



GEOLYSE

**STATEMENT OF ENVIRONMENTAL EFFECTS
PROPOSED RECREATIONAL FACILITY INCLUDING HARNESS RACING TRACK
AND ASSOCIATED INFRASTRUCTURE**

**LAND ENCOMPASSING LOT 14 IN DP787842, LOT 10 IN DP717095 AND LOT 6 IN
DP540566**

**PREPARED FOR
HARNESS RACING NSW**

SEPTEMBER 2012

STATEMENT OF ENVIRONMENTAL EFFECTS
PROPOSED RECREATION FACILITY INCLUDING HARNESS
RACING TRACK AND ASSOCIATED INFRASTRUCTURE

LAND BOUNDED BY COLLEGE ROAD, ETHELTON AVENUE AND THE MAIN
WESTERN RAILWAY LINE, BATHURST - ENCOMPASSING LOT 14 IN
DP787842, LOT 10 IN DP717095 AND LOT 6 IN DP540566

PREPARED FOR:

HARNESS RACING NSW

SEPTEMBER 2012



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The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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Introduction

1.1 BACKGROUND

Geolyse Pty Ltd has been commissioned by Harness Racing NSW to prepare a Statement of Environmental Effects (SEE) to accompany a Development Application (DA) for a new Recreation Facility including a Harness Racing Track together with a club building, external seating area, parade ring, stables, machinery shed and associated car parking and access roads at Lot 14 in DP787842, Lot 10 in DP717095 and Lot 6 in DP540566, Bathurst.

1.2 SCOPE OF THIS REPORT

This SEE has been prepared pursuant to Clause 50 and Part 1 of Schedule 1 of the *Environmental Planning and Assessment Regulation 2000* and is provided in the following format.

- **Section 2** of this report provides a description of the subject site and its locality;
- **Section 3** outlines the proposed development;
- **Section 4** details the planning framework applicable to the subject site and proposed development;
- **Section 5** identifies the impacts of the proposed development; and
- **Section 6** provides a conclusion to the SEE.

The Site & Its Locality

2.1 THE SITE

The subject property measures approximately 60 hectares in size and is located 3 kilometres south of Bathurst CBD and 820 metres east of Mount Panorama raceway.

The site is formed by three separate lots, as shown in **Figure 1** below, and is encompassed by College Road to the west, Ethelton Avenue to the north, and the Main Western Railway Line to the east. The property directly to the south is a single large rural lot with a single dwelling and a quarry. Vale Road to the east is an arterial road managed by Roads and Maritime Services (RMS) and there is an existing railway level crossing on Ethelton Avenue, approaching its intersection with Vale Road.

The property is undulating and generally cleared of trees, having previously been used for grazing purposes. The property benefits from a small farm dam located roughly in the centre of Lot 14.

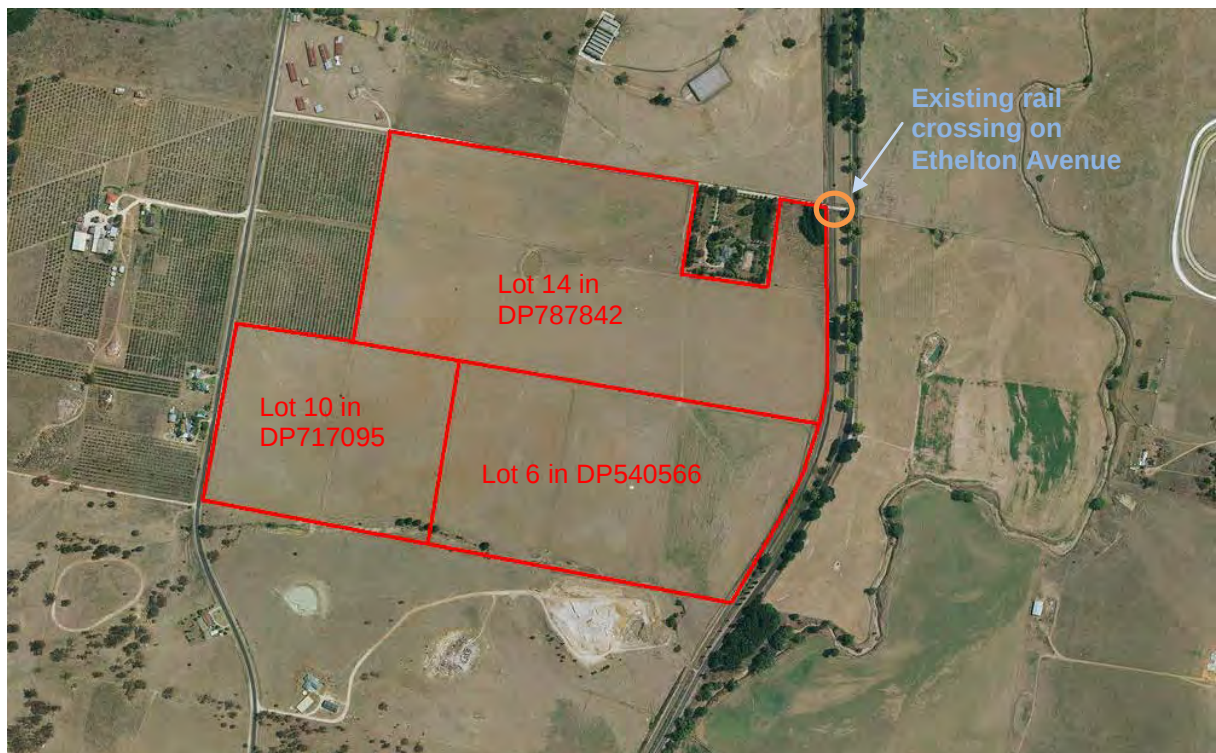


Figure 1: The subject properties (Source: LPMA Six Viewer)

2.2 THE LOCALITY

The surrounding area is characterised by a mix of rural and rural residential lots. Two lots to the north-west of the property are in use as intensive orchards as are lots to the west. A single lot for rural residential purposes is located in the north-east corner of the area bounded by College Road, Ethelton Avenue and the Main Western Highway.

The Development

3.1 DEVELOPMENT DESCRIPTION

This application seeks consent for the development of a Recreation Facility, accommodating a 1040 metre harness racing track together with a club building, parade ring, grassed terrace and stables. It is also proposed that the central reservation of the harness track be used as sports fields in the future, subject to agreement with a local sports club.

The proposed harness racing track is 1040 metres in length, which 244.5 metres longer than the track at the existing facility at the Bathurst Showground.

The proposed club building will feature a lounge, function area/meeting room, bar and servery, viewing platform, concourse with seating, grassed terrace, toilets and offices, all at ground floor level; as shown on **McKinnon Design Drawing 11114_da3 A**. The first floor of the club building will include a control room, judges room, stewards room and race caller room, together with an external camera platform; as shown on **McKinnon Design Drawing 11114_da3 A**.

The club building will be externally clad with corrugated Colorbond sheeting on the walls and 5 degree mono pitch roof; as shown on **McKinnon Design Drawing 11114_da4 A**.

The south-west elevation will feature a Bathurst Harness Racing Club advertising sign.

The proposed stables will accommodate up to 89 horses at any one time together with one (1) stallion box, two (2) urinals, four (4) wash bays, two (2) swab bays, a stewards room, a sick bay, an office, a store room, an owners and trainers room and male and female toilet facilities; as shown on **McKinnon Design Drawing 11114_da6 A**. The stables will measure 58.55 metres long by 41 metres wide by 3.95 metres high. The stables will be externally finished with a mixture of 1200mm high painted tilt panel walls and metal cladding, and will feature Colorbond sliding doors, external vents, and various access doors and windows. The location of the proposed stables is shown on **McKinnon Design Drawing 11114_da1 A**.

Access to the property will be via a sealed access road from College Road and the development proposes 241 gravel public car parking spaces, with all movement areas being sealed. A separate gravel parking area will accommodate a further 43 truck and trailer spaces for owners and trainers, as shown on **McKinnon Design Drawing 11114_da1 A**.

It is proposed to provide landscaping at the property to improve the visual amenity of the property and to provide a visual and acoustic shield to nearby residential properties, as shown on **McKinnon Design Drawing 11114_da2 A**.

Earthworks will be required to provide a flat area for construction of the proposed track.

Stormwater will be managed on site via development of open channels to direct surface water from the car park to the existing on site dam. Other surface water will be discharged to open areas of the site. Stormwater will be managed to ensure that post development flows improve or are equal to pre-development levels. **Geolyse Servicing Drawing 034A_E04** depicts stormwater management.

Statutory Planning Framework

4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

4.1.1 AIMS & OBJECTIVES

In New South Wales (NSW), the relevant planning legislation is the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EP&A Act instituted a system of environmental planning and assessment in NSW and is administered by the Department of Planning (DoP). The objects of the EP&A Act are:

- (a) *to encourage:*
 - (i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
 - (ii) *the promotion and co-ordination of the orderly and economic use and development of land,*
 - (iii) *the protection, provision and co-ordination of communication and utility services,*
 - (iv) *the provision of land for public purposes,*
 - (v) *the provision and co-ordination of community services and facilities, and*
 - (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
 - (vii) *ecologically sustainable development, and*
 - (viii) *the provision and maintenance of affordable housing, and*
- (b) *to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and*
- (c) *to provide increased opportunity for public involvement and participation in environmental planning and assessment.*

4.1.2 SECTION 5A

Section 5A of the EP&A Act requires consideration of whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats as a result of the proposed development. As the property has been historically in use for grazing purposes, and is predominantly cleared, it is not anticipated that the proposed development will have an adverse impact on threatened species, populations or ecological communities, or their habitats.

4.1.3 SCHEDULE 4A

Schedule 4A of the EP&A Act sets out those development types for which regional panels are the consent authority for any application.

As the development proposed is on land that is Council owned and the Capital Investment Value (CIV) exceeds \$5 million, by virtue of Schedule 4A(4) the development would be determined by the Joint Regional Planning Panel (JRPP).

4.1.4 SUBORDINATE LEGISLATION

The EP&A Act facilitates the preparation of subordinate legislation, consisting of:

- Environmental Planning Instruments (EPIs) (including State Environmental Planning Policies (SEPP), Local Environmental Plans (LEP), and deemed EPIs); and
- Development Control Plans (DCP).

In relation to the proposed development, the relevant subordinate legislation includes:

- *Bathurst Region (Interim) Local Environmental Plan 2004*; and
- *Bathurst Region (Interim) Development Control Plan 2011*.

The requirements of these are discussed in the following sections.

4.2 ENVIRONMENTAL PLANNING INSTRUMENTS

4.2.1 STATE ENVIRONMENTAL PLANNING POLICY

4.2.1.1 State Environmental Planning Policy No. 55 – Remediation of Land (SEPP55)

Clause 7 of the SEPP requires the consent authority to consider whether or not the land is contaminated, and if it is, whether the proposed land use is compatible with the level and nature of the contamination, or if the site is suitable for that use after remediation.

The site history investigation indicates a long term use as open grazing land, with no related activities that are indicators of potential site contamination.

4.2.1.2 State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)

Pursuant to section 84 of the *State Environmental Planning Policy (Infrastructure) 2007* ISEPP:

84 Development involving access via level crossings

- (1) *This clause applies to development that involves:*
 - (a) *a new level crossing, or*
 - (b) *the conversion into a public road of a private access road across a level crossing, or*
 - (c) *a likely significant increase in the total number of vehicles or the number of trucks using a level crossing that is in the vicinity of the development.*
- (2) *Before determining a development application for development to which this clause applies, the consent authority must:*
 - (a) *within 7 days after the application is made, give written notice of the application to the chief executive officer of the rail authority for the rail corridor, and*
 - (b) *take into consideration:*
 - (i) *any response to the notice that is received within 21 days after the notice is given, and*
 - (ii) *the implications of the development for traffic safety including the costs of ensuring an appropriate level of safety, having regard to existing traffic characteristics and any likely change in traffic at level crossings as a result of the development, and*
 - (iii) *the feasibility of access for the development that does not involve use of level crossings.*
- (3) *Subject to subclause (5), the consent authority must not grant consent to development to which this clause applies without the concurrence of the chief executive officer of the rail authority for the rail corridor,*

- (4) *In determining whether to provide concurrence, the chief executive officer must take into account:*
 - (a) *any rail safety or operational issues associated with the aspects of the development, and*
 - (b) *the implications of the development for traffic safety including the cost of ensuring an appropriate level of safety, having regard to existing traffic and any likely change in traffic at level crossings as a result of the development.*
- (5) *The consent authority may grant consent to development to which this clause applies without the concurrence of the chief executive officer of the rail authority for the rail corridor if:*
 - (a) *the consent authority has given the chief executive officer notice of the development application, and*
 - (b) *21 days have passed since that notice was given and the chief executive officer has not granted or refused to grant concurrence.*
- (6) *The consent authority must provide the rail authority for the rail corridor with a copy of the determination of the application within 7 days after the determination is made.*
- (7) *In this clause: "level crossing" means a level crossing over railway lines. "traffic" includes rail, road and pedestrian traffic.*

Pursuant to clause 86:

any development (other than development to which clause 88 of the Infrastructure SEPP applies) that involves the penetration of the ground to a depth of at least 2m below ground level (existing) on land that is:

- (a) *within or above a rail corridor; or*
- (b) *within 25m (measured horizontally) of a rail corridor; or*
- (c) *within 25m (measured horizontally) of the ground directly above an underground rail corridor*

The proximity of the development to Ethelton Avenue, and the existence of the Ethelton Avenue railway crossing, triggers the referral of this development to John Holland Rail, who manages the Country Regional Network on behalf of the Australian Rail Track Corporation (ARTC).

The line accommodates 20 pacific passenger movements per week, being the XPT and Indian Pacific Services. In addition the line also accommodates freight movements; however details as to exact numbers were not available at the time of writing this statement.

These rail movements have the potential for increased conflict if traffic volumes were to increase on Ethelton Avenue.

The Ethelton Avenue rail crossing is managed by stop signs, with no lights or barriers, see **Figure 2** below.



Figure 2: Ethelton Avenue railway crossing, looking west

There is a stopping distance of 32 metres between the rail crossing and the pavement of Vale Road, providing limiting space for vehicles, especially long rigid vehicles and those towing trailers such as horse floats, at times when trains are passing over the crossing. This short stopping distance, coupled with a steep entry to Ethelton Avenue by virtue of the shape of the existing table drain, lead to considerable concern that this proposal may lead to increased conflicts at this intersection.

As a result of the above, discussions with Bathurst Regional Council, John Holland Rail, the Roads and Maritime Services and the proponents have resulted in a proposal to permanently close Ethelton Avenue, as a means of reducing potential conflicts between escalating vehicle numbers and rail movements.

RMS have confirmed in writing, via a letter dated 12 March 2012 attached at **Appendix D**, that they have no in principle objections to the closure of Ethelton Avenue. Operatives from John Holland Rail have also confirmed no in principle objections via a telephone conversation of 23 March 2012.

As a result of the above, Bathurst Regional Council is asked to pursue closure of this road in conjunction with Part 34 of the *Roads Act 1993*.

The ISEPP is supported by the Department of Planning and Infrastructure Interim Guideline – *Development Near Rail Corridors and Busy Roads*. Whilst this document does not contain specific advice in respect of recreation facilities, the general intent is relevant.

The guideline seeks to ensure that any potential conflict between passing rail traffic and new developments is minimised, specifically with respect to noise and vibration, safety and design and earthworks.

This is discussed further in **Section 5.16** and the noise assessment undertaken by Wilkinson Murray Pty Limited, attached at **Appendix B** of this statement.

4.2.2 LOCAL ENVIRONMENTAL PLAN

4.2.2.1 Bathurst Region (Interim) Local Environmental Plan 2004

In accordance with the *Bathurst Region (Interim) Local Environmental Plan 2004* (LEP), the property is zoned 1(a) Inner Rural Zone. Pursuant to the LEP, the objectives of the 1(a) Inner Rural Zone are *inter alia*:

- (a) *to support and maintain the continued viability of agricultural development in rural areas located in proximity to the urban fringe areas of the City of Bathurst, and*
- (b) *to enable development that is appropriate for broad acre productive land used for grazing and cropping, and*
- (c) *to provide for a range of compatible land uses to be carried out on land within the zone which are in keeping with the rural character of the locality and do not unnecessarily convert prime crop and pasture land to non-agricultural land uses, and*
- (d) *to protect or conserve the scenic environment by controlling the location of buildings and materials used, particularly in respect of development adjacent to a major road or located within a scenic protection area or within an identified remnant bushland area, and*
- (e) *to protect or conserve valuable deposits of minerals, coal, petroleum and extractive materials by controlling the location of development to enable the efficient extraction of those deposits.*

The development of a recreation facility is permitted with consent in the 1(a) zone.

4.2.2.2 Definitions

Pursuant to the LEP a recreation facility is defined as:

means a building, place or area intended for use:

- (a) *as a children's playground, or*
- (b) *for sporting activities or sporting facilities, or*
- (c) *to provide facilities for recreational or leisure activities which promote the physical, cultural or intellectual welfare of the community, but, in the zoning control table, does not include a building, place or area elsewhere specifically defined for the purposes of this plan.*

It is considered that the development proposed including a harness racing track, sports fields and associated infrastructure, satisfies the definition of a recreation facility.

4.3 DEVELOPMENT CONTROL PLANS

4.3.1 BATHURST REGION (INTERIM) DEVELOPMENT CONTROL PLAN 2011

There are no specific controls within the *Bathurst Regional (Interim) Development Control Plan 2011* (BRIDCP) that apply to development of a Recreation Facility. General matters for consideration as relevant from the BRIDCP are discussed in **Table 4.1** below.

Table 4.1 – Bathurst DCP Development Controls

Required	Provided	Compliance
PARKING, ACCESS, MANOEUVRING AREAS AND FENCING		
The BRIDCP does not contain specific requirements for an outdoor recreation facility, however does contain a requirement that for Indoor Recreation Facilities, 7.5 car parking spaces per 100m ² be supplied.	Based on useable floor area of the club building (excluding staff areas and circulation spaces = a total of 480.m ²) requires 48 car parking spaces. The facility proposes the provision of 241 public car parking spaces, 43 owner/trainer car and trailer spaces and 10 bicycle parking spaces, together with grassed over spill areas for On this basis the car parking requirements are achieved.	✓
On site car parking spaces shall not form part of vehicle manoeuvring areas or loading/unloading areas.	This would be achieved.	✓
All car parking areas are to be located behind the building line or should be adequately screened by landscaping to reduce the effect of the development on the streetscape	This would be achieved. The car parking area is located approximately 590 metres from College Road, and due to the undulating nature of the property will not be visible from College Road.	✓
Car parking spaces and manoeuvring areas must comply with the minimum sizes outlined in Schedules 1 and 2 of the BRIDCP.	This would be achieved.	✓
Visitors parking and disabled parking spaces must be clearly designated and readily accessible.	This would be achieved.	✓
All parking areas are to be paved and line marked in accordance with Council's Engineering Standards.	The car parks in the public area, and all of the private parking area will be gravel topped. The development provides adequate car parking provision	✓
Vehicular crossings and laybacks must be provided for satisfactory ingress/egress to the subject property.	This would be achieved.	✓
Where car parking is provided at the rear of the site, the building is to provide a secondary entrance to integrate access between the building and the car park.	The car parking is not provided at the rear of the property.	N/A
Car parking areas are to be lit. All lights must have fully shielded fittings and security lighting of unattended premises must use a motion detector sensor switch.	This would be achieved.	✓
SITING		
Setbacks		

Table 4.1 – Bathurst DCP Development Controls

Required	Provided	Compliance
The DCP does not contain specific provisions for the setback of recreation facilities developed in the 1(a) zone, however general setback provisions in the 1(a) zone are as follows: - Front, side and rear setback of 50 metres for development on properties of greater than 20 hectares	The development proposes a setback to College Road of 570 metres, a setback to Ethelton Avenue of 184 metres, a setback to the southern boundary of 100 metres and a setback of 90 metres to the Main Western Railway Line. By virtue of the above setbacks, the development achieves the minimum required setbacks.	✓
HEIGHT		
There are no specific height restrictions that apply to buildings within the 1(a) zone or to recreation facilities specifically.	N/A	N/A
SERVICES AND FACILITIES		
Roof and Surface Water Disposal		
All roofed and paved areas shall be drained to the street, piped drainage system, or other approved drainage system to the satisfaction of Council.	This would be achieved.	✓
All stormwater drainage lines are to be gravity fed to a legal point of discharge.	This would be achieved.	✓
Pump-out storm water drainage systems are not permitted as the sole method for stormwater disposal.	Not proposed as part of this development.	N/A
Developments with more than 50% impervious site area are to submit detailed engineering design plans of the proposed storm water drainage layout, including locations of grade inlet pits, size of pipes and modelling results for certain storm events.	<50% impervious.	N/A
At no time, during or after construction, is any ponding of stormwater to occur on adjoining land as a result of new development.	Noted	✓
Effluent Disposal		
The Council have indicated that the effluent waste from the club building will be connected to the reticulated sewer system	The existing reticulated sewer system will be extended to facilitate a connection.	✓
The Council have indicated that the effluent waste from the stables can be discharged to the Councils reticulated sewer system	The existing reticulated sewer system will be extended to facilitate a connection.	✓
Water Supply Requirements		
The Council have indicated that the development must be connected to the town water service	Noted.	✓
Building Form and Design		

Table 4.1 – Bathurst DCP Development Controls

Required	Provided	Compliance
OUTDOOR LIGHTING		
Light is to be directed downwards, not upwards, to illuminate the target area. If there is no alternative to up-lighting, then shields and baffles must be used to reduce spill light to a minimum.	The attached Lighting Assessment Report from A J Stockman Pty Ltd confirms that the effect of spill light emanating from this new facility will have a negligible impact on the adjacent properties.	
Specifically designed lighting equipment is to be used that, once installed, minimises the spread of light near to, or above, the horizontal.		
Do not 'over' light. Provide adequate lighting to achieve the desired effect. To keep glare to a minimum, the main beam angle of all lights directed towards any potential observer is to be kept below 70 degrees. It should be noted that the higher the mounting height, the lower can be the main beam angle. In places with low ambient light, glare can be very obtrusive and extra care should be taken in positioning and aiming light.		
Floodlights with asymmetric beams are to be used that permit the front glazing to be kept at or near parallel to the surface being lit.		
a) All lights must have fully shielded fittings. b) There must be no light trespass to adjacent properties.		

Impacts

5.1 INTRODUCTION

Pursuant to Schedule 1 of the EP&A Regulation, this section of the report outlines the environmental impacts of the proposed development and any measures required to protect the environment or lessen the harm to the environment.

The impacts have been identified through an assessment of the proposed development against the provisions of section 79C(1)(b) and the former NSW Department of Urban Affairs and Planning's (nd) *Guide to Section 79C*.

5.2 CONTEXT AND SETTING

The proposed facility is located within the 1(a) General Rural Zone and is an acceptable development within the locality. Through appropriate mitigation measures, any impacts from noise, light spill, stormwater over flow, traffic generation and safety and security will be managed so as to ensure no detrimental impacts on nearby residential dwellings or the locality.

The existence of the railway crossing Ethelton Avenue has required consideration in the BHR Management Plan to ensure that an inappropriate hazard is not created through increased traffic generation. This is discussed further in **Section 5.3**.

Nearby Vale Road is an arterial road managed by the Roads and Maritime Services (formerly RTA) and the increase of traffic likely to be directed to Vale Road is considered in **Section 5.3** below.

The attached Noise Assessment report by Wilkinson Murray Pty Limited, attached at **Appendix B**, demonstrates that the development will not have a significant detrimental impact on adjoining residential dwellings subject to the use of appropriate mitigation techniques, including the development of an earth bund between the proposed track and the nearest residential received at 23 Ethelton Avenue. This is discussed in detail in **Section 5.16** of this statement.

The Lighting Assessment Report by A J Stockman Pty Ltd, confirms that the effect of spill light emanating from this new facility will have a negligible impact on the adjacent properties. This is discussed in detail in **Section 5.17** of this statement.

The character of the development is considered appropriate in the context of the General Rural Zone and given the close proximity to other nearby recreation facilities, namely Mt Panorama Raceway.

Due to the undulating nature of the property, the development of a single storey club building and single storey stable building will not result in an imposing structure within the area, nor will it interrupt any view paths.

The proposed metal cladding of the stables and machinery shed will integrate these buildings with the character of the rural area.

For the above reasons, it is considered that the development is consistent with the context of the rural zone and represents a positive contribution to the local area, and the region.

5.3 ACCESS, TRANSPORT AND TRAFFIC

5.3.1 CONCLUSIONS OF THE TRAFFIC IMPACT ASSESSMENT

The Traffic Impact Assessment (TIA) completed by Geolyse Pty Ltd, attached at **Appendix A**, demonstrates that the additional volume of vehicles generated as a result of this development can be comfortably accommodated within the existing road network without detrimentally affecting traffic movements.

Due to the lack of storage on Ethelton Avenue between the rail crossing and Vale Road, combined with the poor vertical alignment and substandard condition of the road, it is proposed to block Ethelton Avenue to through traffic. This would prevent vehicles from using the road as an access route to the site and means all traffic accessing the site will do so via College Road.

Whilst the details for the proposed closure of Ethelton Avenue are to be finalised with Bathurst Regional Council and RMS it is proposed to prevent through traffic via a break and/or barrier at some point along the road. This will eliminate through traffic whilst still providing for access to local properties along Ethelton Avenue.

In respect of College Road, the TIA found that the greatest percentage increase in the peak daily traffic following development of the Recreational Facility would occur during major events with an increase of approximately 820%. Whilst this increase appears extremely high it was found that this was primarily due to the extremely low existing daily traffic volume on College Road. It is also noted that such a volume increase only occurs twice per year during the clubs Gold Cup event. Averaged over the year the post development daily traffic volume is only 389 vehicles per day which represents a 30% increase.

The TIA also found that greatest percentage increase in the peak hourly traffic on College Road following development of the Recreational Facility occurs during major events with an increase of over 76,000%. Whilst this increase appears exceptionally high it was found that this was due to the extremely low existing peak hourly traffic volume on College Road. During major events the post development peak hourly flow represented 85% of the road capacity however this reduced to 17.2% for minor events.

Notwithstanding the substantial increase in daily and peak hour traffic volumes on a section of College Road, the overall impact of the additional traffic generated by the proposed Recreation Facility on the surrounding road network is limited and the classification of the surrounding roads will not change following the development of the Recreation Facility.

The provision of a new access off College Road to the proposed Recreation Facility in accordance with Council's Policy codes will see a safe and efficient access provided to the development. The capacity and adequacy of the proposed access treatment was analysed using SIDRA Intersection modelling software and found to function well at an overall Level of Service A.

Hence the increase in traffic volume as a result of the development is capable of being dispersed and absorbed into the surrounding road network with minor impact on the existing traffic facilities.

5.3.2 TIA RECOMMENDATIONS

In completing the assessment of the impact of the traffic generated by the Recreation Facility, the following recommendations are made:

- The increase in AADT and peak hourly traffic on the roads surrounding the development site will not change the classification of the roads under a functional road hierarchy.
- The access point to the site shall be designed and constructed as a rural access driveway in accordance with Bathurst Regional Council's *Guidelines for Engineering Works*.

- A minimum of 241 car parking spaces, 10 bicycle parking spaces, 43 large vehicle parking spaces and grassed spill over parking areas shall be provided with the development with the layout of car parking spaces, aisle access widths and provision for disabled parking and access designed in accordance with AS:NZS:2890 and Council's requirements.
- The detailed design of the development shall make provision for disabled set down and parking areas, bus and taxi drop off areas, delivery vehicle parking, waste collection facilities and service vehicle parking.
- That the proponent work with Bathurst Regional Council to arrange the closure and/or permanent blockage of Ethelton Avenue to prevent vehicles from using the road as an access route to the site and direct all traffic to access the site via College Road. This will eliminate through traffic whilst still providing for access to local properties along Ethelton Avenue

The design of all works shall be carried out to the appropriate standards and the requirements of Bathurst Regional Council.

On the basis of the above, and the traffic impact assessment undertaken and attached at **Appendix A**, the development is considered to be acceptable in the context of the existing transport network and will not result in any unnecessary impacts to local road users.

5.4 PUBLIC DOMAIN

The development will provide for an improved harness racing facility in the region and will attract additional people to the region to take part in events.

An assessment of impact of noise and light spill from the site has been undertaken and are attached as **Appendices C** and **D** respectively. These assessments conclude that, subject to the implementation of appropriate mitigation measures, the proposed development will not have any significant detrimental impact on the public domain as a result of lighting or noise.

5.5 SERVICING

The existing reticulated water and sewer services are developed to within approximately 800 metres to the north-west of the property. Bathurst Regional Council has indicated their intention to extend these services to make them available to the development.

The extension of these services will have a positive social and environmental impact as it will allow nearby lots the opportunity to connect to these services, thereby reducing the need for onsite effluent systems, and allow for consolidated water provision.

Power will be supplied from local services.

5.6 HERITAGE

A review of the Office of Environment and Heritage Aboriginal Heritage Information Management Systems (AHIMS) website confirms that there are no sites of Aboriginal heritage within 1 kilometre of the proposed development.

A review of the Bathurst Interim Local Environmental Plan indicates that the adjacent land at 23 Ethelton Avenue is Heritage Item 246, being Ethelton Cottage including garden and outbuildings. This property is also listed on the state heritage inventory. The cottage is described as:

A single storey part colonial Georgian (late 1840s) and part Victorian Italianate homestead of face brick under a hipped and gabled iron roof. Hip roofed verandah to front supported on slender posts with extravagant brackets, terminated by projecting gabled wing with a pair of tall arched sash windows. Some 12 paned windows in older part of the house, with solid shutters. Original kitchen wing with bakers oven.

It is not considered that the proposed development at the subject site would have any detrimental impact on the heritage quality of this property, and that adequate separation is proposed.

5.7 OTHER LAND RESOURCES

The development results in the loss of land that could be used for agricultural purposes, however, given the close proximity to town and to Mt Panorama raceway, the proposed recreation use is considered to be an appropriate use. The land is presently used for grazing purposes and this could be still sustained on the undeveloped portions of the site to provide additional revenue to the harness racing club. The proposed use is permissible within the 1(a) zone, and is considered compatible with the surrounding land uses.

The proposed development will not have any detrimental impact on surrounding water supply catchments. There is no available information that suggests that the site is likely to be targeted for the extraction of mineral or other resources.

5.8 WATER

Water run-off at the site, including flows from rainwater tank overflow and runoff from the trotting track, car parks, grassed public areas and the trotting track infield, will be directed to the existing on-site dam and to discharge points within the site.

Potable water would be sourced from the existing town water supply and would be used for the preparation of meals, hand washing, drinking water and a supplementary supply to non-potable demands.

Rainwater would be collected from the roofs of the stables and grandstand/administration building. The collected rainwater would be held in a rainwater tank and used for toilet flushing, horse stable wash down and landscape watering.

The development is not located within 40 metres of any waterways or water features that require protection, or separate licence.

On the basis of the above, the development is considered to represent an acceptable development in the context of water use and reuse.

5.9 SOILS

Soil erosion from the track will be controlled by regular watering through race meetings, as set out in **Section 5.8** of this statement, together with landscaping and stormwater management that ensures that any sediment is collected on site.

Soil erosion during construction and earthworks will be appropriately managed through the development and application of a soil and erosion management plan, as set out in **Section 5.24** of this statement.

5.10 AIR AND MICROCLIMATE

Meteorological conditions that influence air quality include gradient wind flow regimes and local conditions typically driven by topographical features, namely drainage flows. Wind speed, wind direction and topography influence dispersion and transport of plumes.

The Bureau of Meteorology (BOM) mean data for the period between 1981 and 2010 was used for the purposes of this assessment.

The lowest mean wind speed at 9am for Bathurst is 3.4 km/hr during June and at 3pm the lowest speed is 6.6km/hr also during June.

The highest mean wind speed at 9am is 7.0km/hr for Bathurst whilst at 3pm the highest mean wind speed of 11.9km/hr was recorded during December.

The nearest receptors are located less than 150m north-east of the proposal.

5.10.1 POTENTIAL IMPACTS

5.10.1.1 During Construction

Air emission sources during construction include particulate matter and mobile vehicle emissions.

Particulate matter is a result of fugitive dust sources produced during construction from traffic on paved and unpaved roads, clearing of groundcover and topsoil, earthmoving works and transport of construction materials.

Mobile vehicle emissions include petrol and diesel-fuelled vehicles and operation of on-site machinery. The emission rates and impact potential would depend on power output of combustion engines, quality of fuel and condition of combustion engines.

The potential impact from particulate matter and mobile vehicle emissions dust would be restricted to standard construction hours (7am to 6pm Monday to Friday and 8am to 1pm on Saturday) thus limiting impact to short term intensive periods.

Odour from vehicle emissions may be detected close to the source however given the rural setting of the works, proximity to residential receivers, low number of mobile sources and existing ambient air quality characteristics and short term nature of works, the potential for odour impacts by vehicle emissions is minimal.

Provided the construction contractor meets the requirements of relevant legislation and regulations, emissions from vehicles are unlikely to result in air quality impacts and therefore not considered further in this assessment.

During construction the following mitigation measures would include but not be limited to:

- Limiting the area of soil and vegetation disturbance;
- Utilising dust suppression on access tracks and exposed soil;
- Covering of trucks transporting soils and construction materials;
- Minimising vehicle movement and speed;
- Avoiding dust generating activities during windy and dry conditions; and
- Maintaining all equipment in good working condition such that the construction contractor and site manager ensure prevent release of smoke by construction equipment in contravention of Section 124 of the *Protection of the Environment Operations Act 1997* and Clause 9 of the *Environment Operations (Clean Air) Regulation 2002*.

5.10.1.2 Post Construction

The two most likely impacts on air quality post construction are noise during events and odour associated with the stable complex.

The nearest residential receivers are individual dwellings located approximately 170 metres to the north and 550 metres to the south and west. A low density residential area is located approximately 850 metres to the north-west.

The rural nature of the site, and the relative distance to any significant residential populations, ensures that the development will not lead to any significant noise impact on residential land users.

Odour associated with the stables will be minimised via the direction of effluent to the Council's reticulated sewer system together with the planting of landscaped buffers between the potential odour sources and any nearby residential properties.

It is considered that noise and odour associated with the development can be appropriately managed to ensure no detrimental impact on adjacent and nearby landowners.

