



**TARMAC TRADING LTD**

**Nosterfield Quarry - Oaklands Extension**

**Lighting Assessment**

**February 2024**

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**Lighting Assessment**

**February 2024**

**PREPARED BY:**

Alan Easley Principal Lighting Designer

**APPROVED BY:**

Mark Dawson Technical Director



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## **1 INTRODUCTION**

### **1.1 Terms of Reference**

1.1.1 Wardell Armstrong LLP has been instructed by Tarmac Trading Ltd to prepare a lighting assessment to discharge a condition attached to planning permission C2/22/00251/CCC for the Oaklands extension to Nosterfield Quarry, Bedale, North Yorkshire.

1.1.2 Planning permission has been granted for a lateral extension to the quarry to allow for the extraction of an additional one million tonnes of sand and gravel and for the rephasing of 471,000 tonnes of existing permitted reserves under the plant site.

1.1.3 Condition 14 of the planning permission states that:

“Prior to the commencement of development, a scheme and programme for the external lighting of the site shall be submitted to the Local Planning Authority for approval in writing. The Scheme and Programme shall include the phasing of the implementation of the approved scheme relative to the phases of the development to ensure the minimum lighting necessary is employed throughout the respective phases.

Lighting shall only be erected and operated in accordance with the approved Scheme and Programme throughout the operational life of the site. All lighting shall be removed from the site following completion of the development”.

1.1.4 This report has been prepared to discharge the requirements of this condition.

## **2 SITE CONTEXT AND DEVELOPMENT**

2.1.1 The quarry is located to the north of the village of Nosterfield, south of Bedale and approximately 4km west of the A1(M) in North Yorkshire. Access to the quarry is via the B6267 onto a purpose-built and surfaced haul road.

2.1.2 The quarry has been worked for many years and comprises a series of lakes, surrounded by grassland and agricultural fields. The Oaklands extension comprises a series of agricultural fields with trees and hedgerows forming internal field boundaries. There are a small number of individual trees in the field immediately to the south of Fox Covert Wood at the northern edge of the site. A large field drain, the Ings Goit, traverses the fields east to west and runs parallel to the field boundaries. The site boundary includes the haul road and the existing plant site, which will remain operational during the working of the Oaklands extension.

- 2.1.3 The plant and offices are located towards the centre of the site and are fully built, operational and with existing lighting arrangements. The quarry, its plant and transport movements are currently restricted to the hours of 07:00 and 18:00 on weekdays and 07:00 and 12:00 on Saturdays. Occasional emergency maintenance may take place outside of these hours. The quarry will operate under the same hours during the Oaklands extension.
- 2.1.4 The scheme extends the permitted life of the quarry, over and above the current permission end date of 2024, by seven years to 2031.
- 2.1.5 The extent of proposed development is shown in Figure 1 below:



**Figure 1:** Oaklands Extension Site Boundary (Nosterfield Quarry)

- 2.1.6 The approved application boundary set within the wider landscape is shown at Appendix 1.
- 2.1.7 The Oaklands extension will be worked primarily by the existing dredger on site and, at points where the dredger cannot reach, by long reach excavator and dumptruck.

All mobile plant will be illuminated only by their own in-built lighting. The existing floodlighting at the plant site will remain in situ and is detailed in Appendix 2. The only change from the current lighting arrangement will therefore be the introduction of mobile plant in-built lighting into the Oaklands extension area, a move from the current Langwith extension working area to the east.

2.1.8 The quarry lighting system operates on a system whereby all lighting is shut down on closure of the quarry each day. There is no lighting on site during evening and night time hours, and lighting is only used when needed depending on season and weather conditions.

### **3 METHODOLOGY**

3.1.1 This report assesses various sources of lighting information at the quarry against a suite of policy and guidance to determine the impact of lighting on human receptors around the site.

3.1.2 The following sources of information have been used:

- Information submitted to support the planning application and its accompanying environmental statement;
- Information provided by Tarmac on the plant site lighting arrangements shown in Appendix 2;
- Other information sources provided by Tarmac;
- Publicly available information sources including online mapping functions.

### **3.2 Policy and Guidance**

3.2.1 The lighting assessment has considered the following guidance and standards:

- British Standard 12464-2:2014 Light & Lighting – lighting of workplaces, Outdoor workplaces (BS 12464-2)
- Society of Light & Lighting (SLL) Code for Lighting 2022
- Chartered Institute of Building Surveyors & Engineers (CIBSE) Lighting Guides (LG 0 - 2, 4 - 22)
- Institute of Lighting Professionals (ILP) Guidance Note 1 The Reduction of Obtrusive Light
- Institute of Lighting Professionals (ILP) Guidance Note 8 Bats and Artificial Lighting 2023

- International Commission on Illumination. (CIE) 112-1994 Glare Evaluation System for use within Outdoor Sport and Area Lighting
- Health & Safety Executive (HSE) HSG38 Lighting at Work

