



APPENDIX C TRAFFIC AND TRANSPORT ASSESSMENT ADDENDUM 3

Our Ref: 18289

1 February 2023

ERM
Level 15,
309 Kent Street
Sydney NSW 2000

Attention: Lucy Baker

Dear Lucy,

RE: [HILLS OF GOLD – TRAFFIC AND TRANSPORT ASSESSMENT
TRAFFIC ADDENDUM 3](#)

As requested, please find herein The Transport Planning Partnership (TPPP)'s response to issues raised by Transport for NSW in a letter dated 14 December 2022.

Background

Comments were received from Transport for NSW (14 December 2022) in response to the updated traffic and transport assessment that was prepared by TPPP (Addendum 2, dated 1 November 2022).

In particular, Transport for NSW have raised the following issues:

Insufficient information has been provided regarding the proposed Nundle Bypass via Route 2:

- No swept paths have been provided for the largest construction design vehicles at the key intersection.
- The OSOM swept paths provided for the Alternate Blade Route provided in the TIA, Route Survey and Amendment Report are considered to be incomplete, as they are presented in segments only and in some cases do not appear to align with adjacent movements. It is understood that this proposed option is under investigation, however, as this proposal may impact any Section 138 approvals and TfNSW's concurrence, and any associated environmental approvals are required to be identified & addressed prior to determination.

- The Amended TIA demonstrates Directional Traffic Splits and an intersection assessment for Oakenville Street / Jenkins Street only, however this does not appear to align with the proposal to split the construction and OSOM traffic between various routes, not all of which include this intersection. Further to this, the same assessments in addition to a turn warrant assessment, for the newly proposed additional key intersections of Oakenville Street & Heron Street North / Innes & Jenkins Street, have not been undertaken.
- It remains unclear:
 - How the proposed split of 35% & 65% for construction traffic volumes will be managed.
 - What the project related traffic impacts are at the key intersection.
 - What the existing general road geometry (including turn treatments) is at the key intersections for Route 2.
 - Whether the intersections are currently capable of accommodating two-way movements of heavy vehicle at each leg of the key intersections, in particular during concurrent opposing heavy vehicle turn movements
 - If an upgrade of the intersections is required to accommodate an increase in traffic and the swept paths of the design vehicles and the extent of that work if applicable.

To clarify and address the queries identified by TfNSW's in their comments, TTPP has prepared this response.

For the purpose of this assessment and response we have divided the trip types in two distinct categories, namely:

- 'General Traffic' which are vehicles associated with the day to day operation of the site. The majority of this is workers commuting, deliveries via standard vehicles and trucks.
- 'OSOM' are oversized over mass non-standard vehicles that deliver components to the windfarm site. These are much less frequent and would be under traffic control in accordance with the relevant regulations for transporting OSOM vehicles. Extremely long or wide vehicles may require a police escort. Other requirements outlined in the TfNSW publication '*Additional Access Conditions: Oversize and overmass heavy vehicles and loads*' would be followed.

The routes to site were assessed separately for General Traffic and OSOM vehicles as the nature of each are significantly different.

General Traffic is concentrated in peak periods and is more likely to impacts on the day to day operation of intersections on the surrounding road network.

OSOM are infrequent events that require traffic control. These are estimated to be in the order of up to 6 trips per day. Most of the returning OSOM vehicles are 'packed down' to be standard vehicles.

Response

General Comments

The assessment considered General Traffic using only two routes to site from Nundles which were set out in the previous assessments. The two routes were via Barry Road and Morrisons Gap Road and the western access via Crawney Road. These routes were assessed for capacity and impact on amenity through environmental capacities. At that time General Traffic was not forecast to use the OSOM route 2.

It is difficult to quantify the impacts of the OSOM routes as the volumes are low and occur infrequently less than once an hour and outside peak traffic periods. The previous assessments noted that at times there could be some delay to one or two vehicles for up to two minutes at some intersections while OSOM vehicles negotiate turns. Mitigation measures include traffic management and operating outside school hours. Further, it is anticipated that **critical turning movements would be tested with 'dummy' loads**, equivalent to real blades loads to identify practical measures to minimise delays.

The following address each specific comment.

1.How the proposed split 35% and 65% for construction will be managed

This is an estimated traffic split not intended to be a traffic management measure but a realistic estimate of the split of traffic for the purposes of estimating the impacts of the project. This is similar to a traffic assessment estimated assignment for a retail or residential development for example. For clarity, the impacts to the road network have also been assessed on a worst-case basis of 100% of traffic using either route.

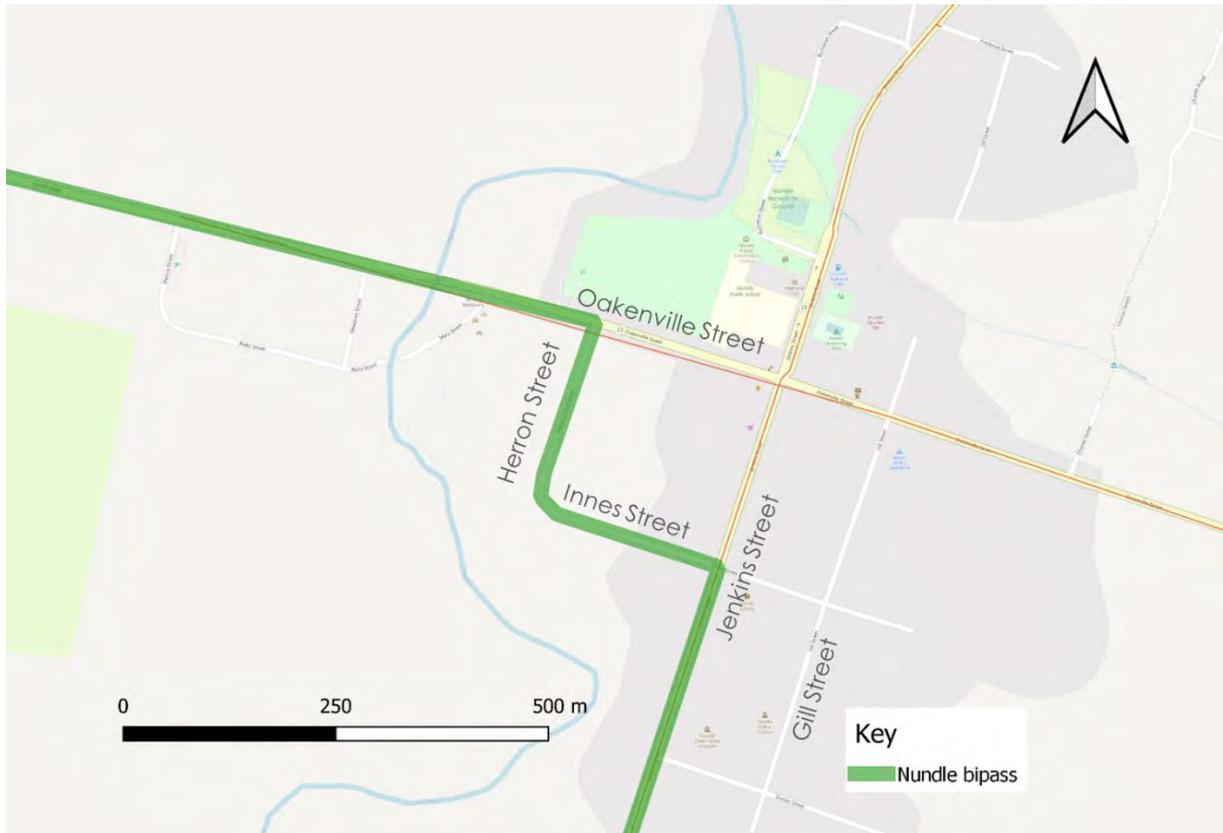
TTPP has been working with the proponents to understand the nature of work that will be undertaken. The split is a forecast based on the location of the accesses to site and the work that will be carried out. The site will have two main access locations, one from Morrisons Gap Road, and one from Crawney Road.

Notwithstanding, the traffic modelling and assessment so far has shown that there is minimal impact from the traffic volumes forecast. Should 100% of traffic choose either Crawney Road or Morrisons Gap Road then it is still forecast that the impacts would be minimal both in terms of delay and intersection operation and environmental capacities, and the Level of Service on all transport routes is assessed to be unaffected in all scenarios

2. What the project related impacts are at the key Intersection

We assume this comment refers to the route that would use Herron Street and Innes Street referred to as the OSOM Route 2 (see Figure 1).

Figure 1: Route 2 Nundle Bypass



In Addendum 2 this route was envisaged to only be used for OSOM vehicles and that General Traffic which are more likely to use the route with the least number of turns at intersections through Oakenville Street and Jenkins Street. However, the proponent is now proposing to encourage Heavy Vehicles travelling to the western project entrance off Crawney Road to use this route to avoid the centre of town. Further details would be provided in a Traffic Management Plan after project approval, and following selection of turbine technology, engagement of construction contractors, detailed design of the project, and consultation with road authorities including Tamworth Regional Council.

3. What the existing general road geometry (including turn treatments) is at the key intersections for Route 2.

Physical assessment for Route 2 is attached showing the existing general road geometry, and the additional hard stand areas required. The intersections would be sufficient for passing B Doubles, and all OSOM vehicles under traffic control.

Although traffic volumes in Heron Street are very low, an additional hardstand area is also being proposed on the western side of Heron Street to provide a waiting bay when OSOM vehicles are using Route 2 (see indicative location in Figure 2).

Figure 2: Heron Street Waiting Bay



4. Whether the intersections are currently capable of accommodating two-way movements of heavy vehicle at each leg of the key intersections, in particular during concurrent opposing heavy vehicle turn movements

See the attached swept paths. Intersections to be widened to allow for two-way movements up to B-Doubles indicatively, though these vehicles are expected to be rarely used. The preliminary designs indicate permanent and temporary disturbance, as well as proposed tree removal and relocation of services.