5.11 FLORA AND FAUNA

The predominant vegetation type appears to 'disturbed grassland'.

Due to the cleared nature of the property, and the fact that the no vegetation aside from grass is required to be cleared to facilitate the development, it is not considered that there will be any detrimental impact on flora and fauna.

The site does not contain any identified critical habitats; threatened species, populations, ecological communities or their habitats; or other protected species.

5.12 WASTE

5.12.1 SOLID WASTE

The applicant will enter into a trade waste agreement with the Council following the grant of consent.

5.13 EFFLUENT DISPOSAL

All effluent generated on site from toilets, amenities and the stables would be directed to sewer via an extension to be constructed by BRC.

In this respect the development is considered acceptable as it will not lead to an unacceptable impact on the environment.

5.14 STORMWATER

As set out in **Section 5.4** stormwater will be harvested from run-off from the roofs of the two proposed buildings, as well as from the sealed areas of the car parks and will be stored on site in rainwater tanks and in the existing on-site dam and re-used for irrigation purposes. Water not directed to the on-site dam will be directed to discharge points within the site.

The stormwater concept plan ensures that stormwater will be catered for and disposed of appropriately.

5.15 ENERGY

The development has been designed within the principles of sustainability, to ensure that energy wastage is minimised.

The development will be connected to the energy grid.

5.16 NOISE & VIBRATION

The DoP *Development Near Rail Corridors and Busy Roads Interim Guidelines* (the Guidelines) sets out that the development of a sensitive development, such as a residential development, seniors living or school development, that is constructed in close proximity to a rail corridor should consider the impacts of the corridor on the proposed development. The development the subject of this application is not considered to constitute a sensitive use and as such the guidelines provide a broad guide only. The Guidelines recommend that a noise impact assessment be completed to determine the extent of the impact from the rail services to the proposed use. The noise assessment also considers the impact of noise generated by the proposed use on the adjacent residential dwelling to the north.

An assessment of the potential noise impacts has been undertaken by Wilkinson Murray Pty Limited, attached as **Appendix B**. This assessment provides recommendations for appropriate mitigation techniques.

It is proposed that an earth bund be developed between the proposed track and the nearest residential receiver, located to the north-east of the site, at 23 Ethelton Avenue. Two options for the height and location of this bund is proposed at Section 7 of the noise assessment.

Provided these recommendations are applied, the operation of the facility should comply with the recommended noise criteria for day, evening and night time.

5.17 LIGHTING

The lighting assessment completed by A J Stockman Pty Ltd, attached as **Appendix C**, demonstrates that the lighting design will ensure minimal light spill from the proposed development. It is not anticipated that the development will have any detrimental impacts on the surrounding locality.

It is proposed that following lighting equipment will be used for this installation:

1. Olympic Disano Metal Halide Floodlights - Code 415211-00 - Version MHN-TD 2KW LA – Cutoff Reflector; and
2. Olympic Disano Metal Halide Floodlights - Code 415211-99 - Version MHN-TD 2KW LA Hot restrike – Cutoff Reflector.

The above fittings are new generation professional asymmetric floodlights with a high purity anodised polished reflector incorporating an adjustable lamp position. This adjustment allows for four different photometric distributions with defined vertical aiming limits. The fittings are specifically designed for race tracks and sporting arenas.

As a result of the use of the above equipment, the horizontal lux level attributed to the track lighting on the boundary of the nearby residential property is 1 lux or less.

Existing flora along the boundaries of the nearby property will collectively contribute to the screening of intrusive light. Plantings of additional flora around the perimeter of the new facility would further screen any intrusive light emanating towards this property.

On the basis of the above, it is considered that the proposed lighting method at the track will not have any detrimental impacts on the surrounding locality.

5.18 NATURAL HAZARDS

A review of the site constraints confirms that there are no natural hazards that will result in risks to people, property and biophysical environment from. The site is not identified as bushfire prone, is not susceptible to flooding or geologic instability.

5.19 TECHNOLOGICAL HAZARDS

The historical use of the property has been grazing purposes. There is no indication of any potential land contamination that would lead to risks to people, property or biophysical environment.

5.20 SAFETY, SECURITY AND CRIME PREVENTION

The guidelines prepared by the NSW Department of Urban Affairs and Planning (DUAP 2001) identify four (4) Crime Prevention Through Environmental Design (CPTED) principles to be considered in any development proposal. Development Applications are to ensure developments do not create or exacerbate crime risk.

These principles are discussed below in relation to the proposed development and include: surveillance, access control, territorial reinforcement, and space management.

5.20.1 SURVEILLANCE

Public areas will be designed so as to be passively surveilled to ensure that opportunities for crime are limited. Those areas not subject to passive surveillance from the club building, such as the car park and stable areas, will be monitored with a combination of technical surveillance, such as CCTV, and human surveillance, via regular security patrols.

The above measures will ensure that opportunities for crime are limited and areas where undesirable activities could occur are not created.

5.20.2 ACCESS CONTROL AND TERRITORIAL REINFORCEMENT

Public and private areas will be clearly delineated through signage and appropriate territorial reinforcement. Members of the public will not be able to access non-public areas unless they are accompanied by a club official or they are taking part in racing events.

5.20.3 SPACE MANAGEMENT

The site and its environs will be appropriately maintained to a high standard to ensure that areas do not degrade and facilitate crime opportunities.

5.21 SOCIAL IMPACT

As defined by the NSW Government Office on Social Policy, social impacts are significant events experienced by people as changes in one or more of the following are experienced:

- peoples' way of life (how they live, work or play and interact with one another on a day-to-day basis);
- their culture (shared beliefs, customs and values); or
- their community (its cohesion, stability, character, services and facilities).

As a result of the mitigation and management techniques proposed via this application it is concluded that the development will not have a significant or detrimental impact on the way of life of adjoining or adjacent residential occupiers.

5.22 ECONOMIC IMPACT

The relocation of the Harness Racing club to the proposed site will release a valuable commodity of land on the existing showground site leading to opportunities for the local community.

The development will also enable the hosting of 5 additional events, by comparison to the current race calendar, due to the increase in the track length of 244.5 metres to 1040 metres. This will have flow on benefits to the local area in terms of increased tourism and trade.

During construction phase, there will be benefits in employment to the local earthmoving and construction trades. This has flow on benefits to the local and regional construction industry.

5.23 SITE DESIGN AND INTERNAL DESIGN

Given the large size of the lot, there is sufficient capacity to operate the proposed recreation facility in such a way so as to be sensitive to the environmental conditions and site attributes.

Site coverage will be low, with much of the site held over in its existing state as grasslands. As such, there is sufficient capacity on site to manage stormwater flows, without increasing run off to adjacent properties.

The nature of the existing topography and the generally low scale of the built form proposed will ensure that the development does not dominate the surrounding landscape and the locality.

Buildings are well setback from all boundaries so as to ensure minimal visual impact to neighbouring properties, as per **McKinnon Design Drawing 11114_da1 A**.

Appropriate landscaping is proposed that will further reduce the visual impact of the development, whilst also ensuring an aesthetically pleasing environment for patrons; see **McKinnon Design Drawing 11114_da1 A**.

The attached noise and lighting assessments, **Appendices B** and **C** respectively, confirm that the proposed development will not negatively impact on the health and safety of patrons or adjoining land owners.

All buildings would be designed and built to conform with the Building Code of Australia with respect to fire rating, access and to ensure minimisation of risk to patrons.

All buildings would be externally finished in materials appropriate to the proposed use and the locality, as shown in **McKinnon Design Drawings 11114_da4 A and 11114_da7 A**.

5.24 CONSTRUCTION IMPACTS

Due to the rural nature of the area and the large size of the property, the impacts of the construction will be minimal and will not lead to any significant loss of amenity to nearby residents or land users.

Notwithstanding this, the following mitigation measures are proposed to ameliorate any adverse impacts:

- Preparation of an Erosion and Sediment Control Plan prior to construction and implementation of the Plan throughout all phases of construction activity;
- The adoption of appropriate soil erosion control measures. This would include techniques such as minimising the area of disturbance at any given time, diverting clean runoff away from disturbed areas, treatment of dirty runoff using sediment traps and filters installed to engineering design standards and rehabilitating disturbed areas as soon as practicable following construction;
- All plant and equipment would be operated and maintained in accordance with the manufacturer's specifications;
- Works would be undertaken in accordance with the standard daytime hours recommended by the Environment Protection Authority: that is, 0700-1800 Monday to Friday and 0800-1300 on Saturday, with no works on Sunday or Public Holidays. Any variation to these hours would first be negotiated in consultation with adjoining landowners; and
- Undertake strategic watering as required and stabilise exposed surfaces with a vegetative cover as soon as is practicable.

In respect of the above mitigation measures, it is considered that construction impacts are appropriately managed and will not unreasonably detract from the amenity of adjacent occupants or have a detrimental impact on the environment of the site or the surrounding area. As such, the development is considered acceptable in this respect.

5.25 CUMULATIVE IMPACTS

Cumulative impact of noise, light spill and increased traffic flows could have an impact on the neighbour in the north-east corner. These are each addressed in **Sections 5.16, 5.17** and **5.3** respectively of this report.

It is concluded that the development will have negligible impacts that have potential to act in unison in terms of:

- individual impacts so close in time that the effects of one are not dissipated before the next (time crowded effects);
- individual impacts so close in space that the effects overlap (space crowded effects);
- repetitive, often minor impacts eroding environmental conditions (nibbling effects); or
- different types of disturbances interacting to produce an effect which is greater or different than the sum of the separate effects (synergistic effects).

Conclusion

6.1 SUITABILITY OF THE SITE

The site does not present any significant constraints in the construction or operation of the development.

The land suitably accommodates the proposed development.

The location is appropriate for the proposed development, and the mitigation measures proposed will adequately address any potential impacts.

There are no natural hazards that unreasonably detract from the suitability of the site.

6.2 CONCLUSION

The development of a proposed recreation facility, including a 1040 metre harness racing track, a sports field, and associated infrastructure, is an acceptable development on the proposed site. The development is acceptable in consideration of the aims of the *Bathurst Interim Local Environmental Plan 2004* and is not antipathetic to the zone objectives.

References

Department of Planning (DoP). 2008, *Development Near Rail Corridors and Busy Roads – Interim Guideline*, NSW Department of Planning, Sydney.

Department of Urban Affairs and Planning (DUAP). nd, *Guide to Section 79C*, NSW Department of Urban Affairs and Planning, Sydney.

Department of Urban Affairs and Planning (DUAP). 2001, *Crime Prevention and the Assessment of Development Applications: Guidelines under section 79C of the Environmental Planning and Assessment Act 1979*, DUAP, Sydney.

Drawings

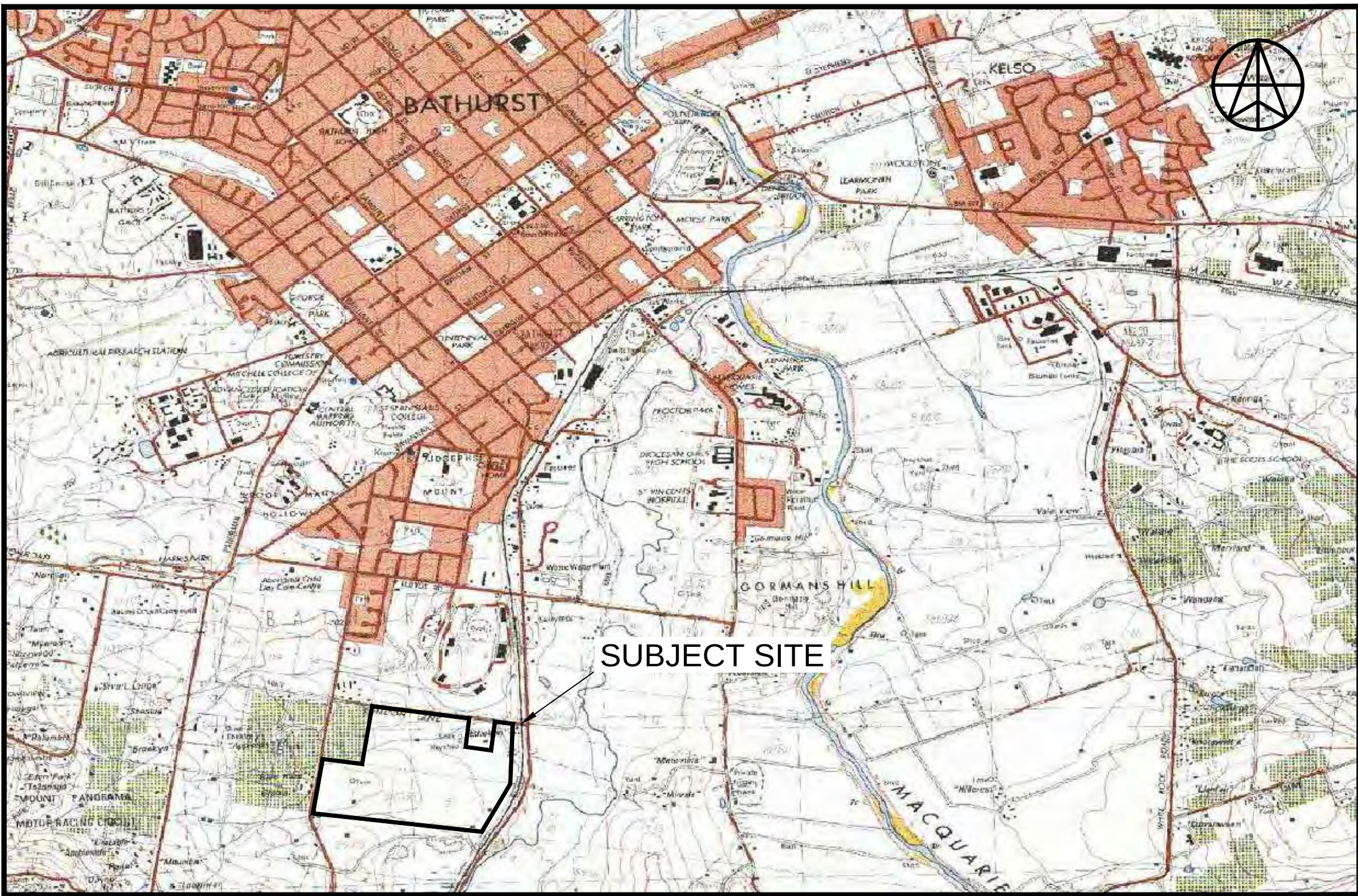
BATHURST HARNESS RACING

VALE ROAD, BATHURST

BATHURST HARNESS RACING

DEVELOPMENT APPLICATION

SCHEDULE OF DRAWINGS			
SHEET	TITLE	REV.	DATE
03A_E01	TITLE SHEET, DRAWING LIST, AND SITE LOCALITY	A	26/09/2012
03A_E02	EXISTING SITE LAYOUT	A	26/09/2012
03A_E03	PROPOSED SITE PLAN	A	26/09/2012
03A_E04	PROPOSED SERVICES LAYOUT	A	26/09/2012



SITE LOCALITY
NOT TO SCALE

No	DATE	DRAFTING CHECK	PM CHECK	DETAILS
A	26/09/12	AJW	AJW	ISSUED FOR APPROVAL

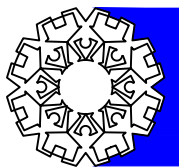
CHECKED/APPROVED	NAME	DATE
APPROVED	AJW	26/09/2012
SURVEY	-	
DESIGNER	MCKINNON DESIGN	26/09/2012
DRAFTING	MY	26/09/2012

APPROVAL AUTHORITY


BATHURST
REGIONAL
COUNCIL

CLIENT
BATHURST HARNESS
RACING

PROJECT
NEW RACETRACK
FOR BATHURST
HARNESS RACING


GEOLYSE

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DRAWING
TITLE SHEET, DRAWING LIST,
AND SITE LOCALITY

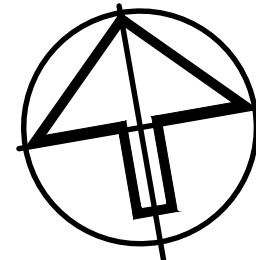
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PROJECT NUMBER: 211291 DRAWING SHEET: 03A_E01 ORIGINAL: A1

AUTOCAD FILE: 211291_03A_E01-E04.dwg 12D/CIVILCAD FILE: REVISION

STATUS: FOR REVIEW SHEET E01 OF E04 A

ETHELTON AVENUE



COLLEGE ROAD

RAILWAY

RAILWAY

DAM

DP 717842

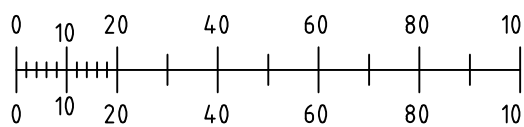
DP 540566

LEGEND:

CONTOUR (0.25m INTERVAL)

SITE BOUNDARY

SCALE 1:1500(A1)



SCALE 1:3000(A3)

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A	26/09/12	AJW	AJW	ISSUED FOR APPROVAL

CHECKED/APPROVED	NAME	DATE
APPROVED	AJW	26/09/2012
SURVEY	-	-
DESIGNER	MCKINNON DESIGN	26/09/2012
DRAFTING	MY	26/09/2012

APPROVAL AUTHORITY



CLIENT

BATHURST HARNESS RACING

PROJECT

NEW RACETRACK FOR BATHURST HARNESS RACING



ORANGE

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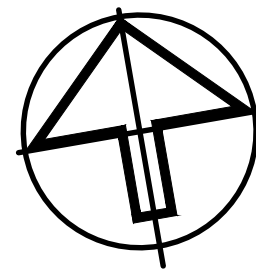
154 PEISLEY STREET
P.O. BOX 1963
ORANGE, NSW 2800
Ph. (02) 6393 5000
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DRAWING

EXISTING SITE LAYOUT

PERMANENT MARK:	RL:	DATUM: A.H.D.
PROJECT NUMBER: 211291	DRAWING SHEET: 03A_E02	ORIGINAL A1
AUTOCAD FILE: 211291_03A_E01-E04.dwg	12D/CIVILCAD FILE:	REVISION
STATUS: FOR REVIEW	SHEET E02 OF E04	A

ETHELTON AVENUE



COLLEGE ROAD

RAILWAY

RAILWAY

DAM

14
DP 717842

PUBLIC AREA

PARADE RING

STABLES

TRUCK/TRAILER
PARKING 43 SPACES

6
DP 540566

INTERSECTION ARRANGEMENT
TO BE AGREED WITH COUNCIL

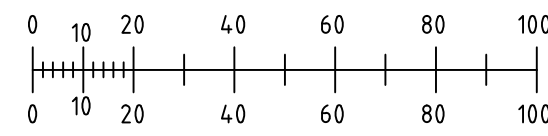
ENTRY ROADWAY

LEGEND:

CONTOUR (0.25m INTERVAL)

SITE BOUNDARY

SCALE 1:1500(A1)



SCALE 1:3000(A3)

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CHECKED/APPROVED	NAME	DATE
APPROVED	AJW	26/09/2012
SURVEY	-	
DESIGNER	MCKINNON DESIGN	26/09/2012
DRAFTING	MY	26/09/2012

APPROVAL AUTHORITY

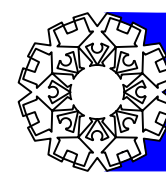


CLIENT

BATHURST HARNESS
RACING

PROJECT

NEW RACETRACK
FOR BATHURST
HARNESS RACING



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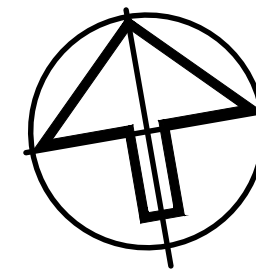
154 PEISLEY STREET
P.O. BOX 1963
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DRAWING

PROPOSED SITE PLAN

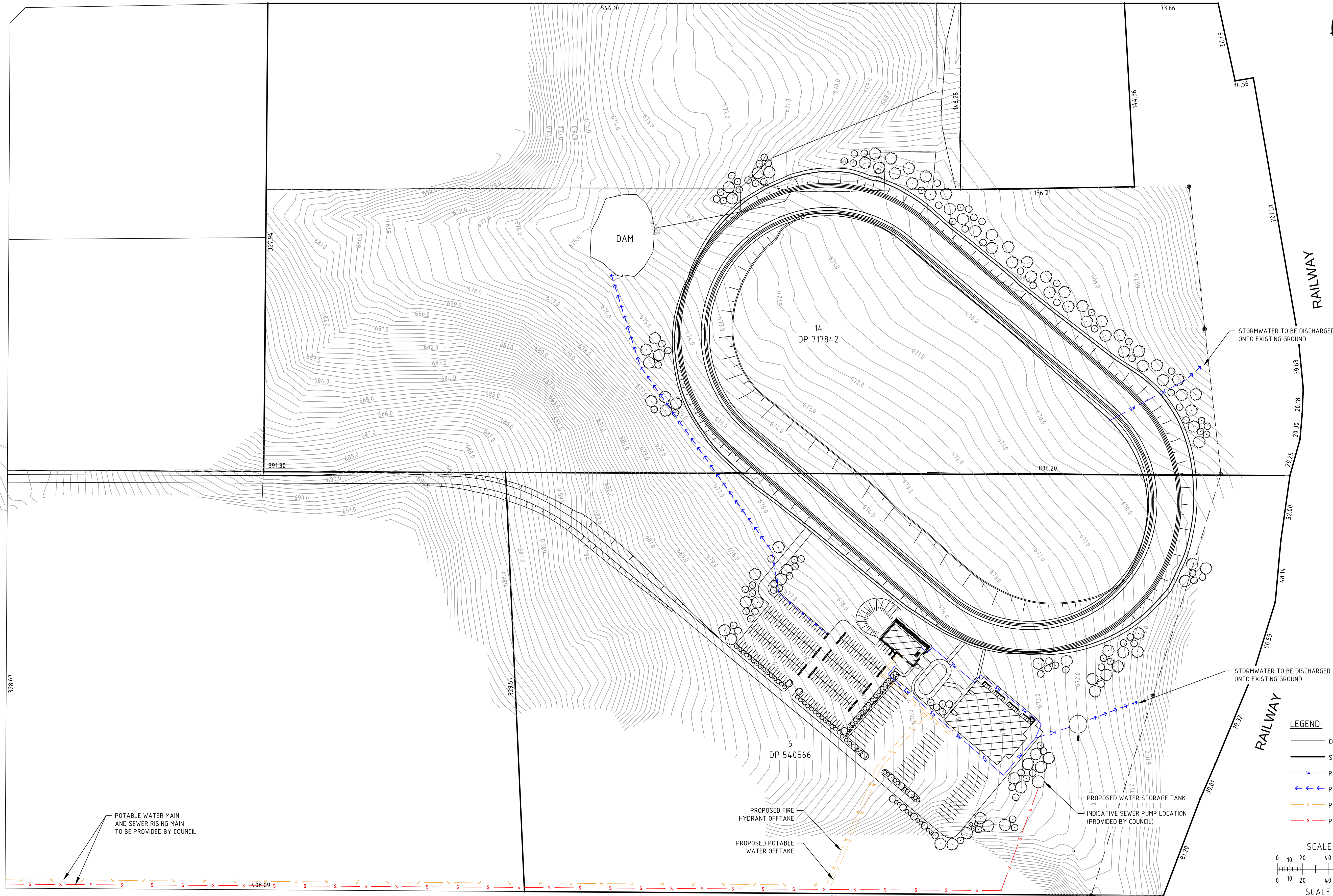
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AUTOCAD FILE:	211291_03A_E01-E04.dwg	12D/CIVILCAD FILE:	
STATUS:	FOR REVIEW	SHEET	E03 OF E04
		REVISION	A

ETHELTON AVENUE



COLLEGE ROAD

RAILWAY



LEGEND:

- CONTOUR (0.25m INTERVAL)
- SITE BOUNDARY
- SW — PROPOSED STORMWATER PIPE
- PROPOSED OPEN CHANNEL
- PROPOSED WATER MAIN
- S — PROPOSED SEWER MAIN

SCALE 1:1500(A1)
0 10 20 40 60 80 100

SCALE 1:3000(A3)
0 10 20 40 60 80 100

No	DATE	DRAFTING CHECK	PM CHECK	DETAILS
A	26/09/12	AJW	AJW	ISSUED FOR APPROVAL

CHECKED/APPROVED	NAME	DATE
APPROVED	AJW	26/09/2012
SURVEY	-	-
DESIGNER	MCKINNON DESIGN	26/09/2012
DRAFTING	MY	26/09/2012

APPROVAL AUTHORITY

BATHURST REGIONAL COUNCIL

CLIENT BATHURST HARNESS RACING

PROJECT NEW RACETRACK FOR BATHURST HARNESS RACING

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DRAWING PROPOSED SERVICES LAYOUT

PERMANENT MARK:	RL:	DATUM: A.H.D.
PROJECT NUMBER: 211291	DRAWING SHEET: 03A_E04	ORIGINAL A1
AUTOCAD FILE: 21291_03A_E04-E04.dwg	12D/CIVILCAD FILE:	REVISION
STATUS: FOR REVIEW	SHEET E04 OF E04	A

Appendix A

TRAFFIC IMPACT ASSESSMENT

TRAFFIC IMPACT ASSESSMENT
TO ACCOMPANY A DEVELOPMENT APPLICATION

PROPOSED RECREATIONAL FACILITY INCLUDING
HARNESS RACING TRACK AND ASSOCIATED
INFRASTRUCTURE

PREPARED FOR:
JOSS CONSTRUCTION

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The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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Introduction

1.1 BACKGROUND

Geolyse Pty Ltd has been commissioned by Joss Construction to prepare a traffic and parking assessment for a proposed new recreational facility including a harness racing track and associated infrastructure on College Road, Bathurst. The proposed development would involve the construction of a harness racing track together with a club building, broadcast box, stables, machinery shed and associated car parking and access roads. The proposed development layout and car parking details are provided in the **Drawings** attached to this report.

This report has been prepared in accordance with Section 14 – Parking of Bathurst Regional Council's *Bathurst Regional (Interim) Development Control Plan 2011*, the NSW Road and Traffic Authority's (RTA) *Guide to Traffic Generating Developments (GTGD)*, and Australian Standard AS2890.1:2004.

1.2 SITE LOCATION

The subject property is approximately 60 hectares and is located 3 kilometres south of Bathurst CBD and 820 metres east of Mount Panorama raceway.

The site is formed by three separate lots, as shown in **Plate 1** below, and is encompassed by College Road to the west, Ethelton Avenue to the north, and the Main Western Railway Line to the east. The property directly to the south is a single large rural lot with a single dwelling and a quarry. Vale Road to the east is an RMS road and there is an existing railway level crossing on Ethelton Avenue, approaching its intersection with Vale Road.

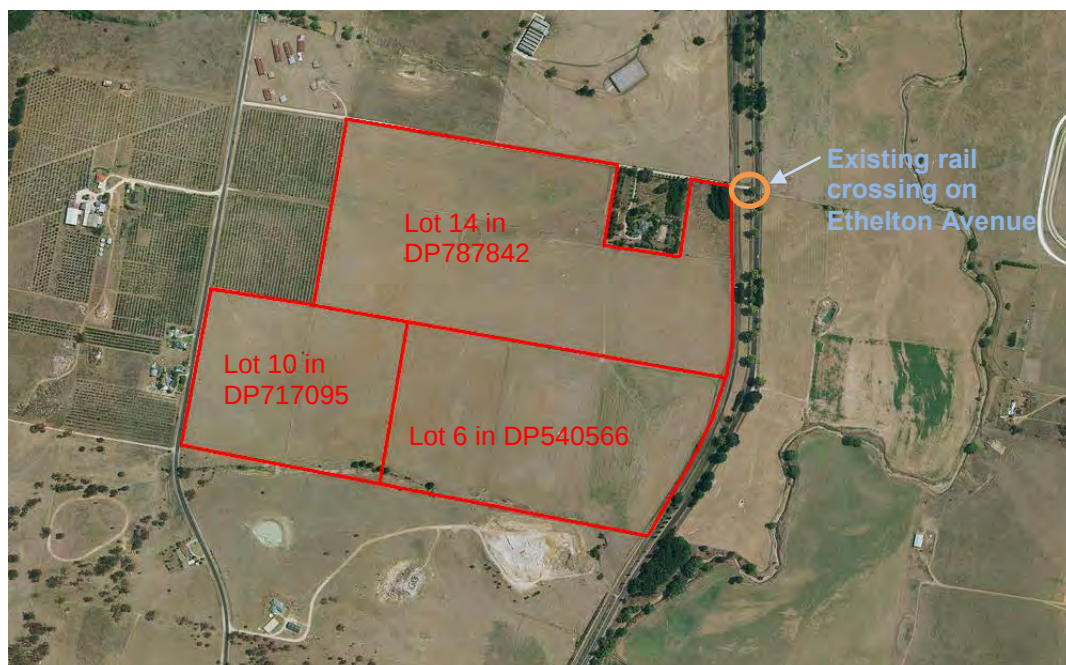


Plate 1 - The Subject Properties

Source: LPMA Six Viewer

The property is undulating and generally cleared of trees, having previously been used for grazing purposes. The property benefits from a small farm dam located roughly in the centre of Lot 14.

1.3 THE LOCALITY

The surrounding area is characterised by a mix of rural and rural residential lots. Two lots to the north-west of the property are in use as intensive orchards as are lots to the west. A single lot in use for rural residential purposes is located in the north-east corner of the area bounded by College Road, Ethelton Avenue and the Main Western Highway.

1.4 PROPOSED DEVELOPMENT

This application seeks consent for the development of a Recreation Facility, accommodating a 1040 metre long harness racing track together with a two storey club building, stables and machinery shed. It is also proposed that the central reservation of the harness track be used as a sports field, subject to agreement with a local sports club. The overall layout of the proposed development is shown on **Drawings 211291_03A_E01-E04**.

The proposed club building will feature at ground floor level a lounge, function area, bar and servery, viewing platform, terrace, broadcast box, toilets and gaming area. The basement of the club building will include storage areas, office space, meeting rooms, additional toilet facilities, bar and tote facilities.

The proposed stables will accommodate up to 102 horses at any one time including two (2) stallion boxes, two (2) urinals, four (4) wash bays, two (2) swab bays, a stewards room, a sick bay, an office, a store room, an owners and trainers room and male and female toilet facilities.

Access to the property will be via a sealed access road from College Road and the development proposes 241 public car parking spaces, with all movement areas being sealed. A separate parking area will accommodate a further 42 truck and trailer spaces for owners and trainers, as shown on **Drawings 211291_03A_E01-E04**.

1.5 METHODOLOGY

This report investigates the impact of the development of the Recreation Facility on the surrounding road network. The report will determine if additional traffic management facilities are required to safely and efficiently control the movement of all vehicular traffic to and from the site.

The establishment of the proposed Recreation Facility will generate an increase in the number and type of traffic movements on the roads surrounding the development site. The provision of safe and efficient means of access to and from the proposed Recreation Facility will be necessary to ensure the satisfactory operation of the complex.

This Traffic Study will address the existing traffic volumes on the roads surrounding the development site and estimate the increase in traffic volume associated with the Recreation Facility. The potential impacts of the additional traffic will be assessed and methods of alleviating the potential impacts and accommodating the requirements of the additional traffic will be determined.

The methodology for preparing the Traffic Study is outlined below.

- i) Review of the existing traffic data held by Bathurst Regional Council for the roads surrounding the development site.
- ii) Determine the traffic generation potential of the Recreation Facility and calculation of the peak daily and peak hour traffic volumes to be added to the existing traffic volumes on the roads surrounding the development site.
- iii) Assessment of the impact of the additional traffic generated by the Recreation Facility on the surrounding road network. Traffic impacts will be assessed in terms of:
 - road capacity;
 - road safety;
 - access requirements.
- iv) Determination of general site access requirements and provision for delivery vehicles and emergency vehicles.
- v) Determination of a schedule of required works that may be necessary to alleviate the potential impacts caused to the surrounding road network by the development of the Recreation Facility.

In summary, this Traffic Study will address the following specific issues:

- Traffic generated by the proposed development;
- Points of access to and from the Recreation Facility;
- Impact on road safety;
- Car parking requirements;
- Impact on safety and amenity of the surrounding road network; and
- Movement and operation of delivery vehicles.

Existing Traffic Conditions

2.1 ROAD NETWORK HIERARCHY

The Roads and Traffic Authority (1984) proposes four basic road classes as the basis for the functional hierarchy of a road network.

A functional classification takes into account the relative balance of the traffic mobility function and amenity/access functions of streets and roads and defines the purpose of a road within the context of an urban area.

The four road classes are arterial, sub-arterial, collector and local roads and are defined below.

- **Arterial Roads**

Roads whose main function is to carry through traffic from one region to another forming the principal means of communication for major traffic movements.

- **Sub-Arterial Roads**

Those roads which supplement the arterial roads in providing for through traffic movement to an individually determined limit that is sensitive to both roadway characteristics and adjoining land uses.

- **Collector Roads**

Roads that distribute traffic between the arterial roads and the local street system and provide access to adjoining property.

- **Local Roads**

Subdivisional roads whose main traffic function is to provide access to adjoining property.

2.2 EXISTING ROADWAY CONDITIONS

2.2.1 COLLEGE ROAD

College Road is a bitumen sealed two lane two way local road with a varying cross section. Adjacent to the site the road is 7m wide with grass verge and table drains either side. College Road has a posted speed limit of 80km/hr adjacent to the site. Approximately 300 m to the north of the proposed access to the site the posted speed limit drops to 60 km/hr.

To the north of the site College Road is divided by a 4.5m wide grassed median with two 6m wide travel lanes up to the intersection with Lloyds Road. North of the intersection with Lloyds Road College Road is undivided and 13m wide with a posted speed limit of 50km/hr.

The intersection of College Road and Lloyds Road to the north of the site is controlled by Give Way signage and line marking on Lloyds Road with priority given to College Road

College Road to the north of the site ends at a T-Intersection with Havannah Street with control provided via Give Way signage and line marking on College Road.

2.2.2 ETHELTON AVENUE

Ethelton Avenue is a gravel surface single lane two way local road connecting College Road to Vale Road. It has a varying carriageway width of between approximately 8m and 12m with grass verge and table drains either side. It has no posted speed signage however College Road and Vale Road have posted speed limits of 80km/hr at either end of Ethelton Avenue.

