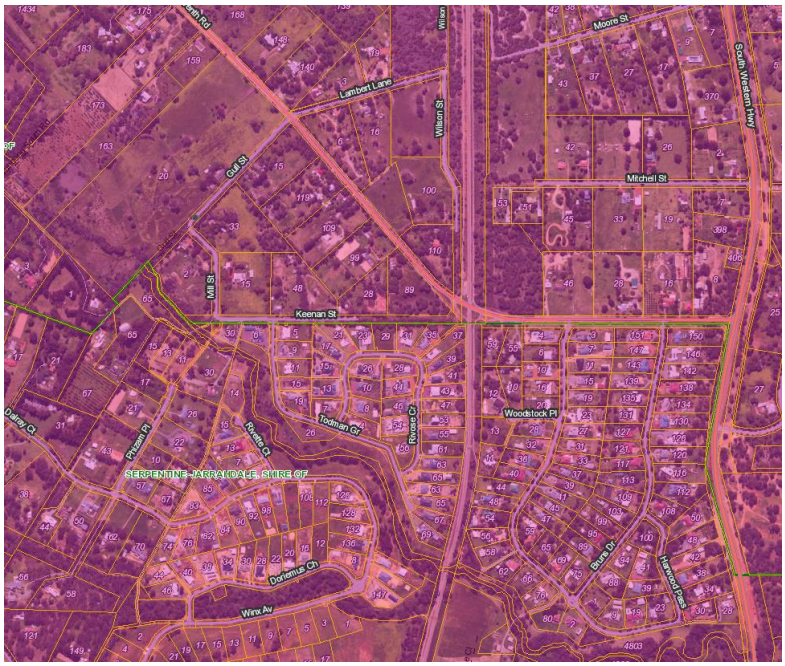

Plate 3: Map of Bush Fire Prone Areas (DFES 2021)

Historical bushfires have been depicted on Plates 4 and 5, using the following publicly available datasets:

- Firewatch which is a Landgate service that uses satellite remote sensing imagery to detect fire hotspots and burnt areas, to track live bushfires but also to review the broad extent of past fire events.
- DBCA Fire History dataset which contains a collection of records of fire events (prescribed burns and bushfire) which were captured on departmental-managed land, and where available non-department managed land in Western Australia. The earliest records available are from 1937.

The greatest bushfire threat to this area is from Wugong Regional Park located east of South-West (SW) Highway, which has continuous forest fuels that would support significant bushfires from extended fire runs (over 3 km long). Fires have historically occurred in this regional park, with the most recent in 2017 (see Plate 4 – dark blue), and bushfires spreading through the park from the east, could be expected to achieve fully-developed behaviour. While it is likely it would take some time to reach a fully-developed state, such a bushfire would be expected to impact existing development near SW Highway. There is potential for fire to spread further west across SW Highway, especially through unmanaged vegetation in rural residential lots and vegetation retained in creeks, but may also spread through ember attack into similar fuels.

Vegetation to the west of SW Highway near Eleventh Road, shows that vegetation is largely fragmented from historical rural residential development, especially north of Eleventh Road, where much if the native vegetation has been cleared, and paddocks are usually grazed grassland with some retained trees. Smaller residential lots south of Eleventh Road created from more recent subdivisions, have largely removed the majority of the vegetation, and what has been retained in either within more managed gardens or constrained along creeks, drainage lines, roads, railway or in isolated plots. There has been very little significant bushfire activity to the west of SW Highway, with historical registry showing past bushfires occurring in large reserves in Forrestdale over 6 km to the west.

Based on the above, the following can be noted about the bushfire risk to the existing development:

- There is certainly potential for impact to existing development near SW Highway from bushfires approaching through continous forest fuels from the east
- There appears limited likelihood of bushfire spread from the west where existing development is more intense, and where associated vegetation modification and management has resulted a fragmented fuel profile unlikely to support signficiant bushfire behaviour, but is more likely to result in smaller localised fires.
- The more intense development to the west of SW Highway results in much better access networks and firewater supplies for attending fire appliances to suppress what will likely be smaller localised fires, and the greater numbers of people, mean that early surveillance and notification of local fires is more likely.
- Evacuation from a bushfire is much more likely to be in a westerly direction, away from a bushfires from the east, however the potential for ember attack igniting local fires should not be disregarded.
- It should be noted that most existing buildings are pre-2015, and are unlikely to have been constructed to an assessed Bushfire Attack Level (BAL) rating. On this basis, sheltering in place within a dwelling, may not always be an appropriate action, and offsite evacuation the safer option.

Plate 4: Bushfire History (Firewatch 2022)

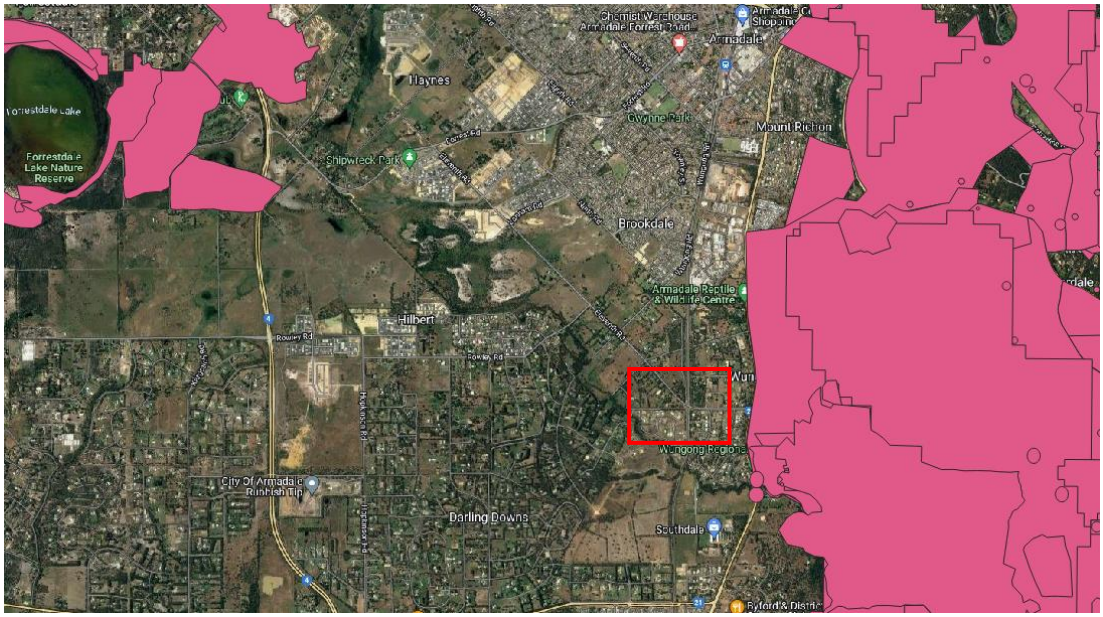

Plate 5: Bushfire History (DBCA 2022)

Regarding potential bushfire impact on the local area around the Eleventh Road modifications:

- ***North-east of railway crossing***
  - There is potential for significant bushfires spreading east from Wugong Regional Reserve through unmanaged vegetation within rural residential land to the north-west of the Eleventh Road, however it is noted it is relatively fragmented by existing development.
- ***South-east of railway crossing***
  - Similar to above, existing development south-east Eleventh Road is most at risk from bushfires approaching from Wugong Regional Park, and while those dwellings near SW Highway will be at risk, the highly managed residential land around Bruns Drive and Harwood Pass would be expected to slow fire spread.
  - There is potential for bushfire spread from the south or south-west, and would be expected to be smaller, localised fires primarily through grassland and isolated plots of forest, however much if this land south of Wugong Creek is likely to subject to future residential development.
- ***North-west of railway crossing***
  - These lots are over 750 m away from SW Highway, which lessens the likelihood of being impacted by bushfires from the east. Notwithstanding, there is potential for ember attack to ignite local fires in surrounding unmanaged vegetation, and for fire spread across the rural residential lots north of Eleventh Road.
  - There is also potential for bushfire impact from the north and west through fragmented vegetation, however there is no historial record of significant fires from these directions, so this is considered less likely
- ***South-west of railway crossing***
  - Given the distance from SW Highway, the impact from fire out of Wugong Regional Park is lessened, but not completely removed given the potential for ember attack.
  - North of Keenan Street but south of Eleventh Road, some unmanaged vegetation remains in the rural residential lots.
  - South of Keenan Street, development is largley residential lots, that contain well-managed vegetation. Existing residential development continues south of Wugong Creek, which creates a fragmented vegetation profile, and future residential development further south and south-east continues to remove potential fire runs.
  - While there is potential for bushfire impact from the west and south-west, this would be through fragmented vegetation, for which there is no historial record of significant fires from these directions.

It is noted that there has not been any signficiant bushfires recorded in any of this land around the proposed Eleventh Road modifications, however given the proximity to Wugong Regional Park and the presence of unmanaged vegetation within existing rural residential development surrounding the area, especially to the north and west, it is not appropriate to discount the potential bushfire risk to the existing area. The existing development to the east of the railway line will be most at risk of bushfire impact from the east, and providing sufficient vehicular access, especially to the west, is critical to enable egress away from a fire. Existing development to the west of the railway line has greater separation from Wugong Regional Park, however ensuring sufficient egress to the west will also be important, especially as many dwellings may not be suitable for onsite sheltering.