#### 4 ASSESSMENT

- 4.1.1 The lighting assessment considers whether any fixed lighting at the plant site and surrounds will intrude into the space of local designated receptors, comprising residential properties surrounding the site. These are detailed in the report below. The assessment considers the type, extent, and operational hours of the lighting and whether or not it will have any detrimental impact on the receptors.
- 4.1.2 The lighting used on the mobile plant will be the plants’ own in-built lighting (such as headlights). The light from these vehicles will be highly localised and unlikely to be a source of disturbance that extends any significant distance and certainly not beyond the site boundary to the residential properties.
- 4.1.3 The Institute of Lighting Professionals (ILP) Guidance Note 1 (The Reduction of Obtrusive Light) categorizes Environmental Zones of baseline lighting characteristics. The zones are detailed in Table 1 below. Nosterfield Quarry falls within Zone E2 (rural with low district brightness).

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, village, or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

a) Rural Zones under protected designations should use a higher standard of policy. b) Zone E0 must always be surrounded by an E1 Zone. c) Zoning should be agreed with the local planning authority.

- 4.1.4 Table 2 below lists the illuminance limitations (lux levels) and maximum luminosity intensity (cd or candelas) specified by the ILP for each environmental zone. These values represent firstly the maximum levels of light that would be permitted to hit a receptor at hours of darkness and secondly, the brightness of the light source when

viewed from the receptor position. For Zone E2 this would be maximum of 5 lux pre-curfew and 1 lux post-curfew. (As a simple comparison, a standard candle at 1 metre would give 1 lux and twilight is judged to be about 1 lux). The maximum luminous intensity allowed would be 7,500 cd pre-curfew and 500 cd post-curfew.

<b>Zone</b>	<b>Pre-Curfew (lx)</b>	<b>Post-Curfew (lx)</b>	<b>Pre-Curfew (cd)</b>	<b>Post-Curfew (cd)</b>
E0	N/A	N/A	0	0
E1	2	<0.1*	2,500	0
E2	5	1	7,500	500
E3	10	2	10,000	1,000
E4	25	5	25,000	2,500
	* If the installation is for public (road) lighting then this can increase to 1 lx		* If the installation is for public (road) lighting then this can increase to 1 lx	

- 4.1.5 Pre-curfew hours would be considered from dusk till 21.00 hours (a reasonable expected time) then from 06.00 till dawn. As the site will only be operational from 07.00 hours until 18.00 hours the post-curfew limits would not apply.
- 4.1.6 The plant site lighting comprises a mixture of metal halide (up to 400w) and LED floodlights (small up to 100w and large up to 200w). The metal halide floodlights are replaced with new LED as they fail but their positions remain the same.
- 4.1.7 The lighting in the plant site has been in place for some time and manufacturer details are not available. However, based on knowledge of equivalent lighting elsewhere It is assumed that the maximum lumen output will be in the region of 30,000 lumens for a typical 400w Metal Halide or 200w LED Floodlight. These will have a maximum luminous intensity of approximately 400 cd.
- 4.1.8 Figure 2 below shows a worst-case scenario for a typical 30,000-lumen output luminaire of medium-distribution and economic-price aimed at a 45-degree angle from the horizontal. This demonstrates that the luminaire will produce less than 1 lux at a distance of 35m.



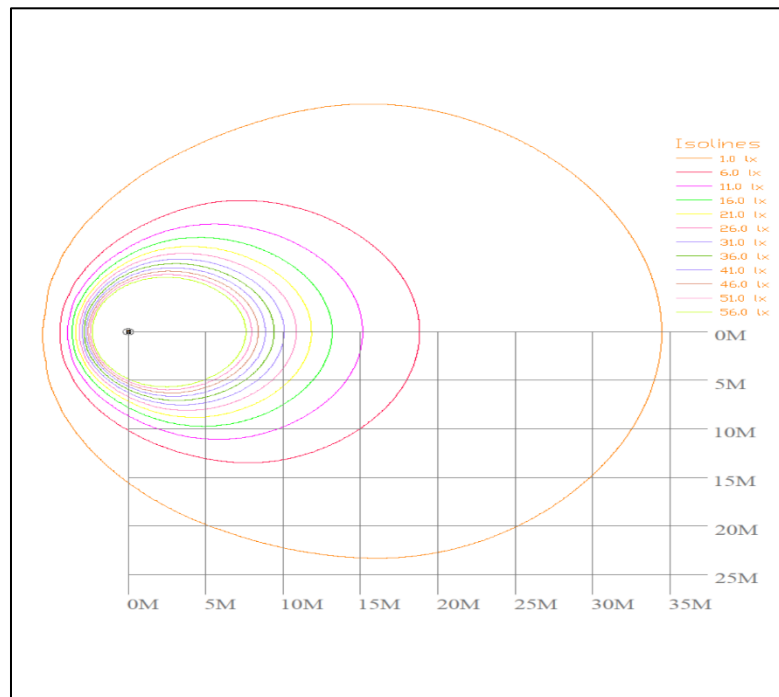


Figure 2: Typical Extent of distribution for 30,000 lumen floodlight

4.1.9 At the Nosterfield plant site all luminaires are aimed inwards to the site, and none is aimed in a position to allow light to leave the boundary. Lux levels will be similar or lower to the typical levels shown in Figure 2 above.