A railway level crossing is currently provided on Ethelton Avenue 32 m from the edge of Vale Road, providing limited storage for vehicles between the railway and Vale Road. Due to the lack of storage on Ethelton Avenue between the rail crossing and Vale Road combined with the poor vertical alignment and substandard condition of the road it is proposed to block Ethelton Avenue to through traffic. This would prevent vehicles from using the road as an access route to the site and force all traffic to access the site via College Road.

Whilst the final details for the proposed blockage of Ethelton Avenue are to be finalised with Bathurst Regional Council it is proposed to prevent through traffic via a break and/or barrier at some point along the road. This will eliminate through traffic whilst still providing for access to local properties along Ethelton Avenue.

2.3 EXISTING ROADWAY CAPACITY

The provision of roads within an urban area provides four main functions:

- i) to cater for moving vehicles;
- ii) to cater for parked vehicles;
- iii) to cater for pedestrians and bicycle traffic; and
- iv) to allow for development and to provide access to adjoining property.

In carrying out the above functions, a road must also be capable of handling the traffic demands placed on it. Roads have varying capacities dependent on the function they are performing. The United States Highway Capacity Manual defines capacity as follows:

“Capacity is the maximum number of vehicles which has a reasonable expectation of passing over a given section of a lane or roadway in one direction (or in both directions for a two-lane or three-lane highway) during a given time period under prevailing roadway and traffic conditions.”

The physical characteristics of a roadway such as lane width, alignment, frequency of intersections etc make up the prevailing roadway conditions.

Based upon its capacity and a driver's expectations of the operational characteristics of a traffic stream is a qualitative measure denoted as the level of service of a road.

Level of service definitions combine such factors as speed, travel time, safety, convenience and traffic interruptions and fall into six levels of service categories ranging from A down to F.

The *AUSTROADS Guide to Traffic Engineering Practice* describes Level of Service A as:

A condition of a free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high and the general level of comfort and convenience provided is excellent.

The categories are graduated from Level of Service A down through six levels to Level of Service F that is a zone of forced flow. If the amount of traffic approaching the point under consideration exceeds that which can pass it flow breakdowns occur and queuing and delays result.

The existing connections onto the surrounding road network provide access to and from the development site via a system of roads regulated by efficient traffic controls such as intersection controls. With Ethelton Avenue is permanently closed College Road will become the only access route to the site.

Based on the physical configuration of College Road in the vicinity of the development site, observations of traffic movements and the methodology outlined in Part 2 *Roadway Capacity* of *AUSTROADS Guide to Traffic Engineering Practice*, the capacity and Level of Service of College Road can be determined as - Level of Service A with a two way capacity of 1,800 vehicles per hour.

2.4 ANNUAL AVERAGE DAILY TRAFFIC

Annual Average Daily Traffic (AADT) is defined as the total volume of traffic passing a roadside observation point over a period of a year divided by the number of days in the year.

Bathurst Regional Council took traffic counts on College Road 60 metres south of Ethelton Avenue from 22 February 2012 to 7 March 2012. Over this period the average daily traffic was calculated to be 300 vehicles per day (split evenly in each travel direction).

2.5 PEAK HOUR TRAFFIC

The traffic count data from Council gave traffic counts for every 15 minutes. **Table 2.1** contains a summary of these daily traffic counts converted to hourly counts

Table 2.1 - College Street Traffic Counts

Time	Morning – AM Traffic Counts per lane Veh/hr	Evening – PM Traffic Counts per lane Veh/hr
12.00 – 1.00	0	34
1.00 – 2.00	0	33
2.00 – 3.00	0	35
3.00 – 4.00	0	27
4.00 – 5.00	2	20
5.00 – 6.00	4	8
6.00 – 7.00	4	4
7.00 – 8.00	9	4
8.00 – 9.00	19	4
9.00 – 10.00	25	3
10.00 – 11.00	34	1
11.00 – 12.00	36	1

Source: Bathurst Regional Council

As shown in **Table 2.1** the AM peak occurred between 11.00 – 12.00 am with a peak of 36 veh/hr and the PM peak occurred between 2.00 – 3.00 pm with a peak of 35 veh/hr.

Impacts

3.1 TRAFFIC GENERATION OF THE PROPOSED DEVELOPMENT

3.1.1 THE DEVELOPMENT

The proposed development is a Recreation Facility, accommodating a 1040 metre long harness racing track together with a two storey club building, stables and machinery shed. It is also proposed that the central reservation of the harness track be used as a sports field, subject to agreement with a local sports club. The overall layout of the proposed development is shown on **Drawings 211291_03A_E01-E04**.

The hours of operation for the Recreation Facility would be 1:00pm to 6:00pm for day meetings and 6:00pm to 10:00pm for night meetings with meetings held generally on Wednesday nights however meetings are also held Thursday's through to Monday's. The development would employ up to 24 staff, with 18 staff at an average meeting.

3.1.2 TRAFFIC GENERATION

The Roads and Traffic Authority's *Guide to Traffic Generating Developments* publishes data on the traffic generating potential of various developments ranging from residential subdivisions, commercial premises, retail premises and industrial developments.

The RTA's guide states that '*Recreational and tourist facilities are site and type specific in their operation and traffic generation, often with seasonal variations in usage. Ideally, analysis of proposed developments should be based on surveys of similar developments. If this is not possible a first principles analysis is required*'.

As no existing data is available a first principles analysis is provided below.

3.1.2.1 Peak Hour Traffic Generation

The facility is expected to have 52 meetings/year, 50 of these will have up to 300 attendees, with 2 of the meetings having up to 2000 attendees. The two major meetings are the 'Carnival of Cups' on the 26th of December and the 'Gold Crown Final Night' on the last Saturday in March. The breakup of the scheduled meetings by day of the week and day or night is provided in **Table 3.1** below. The figures in **Table 3.1** show that Wednesday nights are the most common meeting scheduled with Tuesday being the only day of the week with no meetings scheduled.

Table 3.1 – Annual Meeting Schedule

Day/Night	Day of Week	No of Meetings
Day	Thursday	2
	Friday	2
	Sunday	4
	Monday	1
Night	Wednesday	30
	Thursday	1
	Friday	6
	Saturday	5
	Monday	1

Source: Bathurst Harness Racing

Bathurst Harness Racing have stated that most attendees come to the site 30 minutes before the first race and leave 30 minutes after the last race with staff and trainers arriving and departing 1 hour before the first race and 1 hour after the last race. For a day meeting this will put the peak traffic flows at 12.00-1.00 pm and 6.00-7.00 pm, for a night meeting the peaks will be at 5.00-6.00 pm and 10.00–11.00 pm.

Assuming:

75% of attendees arrive in the peak hours;

10% of staff, drivers and trainers arrive in the peak hour;

2000 attendees, 24 staff, 35 drivers, 45 trainers and 25 stable hands at the two major events;

300 attendees, 18 staff, 30 drivers, 40 trainers and 20 stable hands at the minor events; and

Average vehicle occupancy of 2 persons/vehicle for attendees, 1.5 persons/vehicle for staff, trainers and stable hands and 1 person/vehicle for drivers.

Based on the above assumptions the peak hourly traffic generation of the development for a major event can be calculated as 760 vehicles/hour.

The peak hourly traffic generation of the development for the remaining minor events can be calculated as 121 vehicles/hour

3.1.2.2 Daily Traffic Generation

The number of daily vehicles trips generated by the development can be determined based on the data provided in **Section 3.1.2.1** and the following additional information:

- Each staff member, driver, trainer and stable hand generates an additional 0.5 vehicle trips per meeting accounting for possible offsite errands or additional trips to and from home;
- 5% of the attendees generate an additional 2 vehicle trips per meeting accounting for the potential for a small number of attendees to leave and return to the site during the meet; and
- All delivery vehicles access the site on non-race days

Therefor the total peak daily trips generated by the development for a major event can be calculated as 2460 vehicles/day

The total peak daily trips generated by the development for a minor event can be calculated as 548 vehicles/day

3.1.3 TRAFFIC DISTRIBUTION

Based on the geometry and connectivity of College Road it as assumed that all traffic generated by the development would be from the northern end of college road with no vehicles accessing or leaving the site via the southern end of College Road.

3.2 DELIVERY VEHICLES

Bathurst Harness Racing has advised that delivery vehicles would be as follows:

- Westco- 1 x 6 tonne truck per meeting
- Milkman- 1 x 3 tonne truck per meeting
- Larkin Bros- 1 x ute per meeting
- Top Dress Truck- 1 x 33 tonne truck and dog trailer every 3 months

Deliveries would occur between 8:00am and 5:00pm typically the day before the meeting. All deliveries will be via the site entrance on College Road.

3.3 IMPACT OF THE GENERATED DEVELOPMENT

3.3.1 BASIS OF ASSESSMENT

The impact of the traffic generated by the proposed development on the surrounding road network will be assessed in terms of:

- i) Traffic Volume;
- ii) Intersection Capacity; and
- iii) Access requirements.

The impact of the increased peak daily traffic and peak hour traffic volume on College Road will be assessed. The intersection of the access to the Recreation Facility with College Road will be evaluated to determine operational capacity and efficiency.

3.3.2 TRAFFIC VOLUME

3.3.2.1 Peak Hour

The expected peak hour traffic volume of 760 trips per hour generated by the development of the Recreation Facility during a major event will impact on the existing traffic volumes on College Road. It should be noted that the traffic generated by the development will be primarily around the start and end times of each event with traffic traveling in one direction – that is either inbound at the beginning or outbound at the end of the event. As all traffic will be travelling to/from the northern end of College Road to the site the peak traffic will be concentrated on one side of the road. To allow for this the impact on College Road will be assessed in terms of the each individual direction of travel. A comparison of the estimated existing peak hour traffic volumes on each lane of the road with the total estimated peak hour traffic volume following the development of the Recreation Facility is indicated in **Table 3.2**.

Table 3.2 - Comparison of Existing and Post Development Peak Hour Traffic Volumes on College Road

Time Period	Lane	Existing Peak Hour Traffic (veh/hr)	Post Development Peak Hour Traffic (veh/hr)	% Increase
12.00 – 1.00 pm (minor event)	Southbound	34	155	356%
5.00 – 6.00 pm (minor event)	Southbound	8	129	1,513%
5.00 – 6.00 pm (major event)	Southbound	8	768	9,500%
6.00 – 7.00 (minor event)	Northbound	4	125	3,025%
10.00 – 11.00 (minor event)	Northbound	4	125	3,025%
10.00 – 11.00 (major event)	Northbound	1	761	76,100%

Whilst the percentage increase in the peak hourly traffic post development is exceptionally high at up to 76,100% during the evening peak at a major event it should be noted that this is primarily due to the extremely low existing peak hourly traffic volume on College Road. Furthermore the period of time in which the peak hourly traffic is generated by the development does not coincide with the existing periods of peak hourly traffic flows.

Reference to **Section 2.3** of this Report indicates that College Road has a capacity of 1,800 vehicles per hour which equates to 900 vehicles per lane per hour. The maximum estimated post development peak hour volume of 768 vehicles per hour during a major event is approximately 85% of this capacity. Whilst this is putting the road at close to capacity this will only occur twice a year and be isolated to one lane with peak flows falling quickly either side of the peak hour. For minor events the maximum peak hourly traffic volume of 155 vehicles per hour represents only approximately 17.2% of the road capacity.

Thus the additional peak hour traffic generated by the development during major events will be able to be accommodated by the existing road network whilst the additional peak hour traffic generating during minor events is easily accommodated by the existing road network.

3.3.2.2 Daily Traffic

The expected additional daily traffic volume of 2,460 vehicles per day generated from the development during a major event will impact on the existing daily traffic volumes on College Road. A comparison of the existing daily traffic volumes and the estimated traffic volumes post development is indicated in **Table 3.3**.

Table 3.3 - Comparison of Existing and Post Development Peak Daily Traffic Volumes on College Road

Road	Existing daily traffic (veh/day)	Post Development AADT (veh/day)	% Increase
Minor Event	300	848	183%
Major Event	300	2,760	820%

Whilst the percentage increase in the peak daily traffic post development is extremely high at up to 820% during a major event it should be noted that this is primarily due to the extremely low existing daily traffic volume on College Road. More importantly the post development peak daily traffic volume is still quite mild at 2,760 vehicles per day and this is only for two days each year. For minor events, which only occur on average once per week, the anticipated post development peak daily traffic volume is significantly lower at 792 vehicles per day. Averaged over the year the post development daily traffic volume is only 389 vehicles per day which represents a 30% increase.

Notwithstanding this increase, the impact of the additional traffic generated by development of the Recreation Facility on the surrounding road network is limited and the classification of the surrounding roads will not change following development of the Recreation Facility.

3.3.3 SITE ACCESS

Access to the Recreation Facility will be provided by a driveway constructed off College Road at the frontage of the site. The access driveway will be located approximately 365m south of the College Road and Ethelton Avenue intersection.

The access point to the site will be designed and constructed to ensure safe and efficient operation for all vehicle movements. The access point to the site will be designed and constructed as a rural access driveway in accordance with Bathurst Regional Council's *Guidelines for Engineering Works*. All entry and exit points will also be sign posted in accordance with Council's policy codes.

To assess the capacity and adequacy of the access off College Road the intersection was assessed using SIDRA Intersection modelling software.

SIDRA Intersection is a computerised traffic evaluation tool which is used in the assessment and design of intersection treatments in terms of capacity and operation. The program provides outputs which include delays, queue lengths, total capacities, travel times, and average speeds. SIDRA Intersection is the preferred intersection analysis tool of the RTA and many Local Government Authorities.

As part of the intersection analysis, the SIDRA Intersection model provides an “Average Control Delay” for each approach of the intersection. This control delay is the average delay per vehicle over the peak hour as a result of the intersection and is grouped into six bands labelled A through to F (with ‘A’ being best and ‘F’ being over capacity), termed Level of Service (LOS). The overall Level of Service for a ‘Give Way’ intersection is the LOS result for the worst case turning movement.

The following assumptions were included in the SIDRA analysis:

- Intersection traffic and turning movements refer **Plates 8 and 9**
- Control type: Give Way
- Lane widths assumed: 3.3 m
- Approach lengths on College Road: 500 m each way
- Approach length on new Access Road: 500 m
- Approach/exit cruise speeds on new Access Road: 40kph
- Approach/exit cruise speeds on College Road north: 60kph
- Approach/exit cruise speeds on College Road south: 80kph
- Heavy Vehicle percentage: 0%

Based on the above assumptions, a SIDRA Intersection analysis was carried out for the intersection for the left turn in (beginning of a major event - worst case scenario) and right turn out (end of a major event - worst case scenario) with the outputs from this assessment summarised in **Tables 3.4 and 3.5**.

Table 3.4 - SIDRA Intersection – Left Turn In Results Summary

Scenario	Average Control Delay (Seconds)	LOS	Largest 95% Queue Length (metres)
Right Turn into new Access Road	14.8	B	0
Left Turn into new Access Road	7.2	A	0
Right Turn Out of new Access Round	7.5	A	0
Left Turn Out of new Access Road	7.4	A	0
Southbound College Street	0.0	A	0
Northbound College Street	6.3	A	0

Table 3.5 - SIDRA Intersection – Right Turn Out Results Summary

Scenario	Average Control Delay (Seconds)	LOS	Largest 95% Queue Length (metres)
Right Turn into new Access Road	11.1	A	0
Left Turn into new Access Road	7.2	A	0.0
Right Turn Out of new Access Round	6.1	A	36
Left Turn Out of new Access Road	6.0	A	36
Southbound College Street	0.0	A	0
Northbound College Street	2.6	A	0

As can be seen from the above summary, the worst turning movement is the right turn into the new Access Road during peak hour at the beginning of a major event. The number of vehicles expected to undertake this movement is arguably nil. Notwithstanding it was assumed 1 vehicle would attempt this manoeuvre and it is seen that the average delay was 14.8 seconds corresponding Level of Service B for this movement.

Hence assuming no right turn in movements the proposed intersection will function well at an overall Level of Service A.

3.3.4 IMPACT SUMMARY

The assessment of the impact of the traffic generated by the proposed development on the surrounding road network has been carried out in terms of:

- i) Traffic Volume;
- ii) Intersection Capacity; and
- iii) Access requirements

The greatest percentage increase in the peak daily traffic on College Road following development of the Recreational Facility occurs during major events with an increase of approximately 820%. Whilst this increase appears extremely high it was found that this was primarily due to the extremely low existing daily traffic volume on College Road and only occurs twice per year. Averaged over the year the post development daily traffic volume is only 389 vehicles per day which represents a 30% increase.

The greatest percentage increase in the peak hourly traffic on College Road following development of the Recreational Facility occurs during major events with an increase of over 76,000%. Whilst this increase appears exceptionally high it was found that this was due to the extremely low existing peak hourly traffic volume on College Road. During major events the post development peak hourly flow represented 85% of the road capacity however this reduced to 17.2% for minor events.

Notwithstanding the substantial increase in daily and peak hour traffic volumes on a section of College Road, the overall impact of the additional traffic generated by the proposed Recreation Facility on the surrounding road network is limited and the classification of the surrounding roads will not change following the development of the Recreation Facility.

The provision of a new access off College Road to the proposed Recreation Facility in accordance with Council's Policy codes will see a safe and efficient access provided to the development. The

capacity and adequacy of the proposed access treatment was analysed using SIDRA Intersection modelling software and found to function well at an overall Level of Service A.

Hence the increase in traffic volume as a result of the development is capable of being dispersed and absorbed into the surrounding road network with minor impact on the existing traffic facilities.

Proposed Traffic Facilities

4.1 ON-SITE PARKING

To determine the minimum provision of on-site car parking required to be provided for the proposed Recreation Facility reference was made to Bathurst Regional Council's *Development Control Plan (Interim 2011) (DCP)*. The DCP did not contain any specific rates for parking requirements for a Recreational Facility such as proposed by this development.

The Roads and Traffic Authority's *Guide to Traffic Generating Developments* publishes data on the parking requirements for specific land uses ranging from residential subdivisions, commercial premises, retail premises and industrial developments.

The RTA's guide states that '*Research by the RTA has failed to find a conclusive relationship between parking demand and the size and nature of the recreation facilities surveyed, indicating that the number of parking spaces required is best determined by the nature of the proposed development. Comparisons may be drawn from surveys conducted by the RTA on particular recreation facilities and other similar facilities.*'

The guide does not contain any results of similar developments and as such a first principles analysis to determine the required number of parking spaces is provided below.

As stated in **Section 3.1.2.1** assuming an average vehicle occupancy rate of 2 persons/vehicle for attendees and 1.5 persons/vehicle for staff, trainers and stable hands the following number of required car spaces can be determined:

Minor Event: $300/2 + 78/1.5 = 202$ spaces

Major Event: $2000/2 + 94/1.5 = 1,063$ spaces

It is proposed to provide 240 standard car parking spaces together with an additional 5 disabled car parking spaces. Furthermore an additional spill over parking area for major events is provided on grassed areas within the site. The proposed parking area also has provision for a bus and taxi drop off point.

Assuming 1 person/large vehicle for the harness racing drivers gives a maximum requirement of 35 large vehicle spaces for a major event.

It is proposed to provide 42 large vehicle parking spaces together with large manoeuvring areas around these spaces in a separate car park adjacent to the proposed stables.

In accordance with Bathurst Regional Council's *Development Control Plan (Interim 2011) (DCP)* a minimum of 10 bicycle parking spaces will be provided close to the entrance to the club building.

Hence the provision of 245 car parking spaces, 10 bicycle parking spaces, 35 large vehicle parking spaces and grassed spill over parking areas within the proposed development will be adequate for the proposed development. The layout of the car parking spaces, aisle access widths and provision for disabled parking and access will be designed in accordance with AS:NZS:2890 and Council's requirements.

4.2 SERVICE VEHICLE ACCESS

Bathurst Harness Racing has advised that delivery vehicles would be as follows:

- Westco- 1 x 6 tonne truck per meeting
- Milkman- 1 x 3 tonne truck per meeting
- Larkin Bros- 1 x ute per meeting
- Top Dress Truck- 1 x 33 tonne truck and dog trailer every 3 months

Whilst delivery vehicles would access the site via the general traffic entrance road and access the loading area via the general public carpark, deliveries would occur between 8:00am and 5:00pm typically the day before the meeting to eliminate any conflict between delivery vehicles and general public traffic.

The new access off College Road together with the entrance road and heavy vehicle travel paths within the car park will be designed with sufficient width to cater for the swept path of a 33 tonne truck and dog trailer entering and exiting the site.

Conclusion

5.1 SUMMARY

This Traffic Study has evaluated the traffic generating potential of the proposed Recreation Facility and assessed the impact of the traffic generated by the Recreation Facility on the surrounding road network in terms of:

- i) Traffic Volume;
- ii) Intersection Capacity; and
- iii) Access requirements

The greatest percentage increase in the peak daily traffic on College Road following development of the Recreational Facility occurs during major events with an increase of approximately 820%. Whilst this increase appears extremely high it was found that this was primarily due to the extremely low existing daily traffic volume on College Road and only occurs twice per year. Averaged over the year the post development daily traffic volume is only 389 vehicles per day which represents a 30% increase.

The greatest percentage increase in the peak hourly traffic on College Road following development of the Recreational Facility occurs during major events with an increase of over 76,000%. Whilst this increase appears exceptionally high it was found that this was due to the extremely low existing peak hourly traffic volume on College Road. During major events the post development peak hourly flow represented 85% of the road capacity however this reduced to 17.2% for minor events.

Notwithstanding the substantial increase in daily and peak hour traffic volumes on a section of College Road, the overall impact of the additional traffic generated by the proposed Recreation Facility on the surrounding road network is limited and the classification of the surrounding roads will not change following the development of the Recreation Facility.

The provision of a new access off College Road to the proposed Recreation Facility in accordance with Council's Policy codes will see a safe and efficient access provided to the development. The capacity and adequacy of the proposed access treatment was analysed using SIDRA Intersection modelling software and found to function well at an overall Level of Service A.

Hence the increase in traffic volume as a result of the development is capable of being dispersed and absorbed into the surrounding road network with minor impact on the existing traffic facilities

5.2 RECOMMENDATIONS

In completing the assessment of the impact of the traffic generated by the Recreation Facility, the following recommendations are made:

- The increase in AADT and peak hourly traffic on the roads surrounding the development site will not change the classification of the roads under a functional road hierarchy.
- The access point to the site shall be designed and constructed as a rural access driveway in accordance with Bathurst Regional Council's *Guidelines for Engineering Works*.
- A minimum of 245 car parking spaces, 10 bicycle parking spaces, 35 large vehicle parking spaces and grassed spill over parking areas shall be provided with the development with the layout of car parking spaces, aisle access widths and provision for disabled parking and access designed in accordance with AS:NZS:2890 and Council's requirements.

- The detailed design of the development shall make provision for disabled set down and parking areas, bus and taxi drop off areas, delivery vehicle parking, waste collection facilities and service vehicle parking.
- The design of all works shall be carried out to the appropriate standards and the requirements of Bathurst Regional Council.

References

AUSTROADS 1988, *Guide to Traffic Engineering Practice. Part 2. Roadway Capacity*

AUSTROADS 1988, *Guide to Traffic Engineering Practice. Part 3. Traffic Studies.*

AUSTROADS 1988, *Guide to Traffic Engineering Practice. Part 5. Intersections at Grade.*

AUSTROADS 1988, *Guide to Traffic Engineering Practice. Part 10 Local Area Traffic Management.*

Ogden, K.W. and Bennett, D.W. (Eds) 1984, *Traffic Engineering Practice. Third Edition.* Dept of Civil Engineering Monash University.

Roads and Traffic Authority of NSW. 1991, Road Design Guide Section 4 - Intersections at Grade.

Roads and Traffic Authority (RTA). 2002, *Guide to Traffic Generating Developments*, Version 2.2, Roads and Traffic Authority, Sydney.

Standards Australia AS2890.1:2004 "Off-street Car Parking"

Drawings

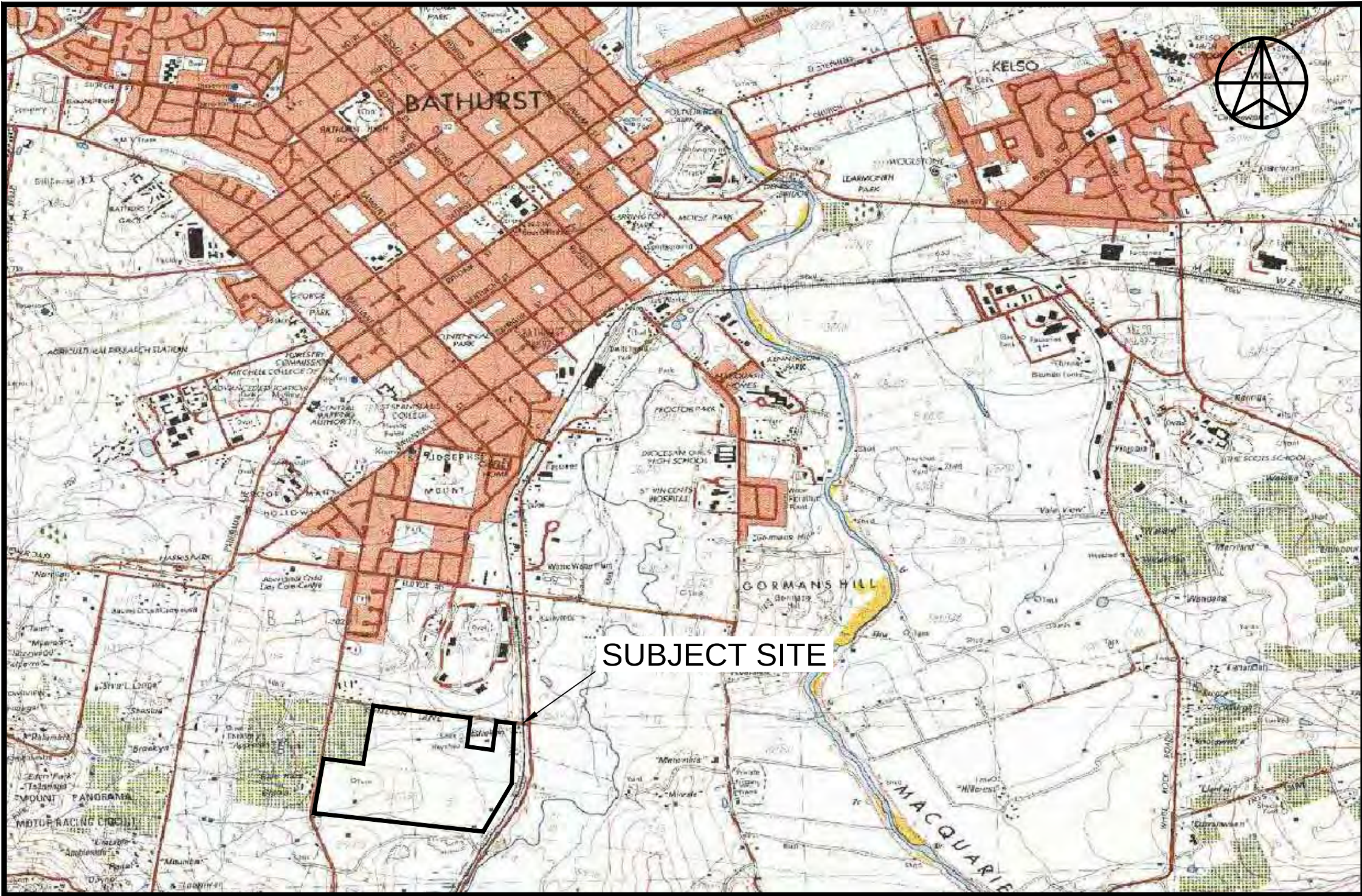
BATHURST HARNESS RACING

VALE ROAD, BATHURST

BATHURST HARNESS RACING

DEVELOPMENT APPLICATION

SCHEDULE OF DRAWINGS			
SHEET	TITLE	REV.	DATE
03A_E01	TITLE SHEET, DRAWING LIST, AND SITE LOCALITY	A	26/09/2012
03A_E02	EXISTING SITE LAYOUT	A	26/09/2012
03A_E03	PROPOSED SITE PLAN	A	26/09/2012
03A_E04	PROPOSED SERVICES LAYOUT	A	26/09/2012



SITE LOCALITY
NOT TO SCALE

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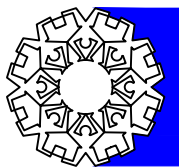
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SURVEY	-	
DESIGNER	MCKINNON DESIGN	26/09/2012
DRAFTING	MY	26/09/2012

APPROVAL AUTHORITY


BATHURST
REGIONAL
COUNCIL

CLIENT
BATHURST HARNESS
RACING

PROJECT
NEW RACETRACK
FOR BATHURST
HARNESS RACING


GEOLYSE

ORANGE

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Ph. (02) 6393 5000
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orange@geolyse.com
www.geolyse.com

DRAWING
TITLE SHEET, DRAWING LIST,
AND SITE LOCALITY

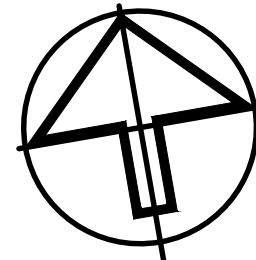
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AUTOCAD FILE: 211291_03A_E01-E04.dwg 12D/CIVILCAD FILE: REVISION

STATUS: FOR REVIEW SHEET E01 OF E04 A

ETHELTON AVENUE



COLLEGE ROAD

RAILWAY

RAILWAY

DAM

DP 717842

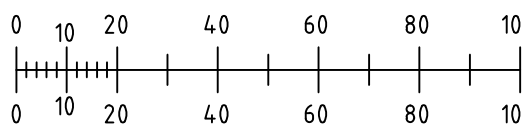
DP 540566

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CONTOUR (0.25m INTERVAL)

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SCALE 1:3000(A3)

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CHECKED/APPROVED	NAME	DATE
APPROVED	AJW	26/09/2012
SURVEY	-	-
DESIGNER	MCKINNON DESIGN	26/09/2012
DRAFTING	MY	26/09/2012

APPROVAL AUTHORITY



CLIENT

BATHURST HARNESS RACING

PROJECT

NEW RACETRACK FOR BATHURST HARNESS RACING



ORANGE

orange@geolyse.com
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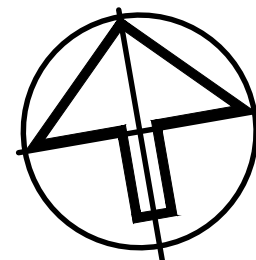
154 PEISLEY STREET
P.O. BOX 1963
ORANGE, NSW 2800
Ph. (02) 6393 5000
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DRAWING

EXISTING SITE LAYOUT

PERMANENT MARK:	RL:	DATUM: A.H.D.
PROJECT NUMBER: 211291	DRAWING SHEET: 03A_E02	ORIGINAL A1
AUTOCAD FILE: 211291_03A_E01-E04.dwg	12D/CIVILCAD FILE:	REVISION
STATUS: FOR REVIEW	SHEET E02 OF E04	A

ETHELTON AVENUE



COLLEGE ROAD

RAILWAY

RAILWAY

INTERSECTION ARRANGEMENT
TO BE AGREED WITH COUNCIL

ENTRY ROADWAY

DAM

14
DP 717842

PUBLIC AREA

PARADE RING

STABLES

6
DP 540566

TRUCK/TRAILER
PARKING 43 SPACES

24
SPACES

CARPARKING

TROTTER TRACK

TRACK

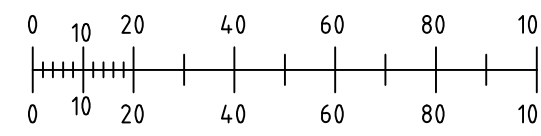
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SITE BOUNDARY

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SCALE 1:3000(A3)

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APPROVED	AJW	26/09/2012
SURVEY	-	
DESIGNER	MCKINNON DESIGN	26/09/2012
DRAFTING	MY	26/09/2012

APPROVAL AUTHORITY

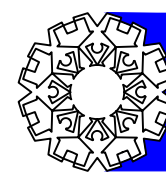


CLIENT

BATHURST HARNESS
RACING

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NEW RACETRACK
FOR BATHURST
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DRAWING

PROPOSED SITE PLAN

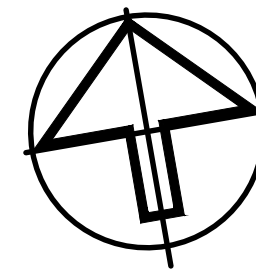
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STATUS:	FOR REVIEW	SHEET	E03 OF E04

ORIGINAL
A1

REVISION

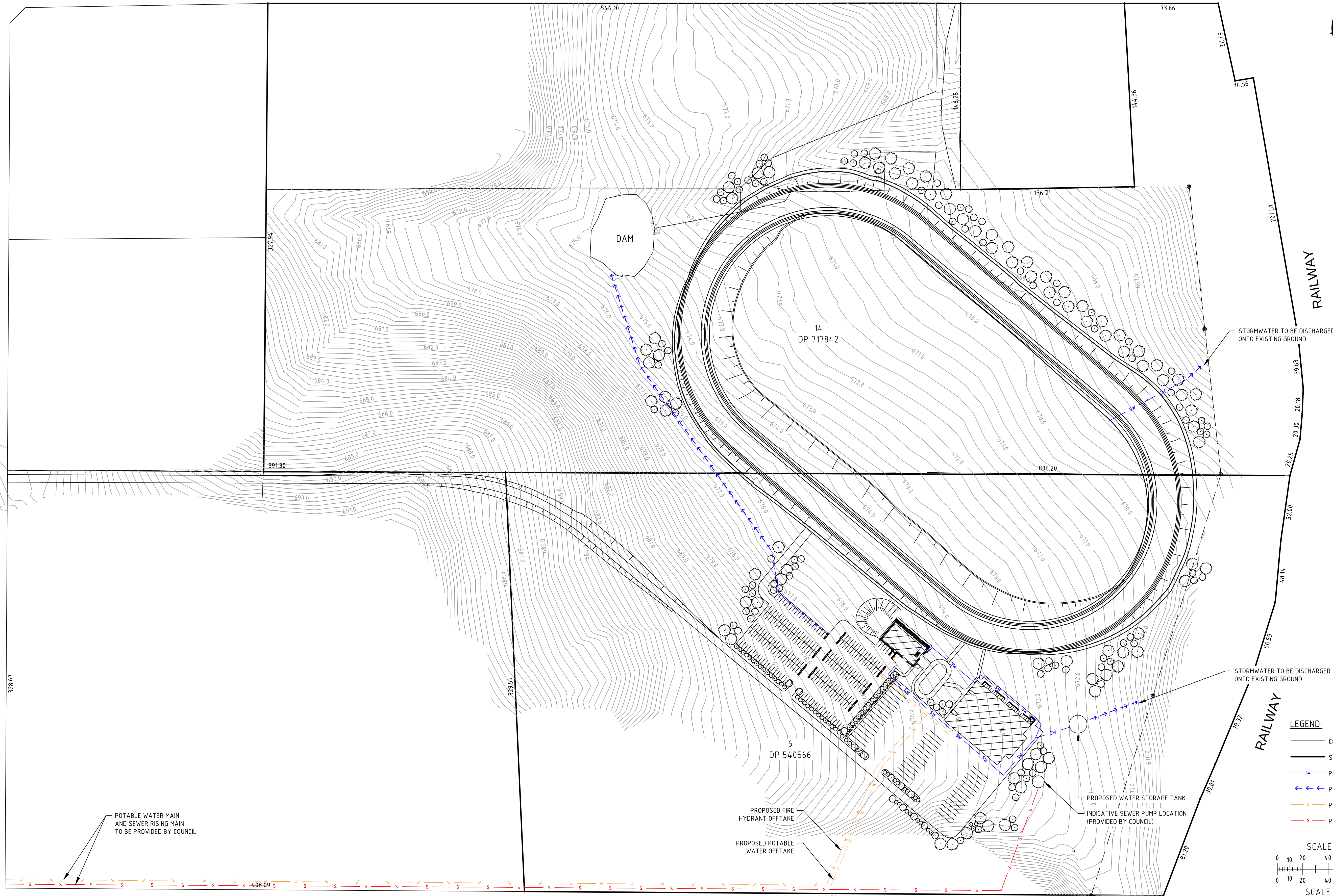
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ETHELTON AVENUE

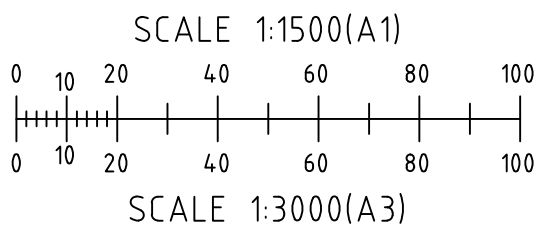


COLLEGE ROAD

RAILWAY



- LEGEND:
- CONTOUR (0.25m INTERVAL)
 - SITE BOUNDARY
 - SW PROPOSED STORMWATER PIPE
 - PROPOSED OPEN CHANNEL
 - PROPOSED WATER MAIN
 - PROPOSED SEWER MAIN



No	DATE	DRAFTING CHECK	PM CHECK	DETAILS
A	26/09/12	AJW	AJW	ISSUED FOR APPROVAL

CHECKED/APPROVED	NAME	DATE
APPROVED	AJW	26/09/2012
SURVEY	-	-
DESIGNER	MCKINNON DESIGN	26/09/2012
DRAFTING	MY	26/09/2012

APPROVAL AUTHORITY



CLIENT
BATHURST HARNESS RACING

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NEW RACETRACK FOR BATHURST HARNESS RACING

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PERMANENT MARK:		RL:	DATUM: A.H.D.
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AUTOCAD FILE:		12D/CIVILCAD FILE:	REVISION
211291_03A_E04-E04.dwg			
STATUS: FOR REVIEW		SHEET E04 OF E04	

Plates



Plate 2 - College Road adjacent to the site looking south.