7.0 Proposed Eleventh Road Modifications

In order to facilitate the new bridge crossing of the railway line, Eleventh Road is required to be modified to create an embanked roadway on either side of the railway line to provide the elevation required for the new Eleventh Road bridge. The elevation of the road requires a number of modifications to local roads and driveways in the surrounding area including the following (also refer to Attachment 5):

7.1 Modifications to south-west of new bridge (extending to north-west)

- Construction of a new drainage basin in the western portion of No. 89 Eleventh Road. Occupation of this lot is to cease as part of the proposed development, with the existing habitable buildings on this lot to be demolished. The remainder of the lot is to remain undeveloped.
- Extension of Keenan Street north along the western lot boundary of No. 89 Eleventh Road, and terminated with a new turning head.
    - Driveway access from the existing dwelling at No. 99 Eleventh Road is to be created to the new turning head, as the existing driveway access directly to Eleventh Road will be terminated as part of the proposed road modifications.
    - The proposed modifications have been done in consultation with the Public Transport Authority (PTA) and the Office of Major Transport Infrastructure Delivery (OMTID), with respect to land acquisition, driveway access and services relocation, with the preferred approach to provide access via Keenan Street. This decision has been heavily influenced by safety constraints and maximum vertical grades due to a level change to accommodate the new grade separation.
- Construction of a new PSP along the southern part of Eleventh Road, and also beneath Eleventh Road along the western side of the railway.
- Additionally, in order to address bushfire vehicular access compliance issues presented by the proposed modifications, the following is also proposed with the reasoning detailed in Section 9.0:
    - Creation of a new EAW from the existing termination of Keenan Street, further east to connect to the existing Rivose Crescent EAW.
    - Creation of a new FSAR/EAW from the northern extent of the existing Rivose Crescent EAW, extending to the existing Wilson Street turning head, using the new PSP beneath Eleventh Road.

7.2 Modifications to north-west of new bridge

- Relocation of the driveway from Lot 12 on DP 223230 (lot immediately north-west of No. 110 Wilson St) further west along Eleventh Road, to minimise travel up the embankment.
- Termination of the existing informal driveway from No. 110 Wilson Street that previously discharged directly to Eleventh Road is required, due to the resultant embankment at this location due to the elevation of the new road.
    - To address bushfire vehicular access compliance issues presented by change, access for No. 110 Wilson Street to Eleventh Road will be provided along the new maintenance track on the northern side of the proposed embankment, which will enable travel to the Lot 12 access crossover to Eleventh Road (in an emergency). Travel along the maintenance track will be approximately 150 m from the existing driveway, with the track proposed to be 5 m wide and finished with a limestone capping in this area.
- As detailed in Section 7.1, a new FSAR/EAW will be extended from Rivose Crescent to connect to the existing Wilson Street turning head, to address the bushfire vehicular access compliance issues resulting from the modifications.

7.3 Modifications to south-east of new bridge

- Bruns Drive connection to Eleventh Road has been moved approximately 90 m further east to a new location north of No. 4 Bruns Drive, to tie into the new vertical geometry of Eleventh Road and to ensure the compliant vertical geometry for the proposed cul-de-sac road.
    - As per the Scope of Works and Technical Criteria (SWTC), Bruns Drive access road has been designed as a one way left turn access from Eleventh Road.
        - This arrangement is currently under review, with the preference to consider converting this to a one-way out exit on to Eleventh Road, rather than as an entry onto Bruns Drive.

        - The need for a one-way road is a product of the elevation of Eleventh Road as it approaches the rail crossing, and limitations with land acquisition.
    - A painted median is proposed along Eleventh Road opposite the Bruns Drive intersection.
    - A turning head is proposed where the one-way in (or potential one-way out) road connects to existing Bruns Drive.
- Construction of a new cul-de-sac public road parallel with Eleventh Road, to provide access to existing dwellings at No. 55 and No. 59 Eleventh Road

7.4 Modifications to north-east of new bridge

- Construction of a new drainage basin in the southern portion of No. 46 Eleventh Road.
- Construction of a new private driveway to the existing dwelling on No. 46 Eleventh Road, including a turnaround facility, to enable vehicular access on the eastern side of the lot.
- No changes in access are proposed to Lot 106 adjacent to the rail reserve

8.0 Bushfire Compliance Impact Resulting from Proposed Modifications (Prior to Additional Bushfire Risk Management Measures)

A review of the level of compliance of the road network, following the proposed road modifications but prior to implementation of any additional bushfire risk management measures, has been conducted against the requirements of the current Guidelines (see Attachment 4) and reveals the following:

8.1 South-west of new bridge

- The proposed modifications works have two main impacts on the existing public road network:
    - The termination of the Rivose Crescent EAW connection to Eleventh Road
    - The rerouting of driveway access of No. 99 Eleventh Road, from Eleventh Road to the new turning head on the extended portion of Keenan Street
- This removes the alternative access/egress route from the Rivose Crescent/Todman Grove/Keenan Street area resulting in the nearest point of choice being available at Mill St/Phizam Place EAW approximately 450 m via single way travel. Addressing the EAW compliance was not originally considered as part of the modification works.
- This modification creates a non-compliance with A3.2a of the Guidelines as public road access is now further than 200 m from a point of choice and the resultant no-through roads don't comply with A3.3.
    - A number of options were considered to resolve this non-compliance, and these are detailed in Section 9.0.
    - Additionally, the proposed Keenan Street extension to access No. 99 Eleventh Street, would also be an overlength no-through road (approximately 430 m from turning head to Keenan Street/Todman Grove intersection).

8.2 North-west of new bridge

- The proposed modification works terminate the existing access from 110 Wilson Street directly to Eleventh Road, due to the resultant embankment at this location. This will result in public road access only being available by the non-compliant Wilson Street which is a no-through road exceeding 200 m in length, with a non-compliant turning head. The compliance of Wilson Street was not being originally considered as part of the proposed modification works.

8.3 South-east of new bridge

- The proposed relocation and reconfiguration of the Bruns Drive connection to Eleventh Road, results in a one-way road being required due to the elevation of Eleventh Road as it approaches the rail crossing, and limitations with land acquisition. It is noted that the option of converting the design to a one-way out road is being reviewed, and is preferred from a bushfire emergency perspective.

  - The reconfiguration to be a one-way in road or a one-way out road, will still enable two-way access and egress to Eleventh Road in a bushfire emergency as an EAW, with the road to be a 6 m wide and a painted median strip enabling crossing of Eleventh Road.
  - Notwithstanding, travel along Bruns Drive is entirely surrounded by residential development, providing a relatively safe travel route between the two entries to Eleventh Road.
  - There is a risk that without signage, roads users won't know the one-way road can be used for two-way use in a bushfire emergency. This is less of an issue if the configuration is as a one-way out arrangement, where regular use is onto Eleventh Road from Bruns Drive.
- The new cul-de-sac public road parallel with Eleventh Road, will be less than 200 m long, with a compliant turning head, which will provide compliant access to No. 55 and No. 59 Eleventh Road.
- The existing road network in this area is currently compliant with the 2021 Guidelines, and will be following implementation of the modification works, other signage being required to indicate that two-way travel is possible in emergencies.

8.4 North-east of new bridge

- The existing access to No. 46 Eleventh Road will be replaced by a new compliant driveway, complete with turning head. This will provide direct connection to Eleventh Road, where travel can be either west or east.
- The access arrangements to Lot 106 on Crown Reserve (R 14217) is not being altered as part of proposed works.
- The existing road network in this area is currently compliant with the 2021 Guidelines, and will be following implementation of the modification works, with no additional bushfire measures required.

9.0 Options assessed to resolve Rivose Crescent EAW termination at Eleventh Road

A number of options were investigated as part of the design process to resolve the termination of the existing Rivose Cres EAW connection to Eleventh Road, as detailed below

9.1.1 Solely reconfigure and extend the Rivose Cres/Keenan Street EAW

- Would have included unlocking and reconfiguring gates, as well as extending the EAW to the new cul-de-sac on Keenan Street, including vegetation management of the verge.
- This arrangement provides a permanently open loop road from the Keenan Street/Todman Grove intersection, through Todman Grove, Rivose Crescent and back to the intersection, that is available for use at all times and mostly travelling through managed residential lots.
- This approach would have relied on small section of single way travel from the Keenan Street/Todman Grove intersection, to Mill St/Phizam Place EAW entrance, which is lined by residential lots to the south and grassland paddock to the north.
- The objection with this approach is that there is still a single point of failure along the road network, and while it was considered still a relatively safe outcome given the level of vegetation management on either side of this route and the limited historical bushfire activity in this area, it was decided this still only produced a single exit from the local area and didn't replicate the existing arrangement.
- It is noted, that this approach does reduce the single way travel from the new Keenan Street turning head (serving No. 99 Eleventh Road) to a "point of choice", from at least 430 m to 140 m if this EAW is connected, albeit being reliant on finding a second access route from the area.

9.1.2 Use the PSP to provide a direct connection to Eleventh Road

- The option of using the proposed PSP along the south of Eleventh Road from the railway, was also investigated as a way of providing a direct connection from the north of the Rivose Crescent EAW to Eleventh Road.
- The PSP has a maximum grade of 3% and width of 4 m and requires a road safety barrier along

Eleventh Road grade separation, as required by Austroads and MRWA guidelines.