5. If an upgrade of the intersections is required to accommodate an increase in traffic and the swept paths of the design vehicles and the extent of that work if applicable.

Upgrades of intersections have been provided in the previous assessments. As it was expected that most General Traffic would not use Route 2 an assessment for general traffic to use this route was not undertaken.

Notwithstanding the above, a new assessment has been undertaken based on general traffic using Route 2 and intersection upgrades have been recommended at both Oakenville Road and Heron Street and at Innes Street and Jenkins Road to accommodate turning movements and mitigate safety impacts. The upgrades will also accommodate Heavy Vehicles travelling westbound along Oakenville Street and turning left into Herron Street, as required.

Revised Assessment and Traffic Management

Traffic Management

The proponents wish to minimise the impacts on the Nundle town centre where practicable and therefore recognise the benefit of using Heron Street and Innes Street to bypass the town centre for Heavy Vehicles travelling to the western project entrance off Crawney Road, as per the OSOM Route 2 previously presented. To achieve this the following measures will be implemented:

- Installing temporary signs (corflute or similar) to signpost the route for the Windfarm heavy vehicle access as part of a detailed traffic management plan.
- Including this route as part of the heavy vehicle 'Driver Code of Conduct' to be agreed to by all drivers of heavy vehicles to the site.

Further, these issues can be addressed as part of the detailed traffic management plan for the site.

Traffic Assessment

Based on the revised routes and assuming a 'worst case' with all General Traffic using Route 2 to Crawney road estimated traffic volumes at the key intersections are shown in Figure 3 and Figure 4. Based on site observations existing traffic volumes in Herron Street and Innes Street are almost negligible.

Figure 3: Morning Peak Forecast Traffic Volumes (Construction)

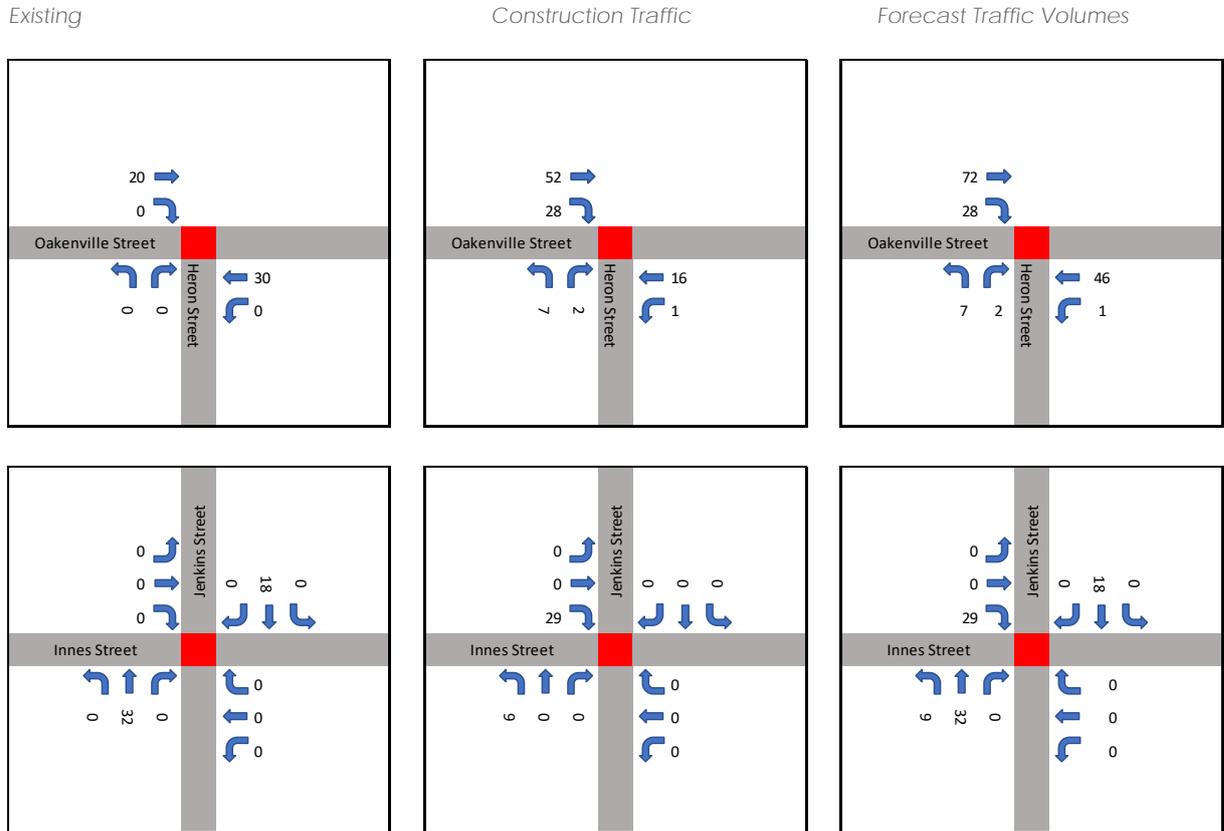
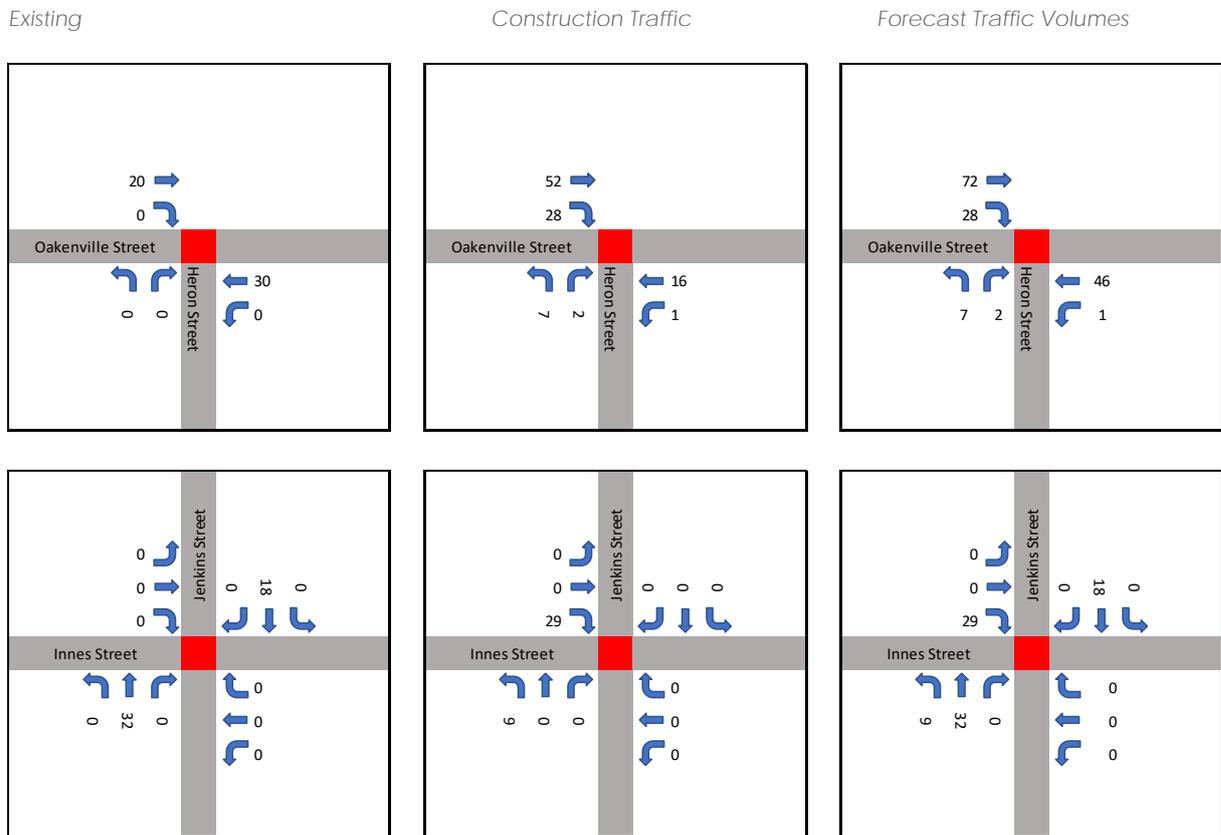


Figure 4: Evening Peak Forecast Traffic Volumes (Construction)



The forecast volumes are very low. At unsignalised intersections with minor roads, where there are relatively low volumes of through and turning vehicles, capacity considerations are usually not significant, and detailed analysis of capacity is not warranted. As a guide, at volumes below the following combinations of maximum hourly volumes at a cross intersection with a two lane two-way road, capacity analysis is not warranted:

- major road 400 vehicles per hour, minor road 250 vehicles per hour;
- major road 500 vehicles per hour, minor road 200 vehicles per hour; and
- major road 650 vehicles per hour, minor road 100 vehicles per hour.

Further, in terms of environmental capacities Heron Street and Innes Street would carry less than 50 vehicles per hour which is below the environmental capacity of 200 vehicles per hour for a local street.

Considering "Worst Case" scenarios where all General Traffic were to use one of the routes this would also be below the environmental capacity and also have minimal impact on the operation of the intersections.