Plate 3 - College Road adjacent to the site looking north with Ethelton Avenue on the right.



Plate 4 - College Road and Ethelton Avenue Intersection looking south towards the site.



Plate 5 - Vale Road and Ethelton Avenue Intersection showing rail crossing over Ethelton Ave.



Plate 6 - College and Loyds Road Intersection looking south down College Road.



Plate 7 - College and Loyds Road Intersection looking north down College Road.

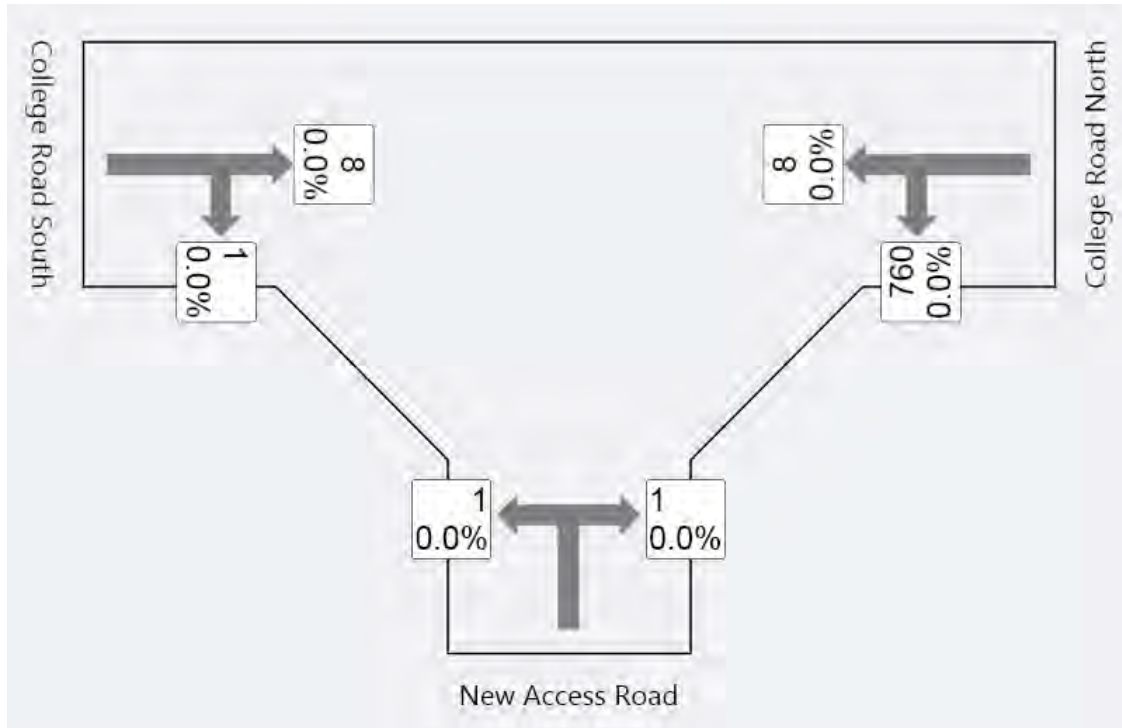


Plate 8 - Left Turn In Peak Hour Traffic Movements

Note: Number represents total vehicles per hour, % indicates % heavy vehicles

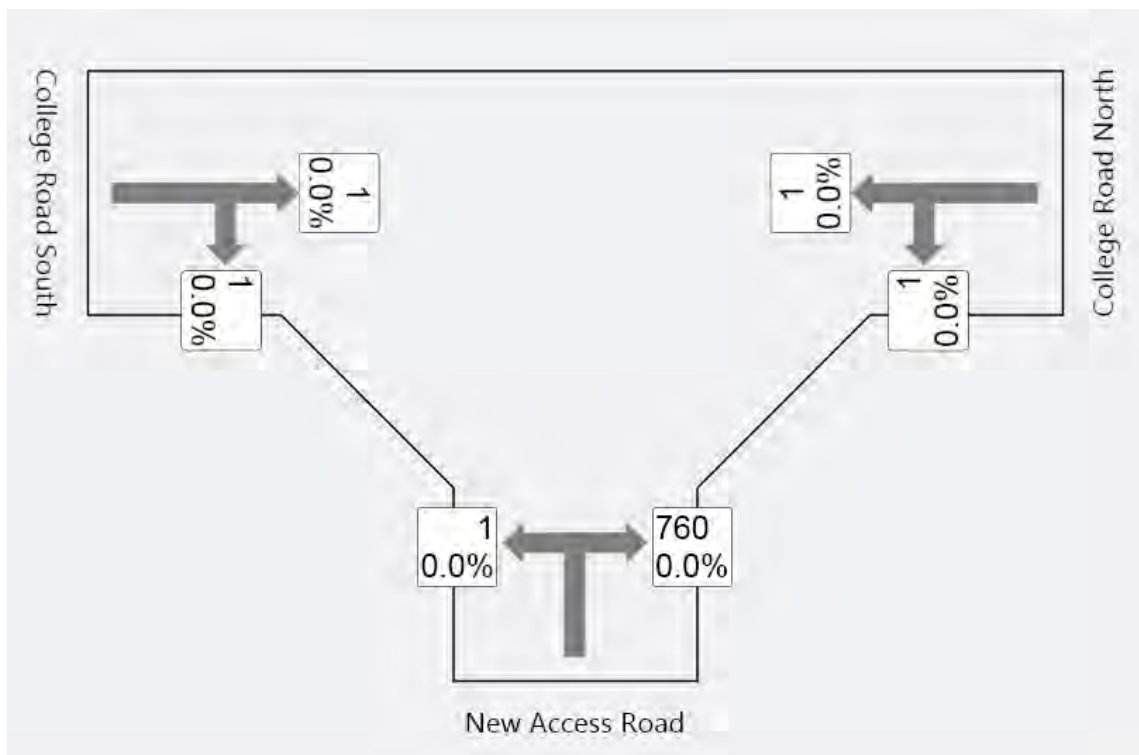


Plate 9 - Right Turn Out Peak Hour Traffic Movements

Note: Number represents total vehicles per hour, % indicates % heavy vehicles

Appendix B

**NOISE AND ACOUSTIC ASSESSMENT BY
WILKINSON MURRAY PTY LIMITED**

BATHURST HARNESS RACING TRACK RELOCATION

**REPORT NO. 12088
VERSION A**

MARCH 2012

PREPARED FOR

Joss Construction

8 BRADWARDINE RD BATHURST N.S.W

DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	23 March 2012	Luke Warren	John Wassermann

Note

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Quality Assurance

We are committed to and have implemented AS/NZS ISO 9001:2008 "Quality Management Systems – Requirements". This management system has been externally certified and Licence No. QEC 13457 has been issued.



AAAC

This firm is a member firm of the Association of Australian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.



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2 DEVELOPMENT DESCRIPTION	3
3 EXISTING AMBIENT NOISE LEVELS	4
4 OPERATIONAL NOISE CRITERIA	4
5 NOISE MODELLING	6
6 NOISE PREDICTIONS	7
7 RECOMMENDATIONS	8
8 CONCLUSION	9

GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

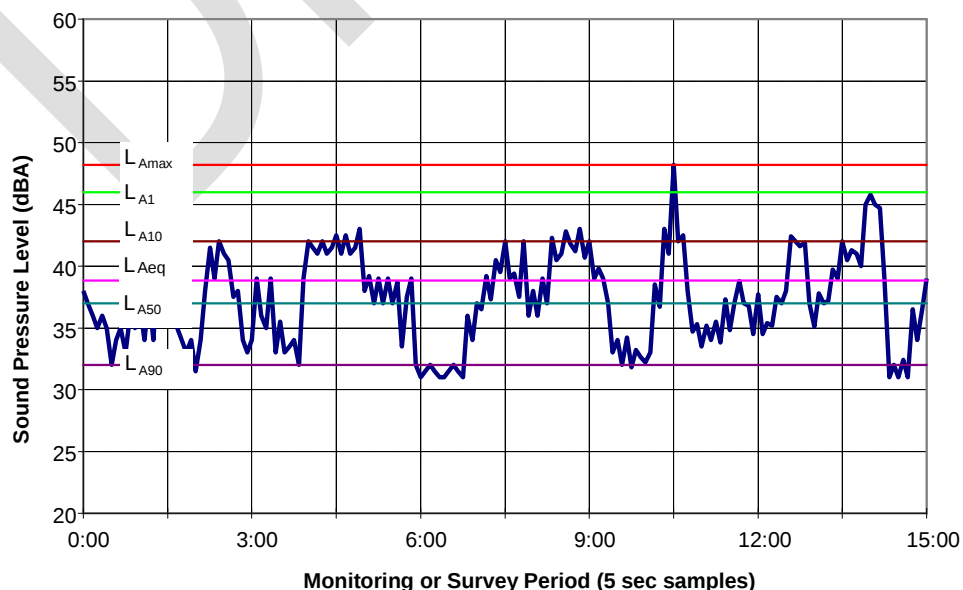
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



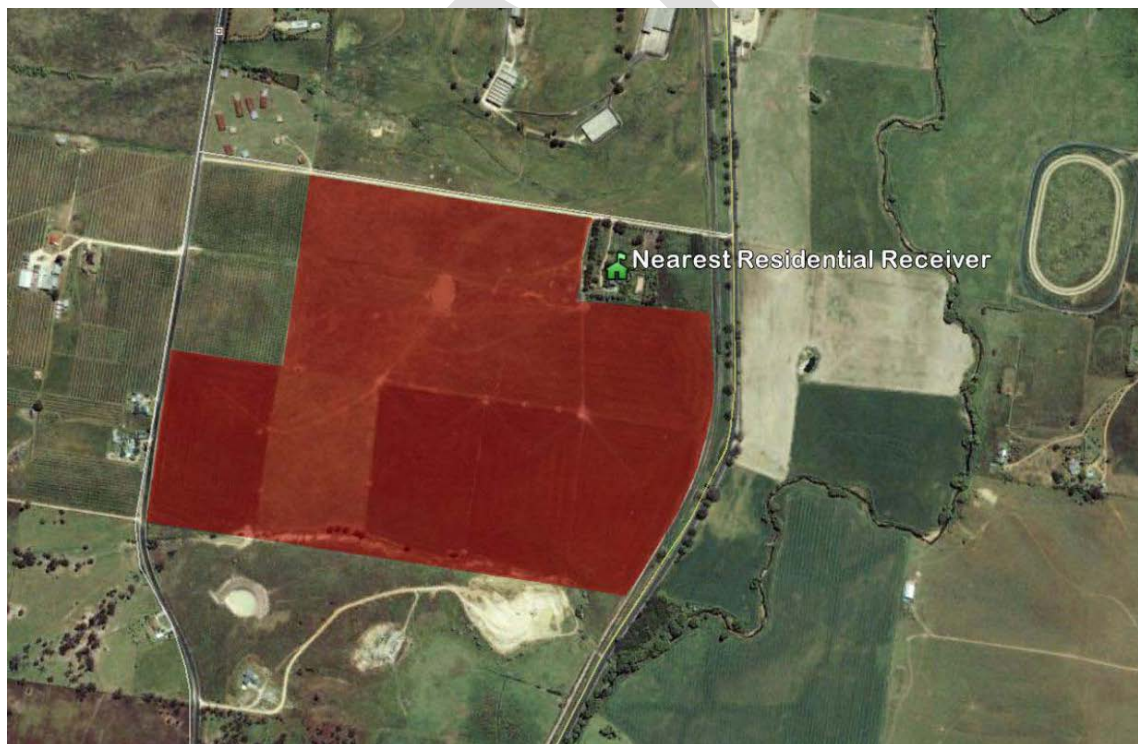
1 INTRODUCTION

This report presents an assessment of the potential noise impact associated with the proposed relocation and subsequent construction of a new harness racing track on land bordered by Ethelton Avenue and College rd in Bathurst, NSW. The harness racing track currently operates at Bathurst showground. The new facility will operate at intermittent intervals between the hours of 7am and 10pm, any day of the week. Figure 1-1 shows the proposed site and surrounding location.

This assessment considers the following issues:

- Operational Noise
 - Noise generated by the Horse racing;
 - Noise emitted from the PA system during race meets; and
 - Noise generated by road traffic entering, exiting and moving around the complex.

Figure 1-1 Bathurst Harness Club Racing Site and surrounding residences



This acoustic assessment consists of the following:

- Measurement of existing noise levels at the existing nearest residential receiver of the proposed site;
- Determination of site specific criteria;
- Measurement of noise levels typical of a race meeting at the existing Bathurst Harness racing track;
- Noise modelling of the proposed new facility, to determine the potential impacts on adjacent noise sensitive receivers;
- Assessment of potential noise emissions against the established criteria; and
- Recommendations for noise control measure's where necessary.

DRAFT

2 DEVELOPMENT DESCRIPTION

The proposed site for the new Bathurst Harness Racing Club trotting track is bound by College rd to the West and Ethelton Avenue to the North east, with the train line to the East. Nearby noise sensitive receivers include the following:

- North : 23 Ethelton Avenue located to the north north east of the site, the closest of all the receivers;
- East: 226 Gormans Hill Rd is the closest residential receiver to the east of the site;
- South: 233 College Rd to the south west and slightly shielded from the sight by the adjacent ridge line; and
- West: 146,170,182 College Rd all residential receivers.

Figure 2-1 shows the proposed location of the trotting track and the major buildings associated with it. Nearby residential receivers are highlighted in yellow.

Figure 2-2 Proposed Layout showing surrounding residential receivers



3 EXISTING AMBIENT NOISE LEVELS

Unattended noise monitoring was conducted between 12 and 18 March 2012. The noise logger was located on the western boundary of the property at 23 Ethelton Avenue, the nearest potentially affected residential receiver.

The noise monitoring equipment used for the noise measurements consisted of an ARL EL215 Noise Logger set to A-weighted, fast response, continuously monitoring each 15-minute period. This equipment is capable of monitoring and storing noise various level descriptors for later detailed analysis.

From the background noise levels (L_{A90}) the Rating Background Levels (RBL's) were determined using methodology as recommended by the INP. OEH considers the RBLs to represent the background noise level. The equipment calibration was checked before and after the survey and no significant drift was noted.

Table 3-1 summarises the results, for the measured daytime, evening and night time noise levels. Detailed charts are available on request.

Table 3-1 Ambient Noise Levels

Time Period ¹	Noise Levels (dBA)	
	L_{Aeq}	RBL
Day	49	38
Evening	52	45
Night	48	38

Note: 1) Daytime 7.00am–6.00am; Evening 6.00pm–10.00pm; Night 10.00pm–7.00am

The two descriptors are defined below:

- **$L_{Aeq,Period}$** – The overall L_{Aeq} noise level measured over the assessment period; and
- **RBL** – Rating Background Level (L_{A90}) is a measure of typical background noise levels which are used in determining noise criteria.

4 OPERATIONAL NOISE CRITERIA

This section of the report discusses noise criteria for the assessment of operational noise which includes:

- Public address system;
- Harness racing activities; and
- Movement of vehicles into, out of and within the complex.

To assist council in assessing developments the Environment Protection Authority (EPA) has prepared the *Noise Guide for Local Government (NGLG)*. The NGLG suggests that council's develop an intrusiveness criterion that limits the permissible level of noise from commercial or

industrial premises to no more than the background noise plus 5dBA when measured over a 15-minute period (L_{Aeq} (15 minute)).

The time periods for which intrusive criteria are applied are daytime (7.00am-6.00pm), evening (6.00pm-10.00pm) and night time (10.00pm-7.00am).

The background level is the Rating Background Noise Level (RBL) which is determined from measurement of L_{A90} noise levels, in the absence of noise from the source. Table 4-1 shows the intrusive noise criteria for the project.

Table 4-1 shows the relevant intrusiveness noise criteria for this assessment.

Time Period	RBL	Intrusiveness Criterion
		$L_{Aeq,15min}$
Day	38	43
Evening	45	50
Night	38	43

Note: 1) Daytime 7.00am–6.00am; Evening 6.00pm–10.00pm; Night 10.00pm–7.00am

For consistency a blanket criteria of 43dBA has been applied for all periods.

5 NOISE MODELLING

Continuous and semi continuous noise associated with the Bathurst Harness Racing Club is generated by the public address system and the racing itself. The facility will operate at intermittent intervals between the hours of 7am and 10pm, any day of the week.

Intermittent noise may also be generated by vehicles accessing the facility, however this is not considered to be an issue.

Noise sources that contribute significantly to the 15 minute and longer term L_{Aeq} noise levels are presented in Table 5-1. These have been adjusted to 15 minute L_{Aeq} levels.

Table 5-1 Measured Source Noise levels

Item	Sound Pressure Level at 25m, L_{Aeq} (dBA)	Sound Pressure Level at 30m, L_{Aeq} (dBA)
Public Address System	52	-
Harness Racing	-	58

Site related noise emissions were modeled using CadnaA noise prediction software. A representative three dimensional model of the site and adjacent residential receivers was constructed.

Factors that are addressed in the modeling are:

- Site specific sound level emissions and locations;
- Screening effects from buildings;
- Receiver locations;
- Noise attenuation due to geometric spreading;
- Ground absorption; and
- Atmospheric absorption.

6 NOISE PREDICTIONS

Noise modelling was completed for a worst case scenario, which was considered to be a race event with continuous announcements and commentating over the public address system. Relative noise levels were predicted at the following potentially worse affected residential receivers listed below in order of proximity to the site:

- 23 Ethelton Avenue;
- 146 College Rd;
- 170 College Rd;
- 182 College Rd;
- 233 College Rd; and
- 226 Gormans Hill Rd.

Table 6-1 presents the predicted levels for each of the residential receivers.

Table 6-1 Night-time Predicted Noise Levels

Receiver Location	Predicted Noise Level (dBA)	Criteria	Comply (Y/N)
23 Ethelton Avenue	47	43	N
146 College Rd	31	43	Y
170 College Rd	34	43	Y
182 College Rd	33	43	Y
233 College Rd	34	43	Y
226 Gormans Hill Rd	31	43	Y

During all time periods the noise levels meet the criteria at all but one receiver, 23 Ethelton Avenue. The criterion at this receiver is exceeded by 4 dB. As a result some mitigation measures will be required to control noise emissions associated with the new facility at this residence. Potential options are provided in the Section 7.

7 RECCOMENDATIONS

It is recommended that a barrier be erected in the form of a dirt bund or noise wall, to attenuate the noise to within the noise criterion. The minimum height of the barrier should be between 3.5 and 4m. Figures 6-1 and 6-2 outline two barrier location options, which are depicted using a thick black line to the South and West of the residential property at 23 Ethelton Avenue.

Figure 6-1 Option 1 - Recommended Location of Noise Barrier



Figure 6-2 Option 2 - Recommended Location of Noise Barrier



It is also suggested that a directional public address system be installed where possible, and that the loud speakers be pointed away from the residential receiver at 23 Ethelton Avenue.

8 CONCLUSION

Wilkinson Murray has conducted a noise assessment of the proposed new Bathurst harness racing Club facility bordered by Ethelton Avenue and College rd in Bathurst, N.S.W.

Operational noise impacts associated with the proposal are predicted to be within the intrusiveness criteria recommended by the *NSW Industrial Noise Policy*, at all but one receiver.

Mitigation options have been provided. Ensuring all recommendations are undertaken, operation of the facility should comply with the recommended noise criteria for day, evening and night time.

Appendix C

**LIGHTING ASSESSMENT BY
A J STOCKMAN PTY LTD**



[Subject]

Lighting Assessment Report

Bathurst Harness Racing

Vale Road & Ethelton Avenue
Bathurst NSW 2795.

Date 27th February 2012

AJS Electrical Contracting
Anthony Stockman
Ph:- (02) 6332 4554
Fax:- (02) 6332 1087

GENERAL

This report outlines the potential impact of the new track lighting on adjacent properties.

This report has been prepared in conjunction with the following documentation:-

- AJS Draft Design - Project No. 2003 01-Rev A
- Site Layout Drawing No. SK5-1.

The methodology to minimise the intrusive light emanating from the new facility is outlined below.

LIGHTING EQUIPMENT

The following lighting equipment will be used for this installation:

1. Olympic Disano Metal Halide Floodlights - Code 415211-00 - Version MHN-TD 2KW LA – Cutoff Reflector
2. Olympic Disano Metal Halide Floodlights - Code 415211-99 - Version MHN-TD 2KW LA Hot restrike – Cutoff Reflector

Characteristics – the above fittings are new generation professional asymmetric floodlights with a high purity anodized polished reflector incorporating an adjustable lamp position. This adjustment allows for four different photometric distributions with defined vertical aiming limits. The fittings are specifically designed for race tracks and sporting arenas.



Fig.1

Figure 1 – the above image shows the effectiveness of the track lighting, which is focused predominantly on the track surface with minimal overspill to the interior of track. The outer area of the track lighting is greater to allow for public access and viewing.

HORIZONTAL ILLUMINANCE OVERSPILL

Calculated horizontal light spill levels at the property boundaries are shown on page 24 of AJS Draft Design - Project No. 2003 01-Rev A. Specifically, the horizontal lux level attributed to the track lighting on the boundary of the nearby residential property is 1 lux or less.

VERTICAL ILLUMINANCE OVERSPILL

Calculated vertical light spill levels at the property boundaries are shown on page 25 of AJS Draft Design - Project No. 2003 01-Rev A. Specifically, the vertical lux level attributed to the track lighting on the boundary of the nearby residential property is 10 lux or less.

SITE PHOTOGRAPH



Fig.2

**North -East Corner of
Residential Block.**

Figure 2 – This photograph, taken from the centre of the newly proposed trotting track layout looking towards the North East corner boundary of the residential block.

Existing flora along the boundaries of the nearby property will collectively contribute to the screening of intrusive light. Plantings of additional flora around the perimeter of the new facility would further screen any intrusive light emanating towards this property.

CONCLUSION

Based on the AJS Draft Design - Project No. 2003 01-Rev A, it is anticipated that the effect of spill light emanating from this new facility will have a negligible impact on the adjacent properties.

Bathurst Harness Track

Lighting Proposals DRAFT

Project code: A2003 01 - Rev A
Date: 24-02-2012

Designer: Andrew Nagy

Description: Rev A - Original Issue DRAFT for review and budget purposes

Per Sky TV spec for Harness Racing:
1200 lux Camera Illuminance (maintained)
Lamp CCT=5600K Ra=90
No backlighting for stewards shown

The nominal values shown in this report are the result of precision calculations, based upon precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice the values may vary due to tolerances on luminaires, luminaire positioning, reflection properties and electrical supply.

Pierlite Australia Pty. Ltd.
Application Engineering Design Centre
98-112 Gow Street
Padstow, NSW 2211 Australia

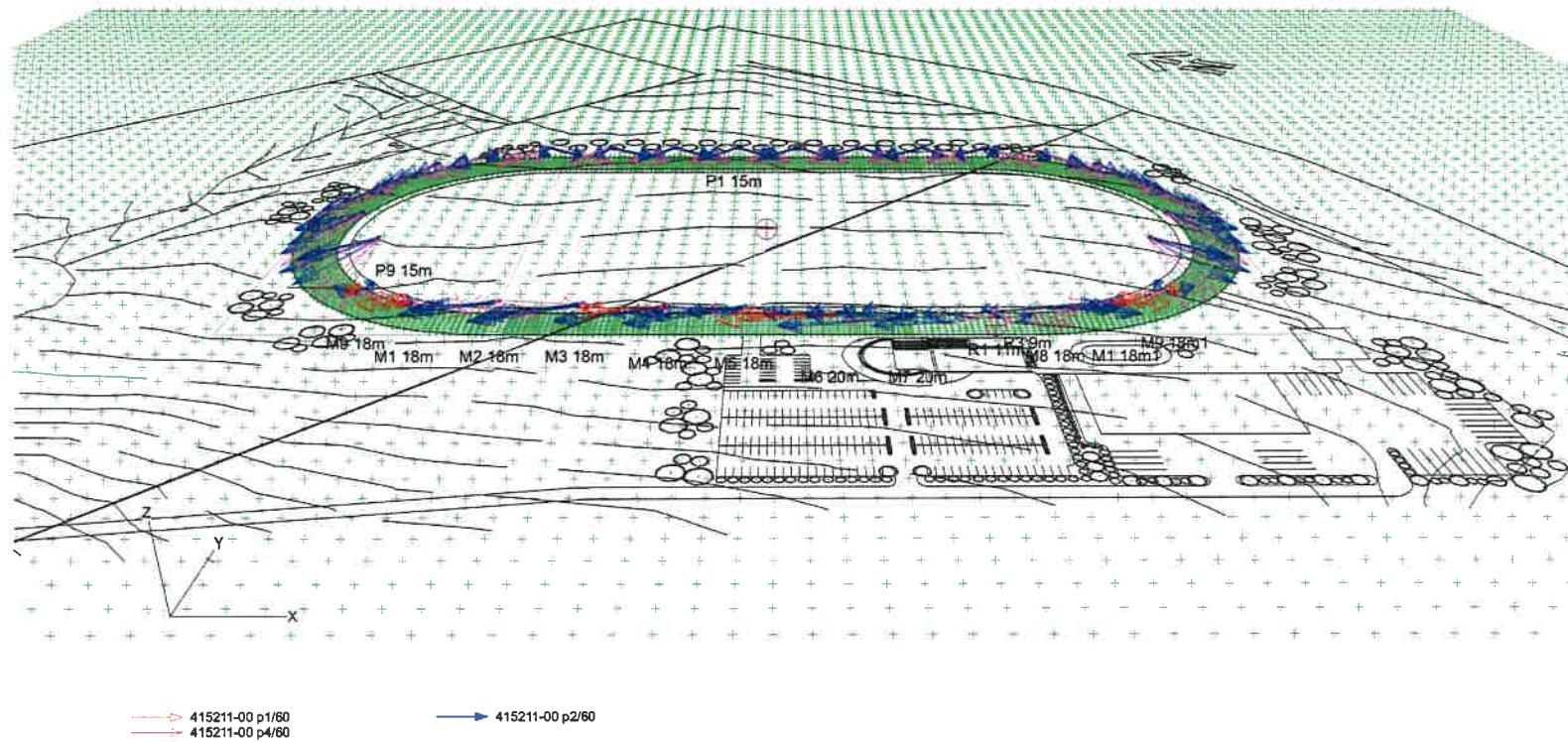
Professional Lighting Solutions
Telephone: +61 2 8794 9300
E-Mail: anagy@pierlite.com.au

CalcuLux Area 7.6.2.0

A1		© CROWN COPYRIGHT		100	200	300			A.J. STOCKMAN PTY. LTD. AJS Electrical Contracting 7 Hampton Park Road KELSO NSW 2786 PHONE: (02) 6332 4354 FAX: (02) 6332 1067 email: info@ajselectrical.com.au		DATE ISSUED: 28 FEBRUARY 2012 DESIGNED: AJS Electrical Pty Ltd CHECKED:		CLIENT: BATHURST HARNESS RACING		ADDITIONAL INFORMATION:		DRAWING TITLE: BATHURST HARNESS RACING TRACK LIGHTING DRAWING NO: AJS - BHR- L-D1		NO IN SET 34 FILE NO: REV NO: 0	
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1. Project Description

1.1 3-D Project Overview

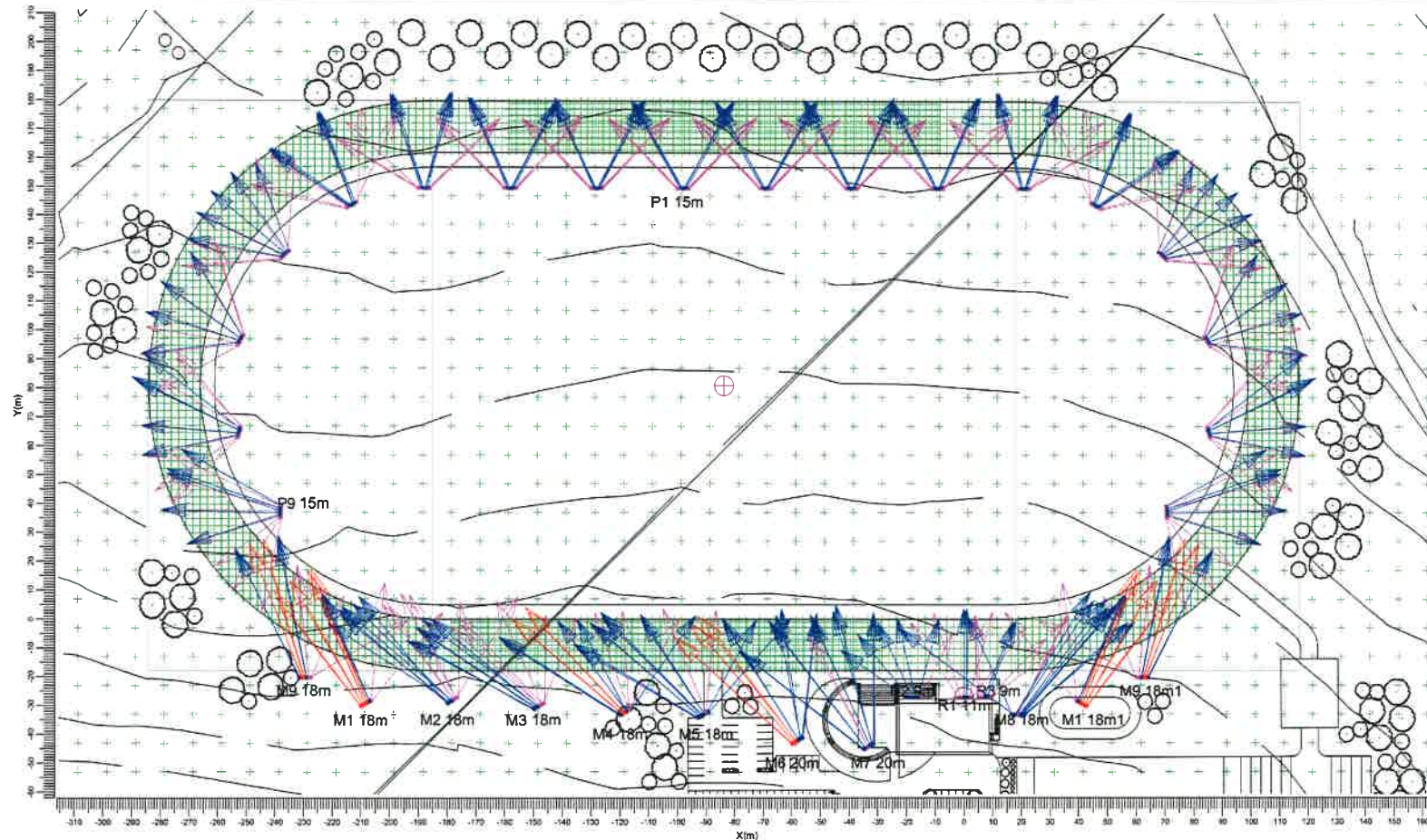


Philips Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

Page: 2/34

				 A.J. STOCKMAN PTY. LTD. Electrical Contracting		A.J STOCKMAN PTY LTD AJS Electrical Contracting 7 Hampden Park Road NELSON NSW 2795 PHONE (02) 6332 4954 FAX (02) 6332 1087 email: ajs@ajselectrical.com.au		DATE ISSUED 26 FEBRUARY 2012 DESIGNED BY AJS Electrical Pty Ltd CHECKED: QUANTITY BATHURST HARNESS RACING		ADDITIONAL INFORMATION		DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING DRAWING NO AJS - BHR- L-D2		NO IN ACT 34 FILE NO REV NO 0	
0 AJS Draft Track Lighting Layout		AJS		06/02/12											
Rev		DETAILS OF AMENDMENTS		APPROVED		DATE									
A1		BROWN COPYRIGHT		105		300									

1.2 Top Project Overview



Philips Lighting B.V. - CalcuLuX Area 7 6.2.0 A2003_01A Bathurst Harness.car

Scale
1:1250

Page: 3/34

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Rev DETAILS OF AMENDMENTS		APPROVED DATE		DRAWING NO AJS - BHR- L-D3		REV. NO 0							

2. Summary

2.1 General Information

The overall maintenance factor used for this project is 0.75.