- The Eleventh Road geometry and alignment is constrained by a number of external factors (rail alignment and associated vertical clearance, permitted road grades etc), and results in a retaining wall to the south of the road. As a result, the road safety barrier is necessary to mitigate the >1 m drop along this interface and extends more than 150 m further west.
- While this option would have provided the best direct replication of the current EAW arrangement, it is not able to be achieved as the road safety barrier essentially prevents use vehicles accessing Eleventh Road from the PSP. Additionally, there is limited ability to alter the alignment or width of the PSP due to the design constraints posed by the Eleventh Road geometry and associated batters, thus achieving a 6 m wide EAW would not be readily achievable. It is for these reasons that this option was not feasible.

9.1.3 Construct an EAW over Wugong Creek, connecting Todman Grove to Dalray Court

- This option would require the construction of a bridge across Wugong Creek to the south of Todman Grove, to connect to Dalray Court on the southern side of the creek. Once on Dalray Court, egress is available in two different directions , both leading back to different points on Wugong South Road from where travel is possible north and south.
- This option doesn't replicate the existing Eleventh Road EAW connection, but is an alternative approach to achieving an egress route that would be compliant with the bushfire Guidelines.
- While this option provides a compliant outcome, it represents a significant impact to the project on the following basis:
    - It is outside the current scope of works for the project
    - The additional works south of Todman Grove, especially in Wugong Creek, are outside the environmental approvals already obtained for the project
    - The design and construction of the bridge structure is not currently considered in the project
    - The above works represent a significant cost and time impact on the project, in addition to the associated approvals risk.

9.1.4 Construct a FSAR/EAW between Rivose Cres EAW and Wilson St cul-de-sac head

- This option involved extending the existing Rivose Crescent EAW 250 m north to the existing Wilson Street turning head, along the new PSP alignment beneath Eleventh Road bridge.
- The trafficable width of the PSP is to be widened to 6 m, other than a section of 5.5 m wide beneath the bridge where widening is not possible due to the bridge design and rail reserve infrastructure clearance requirements.
- Vehicular access to the FSAR/EAW along the PSP is to be via locked gates only, preventing use other than in a bushfire emergency under direction of emergency services personnel.
- The section of 5.5 m FSAR/EAW is only 55 m long and signage is to be provided to indicate that fire appliances will not be able to pass by each other along this section of road
- This option is the preferred approach for the following reasons:
    - Provides a second travel route that restores connectivity to Eleventh Road, from Rivose Crescent and Keenan Street.
    - The access arrangement is managed by emergency services personnel, similar to the current EAW.
    - It primarily utilises infrastructure proposed by the project, rather than requiring significant and costly additional infrastructure.
    - It resolves the overlength Lambert Lane/Wilson Street, by providing a second travel route from this 800 m long non-compliant cul-de-sac road. While there are few lots on that cul-de-sac road, this FSAR/EAW provides an optimal access solution for firefighters to move from the northern to southern side of Eleventh Road and avoid being trapped on the cul-de-sac.

9.1.5 Selected Option

The selected resolution was a combination of two approaches. The FSAR/EAW from Rivose Crescent to Wilson Street, provides a second access route from the south-west area, and removes reliance on the Keenan Street, Mill Street, and potentially Gull Street, being trafficable in a bushfire emergency. Additionally it assists in resolving the Wilson Street non-compliance, which may be particularly useful for firefighters in a bushfire emergency. While the FSAR/EAW provides the second route, the Rivose Crescent/Keenan Street EAW is still required to address the overlength no-through road that would be created to No. 99 Eleventh Road should it not be constructed, and optimises the emergency access throughout this area.

10.0 Proposed Bushfire Risk Management Measures

In addition to the above road and drainage modifications required to elevate Eleventh Road, the project is also proposing the following measures be incorporated to specifically address the bushfire access compliance:

- Modify the existing Rivose Crescent EAW and extend to Keenan Street termination as follows:
  - Relocate the existing northern gate on the Rivose Crescent EAW, to western entrance to the new Keenan Street EAW
  - Extend EAW from current termination at Eleventh Road, to proposed Keenan Street extension. Ensure compliance with EAW specifications including 6 m width and relevant requirements of A3.2.b of the bushfire Guidelines
  - Permanently unlock both EAW gates (i.e. one on Rivose Crescent and relocated gate on Keenan Street)
  - Install compliant signage onto both EAW gates:
    - Stating “NO ENTRY – EMERGENCY ACCESS ONLY”
    - Provides a diagrammatic plan of the local road network depicting the travel routes possible from the area including the two EAWs and the new FSAR/EAW (indicating it is locked), and provide a “YOU ARE HERE” indicator. The plan is to make it clear where the person is located and what their travel options are to evacuate the area as well as whether gates are locked or unlocked.
- Modify all vegetation within Keenan Street road reserve including the proposed EAW (see Plates 2 and 3 for existing vegetation) to a low threat state compliant with AS 3959 Clause 2.2.3.2 (f) primarily consisting of retained mature trees, with managed low understorey vegetation. The modification works are expected to include
  - Retention of mature trees, with underpruning of lower branches to approximately 2 m above ground level
  - Removal of any large shrubs providing a vertical ladder from understorey vegetation to the tree canopies
  - Limitation of understorey vegetation to either managed grass (slashed regularly each bushfire season) or low groundcover species, ideally 100 mm – 200 mm high at maturity
- Regularly slash grassland vegetation within 89 Eleventh Road, outside of the new drainage basin (see Plate 8 for existing vegetation), to manage the bushfire hazard in this area.
  - The existing vegetation is primarily mature, well-spaced trees with grassy understorey due to historical grazing and slashing.

Plate 6: Vegetation along existing Keenan Street verge

Plate 7: Vegetation along proposed Keenan Street EAW

Plate 8: Vegetation within 89 Eleventh Road lot (north of Keenan Street EAW)

- Establish the following at the new Rivose Crescent/Wilson St FSAR/EAW
  - Install locked gates at both entrances to the FSAR/EAW, and ensure keys are provided to all relevant local government, DFES and PTA personnel. Both gates are to open out over the

PSP, to effectively block vehicular traffic past the two entrance points onto the FSAR/EAW.
    - Ensure the FSAR/EAW is no less than 6 m wide throughout its entire length, other than the 55 m section beneath the Eleventh Road bridge which will be 5.5 m wide, and is otherwise compliant with all other specifications for FSARs and EAWs as per the bushfire Guidelines.
    - Install signage indicating at both gates indicating the following:
        - the FSAR/EAW is only for use in a bushfire emergency and to be done under direction of emergency services personnel
        - display the entire FSAR/EAW route depicting the exact location of the entrance gates and the sections of 5.5 m and 6 m wide trafficable surface along its length.
        - denote that fire appliance passing will not be possible beneath the Eleventh Road bridge.
    - Install signs along the FSAR/EAW, prior to the bridge underpass, stating fire appliances will not be able to pass when travelling beneath the bridge.
- Install signage at both ends of the reconfigured Bruns Road/Eleventh Road public road/EAW as follows, depending on final arrangement and confirmation with stakeholders:
    - If one-way entry off Eleventh Road, the following signage is required (or similar approved)
        - At entry - “TWO-WAY USE MAY OCCUR IN BUSHFIRE EMERGENCY”
        - At exit - “NO ENTRY – ONE WAY ONLY UNLESS IN BUSHFIRE EMERGENCY”
    - If one-way exit from Bruns Drive, the following signage is required (or similar approved)
        - At entry - “TWO-WAY USE MAY OCCUR IN BUSHFIRE EMERGENCY”
        - No signage at entry unless required to indicate to emergency services that they can use for access in a bushfire emergency.
- Ensure access for No. 110 Wilson Street to Eleventh Road is provided along the new maintenance track on the northern side of the proposed embankment, to enable travel to the Lot 12 access crossover to Eleventh Road (in an emergency). The maintenance track will be approximately 5 m wide and finished with a limestone capping in this area.

In addition the management measures nominated above, bushfire risk management would also be improved by the following:

- Encourage that the Mill St/Phizam Place EAW is made available for residents, public and emergency services personnel as soon as appropriate, including the following:
    - Ideally remove lock from Phizam Place gate but keep the gate closed, however if the gate must remain locked, fit with a Shire lock
    - Install compliant signage onto both EAW gates, namely at Mill St and Phizam Place, indicating the purpose of the EAW.
- Ongoing management of existing grassland vegetation (slashing grass) along the banks of Wugong Creek (i.e. direct interfaces with Todman Grove and Keenan Street), prior to bushfire season. This would minimise the exposure of evacuating vehicles to bushfire impact.
    - It is noted there appears to be a current regime of slashing in this area but relevant land managers, however the regularity of this is not currently known.
- All lots are managed in accordance with the relevant council firebreak notice
- Upon completion of works, a flyer is to be prepared and issued to all local residents, showing the updated road network and their options for egress in a bushfire emergency.