4.1.10 In addition, the lighting is on a photocell arrangement activated on low natural light levels. This control is also switched off when the site is unoccupied and therefore no lights are left on when the quarry is not in operation.

4.1.11 Table 3 below show the selected potential sensitive receptors.

Table 3: Receptor Locations	
Location	From Quarry Works
Ladybridge Farm (Moor Lane)	625m East
Langwith Farm Cottages (Long Lane)	830m North
Thornfield Rd / Flask Lane (Nosterfield)	700m South West
Well (Long Lane)	1km North West

4.1.12 **Ladybridge Farm** is 625 metres east of quarry centre. The intervening terrain comprises a variety of agricultural fields and the lakes, interspersed with trees and hedgerows. The residential property itself is screened by an agricultural building in the line of sight. There would be some visual light glow in dark working hours but due to distance this would not exceed the permitted levels.

4.1.13 **Langwith Farm Cottages** are 830 metres north of quarry centre. The intervening terrain is similar and slopes slightly downhill to the plant site. There would be some visual light glow in dark working hours but due to distance this would not exceed the permitted levels.

4.1.14 **Thornfield Road / Flask Lane** is 700 metres south-east of quarry centre. The intervening terrain is of a level aspect but with considerable screening from trees and hedgerows. There would be some visual light glow in dark working hours but due to distance this would not exceed the permitted levels.

4.1.15 **Well** is 1 kilometre north-west of quarry centre and sited considerably higher than the quarry. There would be some visual light glow in dark working hours but due to distance this would not exceed the permitted levels.

## **5 CONCLUSION & RECOMMENDATIONS**

5.1.1 Due to the decline in lux levels over distance, and the distance of potential sensitive receptors, the impact of the proposed lighting associated with the operation of Nosterfield Quarry within the Oaklands extension and at the existing plant site will not exceed the recommended illuminance levels for an ELP Environmental Zone E2 – Rural – Low District Brightness and therefore the scheme will not cause harm to those receptors.

5.1.2 No further modifications to the lighting arrangements on site are recommended.

## APPENDICES

**APPENDIX 1:**

Figure 2.2 Application Boundary

**APPENDIX 2:**  
General Luminaire Types & Positions

**STOKE-ON-TRENT**

Sir Henry Doulton House  
Forge Lane  
Etruria  
Stoke-on-Trent  
ST1 5BD  
Tel: +44 (0)1782 276 700

**BIRMINGHAM**

Two Devon Way  
Longbridge Technology Park  
Longbridge  
Birmingham  
B31 2TS  
Tel: +44 (0)121 580 0909

**BOLTON**

41-50 Futura Park  
Aspinall Way  
Middlebrook  
Bolton  
BL6 6SU  
Tel: +44 (0)1204 227 227

**BRISTOL**

Temple Studios  
Temple Gate  
Redcliffe  
Bristol  
BS1 6QA  
Tel: +44 (0)117 203 4477

**BURY ST EDMUNDS**

Armstrong House  
Lamdin Road  
Bury St Edmunds  
Suffolk  
IP32 6NU  
Tel: +44 (0)1284 765 210

**CARDIFF**

Tudor House  
16 Cathedral Road  
Cardiff  
CF11 9LJ  
Tel: +44 (0)292 072 9191

**CARLISLE**

Marconi Road  
Burgh Road Industrial Estate  
Carlisle  
Cumbria  
CA2 7NA  
Tel: +44 (0)1228 550 575

**EDINBURGH**

Great Michael House  
14 Links Place  
Edinburgh  
EH6 7EZ  
Tel: +44 (0)131 555 3311

**GLASGOW**

24 St Vincent Place  
Glasgow  
G1 2EU  
Tel: +44 (0)141 428 4499

**LEEDS**

36 Park Row  
Leeds  
LS1 5JL  
Tel: +44 (0)113 831 5533

**LONDON**

Third Floor  
46 Chancery Lane  
London  
WC2A 1JE  
Tel: +44 (0)207 242 3243

**NEWCASTLE UPON TYNE**

City Quadrant  
11 Waterloo Square  
Newcastle upon Tyne  
NE1 4DP  
Tel: +44 (0)191 232 0943

**TRURO**

Baldhu House  
Wheal Jane Earth Science Park  
Baldhu  
Truro  
TR3 6EH  
Tel: +44 (0)187 256 0738

**International office:**

**ALMATY**

29/6 Satpaev Avenue  
Hyatt Regency Hotel  
Office Tower  
Almaty  
Kazakhstan  
050040  
Tel: +7(727) 334 1310