



Aberdeen Harbour Expansion Project

Construction Environmental Management Document

11th May 2017

DRAGADOS

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Chapter 5

Construction Lighting Management Plan

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5 Construction Lighting Management Plan

5.1 Introduction

5.1.1 Requirements

This Construction Lighting Management Plan (CLMP) has been developed to cover the construction phase of the Aberdeen Harbour Expansion Project (AHEP). This Plan is a specific requirement in the Marine Licences awarded to AHEP by Marine Scotland. Condition 3.2.4 of the Construction Marine Licence states that a lighting plan (including strategy for dimmed and directional lighting) must be developed and implemented through the duration of the construction phase of the project.

For information on the marking and lighting of the marine activities in terms of navigational requirements please see the Vessel Management Plan.

5.1.2 Roles, Responsibilities and Cross-Referencing

Table 5.1 details the responsibilities of selected staff with regards to construction lighting management.

Table 5.1 Roles and Responsibility Table

Job Title	Name	Responsibilities
Construction Manager	Jose Enrique Perez	Managing the lighting during the construction phase of the project and managing changes to the lighting plans if required.
The Environmental Clerk of Works (ECoW)	Emma Bias	Responsible for ensuring that all agreed mitigation measures are followed at AHEP as part of the regular auditing of environmental obligations.

The Construction Manager is responsible for managing the lighting during the construction phase of the project. The Construction Manager will also be responsible for managing changes to the lighting plans if required.

The Environmental Clerk of Works (ECoW) will be responsible for ensuring that all agreed mitigation measures are followed at AHEP as part of the regular auditing of environmental obligations.

5.1.2.1 Cross-Referencing

The CLMP should be read in conjunction with the following CEMDs:

- Construction Method Statement;
- Fish Species Protection Plan;
- Habitat Management Plan; and
- Vessel Management Plan.

5.1.3 Background

The main objectives of this plan are to:

- Provide guidance for construction lighting that reduces the amount of excessive light outside of the construction areas;
- Provide a clear list of lighting types to be used and the approximate locations of each unit of lighting; and
- Outline the mitigation measures that must be implemented and managed.

5.2 General Lighting Guidelines

The Management of Health and Safety at Work Regulations 1999 (MHSW)¹ require employers to have arrangements in place to cover health and safety. This includes lighting which needs to be suitable and adequate to meet the requirements of the workplace (Health, Safety and Welfare) regulations 1992.

For all construction activities where mobile or fixed lighting is required for the project, the contractor shall ensure, at all times, that the control of the lighting is in accordance with BS5489-1:2013, BS EN 13201, BS12464, ILP GN01 and the Clean Neighbourhoods and Environment Act 2005.

The operation of any temporary lighting shall be throughout all hours of darkness, taking into consideration the management and mitigation of obtrusive artificial light, and the Contractor shall institute a means of regular inspection to ensure this requirement is met.

5.2.1 Mitigation Measures

The term obtrusive artificial light refers to, but is not limited to, any light that may cause detriment or undermine safety to the workforce, general public and wildlife.

In accordance with the project Environmental Statement (ES)², the following mitigation measures must be adhered to at all times in an effort to reduce the amount of excessive lighting on site. It is the responsibility of the Construction Manager to ensure that these measures are implemented at the AHEP site:

- Unnecessary discomfort glare is caused when a light source is aimed in the direction of an observer. By keeping the lighting at an elevated height, the risk

¹ Management of Health and Safety at Work Regulations 1999.

http://www.legislation.gov.uk/ukxi/1999/3242/pdfs/ukxi_19993242_en.pdf. Accessed 09/03/2017.