11.0 Bushfire Compliance Impact following Implementation of Proposed Bushfire Risk Management Measures

As noted in Section 2.0, compliance with the Guidelines can be addressed either via the Acceptable Solutions and/or using the relevant Performance Principles (with guidance from the Element Intent). In Section 4.0, the

Element Intent statement and relevant Performance Principles revealed the following key themes to guide the objective of the vehicular access arrangements:

- The design and capacity of vehicular access and egress is to provide for:
  - the community to evacuate to a suitable destination before a bushfire arrives at the site
  - emergency services personnel to attend the site and/or hazard vegetation
  - community and emergency services to move safely and easily throughout the development

A review of the proposed road modifications against the requirements of the current Guidelines, following implementation of the additional bushfire risk management measures, has been documented in Attachment 4, and the compliance rationale detailed below:

11.1 South-west of new bridge

- Following the modifications to the Rivose Crescent/Keenan Street EAW, in conjunction with the surrounding vegetation management works, creates a loop road arrangement that is largely through residential land with surrounding managed vegetation, and provides two separate paths of travel to the Keenan Street and Todman Grove intersection. Unlocking the gates will ensure this loop is open and available to the community at all times, with signage providing information on the egress routes available (including the Rivose Crescent/Wilson Street FSAR/EAW and the Mill Street/Phizam Place EAW).
- From the Keenan Street and Todman Grove intersection, there is a single path of travel for 130 m to a point of choice at the Mill Street/Phizam Place EAW (if open for use), which is lined by both residential development and rural residential land. If the Mill Street/Phizam Place EAW is not open, travel to a point of choice is a further 650 m along Mill St and Gull St, to Eleventh Road.
- This proposed arrangement is an upgrade on the current road network should the existing Rivose Crescent EAW was not opened in a bushfire emergency, and significantly reduces the distance of single path of travel from Todman Grove/Rivose Crescent intersection of 1.2 km (prior to Mill St/Phizam Place EAW) or 500 m (following the Mill St/Phizam Place EAW), to 780 m or 130 m respectively.
- Access to all lots from the public road network is unchanged, other than No. 99 Eleventh Road which diverts to the extended Keenan Street. The rerouting of access for No. 99 Eleventh Road does result in greater travel distance to a point choice than currently exists, however with the Rivose Crescent/Keenan Street EAW constructed, the travel distance from the turning head to the Keenan Street bend is only 150 m, and from there, there is a choice in directions to get to the Keenan Street/Todman Grove intersection.
- To address bushfire compliance issues resulting from the termination of the Rivose Crescent EAW, a new FSAR/EAW is proposed to connect Rivose Crescent EAW to Wilson Street turning head, using the proposed PSP that passes beneath Eleventh Road bridge.
  - The new FSAR/EAW provides an alternative access route to Eleventh Road, via Wilson Street and Lambert Lane, which replaces the existing connection and enables travel to a different suitable destination.
  - The locked gates will prevent everyday use of the FSAR/EAW but enable managed access and egress similar to the current EAW arrangement.
  - The narrow 5.5 m section beneath the bridge will be addressed with signage.
- The existing road network in this area is considered compliant with the 2021 Guidelines, on the basis that although having a locked EAW gate is a deviation from the Acceptable Solutions, it was endorsed by the decision-maker, and prior to the Mill Street/Phizam Place EAW being proposed or constructed.
- Following implementation of the modification works, the vehicular access arrangements are considered compliant with the 2021 Guidelines on the following basis:
  - Other than the locked gates and narrow section on the Rivose Crescent/Wilson Street FSAR/EAW, all proposed works is to be compliant with construction specifications for public roads, no-through roads, EAWs and FSARs.

- Access to all lots from the public road network is unchanged, other than 99 Eleventh Road which diverts to the extended Keenan Street
- The Rivose Crescent/Keenan Street EAW provides greater access via the loop roads, to get to the Keenan Street/Todman Grove intersection, which is also an improvement over the existing arrangement
- The new Rivose Crescent/Wilson Street FSAR/EAW provides the second access to Eleventh Road, which is noted is much longer run that existing EAW, however this also addresses the current Wilson Street overlength non-compliance which will likely be important to firefighters in a bushfire emergency.
- While the Rivose Crescent/Wilson Street FSAR/EAW is slightly narrower than the required 6 m width, the use of signage to indicate this is considered appropriate given the infrequent use in a bushfire emergency and only when managed by emergency services. The reduction to 5.5 m wide, is most likely to only impact fire appliances anyway, with normal 2WD and 4WD vehicles likely to be able to pass anyway.
- The Mill Street/Phizam Place EAW has been constructed, and while the approval is unknown, assuming it is available for use in the near future, it provides a much closer point of choice than the Gull Street/Eleventh Road intersection, and again represents a significant improvement over the existing arrangement.

- It is important to recognize that the proposed development is tying with the legacy road network, and that resolution of the termination of Rivose Crescent EAW does involve balancing of other design issues such as road and bridge design constraints and issues with land acquisition.
- Based on the above, the proposed modifications reinstate the second connection to Eleventh Road, albeit via a longer travel route, however this is offset by the creation of better access throughout the local area, resolution of the dead-end at Wilson Street (especially for firefighters) and the construction of the Mill Street/Phizam Place EAW close to the area. While the proposed access arrangements don't mirror the existing situation, due to the existing road network, proposed modifications and the need to balance a variety of design requirements and other constraints, various options were reviewed and the selected solution still achieves compliance with the Element 3 Intent and Performance Principles, is appropriate to the minimal historical bushfire risk in this area, and provides the best balance of the various constraints.

11.2 North-west of new bridge

- Public road access to the dwelling at No. 110 Wilson Street is via an existing non-compliant public road network that exceeds 200 m in length (Wilson Street and Lambert Lane). Informal access directly to Eleventh Road currently provided an alternative to the long dead-end road, however this connection to Eleventh Road will not be possible following proposed works due to the road embankment.
- In lieu of the direct connection to Eleventh Road, it is proposed that informal access is provided to No. 110 Wilson Street, via the proposed maintenance track to the north of the embankment, to enable emergency access or egress to Eleventh Road via the Lot 12 crossover in a bushfire emergency.
- The proposed track will be compliant with the private driveway specifications, in that it will be 5 m wide for a 150 m long portion of track, which is considered sufficient for the limited use it will have in a bushfire emergency given it will not be for public other than occupants of No. 110 Wilson Street, and any service provider or fire brigade personnel.
- The existing driveway access from Lot 12 on DP 223230 (lot immediately north-west of No. 110 Wilson St) to Eleventh Road, was already compliant with the Guidelines, and the relocation slightly further west along Eleventh Road, to minimise travel up the embankment, is the same compliant configuration.
- The new Rivose Crescent/Wilson Street FSAR/EAW provides an alternative access route to Eleventh Road from the south, however also provides a second access route from the currently non-compliant Lambert Lane/Wilson Street no-through roads to the south, effectively resolving this non-compliance.
- The existing road network in this area enables 110 Wilson Street and Lot 12 to achieve compliant

access with the 2021 Guidelines, however Lambert Lane/Wilson Street form a non-compliant no-through road.

- Following the modifications, the two affected lots will still have access to Eleventh Road and the FSAR/EAW will improve the compliance of the Lambert Lane/Wilson Street no-through road by providing a second connection to the public road network. Similar to above, given the legacy road network and design constraints associated with the proposed modifications, the solution detailed above achieves compliance with the Element 3 Intent and Performance Principles, is appropriate to the minimal historical bushfire risk in this area, and provides the best balance of the various constraints.

11.3 South-east of new bridge

- The proposed relocation and reconfiguration of the Bruns Drive connection to Eleventh Road, results in a one-way road being required due site constraints. The portion of road from the new Bruns Drive turning head to Eleventh Road is to be considered an EAW in bushfire emergency scenarios, and will be signed to indicate it can be used for two-way travel in a bushfire emergency (depending on whether one-way in or out). Given the road will be 6 m wide, this arrangement allows for two-way travel in a bushfire emergency.
- Notwithstanding, travel along Bruns Drive is entirely surrounded by residential development, providing a relatively safe travel route between the two entries to Eleventh Road.
- The new cul-de-sac public road parallel with Eleventh Road, will be less than 200 m long, with a compliant turning head, which will provide compliant access to No. 55 and No. 59 Eleventh Road.
- The existing road network in this area is currently compliant with the 2021 Guidelines.
- Following implementation of the modification works, road design and land acquisition constraints have resulted in the need for a one-way road under normal conditions, however there is sufficient room in emergencies for two-way travel. While not a normal arrangement, the proposed solution provides the best balance of various constraints while still achieving compliance with Element 3 Intent and the Performance Principles, as the community will be able to egress and fire appliances access or egress the area.

11.4 North-east of new bridge

- The existing access to No. 46 Eleventh Road will be replaced by a new compliant driveway, complete with turning head. This will provide direct connection to Eleventh Road, where travel can be either west or east.
- The existing road network in this area is currently compliant with the 2021 Guidelines, and will be compliant with the Acceptable Solutions following implementation of the modification works.

12.0 Summary

All proposed road modifications have sought to replicate or improve the current road network, and by incorporating the nominated bushfire risk management measures, will ensure compliance with the current Guidelines. Where possible, compliance with the Acceptable Solutions has been achieved, however the legacy road network, Eleventh Road and bridge design requirements and land acquisition constraints don't always permit this, in which case compliance is demonstrated with Element 3 Intent and Performance Principles. The solutions proposed provide a balance of the above constraints, but also consider the recent construction of the Mill Street/Phizam Place EAW as a current or imminent alternative access route.