Intersection Upgrades

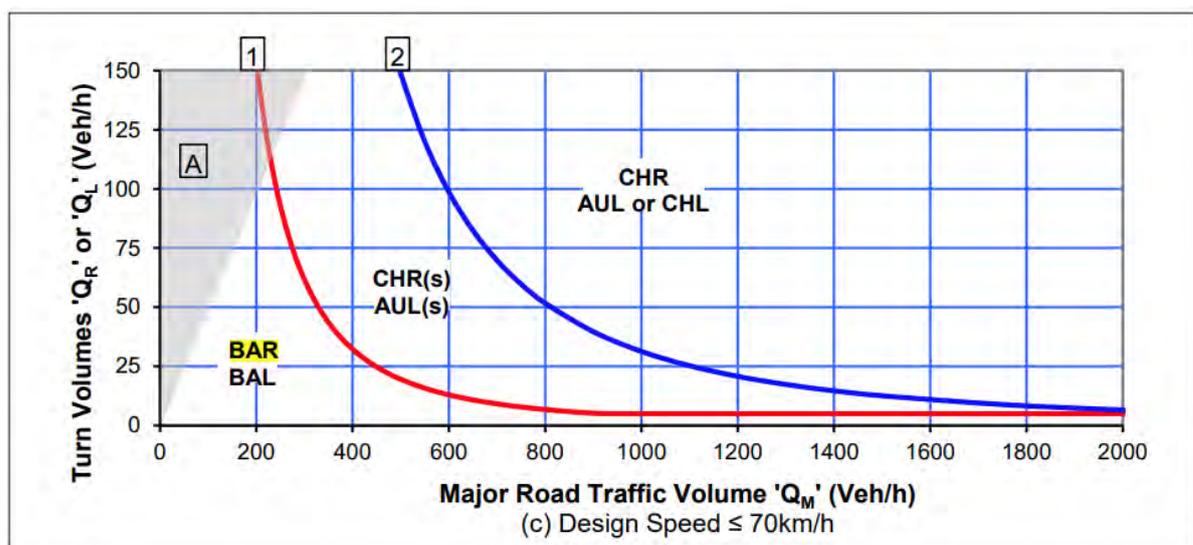
OSOM Vehicles

The OSOM vehicles will require additional hardstand at the intersections along Herron Street and Innes Street. Attached are the swept paths indicating the areas of temporary hard stand that would be required. Turn movements would be undertaken under traffic control with special consideration to travelling outside school peaks where practicable. The nominal hours to be avoided for heavy vehicles are 8:00am – 9:30am and 2:30pm to 4:00pm

General Traffic

The warrants for intersection turn treatments are usually determined using Austroads Guide to Traffic Management Part 6 warrants (Figure 5).

Figure 5: Evening Peak Forecast Traffic Volumes (Construction)



Based on the forecast traffic volumes along Oakenville Street of less than 100 vehicle movements per hour at peak, the Basic Auxiliary Right (BAR) turn treatment would strictly be warranted in accordance with the Austroads Guide. However, we note that this treatment is warranted for any volume greater than 1. And we note the following points for consideration as to the necessity for a BAR treatment at this intersection:

- Temporary construction period with increased right turn traffic;
- Low traffic volumes opposing the right turn vehicles meaning there will unlikely be delays for vehicles waiting for right turning traffic and therefore the queuing times are expected to be negligible; and
- Low speed environmental (50 km/h) resulting in low likelihood of collisions.

Considering that this increased volume of right turn movements at this intersection will only be temporary during construction of the windfarm, in combination with the expected low traffic volumes and low speed environment on Oakenville Street, we consider that a BAR intersection treatment may not be warranted here. However, the Proponent is committed to consulting with TfNSW and Tamworth Regional Council further on this point in preparation of the Traffic Management Plan and Section 138 applications, and will implement this treatment if desired by the relevant roads authority.

For impact purposes, a concept plan for the BAR treatment has been developed and is attached to this letter in Drawing No 1019. The widening to accommodate the bypass lane may have an impact on the existing trees near the road resulting in the loss of trees along the northern edge of Oakenville Road which the Proponent would prefer to avoid if possible.

To mitigate the road safety risks of not providing a BAR we recommend the following measures could be implemented for the 18 month construction period as an alternative:

- Temporary road work speed limit of 40 km/h along Oakenville Road in the vicinity of Herron Street. The current speed limit is 50km/h.
- Provision of truck turning signs in advance of the intersection.
- Portable VMS sign warning of the potential for turning traffic.

A Safe Intersection Sight Distance design is attached in Drawing 1020.

The intersection of Jenkins Street and Innes Street provides a much wider pavement and therefore no intersection upgrades are recommended for General Traffic.

We trust the above is to your satisfaction. Should you have any queries regarding the above or require further information, please do not hesitate to contact the undersigned on 8437 7800.

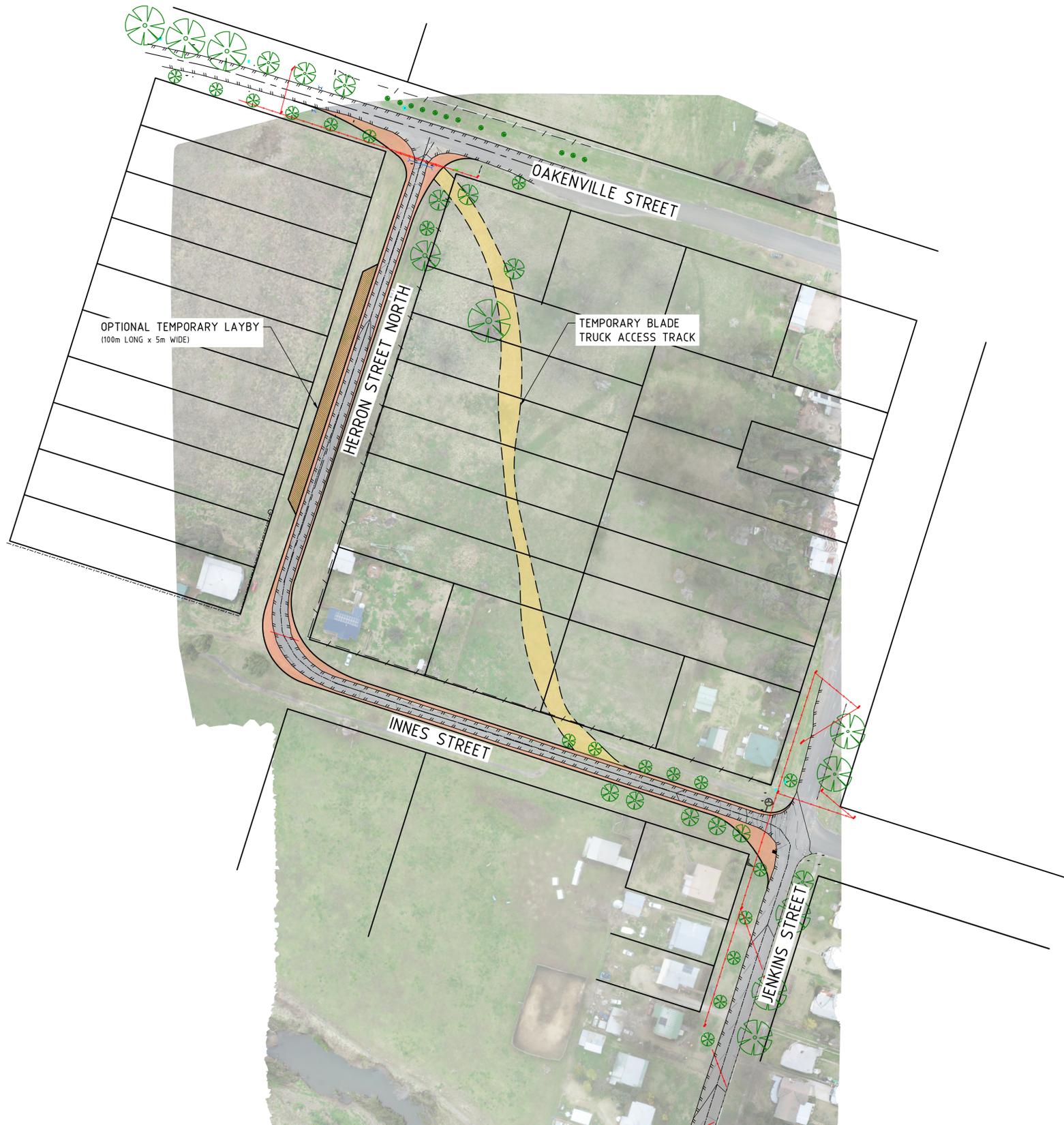
Yours sincerely,



Stephen Read
Associate

Attachment One

Road Intersection Upgrades



GENERAL ARRANGEMENT
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NOTE:

1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
2. ALL COORDINATES ARE TO MGA2020, ZONE 56.
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OPTIONAL TEMPORARY LAYBY
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TEMPORARY BLADE
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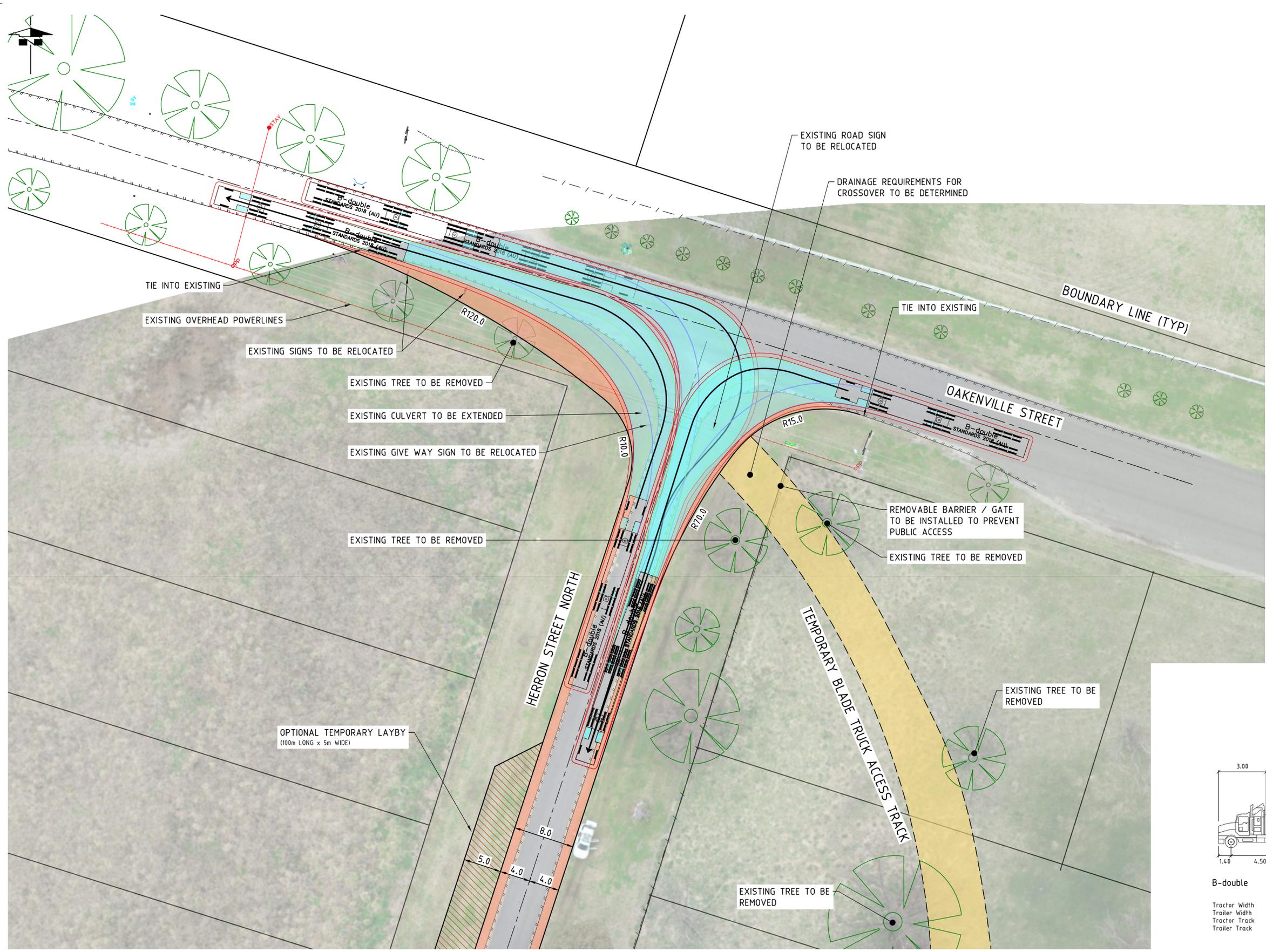
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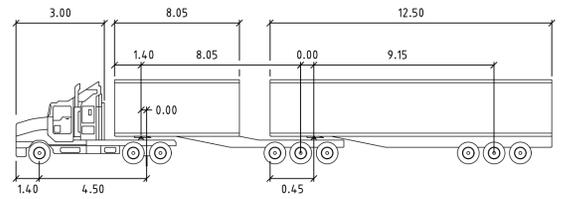
HILLS OF GOLD
EXTERNAL WORKS
OAKENVILLE TO JENKINS
GENERAL ARRANGEMENT

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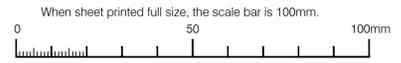


B-double

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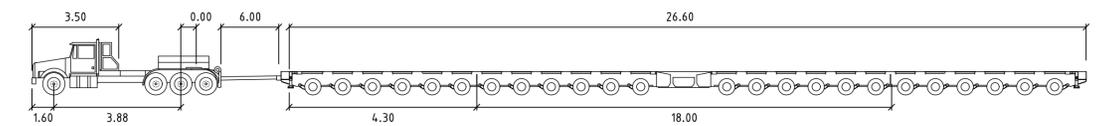
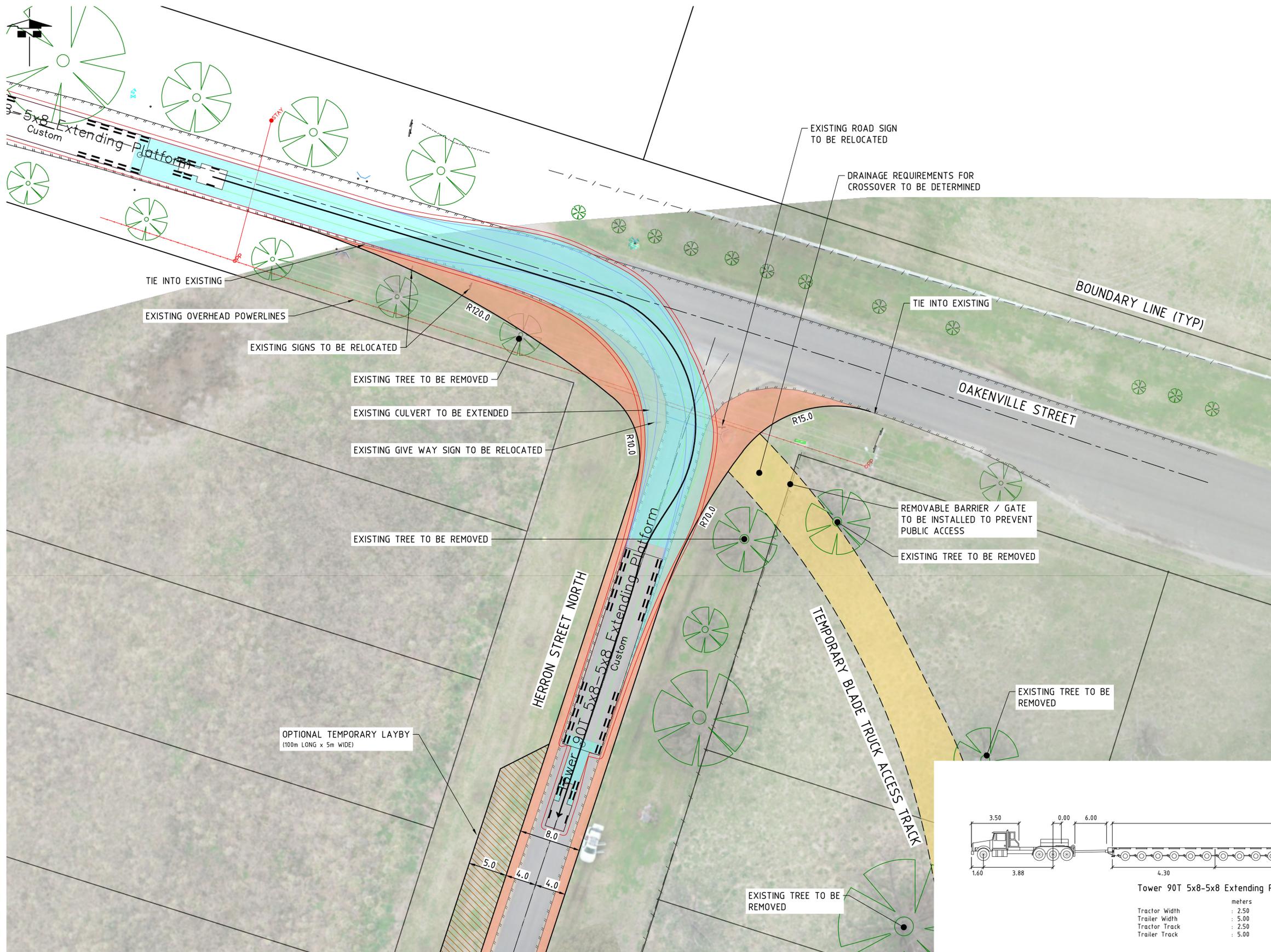
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TURNING - TOWER TRUCK
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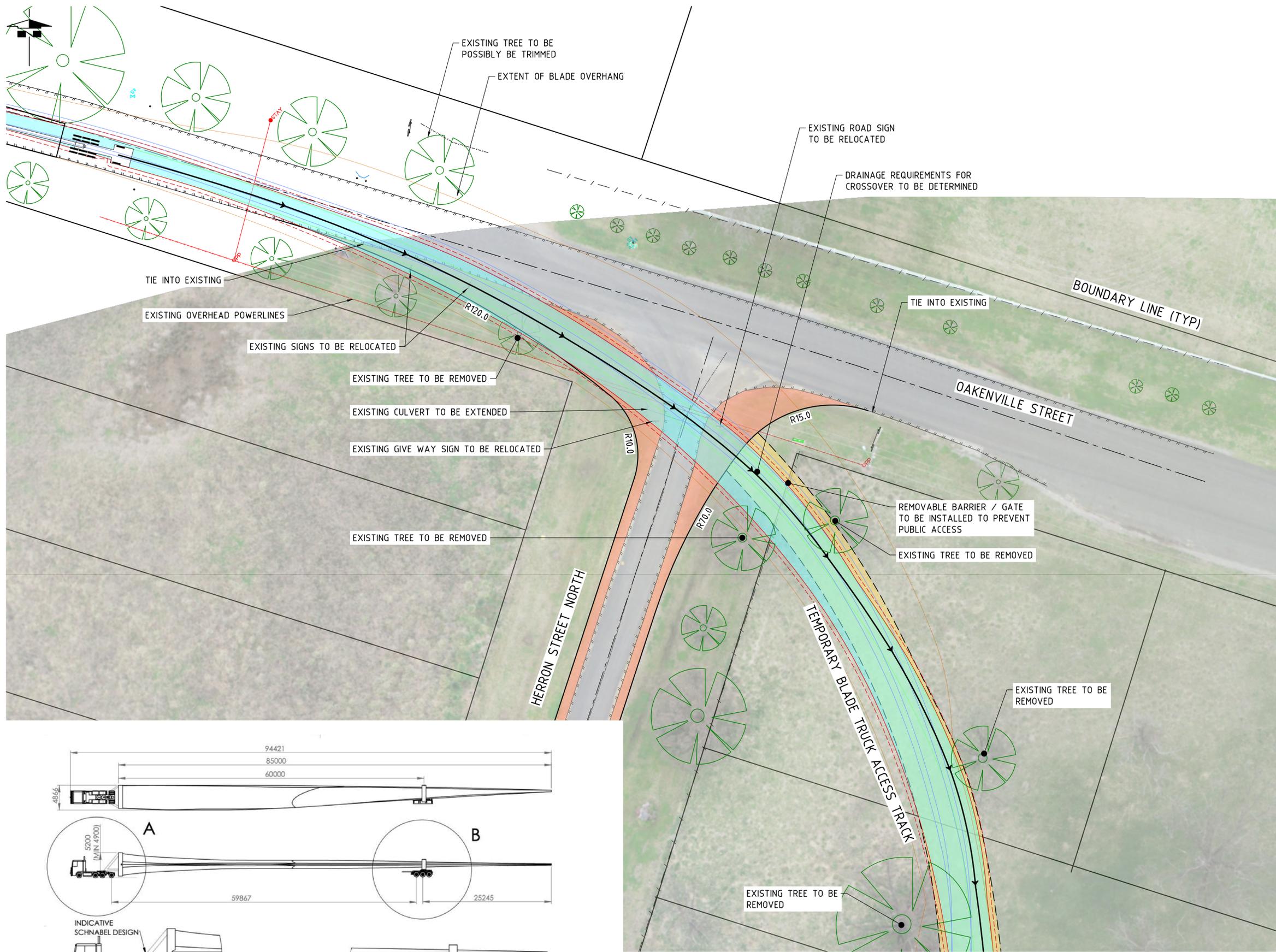
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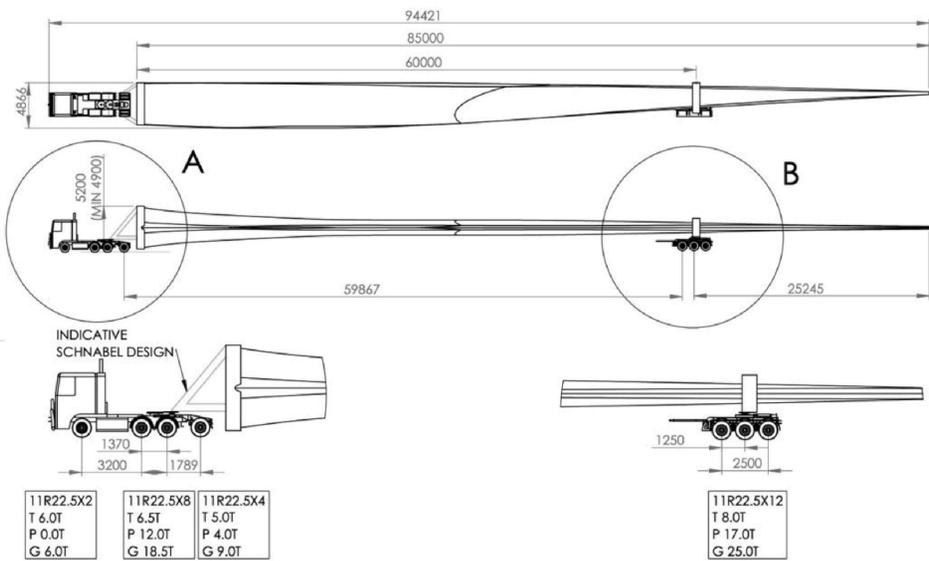
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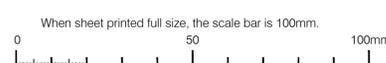