² Waterman and Fugro (2015) Environmental Statement

of glare is reduced. The designer and contractor shall ensure that any mobile or fixed lighting does not cause unnecessary discomfort glare either within the construction site itself or towards the roads adjacent to the construction site;

- Where possible, perimeter and inner lighting should always be facing inwards towards the centre of the work area;
- Construction lighting will never be aimed upwards;
- In the event that lighting is required to be facing to the site exterior, it will be aimed in such a way to focus on a specific work area and controlled as such, using louvres or shields, to ensure the light is not trespassing into areas not controlled by the site;
- Specialist operational lighting that is not providing general lighting to an area will only be active during times when the specific operations are taking place;
- Lighting will be organised and operated to minimise excessive illumination;
- Where practical and safe to do so, dimming or complete switch off of specific lighting shall occur where the traffic flows or tasks decrease or cease respectively;
- To ensure tighter control of light near to marine areas it is envisaged that the column/mast heights near to these locations are lowered to allow better and more accurate control. The detailed design stage modelling will identify areas where spill light will present a problem and all reasonable measures will be taken to ensure that light does not affect these marine areas. The same approach will be taken to mitigate light from areas not associated with the construction site; and
- Lighting directed towards water outside of the main harbour, including lighting used during breakwater construction will be shielded where possible to reduce disturbance to fish and bird species, including eider.

All external lighting installed shall be sufficiently screened and aligned so as to ensure that there is no direct illumination of neighbouring land and that light spillage beyond the boundaries of the site is minimised.

5.3 Construction Activities

The Construction Method Statement (See Chapter 3 of the Construction Environmental Management Document (CEMD)) outlines the construction activities and programme for AHEP. Construction activities will take place outside of daylight hours and in poor light conditions (i.e. during adverse weather conditions) and require both mobile and fixed lighting.

The project will have three temporary compounds throughout the duration of works. The name, brief description and lighting breakdown of each work area is listed in Sections 5.3.2 - 5.3.4. The lighting layout for each temporary compound is included in Appendix A.

When compounds are not in use, taking into account security arrangements, lighting in the storage area will be turned off or dimmed. The use of Passive Infrared (PIR) switching technology shall be investigated for these areas.

5.3.1 AHEP Site

To reduce light trespass and give reassurance as to the suitability of the lighting apparatus, calculations shall be carried out at the detailed design stage to show the levels of light present beyond the limits of the compound. These calculations will incorporate known manufacturer photometry with internal louvres/control, however, physical shielding attached to the masts will not be factored in. The calculations will give a baseline minimum representation of the light trespass which will only improve once physical shields (if required) are installed on site.

5.3.2 Northern Compound

Storage and Visitor Centre

The Northern Compound will serve as a storage area, warehouse, workshop, and may also be used to construct accropodes on a temporary basis at the start of the construction period. The project visitor centre will also be located in the northern work area and this will be accessible to the general public.

There is potential for light emissions to arise from the Northern Compound area and impact the local lighthouse residency if the correct mitigation measures are not adopted.

The lighting units being utilised for the northern compound are:

- Site perimeter- 13 x Luminaire type A columns (Luminaire A BGP627 DM10 Lamp LED-HB 4S/740); and
- Inner site – 2 x Mobile High Mast luminaires (FL800R LED Floodlights).

See Appendix A: Lighting Layout Northern Compound.

5.3.3 Southern Compound

Primary Storage and Accropode Fabrication

The Southern Compound will mainly function as an accropode storage area and also a cement batching plant, and accropode construction area. Access to the southern breakwater construction site is also accessed through the Southern Compound. Due to high levels of personnel activity it is imperative that adequate lighting is in place.

The lighting units being utilised for the Southern Compound are:

- Roadside - 6 x Local authority columns (Luminaire A BGP627 DM10 Lamp LED-HB 4S/740); and
- Inner site – 17 x High Mast Luminaire (FL800R LED Floodlights).

See Appendix B: Lighting Layout Southern Compound.

5.3.4 Central Compound

Welfare Facilities and Secondary Storage

The Central Compound is split across St Fitticks Road and comprises of two storage areas, office and welfare facilities. There is potential for light emissions to impact on the local Torry community if the correct mitigation measures are not adopted.

The lighting units to be used for the Central Temporary Compound are:

- Inner site – 24 x Luminaire Column ((Luminaire A BGP627 DM10 Lamp LED-HB 4S/740); and
- St Fittick's Road- 20 Local Authority Lighting columns (Luminaire A BGP627 DM10 Lamp LED-HB 4S/740).

See Appendix C: Lighting Layout Central Compound.