Additionally, there is almost no record of significant bushfires occurring in the land west of SW Highway, and while this doesn't discount the potential bushfire risk, there does appear to be a lesser likelihood of bushfire impact from this direction likely due to the more fragmented vegetation profile and existing development provides greater surveillance and notification opportunities, as well as greater access for firefighter control and suppression activities. It is also acknowledged that ongoing residential development, especially to the south, is also continuing to remove bushfire hazard from this area, which will further reduce likelihood as development

progresses, in addition to further fragmentation of potential fire runs by non-vegetated elements (roads, buildings etc) and managed vegetation (road verges, gardens etc).

Early notification is a key to successful evacuation responses, which enables people to egress while access networks are less impacted by the fires, which ensures that the roads are safer to use, less likely to be congested, and there is less chance of evacuees being affected by the fire or becoming trapped. Notification of bushfire emergencies is provided by DFES, however ensuring residents are fully informed of the changes to the local road network, and understand what their existing and new evacuation routes and options are, will aid in conducting a smooth evacuation of the area in a bushfire emergency, in the unlikely event it occurs.

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Attachments

- **Attachment 1**: Current road network surrounding Eleventh Road grade crossing
- **Attachment 2**: Vehicular access specifications from bushfire Guidelines (2021)
- **Attachment 3**: Vehicular access specifications from Planning for Bushfire Protection Guidelines (2010)
- **Attachment 4**: Bushfire Compliance Assessment of Existing and Proposed Eleventh Road modification works
- **Attachment 5**: Proposed bushfire management measures incorporated into Eleventh Road modification works
- **Attachment 6**: Summary of Bushfire Risk Management Measures to be incorporated into Eleventh Road modification works

Attachment 1: Current road network surrounding Eleventh Road grade crossing

Attachment 1: Current Public Road Network

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Attachment 2: Vehicular access specifications from bushfire Guidelines (2021)

A3.1 Public roads

SP Sb Do

The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.

Public roads are to meet the minimum technical requirements in Table 6, Column 1.

The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.

A3.2a Multiple access routes

SP Sb Do

Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access).

If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided.

The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met:

- the no-through road travels towards a suitable destination; and
- the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.

A3.2b Emergency access way

SP Sb Do

Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.

An emergency access way is to meet all the following requirements:

- requirements in Table 6, Column 2;
- provides a through connection to a public road;
- be no more than 500 metres in length; and
- must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.

A3.3 Through-roads

SP Sb

All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where:

- it is demonstrated that no alternative road layout exists due to site constraints; and
- the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exemption provisions in A3.2a of this table.

A no-through road is to meet all the following requirements:

- requirements of a public road (Table 6, Column 1); and
- turn-around area as shown in Figure 24

A3.4b Fire service access route SP Sb

Where proposed lots adjoin classified vegetation under AS3959 (excluding Class G Grassland)', and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.

A fire service access route is to meet all the following requirements:

- requirements in Table 6, Column 3;
- be through-routes with no dead-ends;
- linked to the internal road system at regular intervals, every 500 metres;
- must be signposted;
- no further than 500 metres from a public road;
- if gated, gates must open the required trafficable width and can be locked by the local government and/or emergency services, if keys are provided for each gate; and
- turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.

A3.6 Private driveways Dd Dc

There are no private driveway technical requirements where the private driveway is:

- within a lot serviced by reticulated water;
- no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and
- accessed by a public road where the road speed limit is not greater than 70 km/h.

In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following require:

- requirements in Table 6, Column 4;
- passing bays every 200 metres with a minimum length of 20 metres and a minimun additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and
- turn-around area as shown in Figure 28 and within 30 metres of the habitable building.

Table 6: Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public roads	2 Emergency access way[1]	3 Fire service access route[1]	4 Battle-axe and private driveways[2]
Minimum trafficable surface (metres)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (metres)	N/A	6	6	6
Minimum vertical clearance (metres)	4.5			
Minimum weight capacity (tonnes)	15			
Maximum grade unsealed road[3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum grade sealed road[3]		1:7 (14.3%)		
Maximum average grade sealed road		1:10 (10%)		
Minimum inner radius of road curves (metres)		8.5		

Notes:

[1] To have crossfalls between 3 and 6%.

[2] Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

[3] Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

Attachment 3: Vehicular access specifications from Planning for Bushfire Protection Guidelines (2010)

A2.1 Two access routes

Two different vehicular access routes, both of which connect to the public road network, are available to all residents/the public at all times.

And

A2.2 Public roads

Public roads meet the following requirements:

- minimum trafficable surface: 6 metres
- horizontal clearance: 6 metres
- vertical clearance: 4 metres
- maximum grades: 1 in 8
- maximum grade over <50 metres: 1 in 5
- maximum average grade: 1 in 7
- minimum weight capacity: 15 tonnes
- maximum crossfall: 1 in 33
- curves minimum inner radius: 12 metres

Notes to A2.2:
6 metre trafficable surface width does not necessarily mean paving width. It could, for example, include 4 metre wide paving and 1 metre wide constructed road shoulders.

In special circumstances, where 8 or less lots are being serviced, a public road with a minimum trafficable surface of 4 metres for a maximum distance of 90 metres may be provided subject to the approval of both the local government and FESA.

And

A2.3 Cul-de-sacs (including dead end roads) are generally not encouraged in bush fire prone areas. Where used, however, cul-de-sac standards are to be as follows:

- maximum length: 200 metres (if emergency access is provided between cul-de-sac heads maximum length can be increased to 600 metres provided no more than 8 lots are serviced)
- minimum trafficable surface: 6 metres
- horizontal clearance: 6 metres
- maximum grades: 1 in 8
- maximum grade over <50 metres: 1 in 5
- maximum average grade: 1 in 7
- minimum weight capacity: 15 tonnes
- maximum crossfall: 1 in 33
- curves minimum inner radius: 12 metres
- as per turn around area requirements – including 21 metre diameter head.

A2.5 Private driveways

Constructed private driveways meet the following requirements:

- required where house site is more than 50 metres from a public road
- minimum trafficable surface: 4 metres
- horizontal clearance: 6 metres
- vertical clearance: 4 metres
- maximum grades: 1 in 8
- maximum grade over <50 metres: 1 in 5
- maximum average grade: 1 in 7
- minimum weight capacity: 15 tonnes
- maximum crossfall: 1 in 33
- curves minimum inner radius: 12 metres
- passing bays: every 200 metres with a minimum length of 20 metres and a minimum width of 2 metres (ie the combined width of the passing bay and constructed private driveway to be minimum 6 metres)
- turn around areas designed to accommodate 3.4 fire appliances and to enable them to turn around safely: every 500 metres and within 50 metres of a house.

And

A2.6 Emergency access ways

Emergency access ways, providing alternative links to public roads during emergencies meet the following requirements:

- minimum trafficable surface: 6 metres
- horizontal clearance: 6 metres
- vertical clearance: 4 metres
- maximum grades: 1 in 8
- maximum grade over <50 metres: 1 in 5
- maximum average grade: 1 in 7
- minimum weight capacity: 15 tonnes
- maximum crossfall: 1 in 33
- curves minimum inner radius: 12 metres
- must be signposted.

A2.8 Gates

All gates used to restrict traffic on emergency access ways and fire service access routes meet the following requirements:

- minimum width 3.6 metres
- design and construction: to be approved by relevant local government
- emergency access way gates: must not be locked
- fire service access route gates: may be locked but only with a common key that is available to local fire service personnel
- Signposted.

A2.10 Signs

Signs are erected where emergency access ways and fire services access routes adjoin public roads, and meet the following requirements:

- minimum height above ground: 0.9 metres
- design and construction: to be approved by relevant local government
- lettering height: 100 millimetres
- to display the following wording (as appropriate): 'Fire Service Access – No Public Access' or 'Emergency Access Only'.

Attachment 4: Bushfire Compliance Assessment of Existing and Proposed Eleventh Road modification works

Area South-West of Bridge

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
Element 3: Vehicular access *Intent: To ensure that the vehicular access serving a subdivision/ development is available and safe* Performance Principle P3i The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.	A3.1 Public Roads *The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.* Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.	• All existing public roads appear compliant with specifications in Table 6, albeit with minimum width of 6 m • ***Compliance with A3.1 currently achieved***	• All proposed new public roads are to be compliant with specifications in Table 6, and will have a minimum width of 6 m • ***Compliance with A3.1 achieved***	• All proposed new public roads are to be compliant with specifications in Table 6, and will have a minimum width of 6 m • ***Compliance with A3.1 achieved***
	A3.2a Multiple access routes Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access). If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.	• The current Rivose Crescent/Todman Grove/Keenan Street area is currently served by a no-through public road network that has a point of choice at the Mill St/Phizam Place EAW • An alternative vehicular access route is afforded by the existing Rivose Crescent EAW constructed to provide direct access to Eleventh Road. This EAW is gated (without signage) and locked with keys provided to the Shire. The locking of the EAW gates is documented in an endorsed BMP. • It is noted that the locked gates on the EAW are a deviation from the Guidelines and if they aren't unlocked, currently there would be single path of travel to the point of choice at Mill St/Phizam Place EAW of 450 m. • ***Compliance with A3.2a is currently achieved.***	• The Eleventh Road modification works would effectively terminate the existing Rivose Crescent EAW • If bushfire compliance was not assessed for the project, it is likely that the termination of the EAW may not have been addressed, resulting in the loss of the second access/egress route from the Rivose Crescent/Todman Grove/Keenan Street area. • The extension of Keenan Street would create a non-compliant no-through road. • ***Compliance with A3.2a would not have been achieved.***	• To address bushfire compliance issues resulting from the termination of the Rivose Crescent EAW, a new FSAR/EAW is proposed to connect Rivose Crescent EAW to Wilson Street turning head, using the proposed PSP that passes beneath Eleventh Road bridge. The new FSAR/EAW provides an alternative access route to Eleventh Road, via Wilson Street and Lambert Lane, which enables travel to a different suitable destination. • The new FSAR/EAW provides the second access route from Rivose Crescent area, but also resolves the overlength non-compliance of the existing Lambert Lane/Wilson Street roads, by providing an alternative travel route. • The Rivose Cresent EAW will be extended back to the existing termination on Keenan Street, to form a 400 m long EAW. The gate at the northern end will be relocated to Keenan Street, and both will be unlocked and provided with signage. This ensures the Keenan Street extension doesn't create a non-