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OAKENVILLE TO JENKINS - OAKENVILLE / HERRON
TURNING - BLADE TRUCK

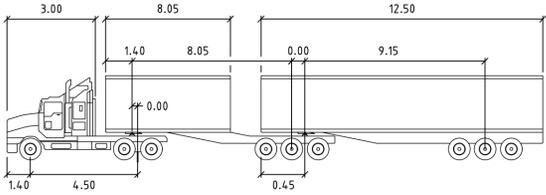
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B-double

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TURNING - B-DOUBLE
SCALE 1:250

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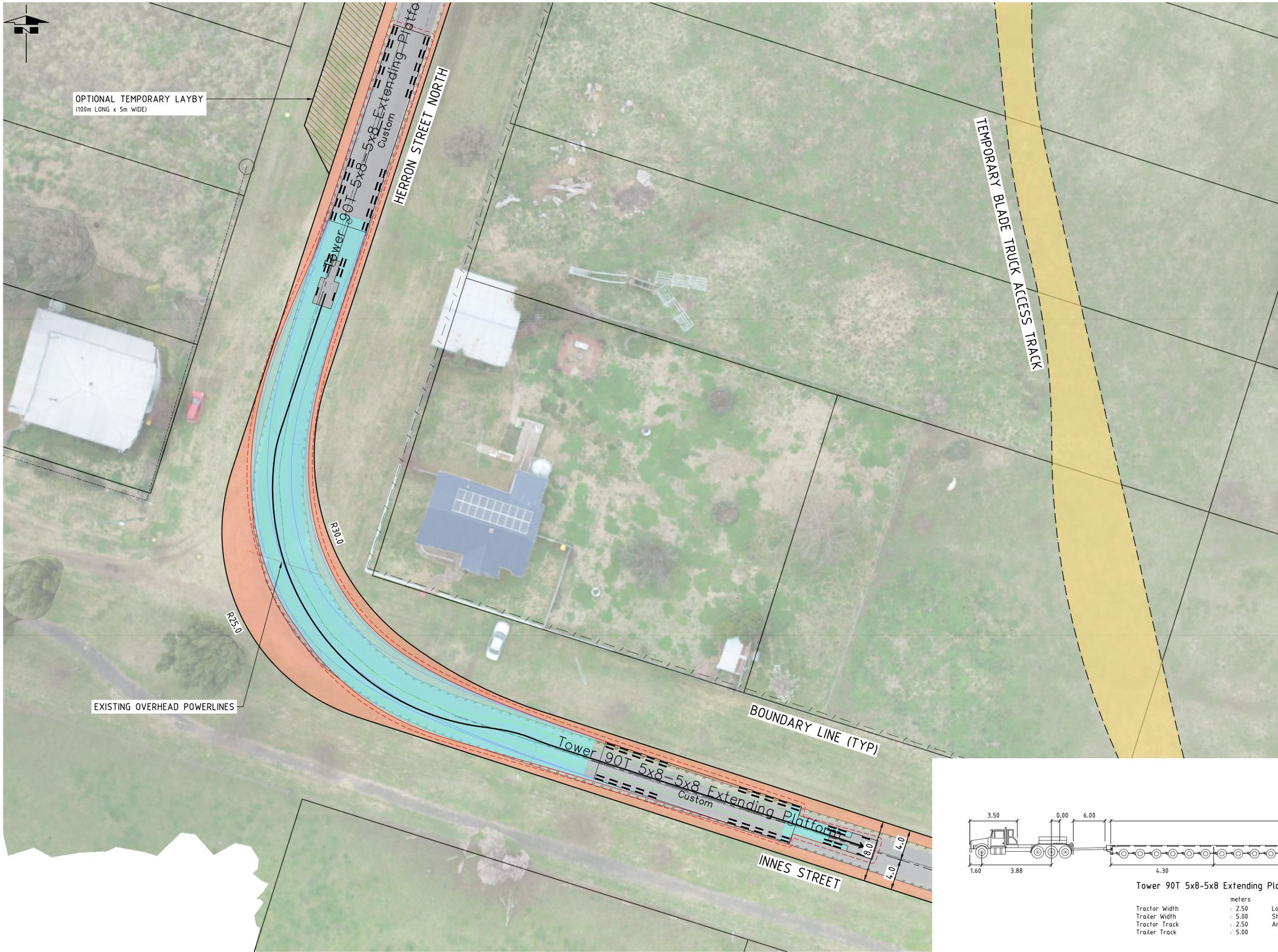


HILLS OF GOLD
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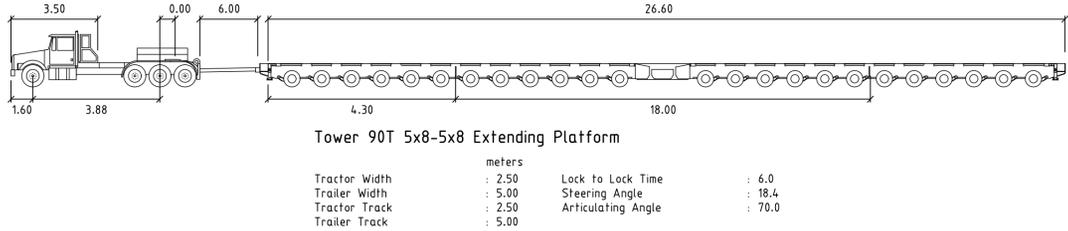
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TURNING - TOWER TRUCK
SCALE 1:250