2.2 Observer Information

Code	Observer	Position		
		X (m)	Y (m)	Z (m)
Aa	Camera	-0.00	-27.00	8.00
Bb	Centre	-83.50	81.00	1.50

2.3 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
A	34	415211-00 p1/60	1 * MHN-LA 2000/956	2114.0	1 * 190000
B	172	415211-00 p2/60	1 * MHN-LA 2000/956	2114.0	1 * 190000
C	160	415211-00 p4/60	1 * MHN-LA 2000/956	2114.0	1 * 190000

The total installed power: 773.72 (kWatt)

Number of Luminaires Per Arrangement

Arrangement	Luminaire Code			Power (kWatt)
	A	B	C	
M1 18m	16	4	4	50.74
M2 18m	0	6	6	25.37
M3 18m	0	6	6	25.37
M4 18m	4	5	3	25.37
M5 18m	0	10	2	25.37
M6 20m	6	6	0	25.37
M7 20m	0	10	2	25.37
M8 18m	0	10	2	25.37
M9 18m	8	8	8	50.74
P1 15m	0	12	12	50.74
P2 15m	0	12	12	50.74
P3 15m	0	12	12	50.74
P4 15m	0	12	12	50.74
P5 15m	0	12	12	50.74
P6 15m	0	10	14	50.74
P7 15m	0	8	16	50.74
P8 15m	0	10	14	50.74
P9 15m	0	10	14	50.74
R1 11m	0	2	4	12.68
R2 9m	0	5	1	12.68
R3 9m	0	2	4	12.68

2.4 Calculation Results

(l)luminance Calculations:

Calculation	Type	Unit	Ave	Min/Ave	Min/Max
Track Eh	Surface Illuminance	lux	860	0.64	0.37
Track Ec	Illuminance -> Aa	lux	1334	0.56	0.26
Home Str Eh	Surface Illuminance	lux	799	0.77	0.55
Home Str Ec	Illuminance -> Aa	lux	1058	0.75	0.42
Back Str Eh	Surface Illuminance	lux	997	0.71	0.62
Back Str Ec	Illuminance -> Aa	lux	1475	0.66	0.50
N Bend Eh	Surface Illuminance	lux	819	0.68	0.50
N Bend Ec	Illuminance -> Aa	lux	1281	0.61	0.46
S Bend Eh	Surface Illuminance	lux	830	0.67	0.42

Philips Lighting B.V. - CalcuLuX Area 7.6 2.0 A2003_01A Bathurst Harness car

Page: 4/34

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A1 B AJS Crown Copyright		100 200 300									

Bathurst Harness Track
A2003 01 - Rev A

Lighting Proposals DRAFT

Pierlite Australia Pty. Ltd.
Date: 24-02-2012

Calculation	Type	Unit	Ave	Min/Ave	Min/Max
S Bend Ec	Illuminance -> Aa	lux	1350	0.68	0.39
Surrounds Eh	Surface Illuminance	lux			
Surrounds Ev	Illuminance -> Bb	lux			

Obtrusive Light Calculations:
The upward light ratio (ULR) is 0.00.

Philips Lighting B.V. - CalcuLuX Area 7.62.0 A2003_01A Bathurst Harness.car

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DATE ISSUED
20 FEBRUARY 2012

DESIGNED
AJS Electrical Pty Ltd
CHECKED

CLIENT
BATHURST HARNESS RACING

ADDITIONAL INFORMATION

DRAWING TITLE
BATHURST HARNESS RACING
TRACK LIGHTING

DRAWING NO
AJS - BHR- L-D5

NO IN SET
34

FILE NO

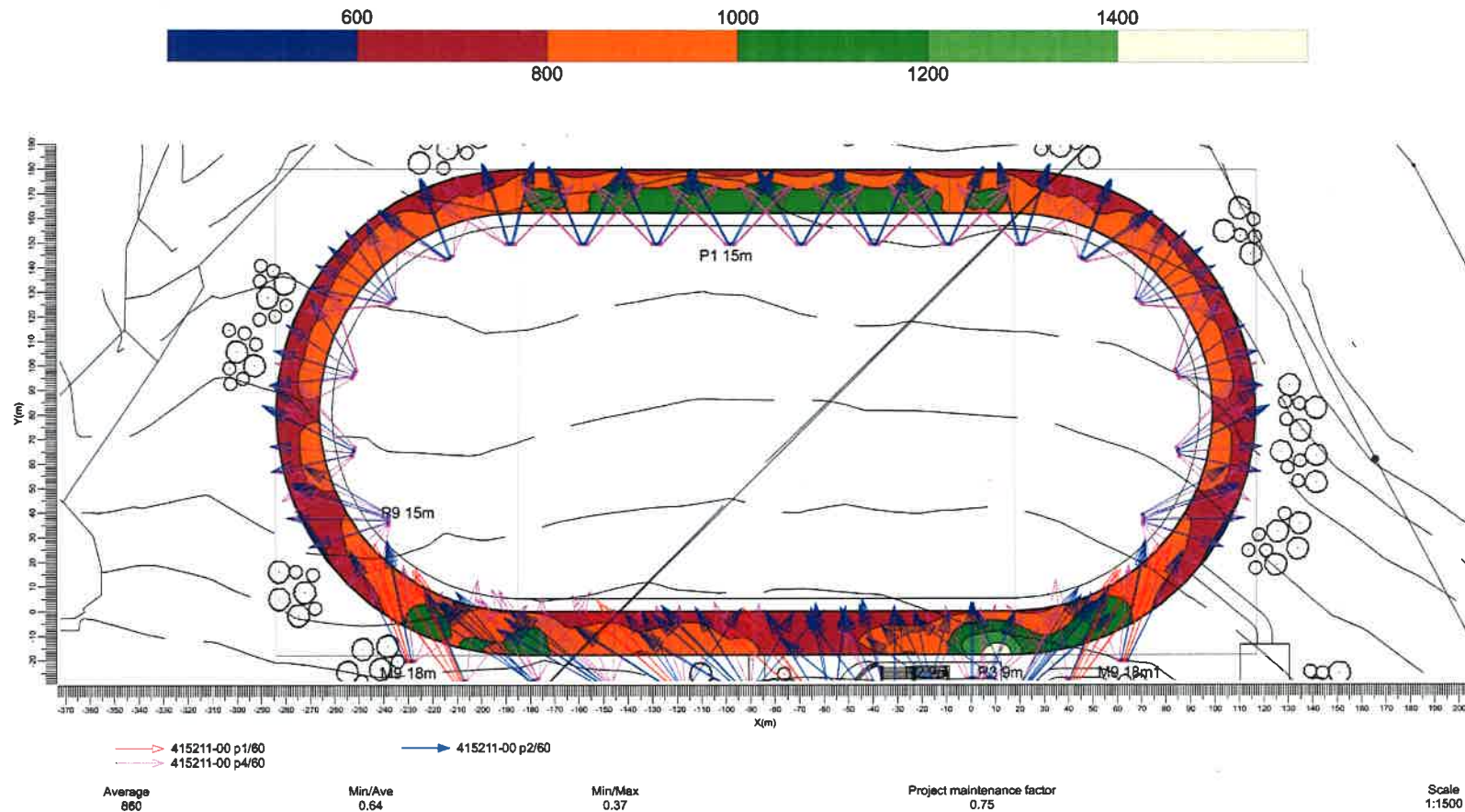
REV NO
0

A1
0.000
© CROWN COPYRIGHT

3. Calculation Results

3.1 Track Eh: Filled Iso Contour

Grid : Track at Z = -0.00 m
Calculation : Surface Illuminance (lux)

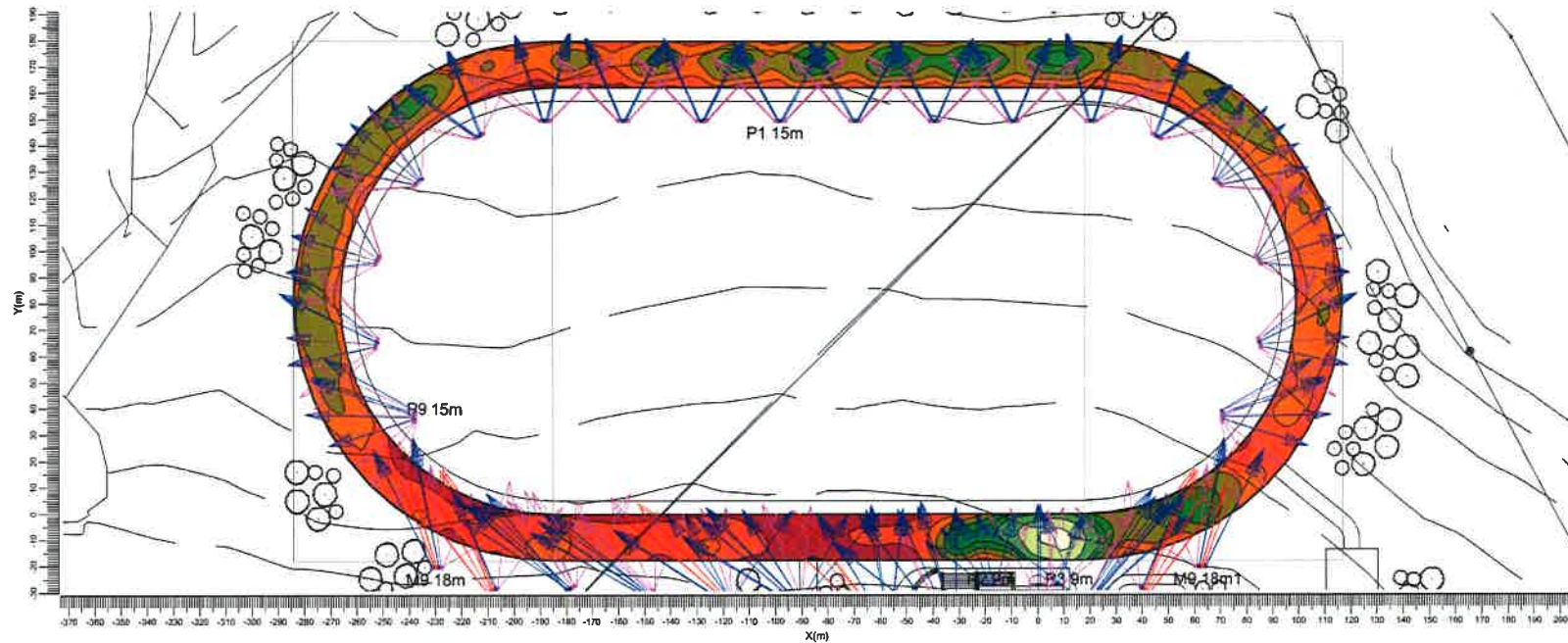
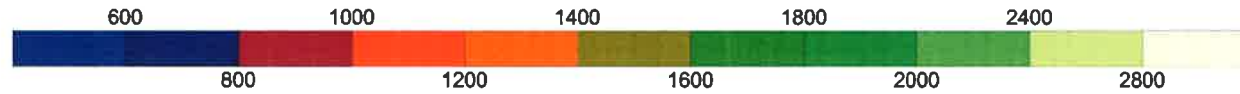


Philips Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

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Re: DETAILS OF AMENDMENTS APPROVED DATE		Re: DETAILS OF AMENDMENTS APPROVED DATE				

3.2 Track Ec: Filled Iso Contour

Grid : Track at Z = -0.00 m
Calculation : Illuminance towards Camera (lux)
Height above grid : 1.50 m



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Average
1334

Min/Ave
0.56

Min/Max
0.26

Project maintenance factor
0.75

Scale
1:1500

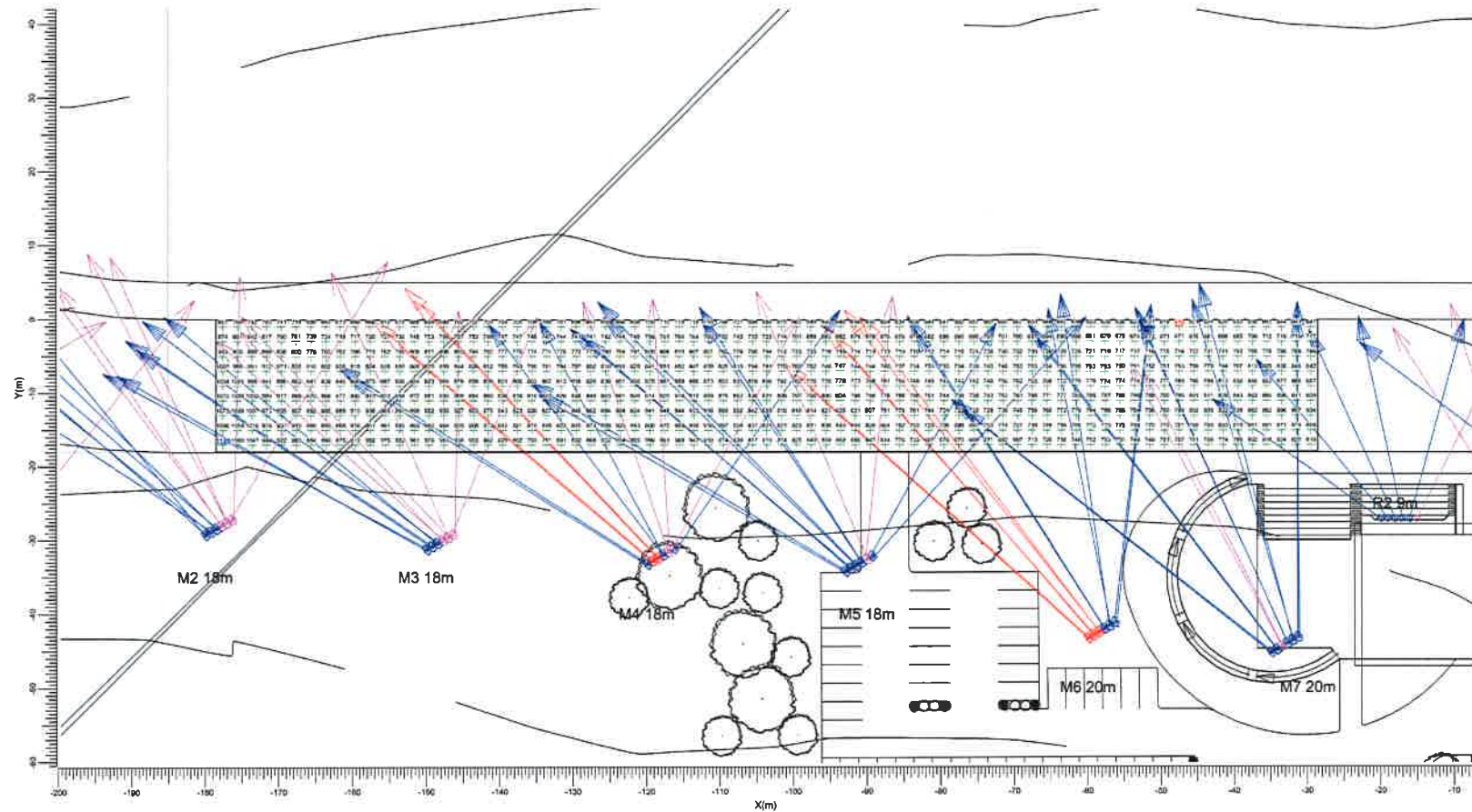
Philips Lighting B.V. - CalculuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

Page: 7/34

 A.J. STOCKMAN PTY. LTD. AJS Electrical Consulting 7 Hampden Park Road KELSO NSW 2785. PHONE (02) 6332 4864 FAX (02) 6332 1067 email - info@ajselectrical.com.au		DATE ISSUED: 28 FEBRUARY 2012 DESIGNED: AJS Electrical Pty Ltd CHECKED:	CLIENT: BATHURST HARNESS RACING	ADDITIONAL INFORMATION	DRAWING TITLE: BATHURST HARNESS RACING TRACK LIGHTING DRAWING NO: AJS - BHR- L-D7	NO IN SET: 34 FILE NO REV NO: 0
1. AJS Draft Track Lighting Layout 2. DETAILS OF AMENDMENTS	APPROVED DATE					

3.3 Home Str Eh: Graphical Table

Grid : Home Str at Z = -0.00 m
Calculation : Surface Illuminance (lux)



→ 415211-00 p1/60
→ 415211-00 p4/60
→ 415211-00 p2/60

Average
799

Min/Ave
0.77

Min/Max
0.55

Project maintenance factor
0.75

Scale
1:500

Philips Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

Page: 8/34



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20 FEBRUARY 2012
DESIGNED
AJS Electrical Pty Ltd
CHECKED

CLIENT:
BATHURST HARNESS RACING

ADDITIONAL INFORMATION

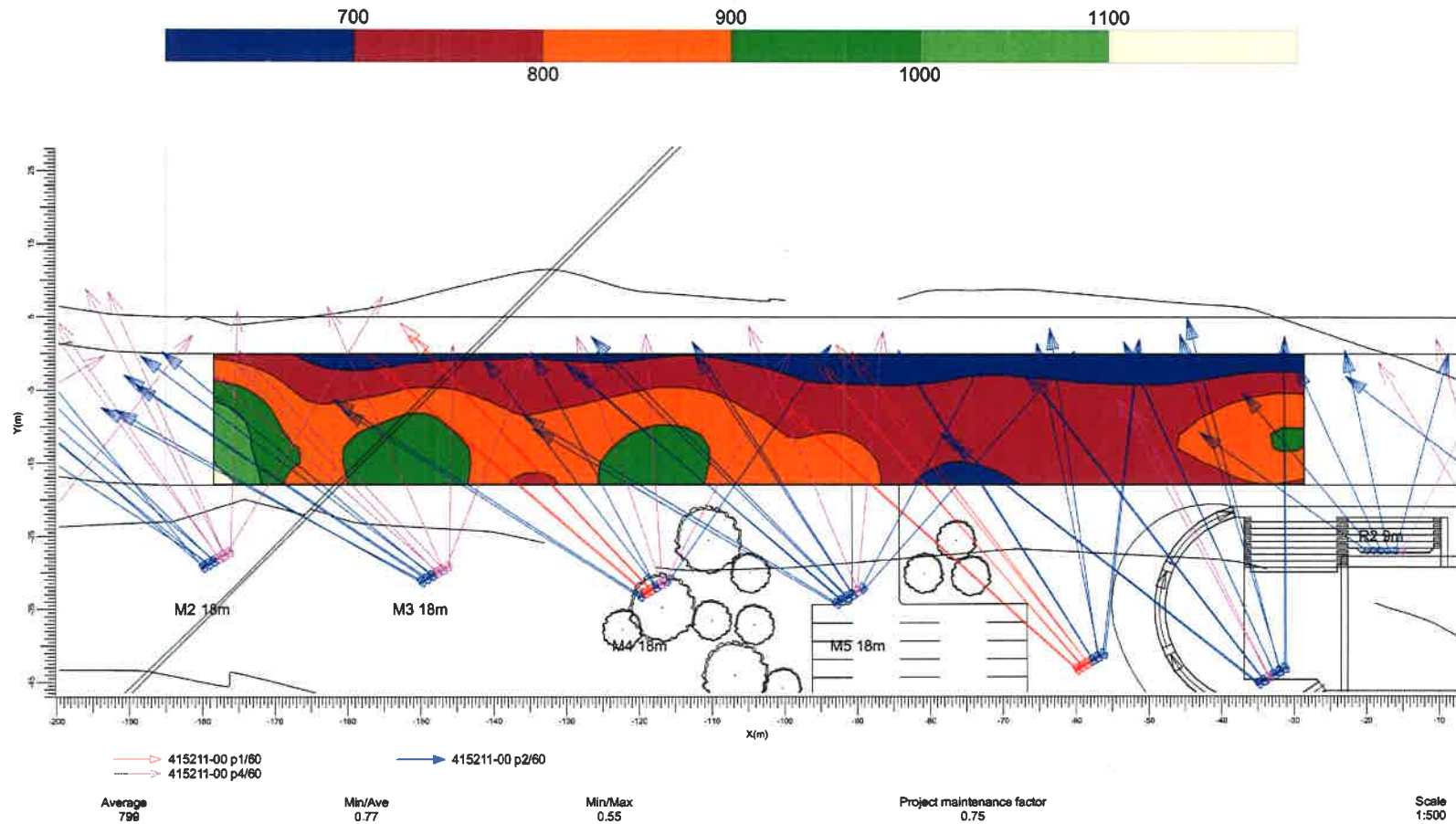
DRAWING TITLE
BATHURST HARNESS RACING
TRACK LIGHTING

DRAWING NO:
AJS - BHR- L-D8

NO IN BCT
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FILE NO
REV NO:
0

3.4 Home Str Eh: Filled Iso Contour

Grid : Home Str at Z = -0.00 m
Calculation : Surface Illuminance (lux)



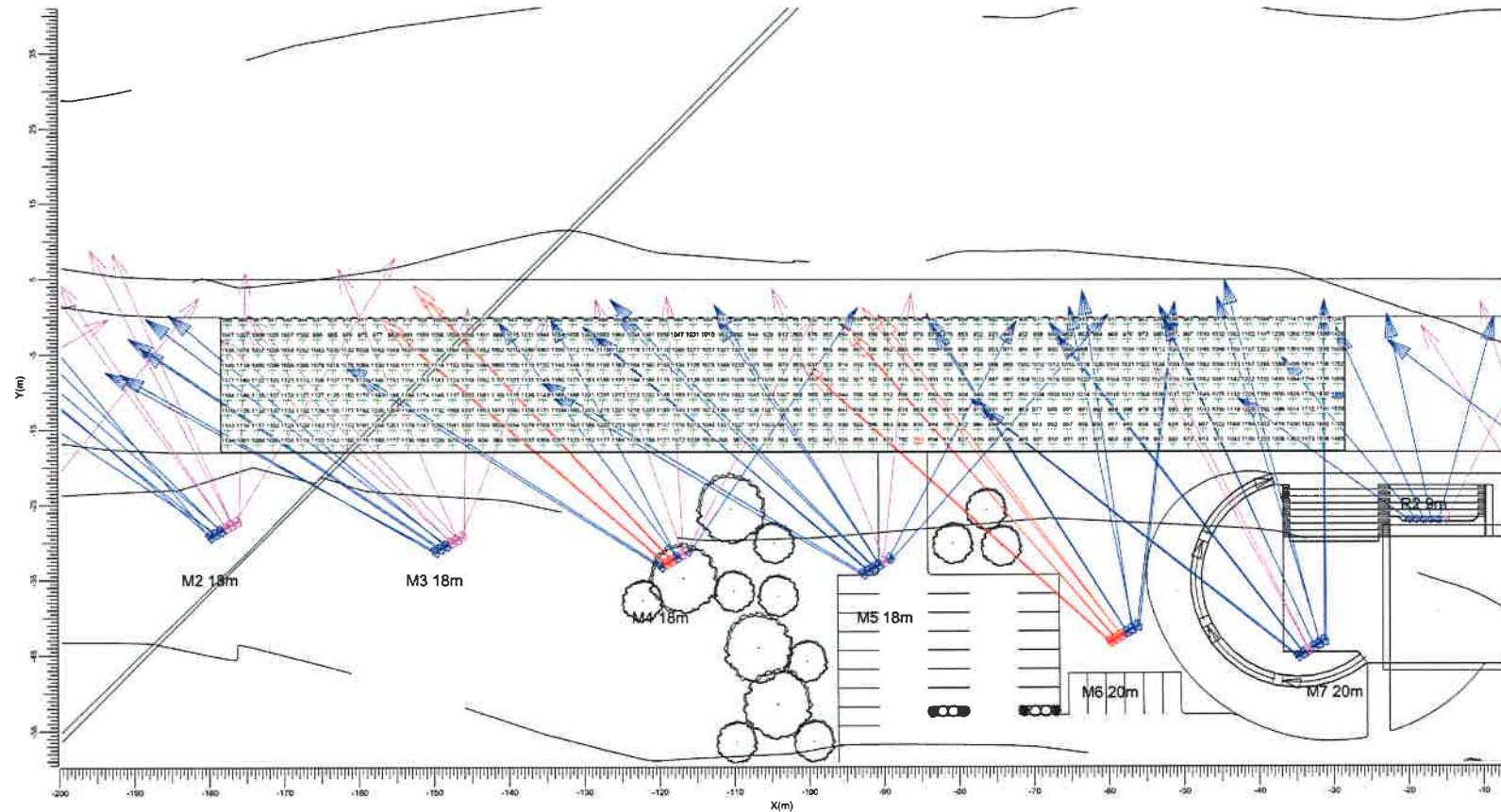
Philips Lighting B.V. - CalcuLux Area 7.6.2.0 A2003_01A Bathurst Harness.car

Page: 9/34

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Rev 0 AJS Draft Track Lighting Layout 100		APPROVED DATE 06/03/12		DETAILS OF AMENDMENTS		DRAWING NO AJS - BHR- L-D9		REV NO 0		CROWN COPYRIGHT		190 200 300	

3.5 Home Str Ec: Graphical Table

Grid : Home Str at Z = -0.00 m
Calculation : Illuminance towards Camera (lux)
Height above grid : 1.50 m



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Average
1058

Min/Ave
0.75

Min/Max
0.42

Project maintenance factor
0.75

Scale
1:500

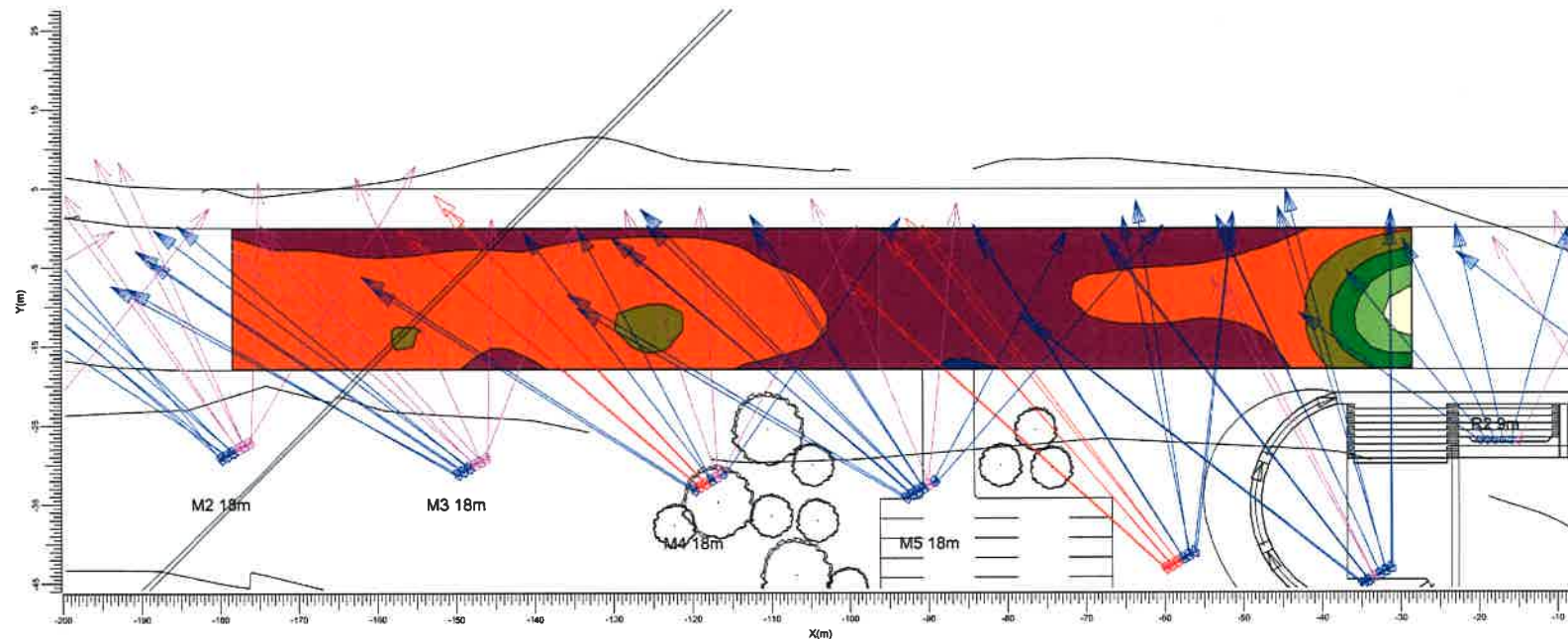
Philips Lighting B.V. - CalcuLux Area 7.6.2.0 A2003_01A Bathurst Harness car

Page: 10/34

AJS A.J. STOCKMAN PTY. LTD. 7 Hampden Park Road KELSO NSW 2795 PHONE: (02) 6332-0594 FAX: (02) 6332-1087 email: info@ajselectrical.com.au		DATE ISSUED 29 FEBRUARY 2012 DESIGNED AJS Electrical Pty Ltd CHECKED:	CLIENT BATHURST HARNESS RACING	ADDITIONAL INFORMATION	DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING	NO IN SET 34
AJS Draft Track Lighting Layout DETAILS OF AMENDMENTS	APPROVED DATE				DRAWING NO AJS - BHR- L-D10	REV NO 0

3.6 Home Str Ec: Filled Iso Contour

Grid : Home Str at Z = -0.00 m
Calculation : Illuminance towards Camera (lux)
Height above grid : 1.50 m



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Average
1058

Min/Ave
0.75

Min/Max
0.42

Project maintenance factor
0.75

Scale
1:500

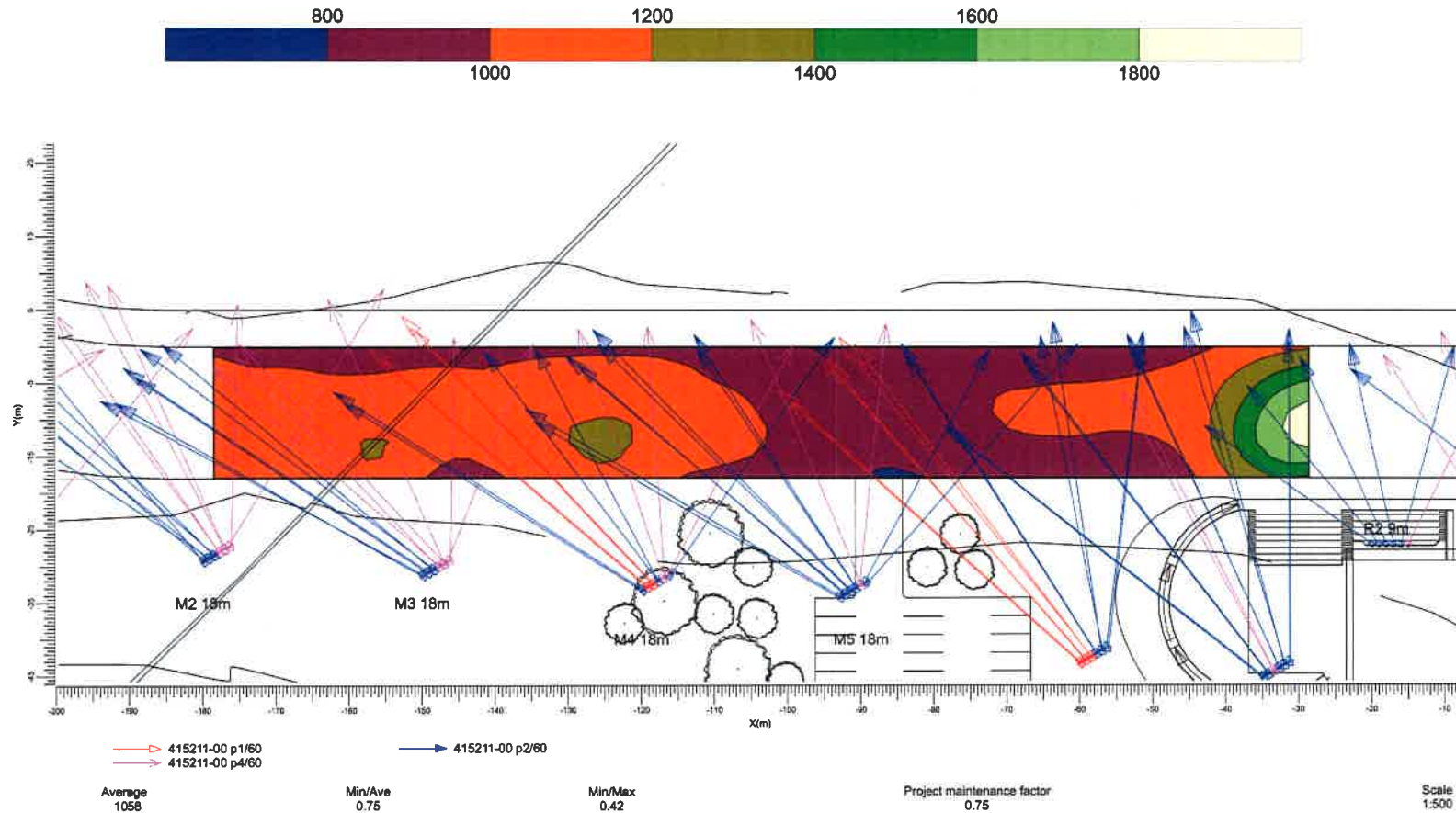
Philips Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

Page: 11/34

 A.J. STOCKMAN PTY. LTD. AJS Electrical Contracting 7 Hempsden Park Road KESJAO NSW 2786 PHONE (02) 6332 4554 FAX (02) 6332 1087 email: info@ajselectrical.com.au		DATE ISSUED 29 FEBRUARY 2012 DESIGNED AJS Electrical Pty Ltd CHECKED:	CLIENT BATHURST HARNESS RACING	ADDITIONAL INFORMATION	DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING DRAWING NO AJS - BHR- L-D11	REV NO 0
11 AJS Bath Track Lighting Layout APPROVED DATE		120 130 140 150 160 170 180 190 200				