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
				compliant no-through road. • ***Compliance with A3.2a will be achieved including addressing the existing Wilson Street non-compliance.***
	A3.2b Emergency access way *Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.* An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.	• An existing EAW from Rivose Crescent EAW provides direct access to Eleventh Road. This EAW is gated (without signage) and locked with keys provided to the Shire. The locking of the EAW gates is documented in an endorsed BMP. • It is noted that the locked gates on the EAW are a deviation from the Guidelines and if they aren't unlocked, currently there would be single path of travel to the point of choice at Mill St/Phizam Place EAW of 450 m. • ***Compliance with A3.2b is currently achieved, other than the locked gates, which presumably decision-makers were satisfied complied with the Element 3 Intent and align with P3i.***	• The Eleventh Road modification works would effectively terminate the existing Rivose Crescent EAW • If bushfire compliance was not assessed for the project, it is likely that the termination of the EAW may not have been addressed, resulting in a dead-end EAW. • ***Compliance with A3.2b would not have been achieved.***	• A new FSAR/EAW is proposed to connect Rivose Crescent EAW to Wilson Street turning head to address bushfire compliance issues resulting from the termination of the Rivose Crescent EAW. • The FSAR/EAW will be compliant with A3.4b, other than having a 55 m section beneath the bridge being 5.5 m wide instead of 6 m wide which is addressed by having signage to warn fire appliances they can't pass in this area. • The Rivose Cresent EAW will be extended back to the existing termination on Keenan Street, to form a 400 m long, 6 m wide EAW, complete with gate relocation and locks being removed. This is compliant with • Various vegetation management actions are also to be conducted along the Keenan Street road verge to create a low threat outcome. • It is recommended that Mill Street/Phizam Place EAW is to be unlocked and signage added to state its purpose, as soon as appropriate. • ***Compliance with A3.2b will be achieved, other than the locking of the FSAR/EAW which is a replication of the existing arrangement and considered compliant with the Element 3 Intent and P3i.***
	A3.3 Through roads All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where:	• The current Rivose Crescent/Todman Grove/Keenan Street area is currently served by a no-through public road network that has a point of choice at the Mill St/Phizam Place EAW. This	• The Eleventh Road modification works would effectively terminate the existing Rivose Crescent EAW, creating a non-compliant road network with no-through roads >200m	• To address bushfire compliance issues resulting from the termination of the Rivose Crescent EAW and extension of Keenan Street, the measures detailed in A3.2b are to be

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
	• it is demonstrated that no alternative road layout exists due to site constraints; and • the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exempt ion provisions in A3.2a of this table. A no-through road is to meet all the following requirements: • requirements of a public road (Table 6, Column 1); and • turn-around area as shown in Figure 24	requires single path travel of 450 m which exceeds the 200 m permitted. • The existing EAW from Rivose Crescent provides direct access to Eleventh Road, which provides the alternative access route to avoid the no-through road non-compliance. • ***Compliance with A3.3 is currently achieved, however is reliant on the existing EAW to provide a second access route.***	long. • Additionally, the proposed extension of the Keenan Street north to a cul-de-sac, would add another 120 m of no-through road. • If bushfire compliance was not assessed for the project, it is likely that the termination of the EAW may not have been addressed, resulting in a dead-end EAW. • ***Compliance with A3.3 would not be achieved***	implemented to reconnect to Eleventh Road and provide a loop road network from Rivose Crescent/Todman Grove/Keenan Street using public roads and EAWs. • The only no-through road will be the new Keenan Street dead-end to access 99 Eleventh Road. • ***Compliance with A3.3 will be achieved***
<u>Performance Principle P3iii</u> Vehicular access is provided which allows: • access and egress for emergency service vehicles; • defendable space for emergency services personnel on the interface • between classified vegetation and development; and • hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s).	<u>A3.4b Fire service access route</u> *Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.* A fire service access route is to meet all the following requirements: • requirements in Table 6, Column 3; • be through-routes with no dead-ends; • linked to the internal road system at regular intervals, every 500 metres; • must be signposted; • no further than 500 metres from a public road; • if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and • turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.	• No existing FSAR is currently established. • ***Not applicable***	• If bushfire compliance was not assessed, establishing FSAR would not be consideration for this project. • ***Not applicable***	• To address bushfire compliance issues resulting from the termination of the Rivose Crescent EAW, a new FSAR/EAW is proposed to connect Rivose Crescent EAW to Wilson Street turning head, using the proposed PSP that passes beneath Eleventh Road bridge. • The FSAR/EAW will be compliant with A3.4b, other than having a 55 m section beneath the bridge being 5.5 m wide instead of 6 m wide which is addressed by having signage to warn fire appliances they can't pass in this area. • ***Compliance with A3.4b will be achieved, other than the narrowing of the FSAR/EAW which is considered compliant with the Element 3 Intent and P3i.***

Area North-West of Bridge

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
Element 3: Vehicular access *Intent: To ensure that the vehicular access serving a subdivision/ development is available and safe* Performance Principle P3i The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.	A3.1 Public Roads *The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.* Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.	• All existing public roads appear compliant with specifications in Table 6, albeit with minimum width of 6 m • ***Compliance with A3.1 currently achieved***	• All proposed new public roads are to be compliant with specifications in Table 6, and will have a minimum width of 6 m • ***Compliance with A3.1 achieved***	• All proposed new public roads are to be compliant with specifications in Table 6, and will have a minimum width of 6 m • ***Compliance with A3.1 achieved***
	A3.2a Multiple access routes Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access). If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.	• Public road access to 110 Wilson Street is via no-through roads with combined length of 800 m (namely Lambert Lane and Wilson Street), however a private driveway to Eleventh Road from the rear boundary, overcomes this non-compliance. • Public road access the adjacent lots all have direct access to Eleventh Road, providing public road access in two directions to two different destinations. • The combination of Lambert Lane and Wilson Street, which provide street access to 110 Wilson Street, exceeds the 200 m permitted maximum length, and doesn't comply with the exemptions. • ***Compliance with A3.2a currently achieved for existing lots however Wilson Street is non-compliant***	• The termination of the existing access from 110 Wilson Street to Eleventh Road, due to the resultant embankment at this location. This will result in public road access only being available by the non-compliant Wilson Street. • If bushfire compliance was not assessed for the project, Wilson Street would remain a non-compliant no-through road due to length. • ***Compliance with A3.2a would not be achieved to existing lots, and Wilson Street would remain non-compliant***	• Driveway access for 110 Wilson Street will be relocated onto the new maintenance track on the northern side of the proposed embankment, which will enable travel to the Lot 12 crossover and access to Eleventh Road (in an emergency), where travel in two directions to two different destinations can be achieved. • Travel along the maintenance track will be approximately 150 m from the existing driveway, with the track proposed to be 5 m wide and finished with a limestone capping in this area. • To address bushfire compliance issues resulting from the termination of the Rivose Crescent EAW south-west of the bridge, a new FSAR/EAW is proposed to connect Rivose Crescent EAW to Wilson Street turning head. The new FSAR/EAW provides an alternative access route to Eleventh Road, which also provides another access route from the currently non-compliant Lambert Lane/Wilson Street roads. • ***Compliance with A3.2a will be achieved for existing lots and Wilson Street would be compliant***
	A3.2b Emergency access way	• No existing EAW is currently established.	• If bushfire compliance was not assessed, establishing EAW would	• A new FSAR/EAW is proposed to connect Rivose Crescent EAW to