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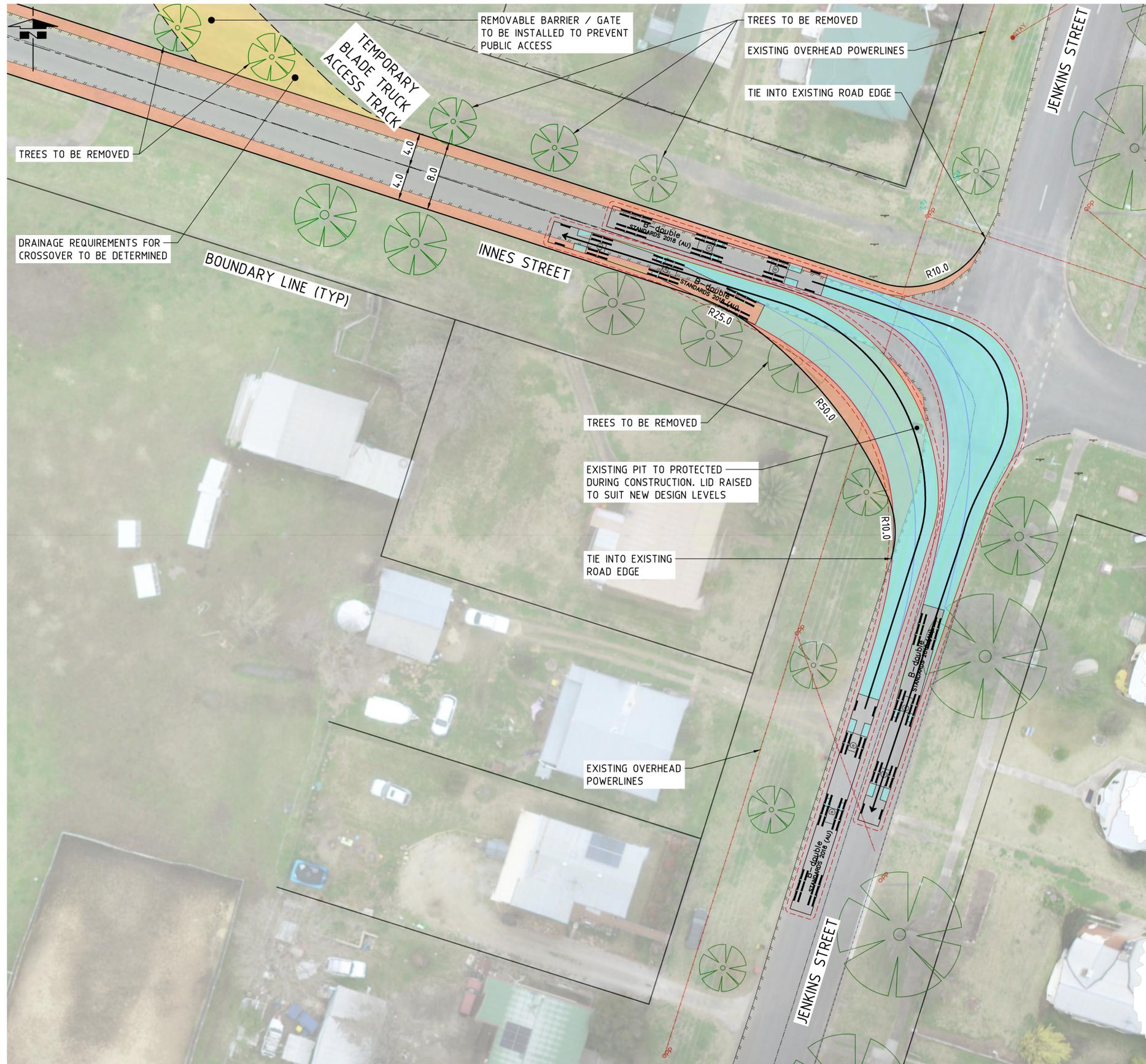
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TURNING - TOWER TRUCK

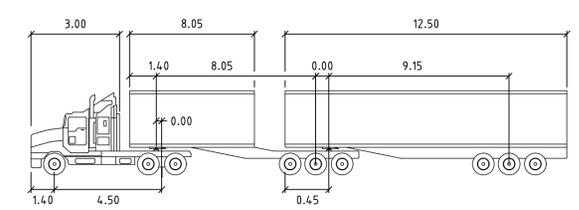
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 - [Hatched Box] OPTIONAL TEMPORARY LAYBY
 - [Red Line] TURNING MOVEMENT - VEHICLE BODY
 - [Green Line] TURNING MOVEMENT - FRONT TYRES
 - [Blue Line] TURNING MOVEMENT - REAR TYRES
 - [Red Dashed Line] TURNING MOVEMENT - 0.5m VEHICLE BODY CLEARANCE



B-double

meters	
Tractor Width	: 2.50
Trailer Width	: 2.50
Tractor Track	: 2.50
Trailer Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 23.4
Articulating Angle	: 70.0

TURNING - B-DOUBLE
 SCALE 1:250

P:\JOBS\2021\1476 - HGC - Devils Elbow\Drawings\WGA\211476-SK-CV-1016.dwg, B, 25/1/2023 1:29 PM, Btklein

When sheet printed full size, the scale bar is 100mm.
 0 50 100mm



R THIS DRAWING INCLUDES COLOURED INFORMATION
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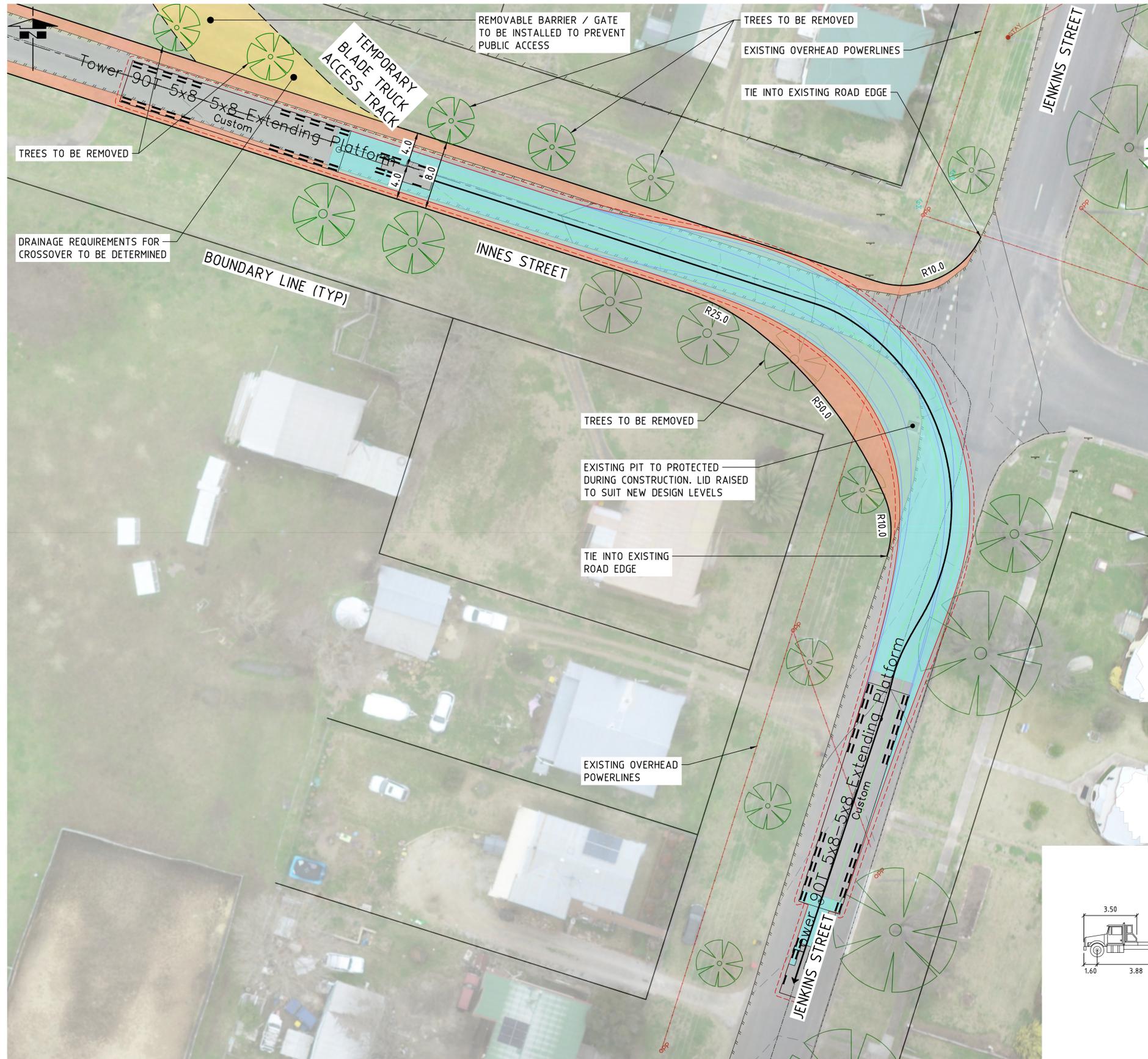
INFORMATION ISSUE
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REV.	DATE	DESCRIPTION	DRAFT	ENG.	CHKD
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B	25.01.2023	ISSUED FOR INFORMATION	EN	JB	JB



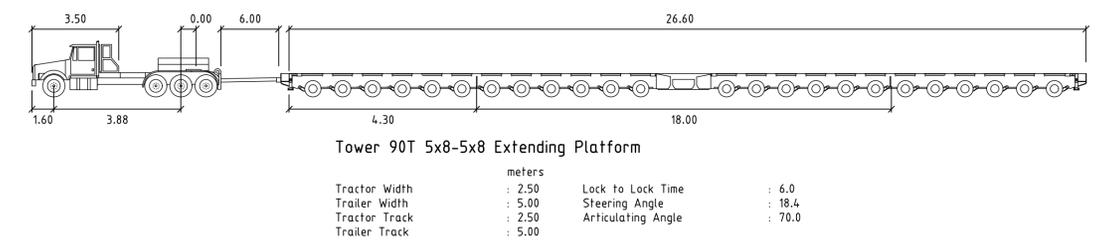
HILLS OF GOLD
EXTERNAL WORKS
 OAKENVILLE TO JENKINS - INNES / JENKINS
TURNING - B-DOUBLE

A1 DOCUMENT NUMBER
 Project Number Sheet No. Rev.
 Design Drawn
 EN EN **WGA211476-SK-CV-1016 B**



- NOTE:**
1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
 2. ALL COORDINATES ARE TO MGA2020, ZONE 56.
 3. ALL LEVELS TO AUSTRALIAN HEIGHT DATUM (AHD).