3.6 Home Str Ec: Filled Iso Contour

Grid : Home Str at Z = -0.00 m
Calculation : Illuminance towards Camera (lux)
Height above grid : 1.50 m



Philippe Lighting B.V. - CalcuLUX Area 7.6.2.0 A2003_01A Bathurst Harness.car

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DATE ISSUED
29 FEBRUARY 2012
DESIGNED BY
AJS Electrical Pty Ltd
CHECKED:

CLIENT
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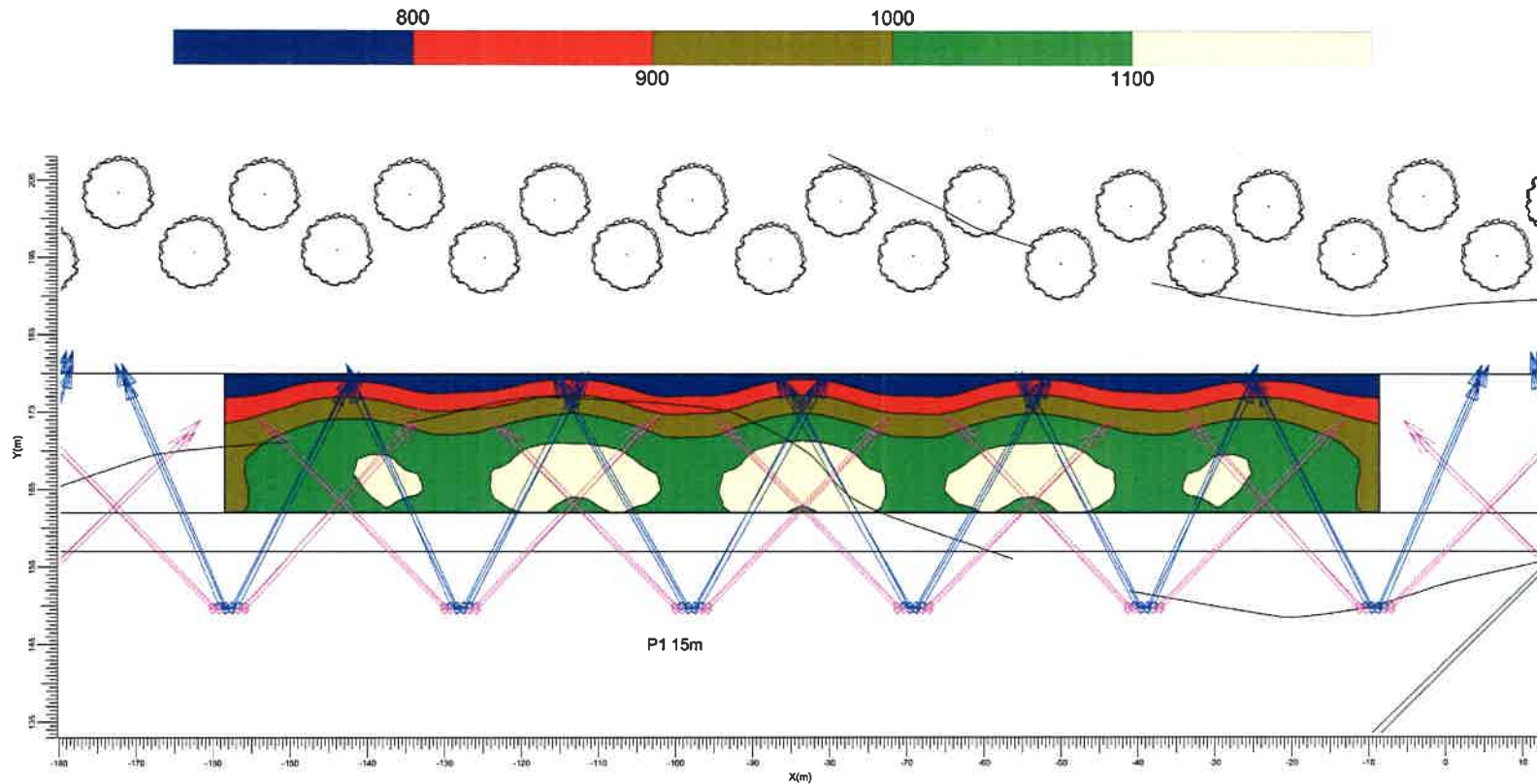
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TRACK LIGHTING
Drawing No
AJS - BHR- L-D12

No in Set 34
File No
Rev No 0

3.8 Back Str Eh: Filled Iso Contour

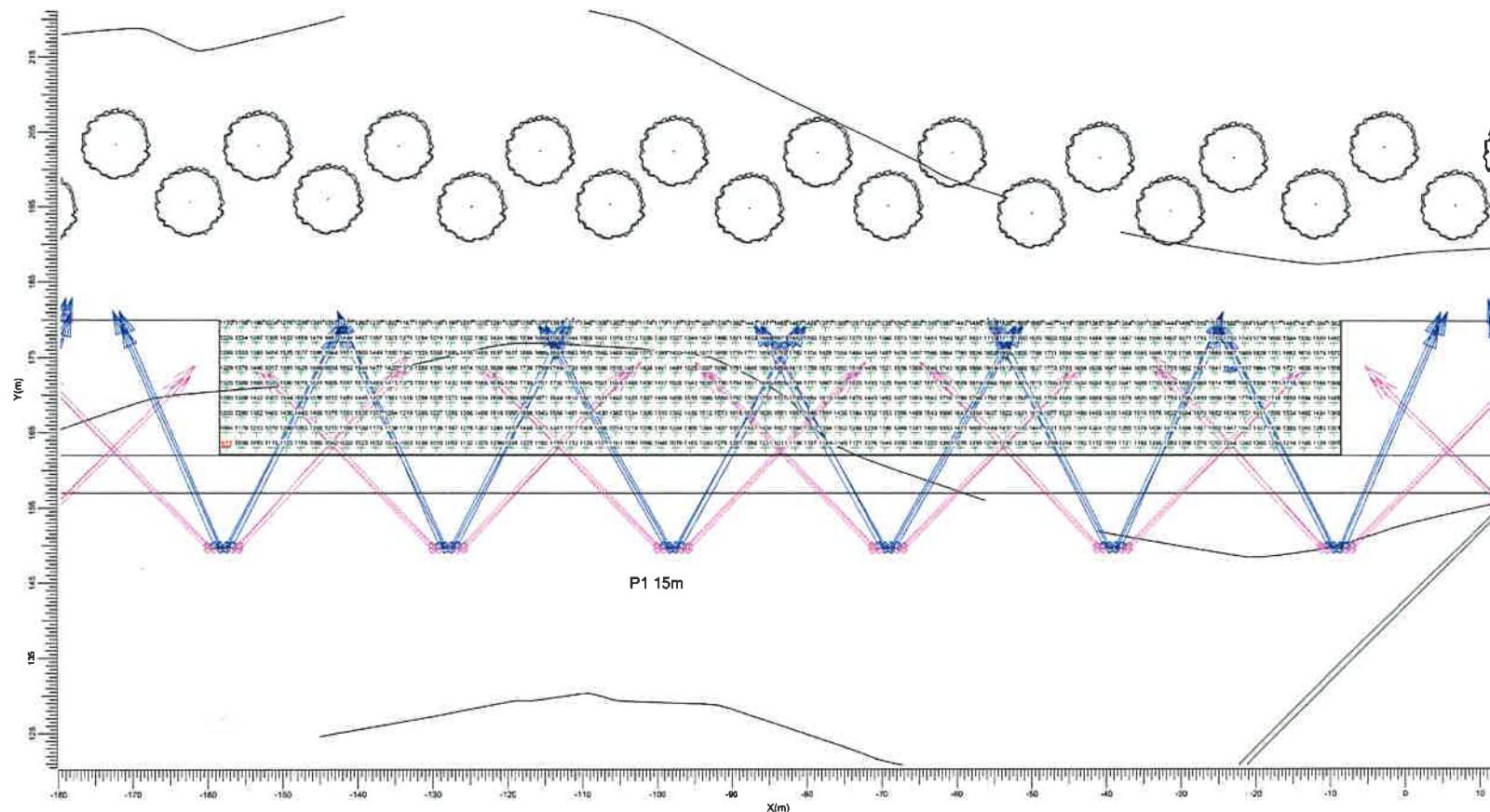
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Calculation : Surface Illuminance (lux)



Average 997 Min/Ave 0.71 Min/Max 0.62 Project maintenance factor 0.75 Scale 1:500
Philips Lighting B.V. - Calculux Area 7.6.2.0 A2003_01A Bathurst Harness car Page: 13/34

AJS A. J. STOCKMAN PTY. LTD. AJS Electrical Consulting 7 Hampden Park Road KELSO NSW 2765 PHONE (02) 6332 4894 FAX (02) 6332 1087 email: info@ajselectrical.com.au		DATE ISSUED 28 FEBRUARY 2012 DESIGNED AJS Electrical Pty Ltd CHECKED:	CLIENT BATHURST HARNESS RACING	ADDITIONAL INFORMATION	DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING DRAWING NO AJS - BHR- L-D13	NO IN SET 34 FILE NO REV A/D 0
AJS Draft Track Lighting Layout DETAILS OF AMENDMENTS APPROVED DATE	AJS DATE 28/02/2012					

Grid : Back Str at Z = -0.00 m
Calculation : Illuminance towards Camera (lux)
Height above grid : 1.50 m



415211-00 p1/60
415211-00 p4/60

→ 415211-00 p2/60

Average
1475

Min/Ave
0.66Min/Max
0.50

Project maintenance factor
0.75

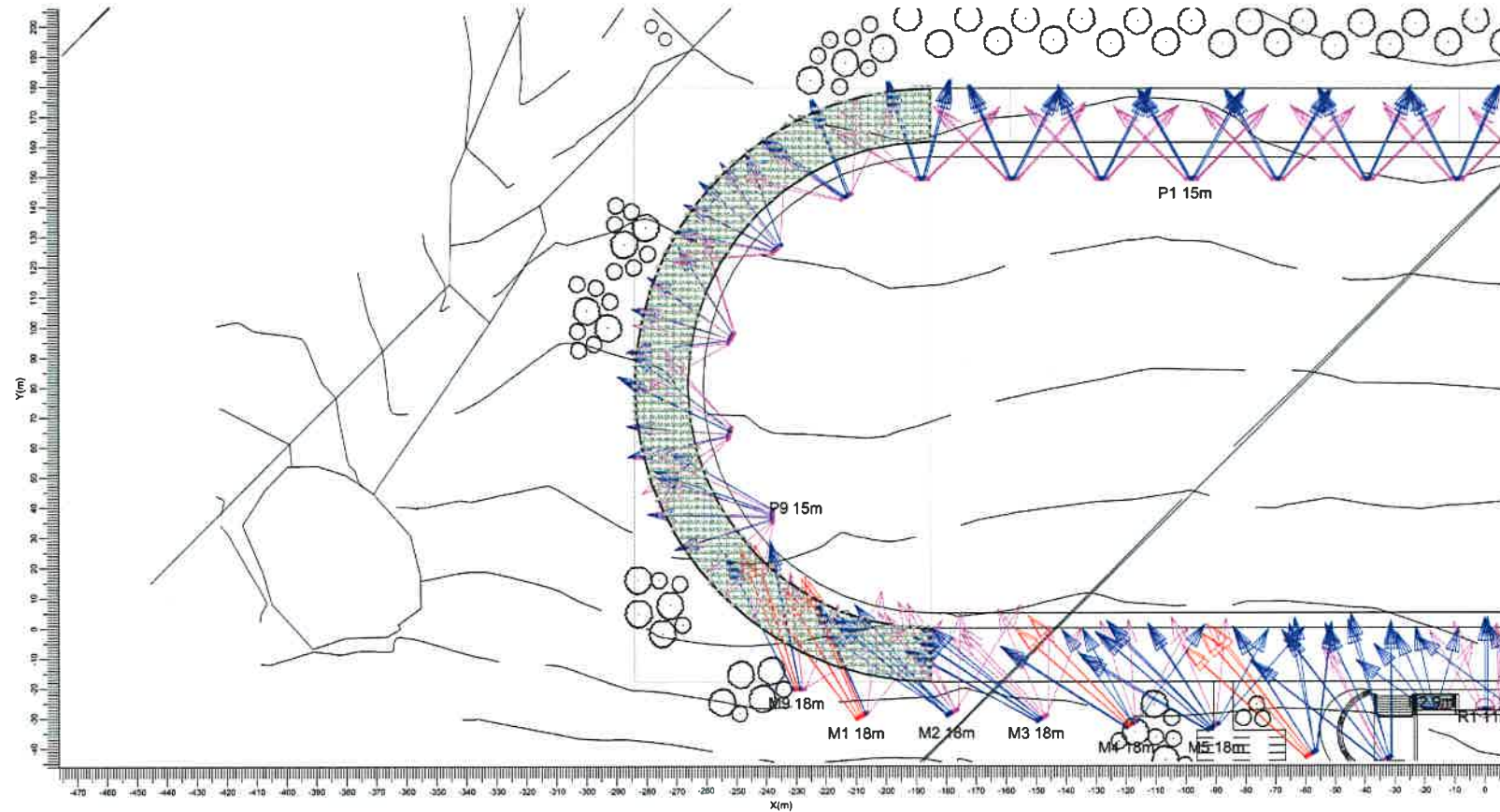
Scale
1:500

Page: 14/34

3.13 N Bend Ec: Graphical Table

Grid
Calculation
Height above grid

N Bend at Z = -0.00 m
Illuminance towards Camera (lux)
1.50 m



415211-00 p1/60
415211-00 p4/60
415211-00 p2/60

Average
1281

Min/Ave
0.61

Min/Max
0.46

Project maintenance factor
0.75

Scale
1:1250

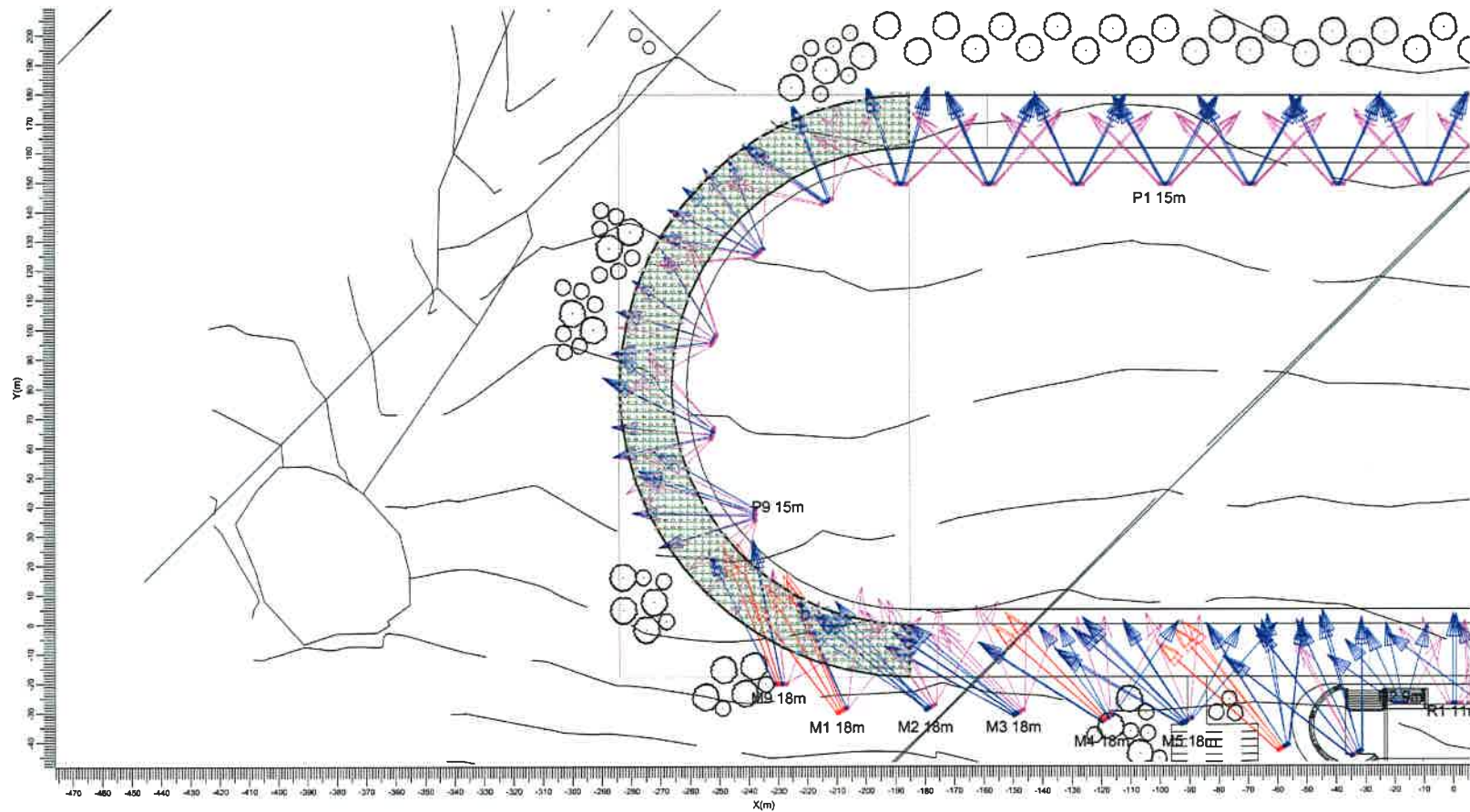
Philips Lighting B.V. - CalcuLux Area 7.6.2.0 A2003_01A Bathurst Harness.car

Page: 18/34

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Re: DETAILS OF AMENDMENTS APPROVED DATE						

3.11 N Bend Eh: Graphical Table

Grid : N Bend at Z = -0.00 m
Calculation : Surface Illuminance (lux)



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Average
819

Min/Ave
0.68

Min/Max
0.50

Project maintenance factor
0.75

Scale
1:1250

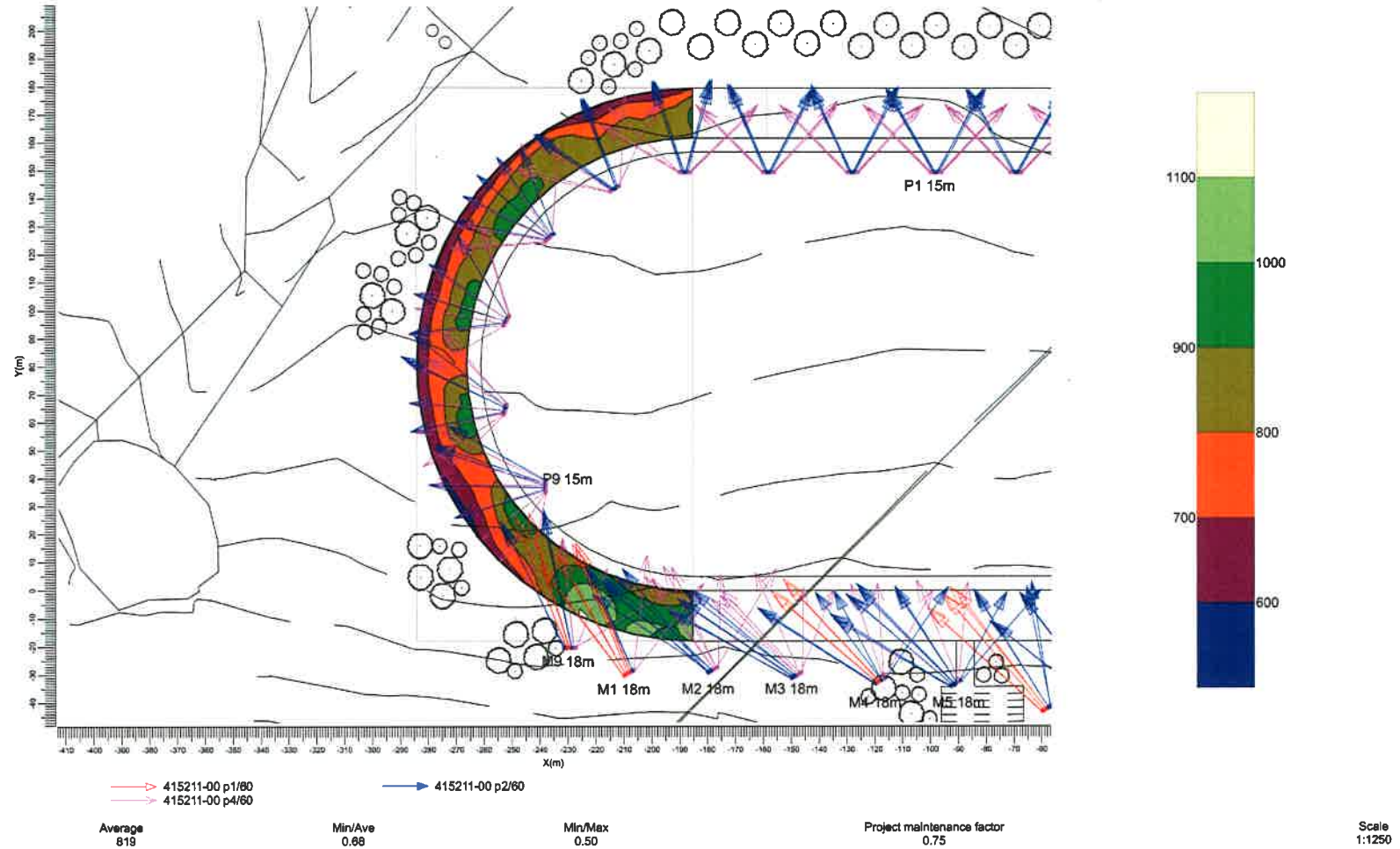
Philips Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

Page: 16/34

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AJS Draft Track Lighting Layout APPROVED: AJS DATE: 08/02/12		DETAILS OF AMENDMENTS				

3.12 N Bend Eh: Filled Iso Contour

Grid : N Bend at Z = -0.00 m
Calculation : Surface Illuminance (lux)



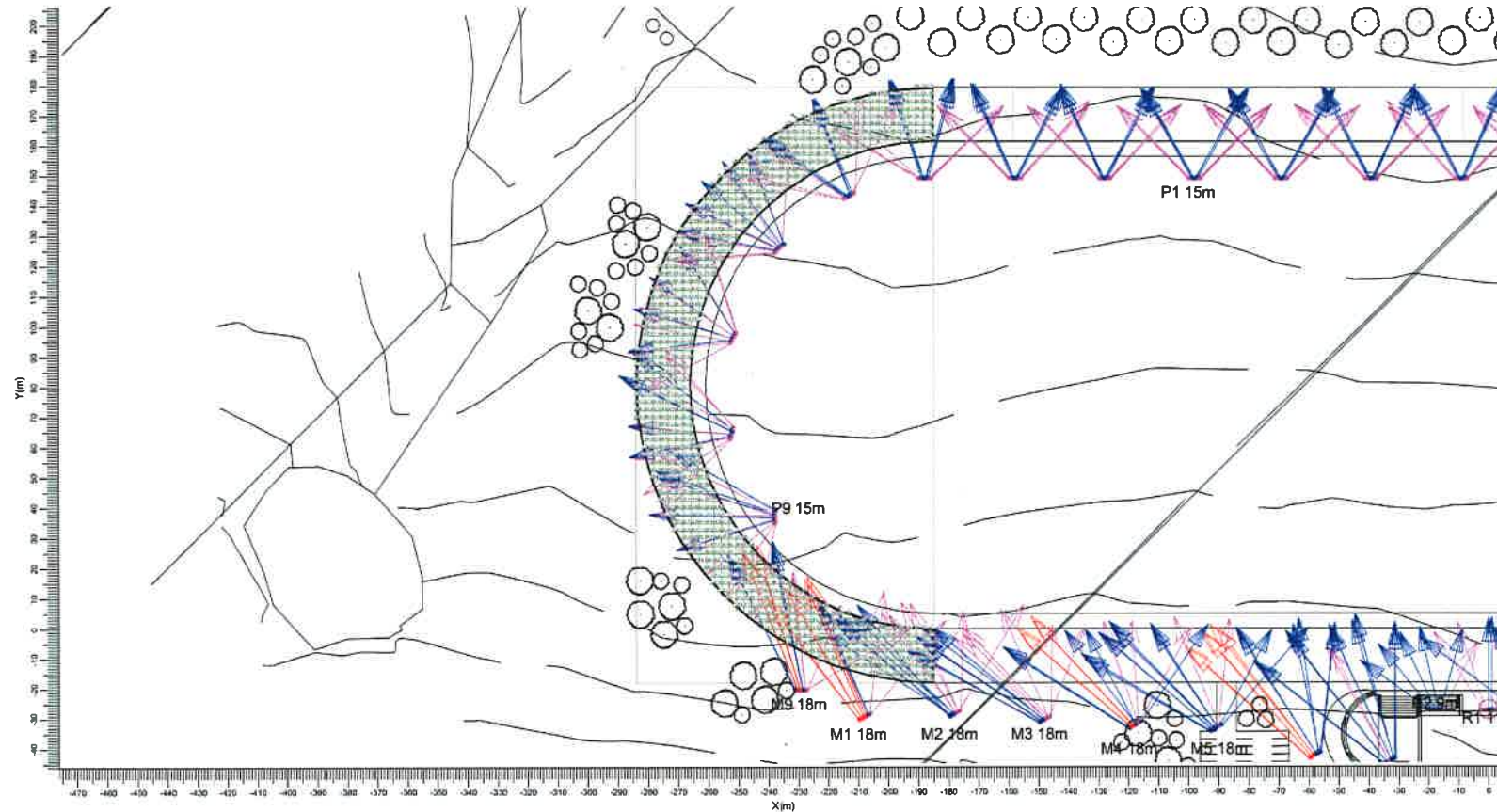
Philips Lighting B.V. - CalcuLux Area 7.6.2.0 A2003_01A Bathurst Harness.car

Page: 17/34

AJS A. J. STOCKMAN PTY. LTD. A.J. STOCKMAN PTY LTD AJS Electrical Contracting 7 Hampton Park Road KELSO NSW 2795 PHONE (02) 8333 4884 FAX (02) 8332 1087 email - info@ajselectrical.com.au	DATE ISSUED: 20 FEBRUARY 2012 DESIGNED: AJS Electrical Pty Ltd CHECKED:	CLIENT: BATHURST HARNESS RACING	ADDITIONAL INFORMATION	DRAWING TITLE: BATHURST HARNESS RACING TRACK LIGHTING DRAWING NO: AJS - BHR- L-D17	NO IN SET: 34 FILE NO: REV NO: 0
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3.13 N Bend Ec: Graphical Table

Grid : N Bend at Z = -0.00 m
Calculation : Illuminance towards Camera (lux)
Height above grid : 1.50 m



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Average
1281

Min/Ave
0.61

Min/Max
0.46

Project maintenance factor
0.75

Scale
1:1250

Philips Lighting B.V. - CalcuLux Area 7.6.2.0 A2003_01A Bathurst Harness.car

Page: 18/34



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7 Hampden Park Road
KELSO NSW 2795
PHONE (02) 6332 4654 FAX (02) 6332 1087
email: info@ajselectrical.com.au

DATE ISSUED
20 FEBRUARY 2012
DESIGNED
AJS Electrical Pty Ltd
CHECKED:

CLIENT
BATHURST HARNESS RACING

ADDITIONAL INFORMATION

DRAWING TITLE
BATHURST HARNESS RACING
TRACK LIGHTING

DRAWING NO
AJS - BHR- L-D18

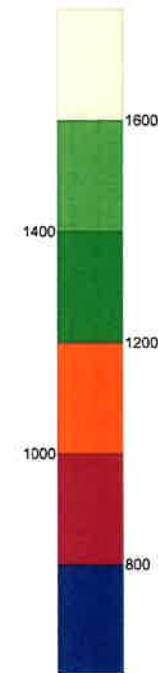
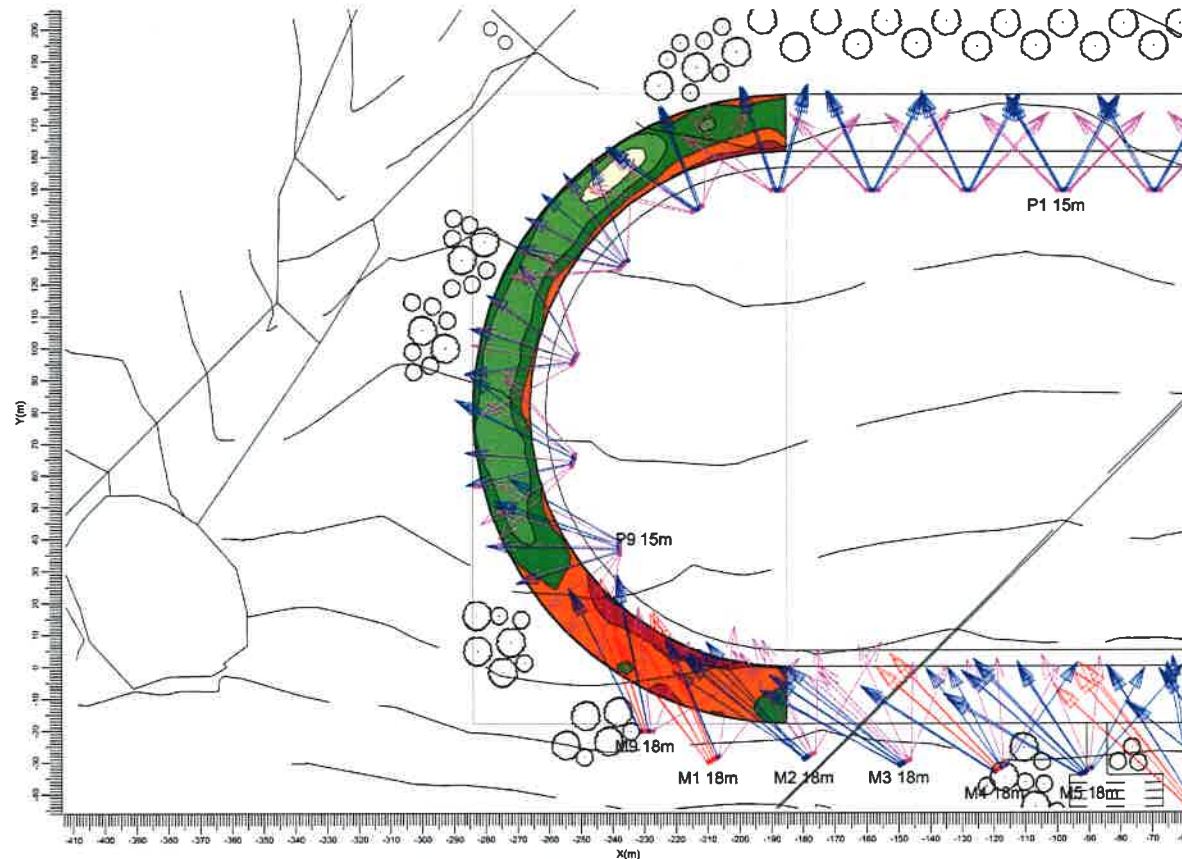
NO IN BCT
34

FILE NO

REV NO
0

3.14 N Bend Ec: Filled Iso Contour

Grid : N Bend at Z = -0.00 m
Calculation : Illuminance towards Camera (lux)
Height above grid : 1.50 m



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Average
1281

Min/Ave
0.61

Min/Max
0.46

Project maintenance factor
0.75

Scale
1:1250

Phillips Lighting B.V. - CalcuLux Area 7.6 2.0 A2003_01A Bathurst Harness.car

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A.J. STOCKMAN PTY LTD
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NEILBO NSW 2765
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DATE ISSUED
29 FEBRUARY 2012
DESIGNED
AJS Electrical Pty Ltd
CHECKED:

CLIENT
BATHURST HARNESS RACING

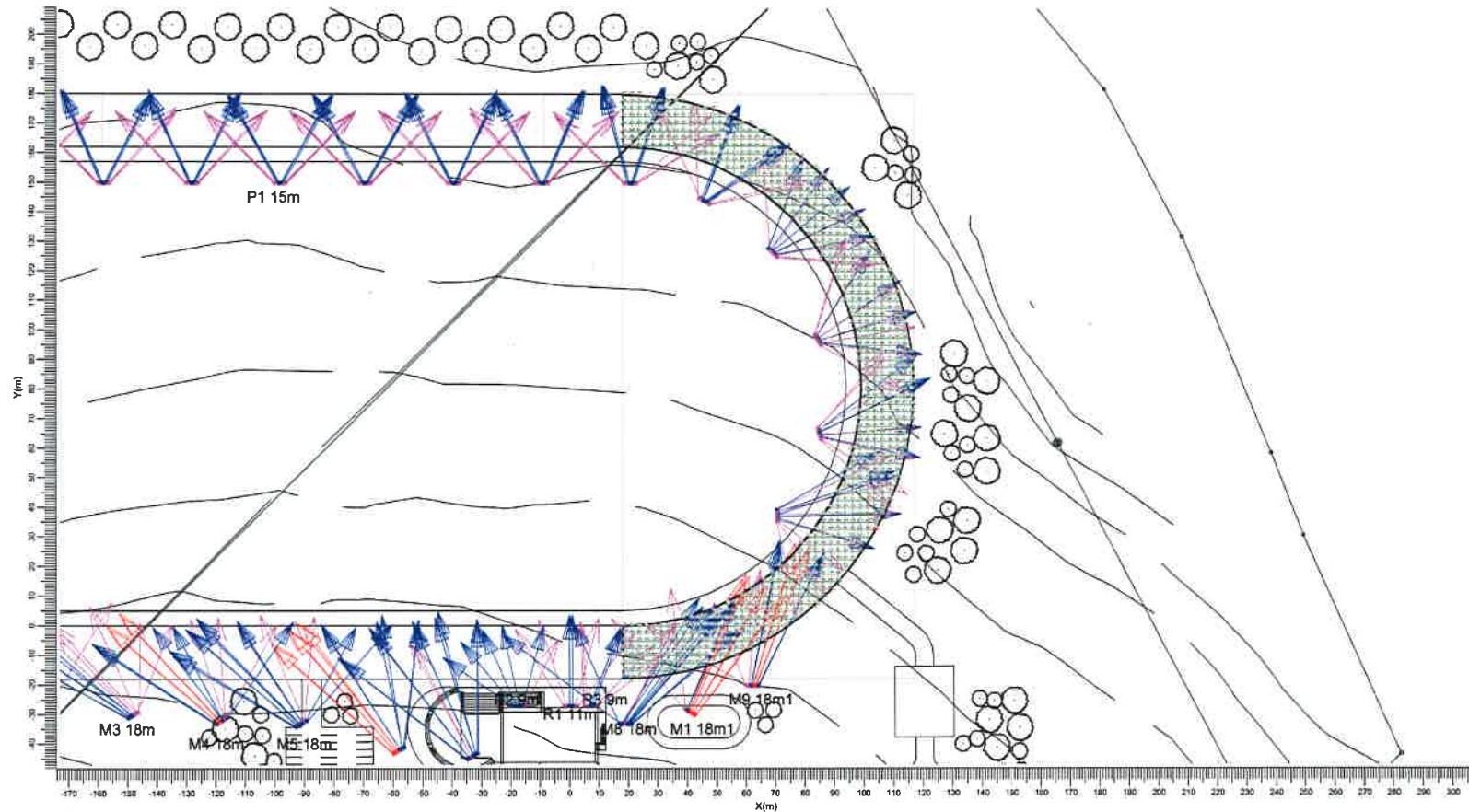
ADDITIONAL INFORMATION

DRAWING TITLE
**BATHURST HARNESS RACING
TRACK LIGHTING**
DRAWING NO.
AJS - BHR- L-D19

NO IN SET
34
FILE NO
REV NO
0

3.15 S Bend Eh: Graphical Table

Grid : S Bend at Z = -0.00 m
Calculation : Surface Illuminance (lux)