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
	Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution. An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.	• ***Not applicable***	not be consideration for this project. • ***Not applicable***	Wilson Street turning head. • The FSAR/EAW will be compliant with A3.2b, other than having access via locked gates and 55 m section beneath the bridge being 5.5 m wide instead of 6 m wide which is addressed by having signage to warn fire appliances they can't pass in this area. • ***Compliance with A3.2b is achieved, other than deviations relating to having locked gates and a small narrow section beneath the bridge.***
	A3.3 Through roads All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where: • it is demonstrated that no alternative road layout exists due to site constraints; and • the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exempt ion provisions in A3.2a of this table. A no-through road is to meet all the following requirements: • requirements of a public road (Table 6, Column 1); and • turn-around area as shown in Figure 24	• Eleventh Road is a compliant through road • The combination of Lambert Lane and Wilson Street, which provide street access to 110 Wilson Street, exceeds the 200 m permitted maximum length, and doesn't comply with the exemptions. Additionally, the existing turnaround at the termination of Wilson Street is <18 m wide. • ***Compliance with A3.3 is currently achieved for Eleventh Road, but not for Wilson Street.***	• Eleventh Road to remain a compliant through road • If bushfire compliance was not assessed, no works would be conducted to resolve the existing Wilson Street non-compliances • ***Compliance with A3.3 would be achieved for Eleventh Road, but Wilson Street would remain non-compliant.***	• Eleventh Road to remain a compliant through road • While Wilson Street will not be altered to be compliant length, the new FSAR/EAW provides an alternative travel route in a bushfire emergency that wouldn't exist without consideration of bushfire compliance. • ***Compliance with A3.3 would be achieved for Eleventh Road, and while Wilson Street would remain non-compliant with A3.3, the new arrangement does comply with P3i.***
Performance Principle P3iii Vehicular access is provided which allows: • access and egress for emergency service vehicles; • defendable space for emergency services personnel on the interface • between classified vegetation and development; and • hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s).	A3.4b Fire service access route *Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.* A fire service access route is to meet all the following requirements: • requirements in Table 6, Column 3; • be through-routes with no dead-ends; • linked to the internal road system at regular intervals, every 500 metres; • must be signposted; • no further than 500 metres from a public road; • if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and	• No existing FSAR is currently established. • ***Not applicable***	• If bushfire compliance was not assessed, establishing FSAR would not be consideration for this project. • ***Not applicable***	• A new FSAR/EAW is proposed to connect Rivose Crescent EAW to Wilson Street turning head. • The FSAR/EAW will be compliant with A3.4b, other than having a 55 m section beneath the bridge being 5.5 m wide instead of 6 m wide which is addressed by having signage to warn fire appliances they can't pass in this area. • ***Compliance with A3.4b is achieved, other than having a small narrow section beneath the bridge.***

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
	• turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.			

Area North-East of Bridge

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
Element 3: Vehicular access *Intent: To ensure that the vehicular access serving a subdivision/ development is available and safe* Performance Principle P3i The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.	A3.1 Public Roads *The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.* Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.	• All existing public roads appear compliant with specifications in Table 6, albeit with minimum width of 6 m • ***Compliance with A3.1 currently achieved***	• All proposed new public roads are to be compliant with specifications in Table 6, and will have a minimum width of 6 m • ***Compliance with A3.1 achieved***	• All proposed new public roads are to be compliant with specifications in Table 6, and will have a minimum width of 6 m • ***Compliance with A3.1 achieved***
	A3.2a Multiple access routes Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access). If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.	• 46 and 28 Eleventh Road have direct driveway access to Eleventh Road, which provides public road access in two directions to two different destinations. • There is no access to Eleventh Road from Lot 106 on Crown Reserve (R 14217), located directly north-east of the railway, which has public road access via several non-compliant no-through roads, namely Mitchell Street, Moore Street and Stone Street, all which exceed 200 m in length. There appear to be internal driveways with the lot to provide access between the different public road connections, however this is unconfirmed. It appears only the northern part of this lot is currently ever actively used, and vehicular access to this lot is not being altered as part of proposed works. • ***Compliance with A3.2a currently achieved for lots being impacted by these works, and while the public roads accessing Lot 106 are non-compliant no-through roads, the likely access to multiple roads could be considered to comply with P3i.***	• Eleventh Road to remain a compliant through road • Vehicular access to Lot 106 is not being altered as part of proposed works. • ***Compliance with A3.2a would be achieved for lots being impacted by these works, with Lot 106 being non-compliant with A3.2a due to overlength no-through roads, but complying with P3i due to access to multiple roads.***	• Eleventh Road to remain a compliant through road • Vehicular access to Lot 106 is not being altered as part of proposed works. • ***Compliance with A3.2a would be achieved for lots being impacted by these works, with Lot 106 being non-compliant with A3.2a due to overlength no-through roads, but complying with P3i due to access to multiple roads.***
	A3.2b Emergency access way	• No existing EAW is currently established.	• No EAW are proposed as part of works in this area	• No EAW are proposed as part of works in this area

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
	Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution. An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.	• ***Not applicable***	• ***Not applicable***	• ***Not applicable***
	A3.3 Through roads All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where: • it is demonstrated that no alternative road layout exists due to site constraints; and • the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exempt ion provisions in A3.2a of this table. A no-through road is to meet all the following requirements: • requirements of a public road (Table 6, Column 1); and • turn-around area as shown in Figure 24	• Eleventh Road is a compliant through road • Mitchell Street, Moore Street and Stone Street are non-compliant no-through roads as all exceed 200 m in length. • ***Compliance with A3.3 is currently achieved for Eleventh Road, but not for the public roads to Lot 106 (which are not impacted by modifications).***	• Eleventh Road to remain a compliant through road • No works are proposed to Mitchell Street, Moore Street and Stone Street, so all will remain non-compliant no-through roads exceeding 200 m in length. • ***Compliance with A3.3 will be achieved for Eleventh Road, but not for the public roads to Lot 106 (which are not impacted by modifications)..***	• Eleventh Road to remain a compliant through road • No works are proposed to Mitchell Street, Moore Street and Stone Street, so all will remain non-compliant no-through roads exceeding 200 m in length. • ***Compliance with A3.3 will be achieved for Eleventh Road, but not for the public roads to Lot 106 (which are not impacted by modifications).***
Performance Principle P3iii Vehicular access is provided which allows: • access and egress for emergency service vehicles; • defendable space for emergency services personnel on the interface • between classified vegetation and development; and • hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s).	A3.4b Fire service access route *Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.* A fire service access route is to meet all the following requirements: • requirements in Table 6, Column 3; • be through-routes with no dead-ends; • linked to the internal road system at regular intervals, every 500 metres; • must be signposted; • no further than 500 metres from a public road; • if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and • turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.	• No existing FSAR is currently established. • ***Not applicable***	• No FSAR are proposed as part of works in this area • ***Not applicable***	• No FSAR are proposed as part of works in this area • ***Not applicable***