5.3.5 Breakwater Lighting Design

Breakwaters construction will take place 7 days a week 24 hours a day. As the breakwater is constructed mobile lighting equipment will be placed along the constructed breakwater. Mobile lighting will consist of four light towers with an output of 500W and an approximate height of 5 metres. These mobile towers will illuminate the breakwater and the haul road to the breakwaters. These towers will be able to illuminate 10 lux at 45 m of distance.

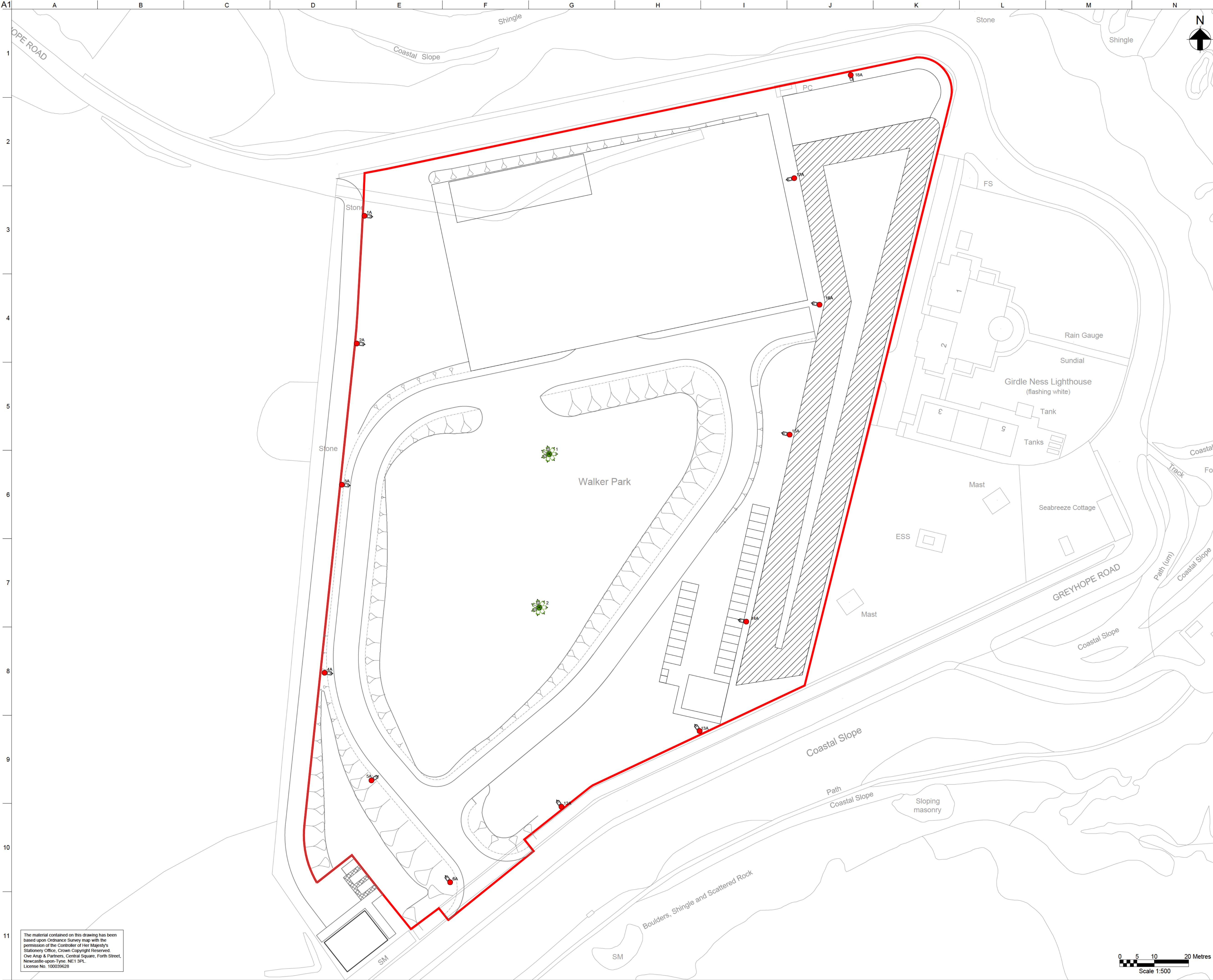
An example of breakwater construction lighting that will be used on site is shown in Figure 5.1.