415211-00 p1/60
415211-00 p2/60

Average
630

Min/Ave
0.67

Min/Max
0.42

Project maintenance factor
0.75

Scale
1:1250

Philips Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

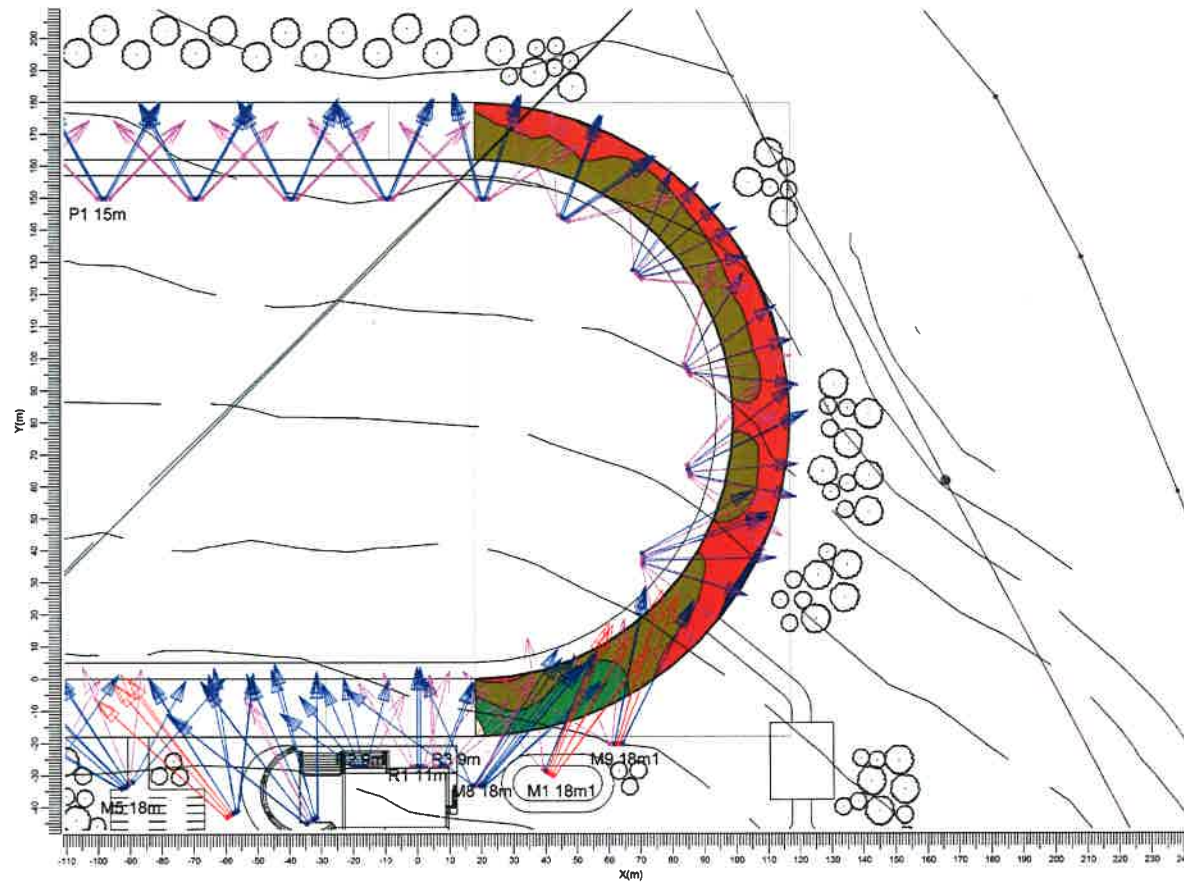
Page: 20/34

AJS A. J. STOCKMAN PTY. LTD.		A.J. STOCKMAN PTY LTD AJS Electrical Consulting 7 Hampton Park Road NEEDS NEW 2795 PHONE (02) 6332 4554 FAX (02) 6332 1067 email: info@ajselectrical.com.au		DATE ISSUED 20 FEBRUARY 2012 DESIGNED AJS Electrical Pty Ltd CHECKED:		CLIENT BATHURST HARNESS RACING		ADDITIONAL INFORMATION		DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING		NO IN ACT 34	
Rev: 0 AJS Draft Track Lighting Layout		AJS: 18/02/12		APPROVED:		DATE:		DRAWING NO: AJS - BHR- L-D20		REV NO: 0			

3.16 S Bend Eh: Filled Iso Contour

Grid
Calculation

S Bend at Z = -0.00 m
Surface Illuminance (lux)



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Average
830

Min/Ave
0.67

Min/Max
0.42

Project maintenance factor
0.75

Scale
1:1250

Philips Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

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A.J. STOCKMAN PTY LTD
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DATE ISSUED
29 FEBRUARY 2012
DESIGNED
AJS Electrical Pty Ltd
CHECKED:

CLIENT
BATHURST HARNESS RACING

ADDITIONAL INFORMATION

DRIVER'S TITLE
BATHURST HARNESS RACING
TRACK LIGHTING

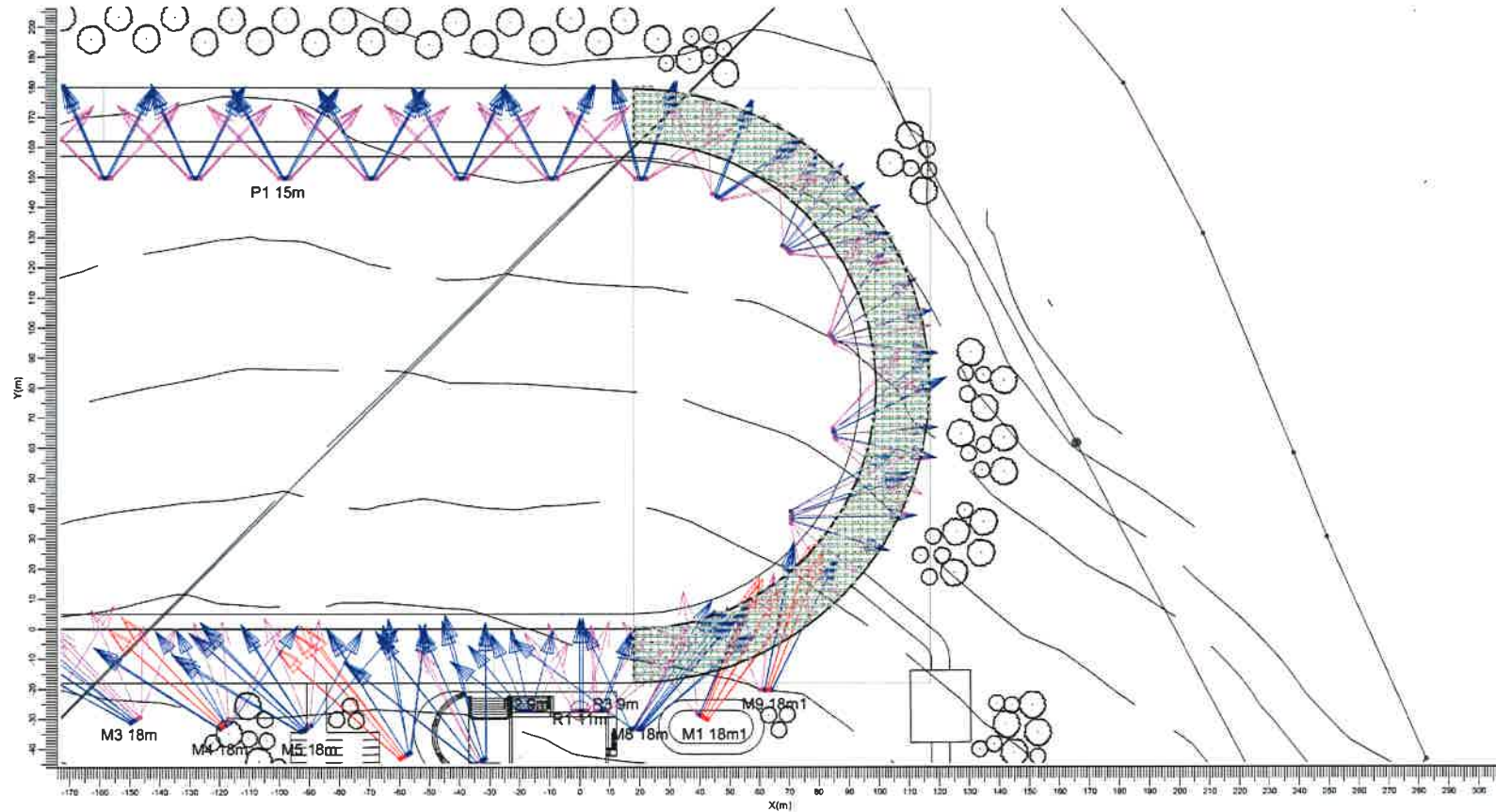
DRAWING NO.
AJS - BHR- L-D21

NO IN SET
34
FILE NO
REV NO
0

3.17 S Bend Ec: Graphical Table

Grid
Calculation
Height above grid

S Bend at Z = -0.00 m
Illuminance towards Camera (lux)
1.50 m



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Average
1350

Min/Ave
0.68

Min/Max
0.39

Project maintenance factor
0.75

Scale
1:1250

Philips Lighting B.V. - CalculuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

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A.J. STOCKMAN PTY LTD
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DATE ISSUED
20 FEBRUARY 2012
DESIGNED
AJS Electrical Pty Ltd
CHECKED

CLIENT
BATHURST HARNESS RACING

ADDITIONAL INFORMATION

DRAWING TITLE
BATHURST HARNESS RACING
TRACK LIGHTING

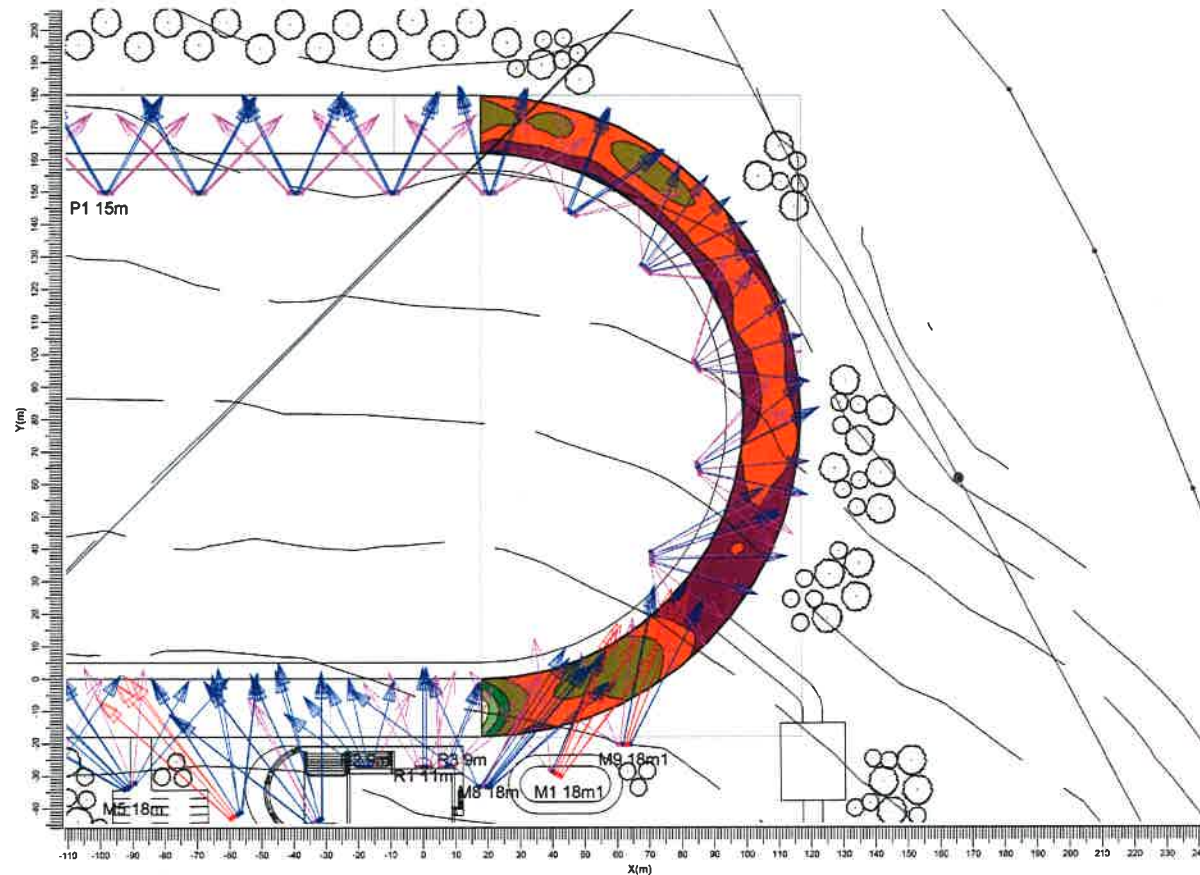
DRAWING NO
AJS - BHR- L-D22

FILE NO
34

REV A/D
0

3.18 S Bend Ec: Filled Iso Contour

Grid : S Bend at Z = -0.00 m
Calculation : Illuminance towards Camera (lux)
Height above grid : 1.50 m



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Average
1350

Min/Ave
0.68

Min/Max
0.39

Project maintenance factor
0.75

Scale
1:1250

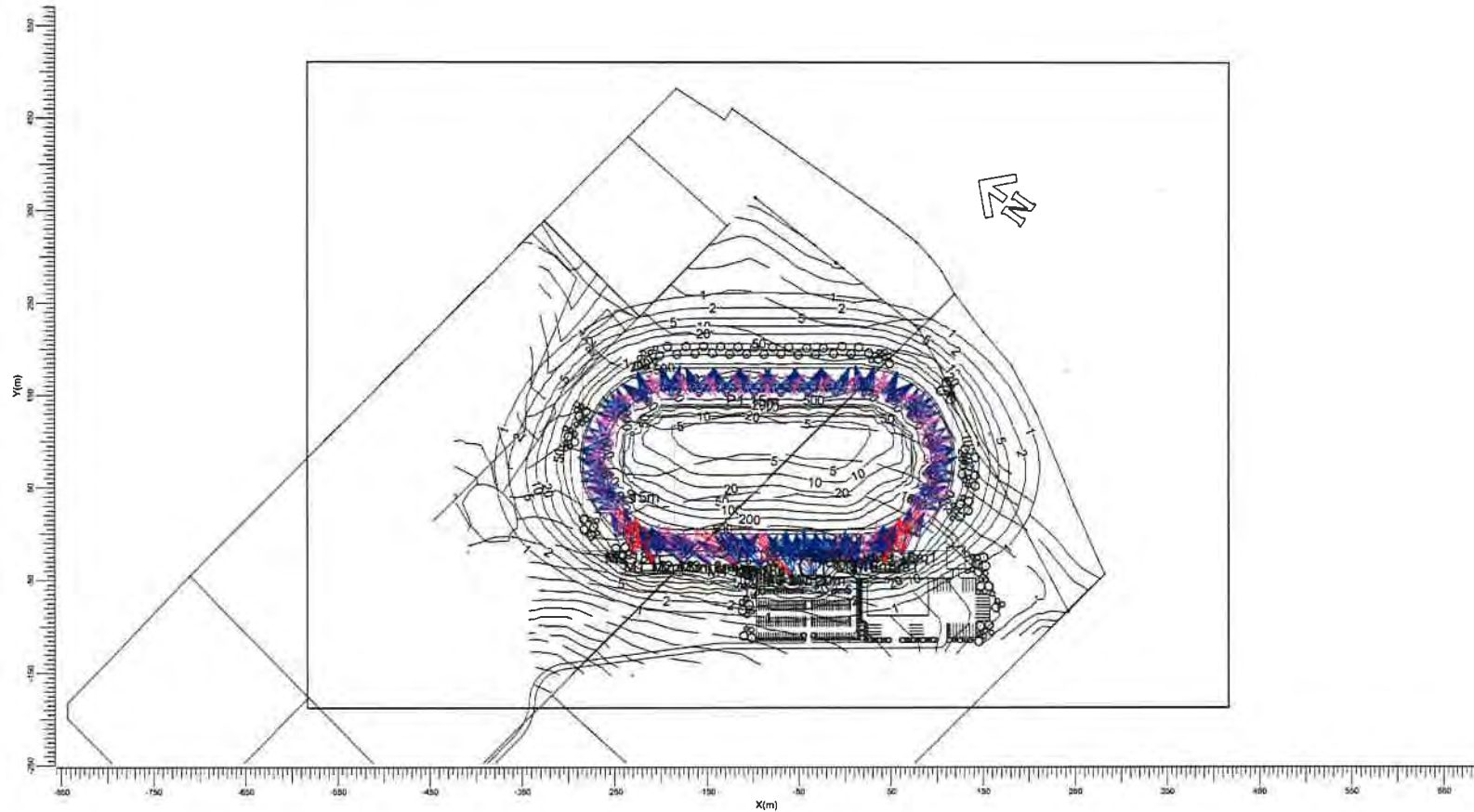
Philips Lighting B.V. - CalcuLux Area 7.6.2.0 A2003_01A Bathurst Harness.cdr

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 A.J. STOCKMAN PTY. LTD. AJS Electrical Contracting 7 Hampton Park Road KELSO NSW 2765 PHONE (02) 6332 4654 FAX (02) 6332 1087 email: info@ajselectrical.com.au		DATE ISSUED 20 FEBRUARY 2012 DESIGNED AJS Electrical Pty Ltd CHECKED	CLIENT BATHURST HARNESS RACING	ADDITIONAL INFORMATION	DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING DRAWING NO AJS - BHR- L-D23	NO IN SET 34 FILE NO REV NO 0
Re: DETAILS OF AMENDMENTS APPROVED DATE						

3.19 Surrounds Eh: Iso Contour

Grid
Calculation : Surrounds at Z = -0.00 m
: Surface Illuminance (lux)



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Project maintenance factor
0.75

Scale
1:4000

Philips Lighting B.V. - CalcuLux Area 7.6 2.0 A2003_01A Bathurst Harness car

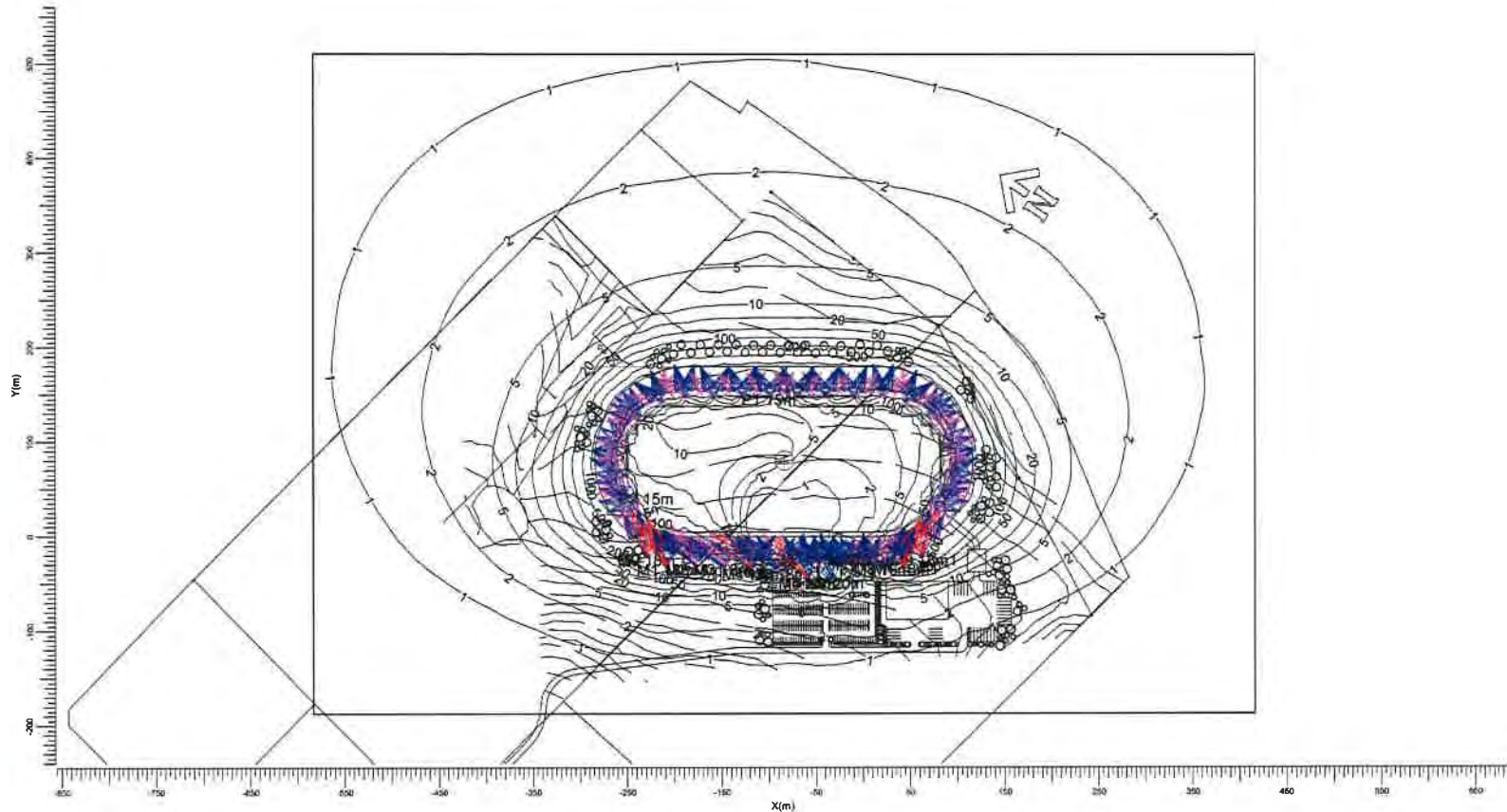
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AJS A. J. STOCKMAN PTY. LTD.		A.J. STOCKMAN PTY LTD AJS Electrical Consulting 7 Hampton Park Road KELSO NSW 2795 PHONE (02) 6332 4554 FAX (02) 6332 1087 email: info@ajselectrical.com.au		DATE ISSUED 29 FEBRUARY 2012 DESIGNED AJS Electrical Pty Ltd CHECKED:		CLIENT BATHURST HARNESS RACING		ADDITIONAL INFORMATION		DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING		DRAWING NO AJS - BHR- L-D24		NEW SET 34	
AJS Draft Track Lighting Layout		APPROVED DATE		DETAILS OF AMENDMENTS		REV 01		REV 02		REV 03		REV 04		REV 05	

3.20 Surrounds Ev: Iso Contour

Grid
Calculation
Height above grid

Surrounds at Z = -0.00 m
Illuminance towards Centre (lux)
1.50 m



415211-00 p1/60
415211-00 p4/60

415211-00 p2/60

Project maintenance factor
0.75

Scale
1:4000

Philips Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness car

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A1 0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000	AJS A. J. STOCKMAN PTY. LTD.	A.J. STOCKMAN PTY LTD AJS Electrical Contracting 7 Hempton Park Road NELSON NSW 2796 PHONE (02) 6332 4554 FAX (02) 6332 1087 email: info@ajselectrical.com.au	DATE ISSUED 20 FEBRUARY 2012 DESIGNED BY AJS Electrical Pty Ltd CHECKED BY	CLIENT BATHURST HARNESS RACING	ADDITIONAL INFORMATION	DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING DRAWN (L101) AJS - BHR- L-D25	NO. IN SET 34 FILE NO. REV. NO. 0
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4. Luminaire Details

4.1 Project Luminaires

Olympic
415211-00 1xMHN-LA 2000/842 p1/60

Light output ratios
DLOR : 0.74
ULOR : 0.00
TLOR : 0.74
Lamp flux : 190000 lm
Luminaire wattage : 2114.0 W
Measurement code : CF1083

Note: Luminaire data not from database.

Olympic
415211-00 1xMHN-LA 2000/842 p2/60

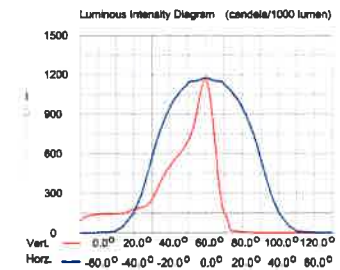
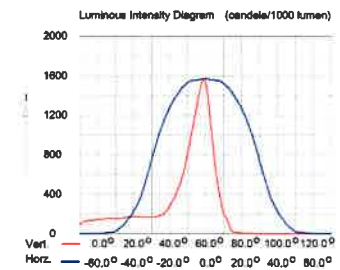
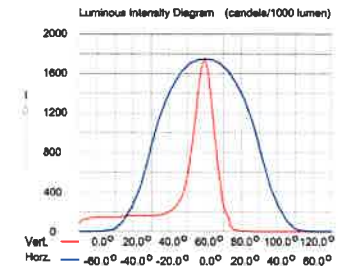
Light output ratios
DLOR : 0.75
ULOR : 0.00
TLOR : 0.75
Lamp flux : 190000 lm
Luminaire wattage : 2114.0 W
Measurement code : CF1073

Note: Luminaire data not from database.

Olympic
415211-00 1xMHN-LA 2000/842 p4/60

Light output ratios
DLOR : 0.73
ULOR : 0.00
TLOR : 0.73
Lamp flux : 190000 lm
Luminaire wattage : 2114.0 W
Measurement code : CF1087

Note: Luminaire data not from database.



A.J. STOCKMAN PTY LTD
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DATE ISSUED
29 FEBRUARY 2012

DESIGNED
AJS Electrical Pty Ltd

CHECKED:

CLIENT
BATHURST HARNESS RACING

ADDITIONAL INFORMATION

DRAWING TITLE
BATHURST HARNESS RACING
TRACK LIGHTING

DRAWING NO
AJS - BHR- L-D26

NO IN SET
34

FILE NO

REV NO
0

5. Installation Data

5.1 Legends

Project Luminaires:			
Code	Qty	Luminaire Type	Lamp Type
A	34	415211-00 p1/80	1 * MHN-LA 2000/856
B	172	415211-00 p2/60	1 * MHN-LA 2000/856
C	160	415211-00 p4/80	1 * MHN-LA 2000/856

Flux (lm)
1 * 190000
1 * 190000
1 * 190000

Code	Arrangement
1	P1 15m
2	P2 15m
3	P3 15m
4	P4 15m
5	P5 15m
6	P6 15m
7	P7 15m
8	P8 15m
9	P9 15m
10	M1 18m
11	M2 18m
12	M3 18m
13	M4 18m
14	M5 18m
15	M6 20m
16	M7 20m
17	M8 18m
18	R1 11m
19	R2 9m
20	R3 9m
21	M9 18m

5.2 Luminaire Positioning and Orientation

Qty and Code	Position			Aiming Points			Aiming Angles			Arr.
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	
1 * C	-100.00	149.47	14.62	-122.89	173.01	0.00	134.2	66.0	0.0	1
1 * C	-100.00	150.00	15.15	-124.02	174.10	0.00	134.9	66.0	0.0	1
1 * C	-99.15	149.47	14.62	-122.06	173.00	0.00	134.2	66.0	0.0	1
1 * B	-99.15	150.00	15.15	-115.91	179.62	0.00	119.5	66.0	0.0	1
1 * B	-98.30	149.47	14.62	-114.64	177.95	0.00	119.8	66.0	0.0	1
1 * B	-98.30	150.00	15.15	-115.05	179.62	0.00	119.5	66.0	0.0	1
1 * B	-97.45	149.47	14.62	-81.96	178.42	0.00	61.8	66.0	0.0	1
1 * B	-97.45	150.00	15.15	-80.80	179.67	0.00	60.7	66.0	0.0	1
1 * C	-96.60	149.47	14.62	-73.92	173.22	0.00	46.3	66.0	0.0	1
1 * B	-96.60	150.00	15.15	-79.95	179.67	0.00	60.7	66.0	0.0	1
1 * C	-95.75	149.47	14.62	-73.06	173.21	0.00	46.3	66.0	0.0	1
1 * C	-95.75	150.00	15.15	-72.11	174.48	0.00	46.0	66.0	0.0	1
1 * C	-71.25	149.47	14.62	-93.94	173.21	0.00	133.7	66.0	-0.0	1
1 * C	-71.25	150.00	15.15	-94.89	174.48	0.00	134.0	66.0	-0.0	1
1 * C	-70.40	149.47	14.62	-93.08	173.22	0.00	133.7	66.0	-0.0	1
1 * B	-70.40	150.00	15.15	-87.05	179.67	0.00	119.3	66.0	-0.0	1
1 * B	-69.55	149.47	14.62	-85.04	178.42	0.00	118.2	66.0	-0.0	1
1 * B	-69.55	150.00	15.15	-86.20	179.67	0.00	119.3	66.0	-0.0	1
1 * B	-68.70	149.47	14.62	-52.36	177.95	0.00	60.2	66.0	-0.0	1
1 * B	-68.70	150.00	15.15	-51.95	179.62	0.00	60.5	66.0	-0.0	1

Philips Lighting B.V. - CalcuLux Area 7.5.2.0 A2003_01A Bathurst Harness car

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		A.J. STOCKMAN PTY. LTD. AJS Electrical Consulting 7 Hampden Park Road KESWICK VIC 3215 PHONE (03) 8532 4554 FAX (03) 8532 1067 email: info@ajselectrical.com.au		DATE ISSUED 29 FEBRUARY 2012 DESIGNED AJS Electrical Pty Ltd CHECKED:		CLIENT BATHURST HARNESS RACING		ADDITIONAL INFORMATION		DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING		NO. IN SET 34	
No. 1 AJS Bathurst Harness Lighting Layout		AJS 010312		APPROVED DATE		DRAWING NO. AJS - BHR - L-D27		REV #02 0					

Pierlite Australia Pty. Ltd.
Date: 24-02-2012

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Qty and Code	Position			Aiming Points			Aiming Angles			Arr.
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	
1*B	-189.15	150.00	15.15	-199.78	182.33	0.00	108.2	66.0	0.0	4
1*B	-188.30	149.47	14.62	-199.46	180.35	0.00	109.9	66.0	0.0	4
1*B	-188.30	150.00	15.15	-198.93	182.32	0.00	108.2	66.0	0.0	4
1*B	-187.45	149.47	14.62	-178.23	180.99	0.00	73.7	66.0	0.0	4
1*B	-187.45	150.00	15.15	-178.90	182.94	0.00	75.5	66.0	0.0	4
1*C	-186.60	149.47	14.62	-163.12	172.43	0.00	44.4	66.0	0.0	4
1*B	-186.60	150.00	15.15	-178.08	182.94	0.00	75.5	66.0	0.0	4
1*C	-185.75	149.47	14.62	-162.29	172.44	0.00	44.4	66.0	0.0	4
1*C	-185.75	150.00	15.15	-161.61	173.98	0.00	44.8	66.0	0.0	4
1*C	18.75	149.47	14.62	-4.71	172.44	0.00	135.6	66.0	-0.0	4
1*C	18.75	150.00	15.15	-5.39	173.98	0.00	135.2	66.0	-0.0	4
1*C	19.60	149.47	14.62	-3.88	172.43	0.00	135.6	66.0	-0.0	4
1*B	19.60	150.00	15.15	11.08	182.94	0.00	104.5	66.0	-0.0	4
1*B	20.45	149.47	14.62	11.23	180.99	0.00	106.3	66.0	-0.0	4
1*B	20.45	150.00	15.15	11.90	182.94	0.00	104.5	66.0	-0.0	4
1*B	21.30	149.47	14.62	32.46	180.35	0.00	70.1	66.0	-0.0	4
1*B	21.30	150.00	15.15	31.93	182.32	0.00	71.8	66.0	-0.0	4
1*C	22.15	149.47	14.62	50.21	166.53	0.00	31.3	66.0	-0.0	4
1*B	22.15	150.00	15.15	32.78	182.33	0.00	71.8	66.0	-0.0	4
1*C	23.00	149.47	14.62	51.06	166.53	0.00	31.3	66.0	-0.0	4
1*C	23.00	150.00	15.15	48.29	172.76	0.00	42.0	66.0	-0.0	4
1*C	-215.00	143.00	15.15	-248.06	151.06	0.00	166.3	66.0	0.0	5
1*C	-214.73	142.54	14.62	-246.87	149.28	0.00	168.2	66.0	0.0	5
1*B	-214.26	143.43	15.15	-242.03	163.09	0.00	144.7	66.0	0.0	5
1*C	-214.00	142.97	14.62	-241.47	160.96	0.00	146.8	66.0	0.0	5
1*B	-213.53	143.85	15.15	-241.29	163.53	0.00	144.7	66.0	0.0	5
1*B	-213.26	143.39	14.62	-240.71	161.41	0.00	146.7	66.0	0.0	5
1*B	-212.79	144.28	15.15	-225.19	175.97	0.00	111.4	66.0	0.0	5
1*B	-212.53	143.82	14.62	-223.98	174.60	0.00	110.4	66.0	0.0	5
1*B	-212.06	144.70	15.15	-224.48	176.38	0.00	111.4	66.0	0.0	5
1*C	-211.79	144.24	14.62	-197.91	174.00	0.00	65.0	66.0	0.0	5
1*C	-211.32	145.13	15.15	-197.02	176.00	0.00	65.1	66.0	0.0	5
1*C	-211.05	144.67	14.62	-209.35	177.46	0.00	87.0	66.0	0.0	5
1*C	44.05	144.67	14.62	42.35	177.46	0.00	93.0	66.0	-0.0	5
1*C	44.32	145.13	15.15	30.02	176.00	0.00	114.9	66.0	-0.0	5
1*C	44.79	144.24	14.62	30.91	174.00	0.00	115.0	66.0	-0.0	5
1*B	45.06	144.70	15.15	57.48	176.38	0.00	68.6	66.0	-0.0	5
1*B	45.53	143.82	14.62	56.98	174.60	0.00	69.6	66.0	-0.0	5
1*B	45.79	144.28	15.15	58.19	175.97	0.00	68.6	66.0	-0.0	5
1*B	46.26	143.39	14.62	73.71	161.41	0.00	33.3	66.0	-0.0	5
1*B	46.53	143.85	15.15	74.29	163.53	0.00	35.3	66.0	-0.0	5
1*C	47.00	142.97	14.62	74.47	160.96	0.00	33.2	66.0	-0.0	5
1*B	47.26	143.43	15.15	75.03	163.09	0.00	35.3	66.0	-0.0	5
1*C	47.73	142.54	14.62	79.87	149.26	0.00	11.8	66.0	-0.0	5
1*C	48.00	143.00	15.15	81.06	151.06	0.00	13.7	66.0	-0.0	5
1*C	-238.00	125.00	15.15	-271.94	122.54	0.00	-175.8	66.0	0.0	6
1*C	-237.63	124.63	14.62	-270.35	121.90	0.00	-175.2	66.0	0.0	6
1*B	-237.40	125.60	15.15	-270.83	131.93	0.00	169.3	66.0	0.0	6
1*C	-237.02	125.23	14.62	-269.39	130.76	0.00	170.3	66.0	0.0	6
1*B	-236.80	126.20	15.15	-267.37	141.13	0.00	154.0	66.0	0.0	6
1*C	-236.42	125.83	14.62	-265.96	140.17	0.00	154.1	66.0	0.0	6
1*B	-236.20	126.80	15.15	-262.27	148.66	0.00	140.0	66.0	0.0	6
1*C	-235.82	126.43	14.62	-254.65	153.33	0.00	125.0	66.0	0.0	6
1*B	-235.60	127.40	15.15	-255.25	155.18	0.00	125.3	66.0	0.0	6
1*C	-235.22	127.03	14.62	-233.00	159.79	0.00	86.1	66.0	0.0	6