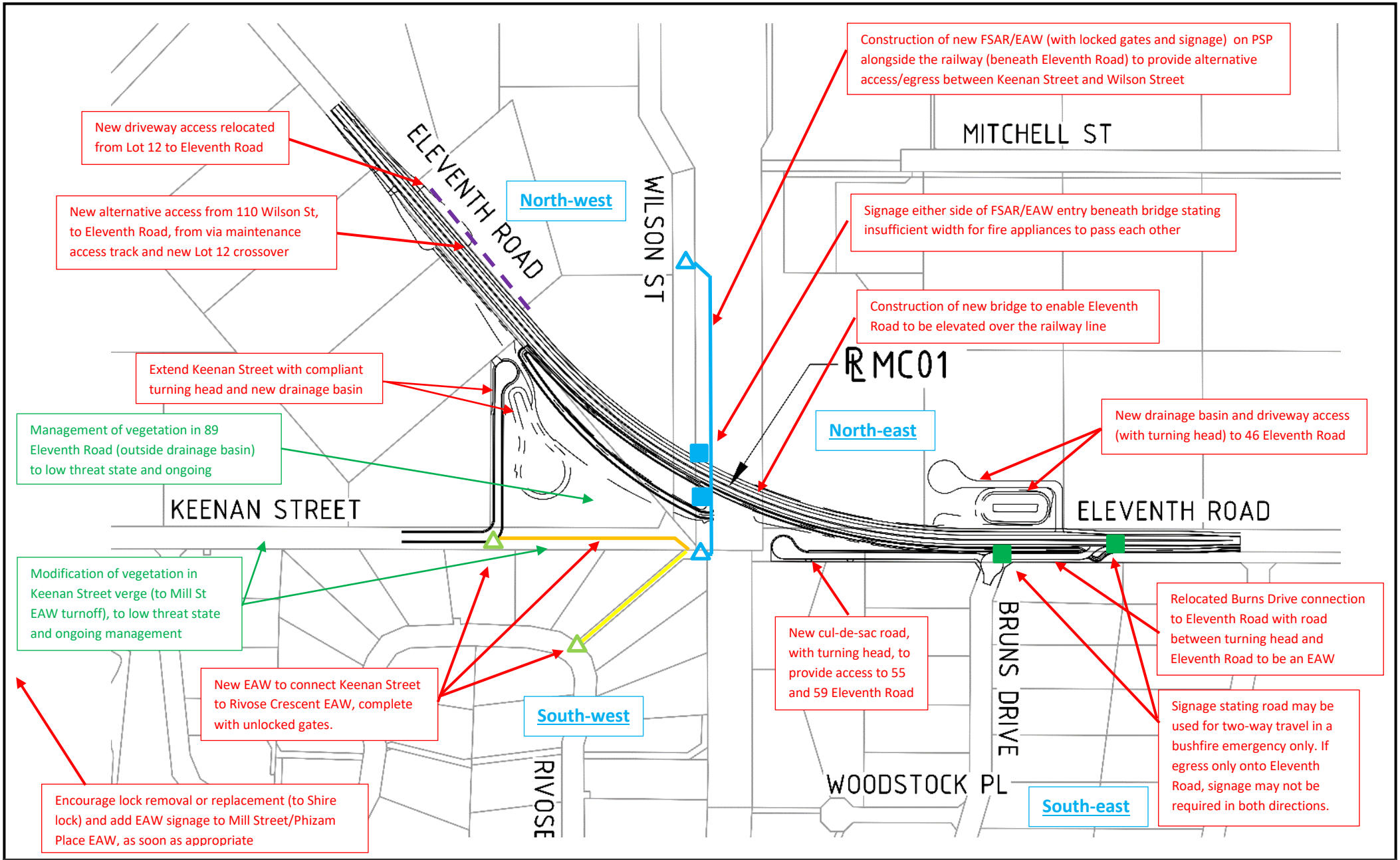
Area South-East of Bridge

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
Element 3: Vehicular access *Intent: To ensure that the vehicular access serving a subdivision/ development is available and safe* Performance Principle P3i The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.	A3.1 Public Roads *The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.* Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.	• All existing public roads appear compliant with specifications in Table 6, albeit with minimum width of 6 m • ***Compliance with A3.1 currently achieved***	• All proposed new public roads are to be compliant with specifications in Table 6, and will have a minimum width of 6 m • ***Compliance with A3.1 achieved***	• All proposed new public roads are to be compliant with specifications in Table 6, and will have a minimum width of 6 m • ***Compliance with A3.1 achieved***
	A3.2a Multiple access routes Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access). If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.	• Bruns Drive (and Harewood Pass), which forms a loop road connecting at two locations along Eleventh Road (connections are 240 m apart) from where two-way travel is possible. • Woodstock Place is a compliant cul-de-sac road, less than 200 m long. • Travel is largely through a residential area with roads lined by urban lots, other than some exposure to unmanaged vegetation along the southern portion of Harewood Pass. • ***Compliance with A3.2a currently achieved***	• The western connection from Bruns Drive to Eleventh Road is to be reconfigured to be a one-way left turn in road, however the option of converting to a one-way out road is being reviewed. The need for a one-way road is a product of the elevation of Eleventh Road as it approaches the rail crossing, and limitations with land acquisition. • The reconfiguration to be a one-way in road, will still enable two-way access and egress to Eleventh Road in a bushfire emergency as an EAW, with the road to be a 6 m wide, however this presents a risk that roads users don't know the one-way road can be use for two-way use in an emergency. • Notwithstanding, travel along Bruns Drive is entirely surrounded by residential development, providing a safe travel route between the two entries to Eleventh Road. • Eleventh Road will have a painted median strip opposite the reconfigured Bruns Drive connection, which will enable vehicles to cross to the northern side to travel east, if required. • ***Compliance with A3.2a would be achieved, albeit with risk of using the one-way road for emergency***	• In addition to the Bruns Drive reconfiguration, additional signage is to be provide at the new entrance and exit, stating that the road may be used for two-way travel in bushfire emergencies. • Alternatively, travel is available via Bruns Drive through a residential area, to the other exit onto Eleventh Road, if required. • ***Compliance with A3.2a would be achieved***

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
			two-way use.	
	A3.2b Emergency access way *Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.* An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.	• No existing EAW is currently established. • ***Not applicable***	• The two-way use of the Bruns Drive connection to Eleventh Road could be considered to function as an EAW in a bushfire emergency. This section is only 90 m long and will be 6 m wide therefore would comply with EAW specifications other than signage provision. • ***Compliance with A3.2b would be achieved other than signage.***	• In addition to the reconfiguration of the Bruns Drive connection, assessment of bushfire compliance has required that the signage be provided that the normally one-way roads is available for two-way use in a bushfire emergency. • ***Compliance with A3.2b would be achieved***
	A3.3 Through roads All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where: • it is demonstrated that no alternative road layout exists due to site constraints; and • the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exempt ion provisions in A3.2a of this table. A no-through road is to meet all the following requirements: • requirements of a public road (Table 6, Column 1); and • turn-around area as shown in Figure 24	• Bruns Drive (and Harewood Pass), which forms a loop road connecting at two locations along Eleventh Road from where two-way travel is possible. • Woodstock Place is a compliant cul-de-sac road, less than 200 m long • ***Compliance with A3.3 currently achieved***	• The reconfiguration to be a one-way in road, will still enable two-way access and egress to Eleventh Road in a bushfire emergency as an EAW, with the road to be a 6 m wide. • Notwithstanding, travel along Bruns Drive is entirely surrounded by residential development, providing a safe travel route between the two entries to Eleventh Road. • The new cul-de-sac public road parallel with Eleventh Road, will be less than 200 m long, with a compliant turning head, which will provide compliant access to No. 55 and No. 59 Eleventh Road. • ***Compliance with A3.3 would be achieved***	• Other than signage on the Bruns Drive reconfigured connection to indicate the potential for two-way use in a bushfire emergency as an EAW, the road network will not be changed further for bushfire compliance purposes. • ***Compliance with A3.3 would be achieved***
Performance Principle P3iii Vehicular access is provided which allows: • access and egress for emergency service vehicles; • defendable space for emergency services personnel on the interface • between classified vegetation and	A3.4b Fire service access route *Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.* A fire service access route is to meet all the following requirements: • requirements in Table 6, Column 3; • be through-routes with no dead-ends; • linked to the internal road system at regular intervals, every 500	• No existing FSAR is currently established. • ***Not applicable***	• No FSAR are proposed as part of works in this area • ***Not applicable***	• No FSAR are proposed as part of works in this area • ***Not applicable***

Bushfire protection criteria		Compliance Assessment		
Performance Principle	**Acceptable solutions**	**Compliance of existing road network**	**Compliance impact from Eleventh Road modifications (without bushfire risk management measures)**	**Compliance impact from Eleventh Road modifications (with bushfire risk management measures)**
development; and • hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s).	metres; • must be signposted; • no further than 500 metres from a public road; • if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and • turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.			

Attachment 5: Proposed bushfire management measures incorporated into Eleventh Road modification works



Attachment 5: Proposed bushfire management measures incorporated into Eleventh Road modification works

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Attachment 6: Summary of Bushfire Risk Management Measures to be incorporated into Eleventh Road modification works

Various bushfire measures are required to be adopted and implemented on an ongoing basis by the Proponent (MetCONNX), Public Transport Authority (PTA), the relevant Local Government and surrounding landowners, to ensure an optimal vehicular access outcome is achieved to manage a bushfire emergency. These measures are summarised in the table below.

Implementation/management table	
Proponent (MetCONNX)	
No.	*Implementation action*
1	Modify the existing Rivose Crescent EAW and extend to new Keenan Street including: • Compliance with EAW specifications of A3.2b in the Guidelines • Relocation of gate from north to Keenan Street • Unlocking of both gates and addition of signage
2	Modify all vegetation within Keenan Street road reserve including the proposed EAW (to a low threat state compliant with AS 3959 Clause 2.2.3.2 (f) primarily consisting of retained mature trees, with managed low understorey vegetation.
3	Regularly slash grassland vegetation within 89 Eleventh Road, outside of the new drainage basin, during construction works.
4	Establish the new Rivose Crescent/Wilson St FSAR/EAW including: • Compliance with EAW and FSAR specifications in the Guidelines (A3.2b and A3.4b respectively) • Locked gates (with keys to relevant local government, DFES and PTA personnel) with gates configured to open onto PSP to effectively block vehicular traffic from passing by entrance points • Signage at both gates indicating the FSAR/EAW is only for use in a bushfire emergency, displaying the entire FSAR/EAW route depicting the exact location of the entrance gates and the sections of 5.5 m and 6 m wide trafficable surface along its length and denote that fire appliance passing will not be possible beneath the Eleventh Road bridge. • Signage prior on each side of the bridge underpass stating fire appliances will not be able to pass when travelling beneath the bridge.
5	Install signage at both ends of the reconfigured Bruns Drive/Eleventh Road public road/EAW indicating that the road may be used for two-way access in a bushfire emergency.
6	Ensure access for No. 110 Wilson Street to Eleventh Road is provided along the new maintenance track, to enable travel to the Lot 12 access crossover to Eleventh Road (in an emergency).
7	Upon completion of works, a flyer is to be prepared and issued to all local residents, showing the updated road network and their options for egress in a bushfire emergency.
8	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954, including maintenance of perimeter firebreaks and required grassland slashing and vegetation management.

Implementation/management table	
PTA – ongoing	
No.	*Implementation action*
1	Maintain Rivose Crescent/Keenan Street EAW including gates and signage
2	Maintain the Rivose Crescent/Wilson St FSAR/EAW including gates and signage
3	Maintain Bruns Drive/Eleventh Road public road/EAW including any signage
4	Maintain maintenance track between 110 Wilson Street and Lot 12 crossover.
5	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954, including maintenance of perimeter firebreaks and required grassland slashing and vegetation management.
Relevant Local Government – ongoing	
No.	*Implementation action*
1	Regularly slash grassland vegetation within 89 Eleventh Road, outside of the new drainage basin, during construction works.
2	Maintain road verges, including Keenan Street, in a low threat minimal fuel condition as per Clause 2.2.3.2 (f) of AS 3959.
3	Encourage Mill St/Phizam Place EAW to be open and available for use at all times, including removal of padlock (or changing to Shire lock) and addition of signage indicating purpose
Landowners – ongoing	
No.	*Implementation action*
1	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954, including maintenance of perimeter firebreaks and required grassland slashing and vegetation management.
2	Ensure they remain aware of updated road network and their options for egress in a bushfire emergency