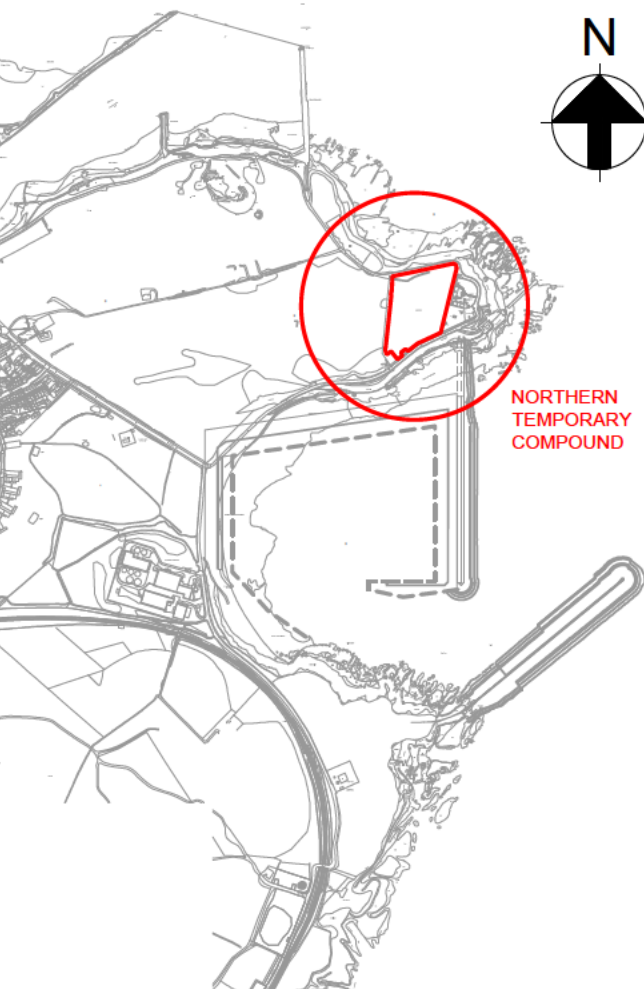
Figure 5.1: Example of Breakwater Construction Lighting

Appendix A

Lighting Layout Northern Compound



HEALTH AND SAFETY INFORMATION
SIGNIFICANT OR EXCEPTIONAL RISKS ARE IDENTIFIED BELOW
(Insert Risks Here)



Key Plan

- Legend:**
- Site Boundary
 - Luminaire A Column
 - High Mast Luminaire
 - Mobile High Mast Luminaire
 - Indicative position of proposed Local Authority columns

0	17/02/17	MWM	RF	NL
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ARUP

Scotstoun House, South Queensferry
West Lothian, EH30 9SE
Tel +44 (0)13 1331 1999 Fax +44 (0)13 1331 3730
www.arup.com