- LEGEND**
- /---/--- EXISTING FENCES
 - ===== EDGE OF EXISTING SEAL
 - ROAD CENTRELINE
 - EDGE OF ROAD
 - EDGE OF TRACK
 - [Orange Box] EXTENT OF ROAD WIDENING
 - [Yellow Box] MINIMUM EXTENT OF TEMPORARY TRACK
 - [Hatched Box] OPTIONAL TEMPORARY LAYBY
 - [Red Line] TURNING MOVEMENT - VEHICLE BODY
 - [Green Line] TURNING MOVEMENT - FRONT TYRES
 - [Blue Line] TURNING MOVEMENT - REAR TYRES
 - [Dashed Red Line] TURNING MOVEMENT - 0.5m VEHICLE BODY CLEARANCE



TURNING - TOWER TRUCK
SCALE 1:250

P:\JOBS\2021\1476 - HIG - Devils Elbow\Drawings\WGA\211476-SK-CV-1017.dwg, B, 25/1/2023 1:30 PM, B:\Users

When sheet printed full size, the scale bar is 100mm.
0 50 100mm

5 2.5 0 5 10
SCALE BAR (m)
1:250

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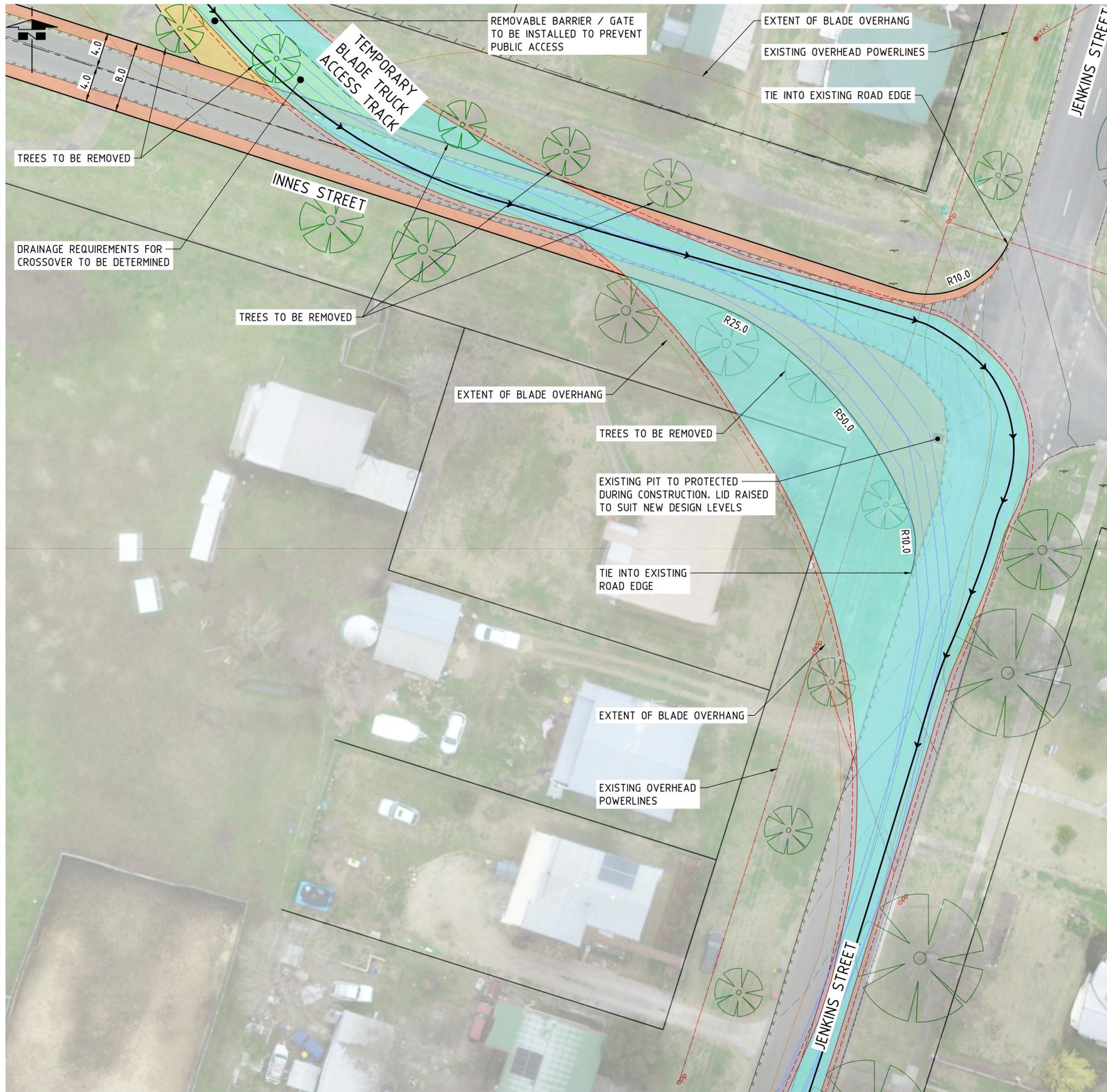
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REV.	DATE	DESCRIPTION	DRAFT	ENG.	CHKD
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B	25.01.2023	ISSUED FOR INFORMATION	EN	JB	JB

WGA

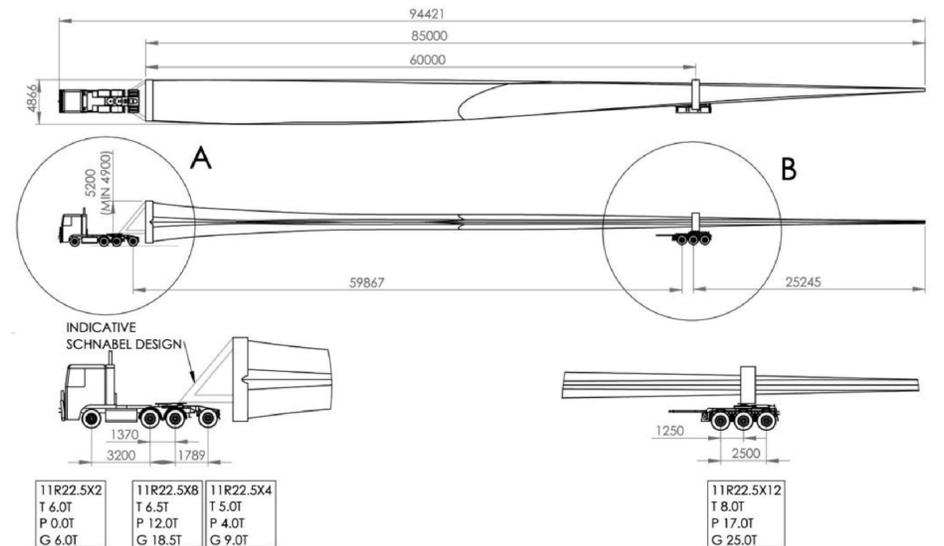
HILLS OF GOLD
EXTERNAL WORKS
OAKENVILLE TO JENKINS - INNES / JENKINS
TURNING - TOWER TRUCK

A1 DOCUMENT NUMBER
Project Number Sheet No. Rev.
Design Drawn
EN EN **WGA211476-SK-CV-1017 B**



- NOTE:**
1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
 2. ALL COORDINATES ARE TO MGA2020, ZONE 56.
 3. ALL LEVELS TO AUSTRALIAN HEIGHT DATUM (AHD).

- LEGEND**
- /---/--- EXISTING FENCES
 - EDGE OF EXISTING SEAL
 - ROAD CENTRELINE
 - EDGE OF ROAD
 - EDGE OF TRACK
 - EXTENT OF ROAD WIDENING
 - MINIMUM EXTENT OF TEMPORARY TRACK
 - OPTIONAL TEMPORARY LAYBY
 - TURNING MOVEMENT - VEHICLE BODY
 - TURNING MOVEMENT - FRONT TYRES
 - TURNING MOVEMENT - REAR TYRES
 - TURNING MOVEMENT - 0.5m VEHICLE BODY CLEARANCE



TURNING - BLADE TRUCK
SCALE 1:250

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When sheet printed full size, the scale bar is 100mm.
0 50 100mm

5 2.5 0 5 10
SCALE BAR (m)
1:250

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B	25.01.2023	ISSUED FOR INFORMATION		EN	JB

WGA

HILLS OF GOLD
EXTERNAL WORKS
OAKENVILLE TO JENKINS - INNES / JENKINS
TURNING - BLADE TRUCK

A1 DOCUMENT NUMBER
Project Number Sheet No. Rev.