Philippe Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness car

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AJS A. J. STOCKMAN PTY. LTD.		DATE ISSUED: 29 FEBRUARY 2012		ADDITIONAL INFORMATION:		DRAWING TITLE: BATHURST HARNESS RACING TRACK LIGHTING		NO IN SET: 34	
DESIGNED: AJS Electrical Pty Ltd		CLIENT: BATHURST HARNESS RACING				DRAWING NO: AJS - BHR- L-D29		REV NO: 0	
CHECKED:									
AJS A. J. STOCKMAN PTY. LTD.		AJS Electrical Contracting 7 Hampton Park Road WHEELS MEET 2756 PHONE (02) 8332 4854 FAX (02) 8332 1087 email: info@ajselectrical.com.au							
A1 TO 901		CROWN COPYRIGHT		180		200		300	

Qty and Code	Position			Aiming Points			Aiming Angles			Att.
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	
1* C	-234.99	128.01	15.15	-246.45	160.05	0.00	109.7	66.0	0.0	6
1* B	-234.62	127.63	14.62	-246.60	158.20	0.00	111.4	66.0	0.0	6
1* B	67.62	127.63	14.62	79.60	158.20	0.00	68.6	66.0	-0.0	6
1* C	67.99	128.01	15.15	79.45	160.05	0.00	70.3	66.0	-0.0	6
1* C	68.22	127.03	14.62	66.00	159.79	0.00	93.9	66.0	-0.0	6
1* B	68.80	127.40	15.15	88.25	155.18	0.00	54.7	66.0	-0.0	6
1* C	68.82	126.43	14.62	87.65	153.33	0.00	55.0	66.0	-0.0	6
1* B	69.20	126.80	15.15	95.27	148.66	0.00	40.0	66.0	-0.0	6
1* C	69.42	125.83	14.62	98.96	140.17	0.00	25.9	66.0	-0.0	6
1* B	69.80	126.20	15.15	100.37	141.13	0.00	26.0	66.0	-0.0	6
1* C	70.02	125.23	14.62	102.39	130.76	0.00	9.7	66.0	-0.0	6
1* B	70.40	125.60	15.15	103.83	131.93	0.00	10.7	66.0	-0.0	6
1* C	70.63	124.63	14.62	103.35	121.90	0.00	-4.8	66.0	-0.0	6
1* C	71.00	125.00	15.15	104.94	122.54	0.00	-4.2	66.0	-0.0	6
1* C	-253.00	95.00	15.15	-286.86	91.67	0.00	-174.4	66.0	0.0	7
1* B	-252.58	95.74	15.15	-286.41	92.04	0.00	-173.8	66.0	0.0	7
1* C	-252.54	94.73	14.62	-281.26	78.81	0.00	-151.0	66.0	0.0	7
1* B	-252.15	96.47	15.15	-284.75	106.23	0.00	163.3	66.0	0.0	7
1* C	-252.12	95.47	14.62	-284.46	101.16	0.00	170.0	66.0	0.0	7
1* B	-251.73	97.21	15.15	-279.49	116.89	0.00	144.7	66.0	0.0	7
1* C	-251.69	96.21	14.62	-282.75	106.86	0.00	161.1	66.0	0.0	7
1* B	-251.30	97.94	15.15	-269.25	126.85	0.00	121.8	66.0	0.0	7
1* C	-251.27	96.94	14.62	-278.37	115.49	0.00	145.6	66.0	0.0	7
1* C	-250.88	98.68	15.15	-260.92	131.19	0.00	107.2	66.0	0.0	7
1* C	-250.84	97.68	14.62	-268.00	125.67	0.00	121.5	66.0	0.0	7
1* C	-250.42	98.42	14.62	-260.16	129.78	0.00	107.2	66.0	0.0	7
1* C	83.42	98.42	14.62	93.16	129.78	0.00	72.8	66.0	-0.0	7
1* C	83.84	97.68	14.62	101.00	125.67	0.00	58.5	66.0	-0.0	7
1* C	83.88	98.68	15.15	93.92	131.19	0.00	72.8	66.0	-0.0	7
1* C	84.27	96.94	14.62	111.37	115.49	0.00	34.4	66.0	-0.0	7
1* B	84.30	97.94	15.15	102.25	126.85	0.00	58.2	66.0	-0.0	7
1* C	84.69	96.21	14.62	115.75	106.86	0.00	18.9	66.0	-0.0	7
1* B	84.73	97.21	15.15	112.49	116.89	0.00	35.3	66.0	-0.0	7
1* C	85.12	95.47	14.62	117.46	101.16	0.00	10.0	66.0	-0.0	7
1* B	85.15	96.47	15.15	117.75	106.23	0.00	16.7	66.0	-0.0	7
1* C	85.54	94.73	14.62	114.26	78.81	0.00	-29.0	66.0	-0.0	7
1* B	85.58	95.74	15.15	119.41	92.04	0.00	-6.2	66.0	-0.0	7
1* C	86.00	95.00	15.15	119.86	91.67	0.00	-5.6	66.0	-0.0	7
1* C	-253.00	63.00	15.15	-281.54	44.48	0.00	-147.0	66.0	0.0	8
1* B	-252.78	63.82	15.15	-286.07	56.75	0.00	-168.0	66.0	0.0	8
1* B	-252.56	64.64	15.15	-286.49	67.16	0.00	175.8	66.0	0.0	8
1* C	-252.49	62.86	14.62	-276.05	39.98	0.00	-135.8	66.0	0.0	8
1* B	-252.34	65.46	15.15	-289.64	83.94	0.00	153.6	70.0	0.0	8
1* C	-252.27	63.68	14.62	-284.24	56.19	0.00	-166.8	66.0	0.0	8
1* B	-252.12	66.28	15.15	-285.12	91.65	0.00	142.4	70.0	0.0	8
1* C	-252.05	64.50	14.62	-284.77	67.25	0.00	175.2	66.0	0.0	8
1* C	-251.90	67.11	15.15	-274.18	92.83	0.00	130.9	66.0	0.0	8
1* B	-251.83	65.33	14.62	-288.17	82.45	0.00	154.8	70.0	0.0	8
1* C	-251.61	66.15	14.62	-279.76	83.06	0.00	149.0	66.0	0.0	8
1* C	-251.39	66.97	14.62	-274.19	90.80	0.00	134.0	66.0	0.0	8
1* C	84.39	66.97	14.62	107.19	90.60	0.00	46.0	66.0	-0.0	8
1* C	84.61	66.15	14.62	112.76	83.06	0.00	31.0	66.0	-0.0	8
1* B	84.83	65.33	14.62	121.17	82.45	0.00	25.2	70.0	-0.0	8
1* C	84.90	67.11	15.15	107.18	92.83	0.00	49.1	66.0	-0.0	8
1* C	85.05	64.50	14.62	117.77	67.25	0.00	4.8	66.0	-0.0	8

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A1		AJS		A.J. STOCKMAN PTY. LTD.		DATE ISSUED 29 FEBRUARY 2012		ADDITIONAL INFORMATION		DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING		NO IN SET 34	
No.		AJS Draft Track Lighting Layout		AJS Electrical Contracting 7 Hampden Park Road MELBOURNE VIC 3000 PHONE (02) 8332 4554 FAX (02) 8332 1087 email: info@ajsaustralia.com.au		DESIGNED BY AJS Electrical Pty Ltd		CHECKED BY BATHURST HARNESS RACING		DRAWN BY AJS - BHR- L-D30		FILE NO	
APPROVED		DATE										REVISED 0	

Qty and Code	Position			Aiming Points			Aiming Angles			Arr.
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)	Rot	Tilt90	Tilt0	
1 * B	85.12	66.28	15.15	118.12	91.85	0.00	37.6	70.0	-0.0	8
1 * C	85.27	63.68	14.62	117.24	56.19	0.00	-13.2	66.0	-0.0	8
1 * B	85.34	65.46	15.15	122.64	83.94	0.00	26.4	70.0	-0.0	8
1 * C	85.49	62.86	14.62	109.05	39.98	0.00	-44.2	66.0	-0.0	8
1 * B	85.56	64.64	15.15	119.49	67.16	0.00	4.2	66.0	-0.0	8
1 * B	85.78	63.82	15.15	119.07	56.75	0.00	-12.0	66.0	-0.0	8
1 * C	86.00	63.00	15.15	114.54	44.48	0.00	-33.0	66.0	-0.0	8
1 * C	-238.00	35.00	15.15	-254.28	10.12	0.00	-123.2	63.0	0.0	9
1 * B	-238.00	35.85	15.15	-270.53	25.85	0.00	-162.9	66.0	0.0	9
1 * B	-238.00	36.70	15.15	-279.61	37.79	0.00	178.5	70.0	0.0	9
1 * B	-238.00	37.55	15.15	-277.50	50.67	0.00	161.6	70.0	0.0	9
1 * B	-238.00	38.40	15.15	-277.32	52.05	0.00	160.9	70.0	0.0	9
1 * C	-238.00	39.25	15.15	-275.62	57.07	0.00	154.7	70.0	0.0	9
1 * C	-237.47	35.00	14.62	-244.45	2.91	0.00	-102.3	66.0	0.0	9
1 * C	-237.47	35.85	14.62	-260.30	18.46	0.00	-142.7	63.0	0.0	9
1 * C	-237.47	36.70	14.62	-268.72	26.62	0.00	-162.1	66.0	0.0	9
1 * C	-237.47	37.55	14.62	-277.63	38.21	0.00	179.1	70.0	0.0	9
1 * C	-237.47	38.40	14.62	-276.35	48.49	0.00	165.5	70.0	0.0	9
1 * B	-237.47	39.25	14.62	-272.52	58.88	0.00	150.8	70.0	0.0	9
1 * C	70.47	35.00	14.62	77.45	2.91	0.00	-77.7	66.0	-0.0	9
1 * C	70.47	35.85	14.62	93.30	18.46	0.00	-37.3	63.0	-0.0	9
1 * C	70.47	36.70	14.62	101.72	26.62	0.00	-17.9	66.0	-0.0	9
1 * C	70.47	37.55	14.62	110.83	38.21	0.00	0.9	70.0	-0.0	9
1 * C	70.47	38.40	14.62	109.35	48.49	0.00	14.5	70.0	-0.0	9
1 * B	70.47	39.25	14.62	105.52	58.88	0.00	29.2	70.0	-0.0	9
1 * C	71.00	35.00	15.15	87.28	10.12	0.00	-56.8	63.0	-0.0	9
1 * B	71.00	35.85	15.15	103.53	25.85	0.00	-17.1	66.0	-0.0	9
1 * B	71.00	36.70	15.15	112.61	37.79	0.00	1.5	70.0	-0.0	9
1 * B	71.00	37.55	15.15	110.50	50.67	0.00	18.4	70.0	-0.0	9
1 * B	71.00	38.40	15.15	110.32	52.05	0.00	19.1	70.0	-0.0	9
1 * C	71.00	39.25	15.15	108.62	57.07	0.00	25.3	70.0	-0.0	9
1 * A	-210.00	-30.00	18.15	-240.06	9.79	0.00	127.1	70.0	0.0	10
1 * A	-209.73	-30.46	17.62	-239.32	7.85	0.00	127.7	70.0	0.0	10
1 * A	-209.26	-29.58	18.15	-234.46	13.45	0.00	120.4	70.0	0.0	10
1 * A	-208.00	-30.03	17.62	-232.79	12.13	0.00	119.4	70.0	0.0	10
1 * A	-208.53	-29.15	18.15	-228.27	16.64	0.00	113.3	70.0	0.0	10
1 * A	-208.26	-29.61	17.62	-227.18	14.95	0.00	113.0	70.0	0.0	10
1 * A	-207.79	-28.73	18.15	-227.09	17.25	0.00	112.8	70.0	0.0	10
1 * A	-207.53	-29.18	17.62	-225.93	15.60	0.00	112.3	70.0	0.0	10
1 * B	-207.06	-28.30	18.15	-223.53	8.99	0.00	113.8	66.0	0.0	10
1 * B	-206.79	-28.76	17.62	-222.09	7.74	0.00	112.7	66.0	0.0	10
1 * C	-206.32	-27.88	18.15	-201.50	12.60	0.00	83.2	66.0	0.0	10
1 * C	-206.05	-28.33	17.62	-181.29	2.55	0.00	51.3	66.0	0.0	10
1 * C	39.05	-28.33	17.62	14.29	2.55	0.00	128.7	66.0	-0.0	10
1 * C	39.32	-27.88	18.15	34.50	12.60	0.00	96.8	66.0	-0.0	10
1 * B	39.79	-28.76	17.62	55.09	7.74	0.00	67.3	66.0	-0.0	10
1 * B	40.06	-28.30	18.15	56.53	8.99	0.00	66.2	66.0	-0.0	10
1 * A	40.53	-29.18	17.62	58.93	15.60	0.00	67.7	70.0	-0.0	10
1 * A	40.79	-28.73	18.15	60.09	17.25	0.00	67.2	70.0	-0.0	10
1 * A	41.26	-29.61	17.62	60.18	14.95	0.00	67.0	70.0	-0.0	10
1 * A	41.53	-29.15	18.15	61.27	16.64	0.00	66.7	70.0	-0.0	10
1 * A	42.00	-30.03	17.62	65.79	12.13	0.00	60.6	70.0	-0.0	10
1 * A	42.26	-29.58	18.15	67.46	13.45	0.00	59.6	70.0	-0.0	10
1 * A	42.73	-30.46	17.62	72.32	7.85	0.00	52.3	70.0	-0.0	10
1 * A	43.00	-30.00	18.15	73.06	9.79	0.00	52.9	70.0	-0.0	10

Philips Lighting B.V. - Calculux Area 7.6.2.0 A2003_01A Bathurst Harness car

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A.J. STOCKMAN PTY. LTD. AJS Electrical Contracting 7 Hampden Park Road WELLS NSW 2796 PHONE (02) 6332 4554 FAX (02) 6332 1887 email - info@ajselectrical.com.au		DATE ISSUED 29 FEBRUARY 2012 DESIGNED AJS Electrical Pty Ltd CHECKED	CLIENT BATHURST HARNESS RACING	ADDITIONAL INFORMATION	DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING DRAWN/DAT AJS - BHR- L-D31	NO. IN SET 34 REV. NO. 0
AJS A.J. STOCKMAN PTY. LTD.		AJS AJS Electrical Contracting				
APPROVED DATE		APPROVED DATE				
CROWN COPYRIGHT		CROWN COPYRIGHT				

Qty and Code	Position		Aiming Points			Aiming Angles			Arr.	
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)	Rot.	Tilt90		Tilt0
1 * B	-180.00	-29.00	18.15	-217.80	3.52	0.00	139.3	70.0	0.0	11
1 * B	-179.73	-29.46	17.62	-210.51	7.91	0.00	129.5	70.0	0.0	11
1 * B	-179.26	-28.58	18.15	-221.13	-1.50	0.00	147.1	70.0	0.0	11
1 * B	-179.00	-29.03	17.62	-216.71	1.33	0.00	141.2	70.0	0.0	11
1 * B	-178.53	-28.15	18.15	-216.47	4.21	0.00	139.5	70.0	0.0	11
1 * B	-178.26	-28.61	17.62	-212.80	5.31	0.00	135.5	70.0	0.0	11
1 * C	-177.79	-27.73	18.15	-202.12	4.98	0.00	126.6	66.0	0.0	11
1 * C	-177.53	-28.18	17.62	-199.93	4.44	0.00	124.5	66.0	0.0	11
1 * C	-177.06	-27.30	18.15	-195.89	8.86	0.00	117.5	66.0	0.0	11
1 * C	-176.79	-27.76	17.62	-192.87	8.40	0.00	114.0	66.0	0.0	11
1 * C	-176.32	-26.88	18.15	-155.08	7.91	0.00	58.6	66.0	0.0	11
1 * C	-176.05	-27.33	17.62	-175.10	5.79	0.00	88.3	62.0	0.0	11
1 * B	-150.00	-31.00	18.15	-193.90	-7.34	0.00	151.7	70.0	0.0	12
1 * B	-149.73	-31.46	17.62	-191.89	-7.67	0.00	150.6	70.0	0.0	12
1 * B	-149.26	-30.58	18.15	-190.73	-2.88	0.00	146.3	70.0	0.0	12
1 * B	-149.00	-31.03	17.62	-189.26	-4.14	0.00	146.3	70.0	0.0	12
1 * B	-148.53	-30.15	18.15	-188.43	-0.23	0.00	143.1	70.0	0.0	12
1 * B	-148.26	-30.61	17.62	-185.52	0.30	0.00	140.3	70.0	0.0	12
1 * C	-147.79	-29.73	18.15	-178.46	-2.88	0.00	138.8	66.0	0.0	12
1 * C	-147.53	-30.18	17.62	-175.00	-1.70	0.00	134.0	66.0	0.0	12
1 * C	-147.06	-29.30	18.15	-174.97	0.41	0.00	133.2	66.0	0.0	12
1 * C	-146.79	-29.76	17.62	-162.74	6.46	0.00	113.8	66.0	0.0	12
1 * C	-146.32	-28.88	18.15	-134.75	0.35	-0.00	68.4	60.0	0.0	12
1 * C	-146.05	-29.33	17.62	-145.51	1.18	-0.00	89.0	60.0	0.0	12
1 * B	-120.00	-33.00	18.15	-162.04	-6.19	0.00	147.5	70.0	0.0	13
1 * B	-119.73	-33.46	17.62	-160.68	-7.63	0.00	147.8	70.0	0.0	13
1 * A	-119.26	-32.58	18.15	-157.17	-0.18	0.00	139.5	70.0	0.0	13
1 * A	-119.00	-33.03	17.62	-155.80	-1.58	0.00	139.5	70.0	0.0	13
1 * A	-118.53	-32.15	18.15	-152.89	4.18	0.00	133.2	70.0	0.0	13
1 * A	-118.26	-32.61	17.62	-151.51	2.57	0.00	133.4	70.0	0.0	13
1 * B	-117.79	-31.73	18.15	-134.44	-0.24	0.00	117.9	63.0	0.0	13
1 * B	-117.53	-32.18	17.62	-141.42	-0.63	0.00	127.1	66.0	0.0	13
1 * C	-117.06	-31.30	18.15	-128.53	2.42	0.00	108.8	63.0	0.0	13
1 * C	-116.79	-31.76	17.62	-119.04	2.75	0.00	93.7	63.0	0.0	13
1 * C	-116.32	-30.88	18.15	-99.09	0.30	0.00	61.1	63.0	0.0	13
1 * B	-116.05	-31.33	17.62	-93.55	1.23	0.00	55.4	66.0	0.0	13
1 * B	-93.00	-34.00	18.15	-135.85	-8.49	0.00	149.2	70.0	0.0	14
1 * B	-92.73	-34.46	17.62	-134.62	-10.19	0.00	149.9	70.0	0.0	14
1 * B	-92.26	-33.58	18.15	-130.27	-1.30	0.00	139.7	70.0	0.0	14
1 * B	-92.00	-34.03	17.62	-128.63	-2.38	0.00	139.2	70.0	0.0	14
1 * B	-91.53	-33.15	18.15	-126.54	2.36	0.00	134.6	70.0	0.0	14
1 * B	-91.26	-33.61	17.62	-125.80	0.31	0.00	135.5	70.0	0.0	14
1 * B	-90.79	-32.73	18.15	-112.71	1.64	0.00	122.5	66.0	0.0	14
1 * B	-90.53	-33.18	17.62	-112.37	-0.17	0.00	123.5	66.0	0.0	14
1 * C	-90.06	-32.30	18.15	-86.45	3.14	0.00	84.2	63.0	0.0	14
1 * C	-89.79	-32.76	17.62	-104.93	3.81	0.00	112.5	66.0	0.0	14
1 * B	-89.32	-31.88	18.15	-72.42	-0.52	0.00	61.7	63.0	0.0	14
1 * B	-89.05	-32.33	17.62	-60.15	0.33	0.00	48.5	68.0	0.0	14
1 * A	-80.00	-43.00	20.15	-101.14	-5.95	0.00	138.0	70.0	0.0	15
1 * A	-59.73	-43.46	19.62	-99.81	-7.41	0.00	138.0	70.0	0.0	15
1 * A	-59.26	-42.58	20.15	-95.71	-0.91	0.00	131.2	70.0	0.0	15
1 * A	-59.00	-43.03	19.62	-94.23	-2.23	0.00	130.8	70.0	0.0	15
1 * A	-58.53	-42.15	20.15	-92.88	1.27	0.00	128.3	70.0	0.0	15
1 * A	-58.26	-42.61	19.62	-90.81	0.36	0.00	127.1	70.0	0.0	15
1 * B	-57.79	-41.73	20.15	-84.39	0.46	0.00	122.2	68.0	0.0	15

Philips Lighting B.V. - CalcuLuX Area 7.6.2.0 A2003_01A Bathurst Harness.car

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AJS ELECTRICAL CONTRACTORS A. J. STOCKMAN PTY. LTD.		A.J. STOCKMAN PTY LTD AJS Electrical Contracting 7 Hampden Park Road BELLINGHAM NSW 2796 PHONE (02) 6332 4554 FAX (02) 6332 1087 email - nfo@ajselectrical.com.au		DATE ISSUED 29 FEBRUARY 2012 DESIGNED BY AJS Electrical Pty Ltd CHECKED BY		CLIENT BATHURST HARNESS RACING		ADDITIONAL INFORMATION		DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING DRAWING NO AJS - BHR- L-D32		NO IN SET 34 FILE NO REV NO 0	
AJS Bathurst Harness Lighting Layout		AJS		DATE									
DETAILS OF AMENDMENTS		APPROVED		DATE									

Qty and Code	Position			Aiming Points			Aiming Angles			Arr.
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	
1*B	-57.53	-42.18	19.62	-83.63	-1.23	0.00	122.5	68.0	0.0	15
1*B	-57.06	-41.30	20.15	-83.60	3.48	0.00	98.3	66.0	0.0	15
1*B	-56.79	-41.76	19.62	-65.33	1.47	0.00	101.2	66.0	0.0	15
1*B	-56.32	-40.88	20.15	-51.29	2.04	-0.00	83.3	65.0	0.0	15
1*B	-56.05	-41.33	19.62	-51.35	0.48	0.00	83.6	65.0	0.0	15
1*B	-35.00	-45.00	20.15	-78.57	-10.84	0.00	141.9	70.0	0.0	16
1*B	-34.73	-45.46	19.62	-77.08	-12.11	0.00	141.8	70.0	0.0	16
1*B	-34.28	-44.58	20.15	-67.99	-0.88	0.00	127.5	70.0	0.0	16
1*B	-34.00	-45.03	19.62	-67.02	-2.42	0.00	127.8	70.0	0.0	16
1*C	-33.53	-44.15	20.15	-54.15	-6.17	-0.00	118.5	65.0	0.0	16
1*C	-33.26	-44.61	19.62	-52.31	-7.10	0.00	116.9	65.0	0.0	16
1*B	-32.79	-43.73	20.15	-53.46	1.66	0.00	114.5	68.0	0.0	16
1*B	-32.53	-44.18	19.62	-52.84	-0.07	0.00	114.7	68.0	0.0	16
1*B	-32.06	-43.30	20.15	-44.70	4.95	0.00	104.7	68.0	0.0	16
1*B	-31.79	-43.76	19.62	-45.68	2.77	0.00	106.6	68.0	0.0	16
1*B	-31.32	-42.88	20.15	-31.32	2.38	0.00	90.0	66.0	0.0	16
1*B	-31.05	-43.33	19.62	-31.37	0.74	0.00	90.4	66.0	0.0	16
1*B	17.00	-33.53	17.62	1.38	0.87	0.00	114.4	65.0	0.0	17
1*B	17.00	-33.00	18.15	-22.88	-3.07	0.00	143.1	70.0	0.0	17
1*B	17.85	-33.53	17.62	45.26	6.38	0.00	55.5	70.0	0.0	17
1*B	17.85	-33.00	18.15	44.08	9.41	0.00	58.3	70.0	0.0	17
1*C	18.70	-33.53	17.62	35.82	0.15	0.00	63.1	65.0	0.0	17
1*C	18.70	-33.00	18.15	36.19	1.77	0.00	63.3	65.0	0.0	17
1*B	19.55	-33.53	17.62	50.07	4.05	0.00	50.9	70.0	0.0	17
1*B	19.55	-33.00	18.15	49.51	6.87	0.00	53.1	70.0	0.0	17
1*B	20.40	-33.53	17.62	51.90	3.23	0.00	49.4	70.0	0.0	17
1*B	20.40	-33.00	18.15	52.88	4.84	0.00	49.4	70.0	0.0	17
1*B	21.25	-33.53	17.62	57.21	-1.12	0.00	42.0	70.0	0.0	17
1*B	21.25	-33.00	18.15	59.55	-1.07	0.00	39.8	70.0	0.0	17
1*C	-2.00	-27.00	11.15	-18.34	-1.09	0.00	122.2	70.0	0.0	18
1*C	-1.00	-27.00	11.15	-10.45	2.14	0.00	108.0	70.0	0.0	18
1*B	-0.00	-27.00	11.15	0.00	3.63	0.00	90.0	70.0	0.0	18
1*B	1.00	-27.00	11.15	1.00	3.63	0.00	90.0	70.0	0.0	18
1*C	2.00	-27.00	11.15	10.04	2.56	0.00	74.8	70.0	0.0	18
1*C	3.00	-27.00	11.15	21.85	-2.85	0.00	52.0	70.0	0.0	18
1*B	-20.00	-27.00	9.15	-43.02	-10.77	0.00	144.8	72.0	0.0	19
1*B	-19.00	-27.00	9.15	-37.00	-5.35	0.00	129.7	72.0	0.0	19
1*B	-18.00	-27.00	9.15	-29.73	-1.40	0.00	114.6	72.0	0.0	19
1*B	-17.00	-27.00	9.15	-22.98	0.52	0.00	102.3	72.0	0.0	19
1*B	-16.00	-27.00	9.15	-8.61	0.17	0.00	74.8	72.0	0.0	19
1*C	-15.00	-27.00	9.15	-3.75	-4.52	0.00	63.4	70.0	0.0	19
1*C	5.00	-27.00	9.15	3.76	1.13	0.00	92.5	72.0	0.0	20
1*C	6.00	-27.00	9.15	4.08	1.10	0.00	93.9	72.0	0.0	20
1*B	7.00	-27.00	9.15	17.36	-0.82	0.00	68.4	72.0	0.0	20
1*B	8.00	-27.00	9.15	18.24	-0.77	0.00	68.7	72.0	0.0	20
1*C	9.00	-27.00	9.15	28.60	-6.78	0.00	45.9	72.0	0.0	20
1*C	10.00	-27.00	9.15	32.30	-9.81	0.00	37.6	72.0	0.0	20
1*B	-231.25	-20.53	17.62	-252.72	22.86	0.00	116.3	70.0	-0.0	21
1*B	-231.25	-20.00	18.15	-253.80	24.48	0.00	116.9	70.0	-0.0	21
1*A	-230.40	-20.53	17.62	-248.06	24.55	0.00	111.4	70.0	-0.0	21
1*A	-230.40	-20.00	18.15	-248.77	26.36	0.00	111.6	70.0	-0.0	21
1*A	-229.55	-20.53	17.62	-243.80	25.74	0.00	107.1	70.0	-0.0	21
1*A	-229.55	-20.00	18.15	-243.92	27.75	0.00	106.8	70.0	-0.0	21
1*B	-228.70	-20.53	17.62	-238.76	26.82	0.00	102.0	70.0	-0.0	21
1*B	-228.70	-20.00	18.15	-238.52	28.89	0.00	101.4	70.0	-0.0	21

A1		BATHURST HARNESS RACING TRACK LIGHTING		DATE ISSUED 20 FEBRUARY 2012		ADDITIONAL INFORMATION:		DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING		REV NO 34	
AJS		A.J. STOCKMAN PTY. LTD.		DESIGNED AJS Electrical Pty Ltd		CLIENT BATHURST HARNESS RACING		DRAWING NO AJS - BHR- L-D33		REV NO 0	
AJS Draft Team Lighting Layout		AJS		08/02/12							
DETAILS OF AMENDMENTS		APPROVED		DATE							
© CHOWN COPYRIGHT		180		200		300					

Qty and Code	Position			Aiming Points			Aiming Angles			Arr.
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	
1 * C	-227.85	-20.53	17.62	-231.87	17.04	0.00	96.1	65.0	-0.0	21
1 * C	-227.85	-20.00	18.15	-231.89	18.71	0.00	96.0	65.0	-0.0	21
1 * C	-227.00	-20.53	17.62	-215.92	7.91	-0.00	68.7	80.0	-0.0	21
1 * C	-227.00	-20.00	18.15	-193.42	-0.32	0.00	30.4	65.0	-0.0	21
1 * C	60.00	-20.53	17.62	48.92	7.91	-0.00	111.3	60.0	0.0	21
1 * C	60.00	-20.00	18.15	26.42	-0.32	0.00	149.8	65.0	0.0	21
1 * C	60.85	-20.53	17.62	64.87	17.04	0.00	83.9	65.0	0.0	21
1 * C	60.85	-20.00	18.15	64.89	18.71	0.00	84.0	65.0	0.0	21
1 * B	61.70	-20.53	17.62	71.76	26.82	0.00	78.0	70.0	0.0	21
1 * B	61.70	-20.00	18.15	71.52	28.89	0.00	78.8	70.0	0.0	21
1 * A	62.55	-20.53	17.62	78.80	25.74	0.00	72.9	70.0	0.0	21
1 * A	62.55	-20.00	18.15	78.92	27.75	0.00	73.2	70.0	0.0	21
1 * A	63.40	-20.53	17.62	81.06	24.55	0.00	68.6	70.0	0.0	21
1 * A	63.40	-20.00	18.15	81.77	26.36	0.00	68.4	70.0	0.0	21
1 * B	64.25	-20.53	17.62	85.72	22.86	0.00	63.7	70.0	0.0	21
1 * B	64.25	-20.00	18.15	86.80	24.48	0.00	63.1	70.0	0.0	21

 A.J. STOCKMAN PTY. LTD. AJS Electrical Consulting 7 Hampton Park Road KELSO NSW 2795 PHONE (02) 6332 4654 FAX (02) 6332 1067 email - info@ajselectrical.com.au		DATE ISSUED 29 FEBRUARY 2012 DESIGNED: AJS Electrical Pty Ltd CHECKED:	CLIENT BATHURST HARNESS RACING	ADDITIONAL INFORMATION	DRAWING TITLE BATHURST HARNESS RACING TRACK LIGHTING DRAWING NO AJS - BHR- L-D34	NO IN SET 34 FILE NO REV NO 0
Rev: AJS Draft Track Lighting Layout APPROVED DATE						

Appendix D

**CORRESPONDENCE FROM RMS
DATED 12/03/2012**



SF2012/000744; CR2012/001449; WST12/00026

David Walker
Geolyse
PO Box 1963
Orange NSW 2800

Dear Sir

Pre DA enquiry proposed closure of Ethelton Lane Bathurst

Thank you for your letter dated 15 February 2012 requesting Pre-DA advice for a recreational facility on Ethelton Lane Bathurst. Roads and Maritime Services (RMS) provides the following preliminary comments.

RMS notes:

- The proposal will remove one rail level crossing
- The at-grade intersection of Ethelton Lane with Vale Road will be removed
- Access to the development will be via College Street.

RMS provides in principle support to the closure of Ethelton Lane.

Should you require any further information please contact Fiona Francis (02) 6861 1453.

Yours faithfully

8 MAR 2012

Tony Hendry
Road Safety & Traffic Manager
Western

CC: Bathurst Regional Council