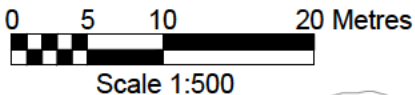


Job Title
Aberdeen Harbour Expansion Project

Drawing Title
Northern Temporary Compound Lighting Layout

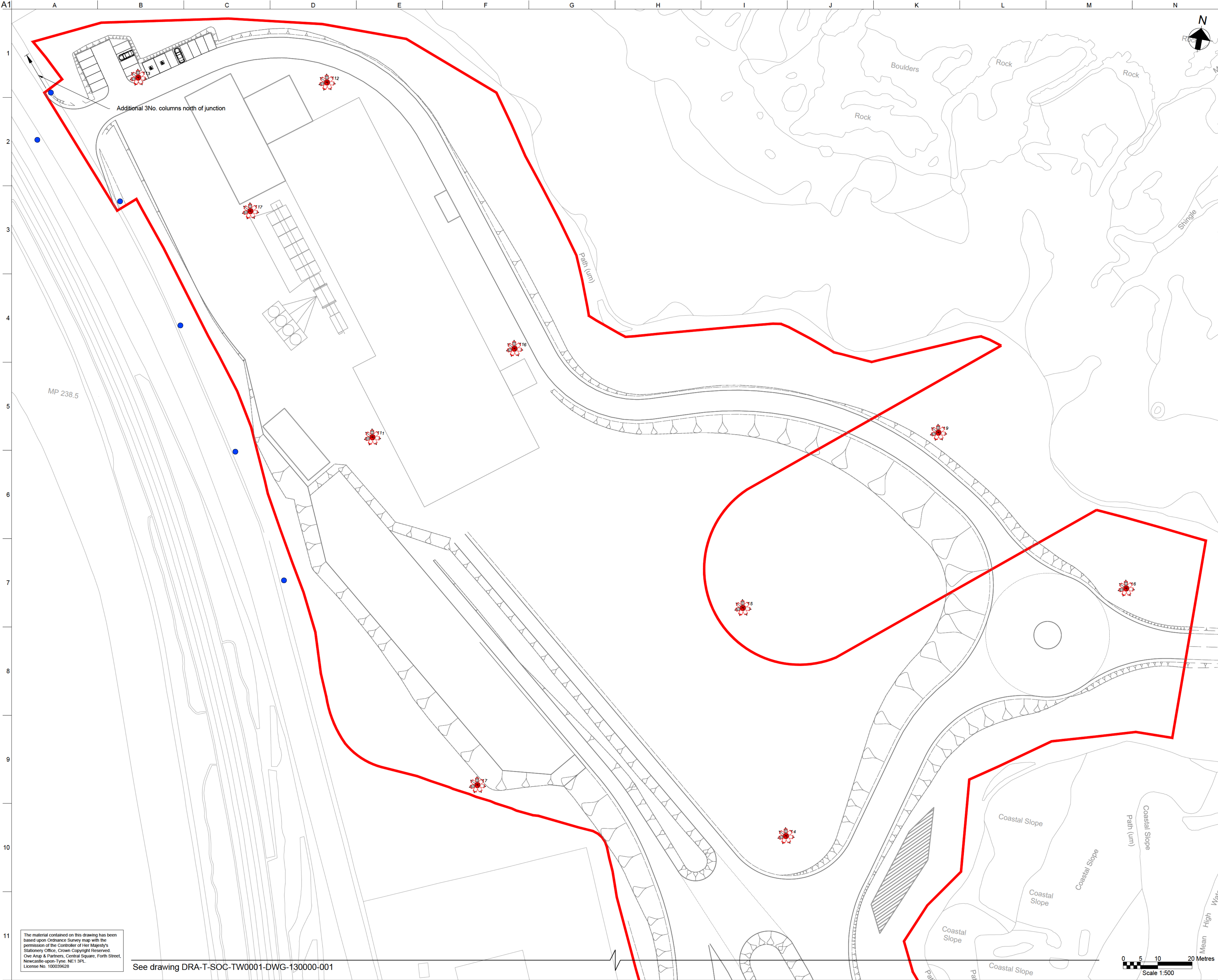
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Appendix B

Lighting Layout Southern Compound



HEALTH AND SAFETY INFORMATION

SIGNIFICANT OR EXCEPTIONAL RISKS ARE IDENTIFIED BELOW

(Insert Risks Here)

N

SOUTHERN TEMPORARY COMPOUND

Key Plan

Legend:

Site Boundary

Luminaire A Column

High Mast Luminaire

Mobile High Mast Luminaire

Indicative position of proposed Local Authority columns

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ARUP

Scotstoun House, South Queensferry
West Lothian, EH30 9SE
Tel +44 (0)13 1331 1999 Fax +44 (0)13 1331 3730
www.arup.com