Design Drawn
EN EN
WGA211476-SK-CV-1018 B

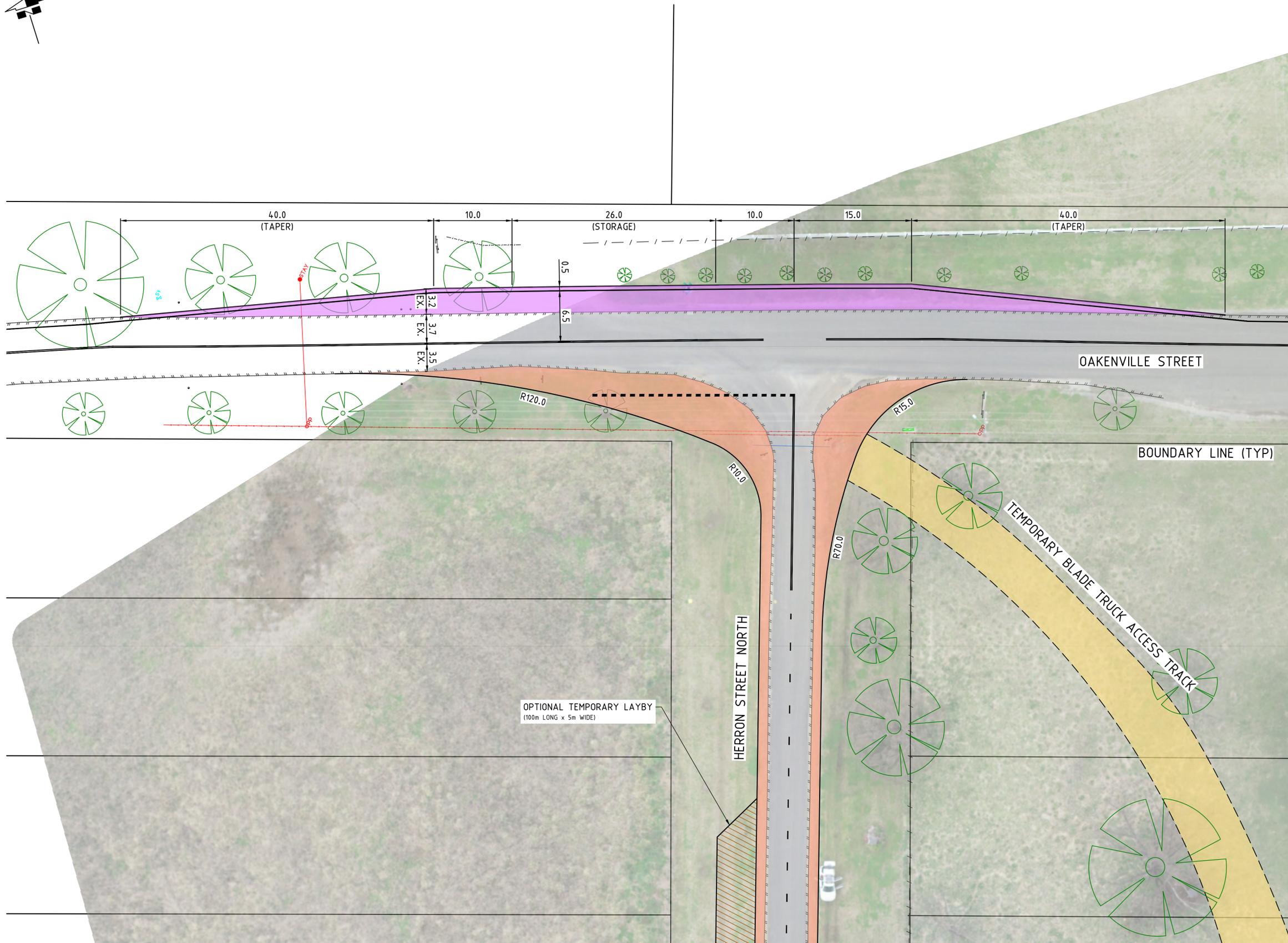


NOTE:

1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
2. ALL COORDINATES ARE TO MGA2020, ZONE 56.
3. ALL LEVELS TO AUSTRALIAN HEIGHT DATUM (AHD).

LEGEND

- EXISTING FENCES
- EDGE OF EXISTING SEAL
- EDGE OF PROPOSED SEAL
- EDGE OF TEMPORARY TRACK
- EXTENT OF ROAD WIDENING
- MINIMUM EXTENT OF TEMPORARY TRACK
- OPTIONAL TEMPORARY LAYBY
- OPTIONAL BYPASS LANE
- LINEMARKING - EDGE LINE
- LINEMARKING - GIVE-WAY LINE
- LINEMARKING - DOUBLE BARRIER LINE
- LINEMARKING - CONTINUITY LINE



INTERSECTION LAYOUT - ALTERNATIVE BAR ARRANGEMENT

SCALE 1:250

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SCALE BAR (m)
1:250



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B	25.01.2023	ISSUED FOR INFORMATION	EN	JB	JB



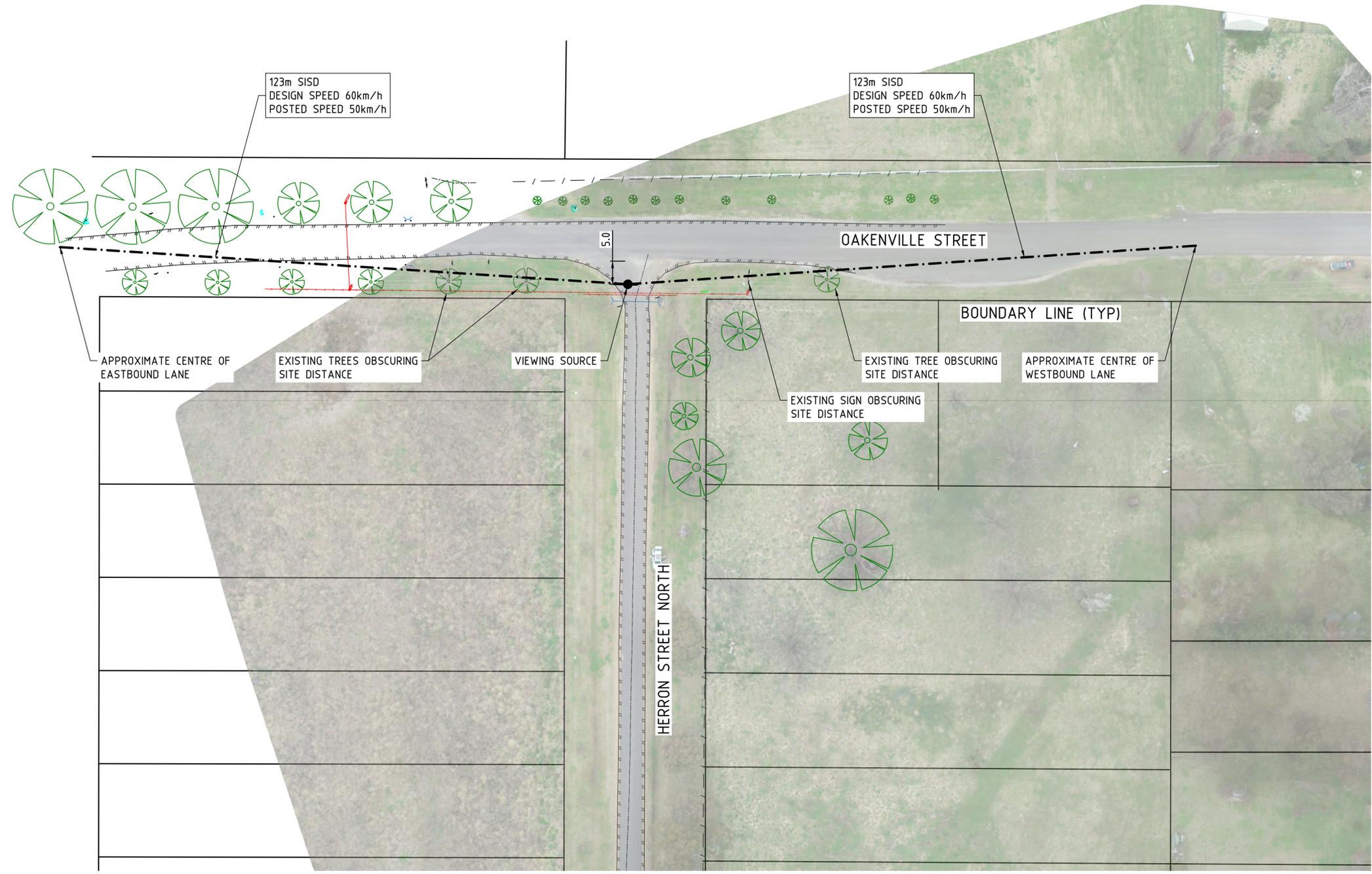
HILLS OF GOLD
EXTERNAL WORKS
OAKENVILLE TO JENKINS - OAKENVILLE / HERRON
ALTERNATIVE BAR ARRANGEMENT

A1 DOCUMENT NUMBER
Project Number Sheet No. Rev.
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- NOTE:**
1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
 2. ALL COORDINATES ARE TO MGA2020, ZONE 56.
 3. ALL LEVELS TO AUSTRALIAN HEIGHT DATUM (AHD).

- LEGEND**
- /---/--- EXISTING FARM FENCES
 - ==== EDGE OF EXISTING SEAL
 - ROAD CENTRELINE



CURRENT INTERSECTION SISD
SCALE 1:500

P:\JOBS\2021\1476 - HOG - Devils Elbow\Drawings\WGA\211476-SK-CV-1020.dwg, B, 25/1/2023 1:05 PM, Bkheir's

When sheet printed full size, the scale bar is 100mm.

SCALE BAR (m)
1:500

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B	25.01.2023	ISSUED FOR INFORMATION	EN	JB	JB



HILLS OF GOLD
EXTERNAL WORKS
OAKENVILLE TO JENKINS - OAKENVILLE / HERRON
CURRENT INTERESECTION SISD

A1 DOCUMENT NUMBER
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