Client

DRAGADOS

Job Title

Aberdeen Harbour Expansion Project

Drawing Title

Southern Temporary Compound Lighting Layout Sheet 1 of 2

Arup Job No

253300-00

Scale at A1

1:500

Discipline

13 - Road Lighting

Drawing Status

Issued For Information

Rev

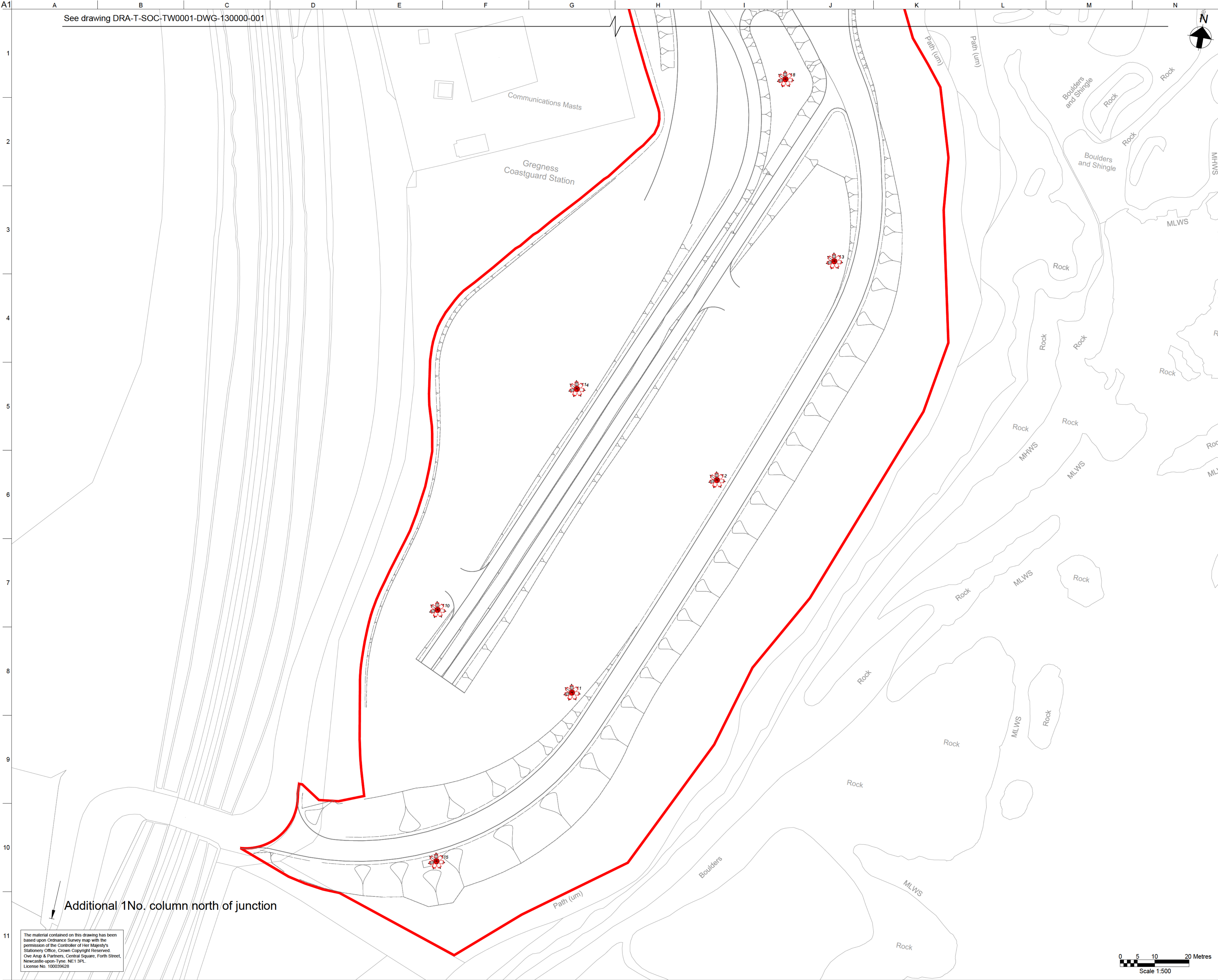
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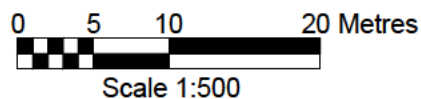
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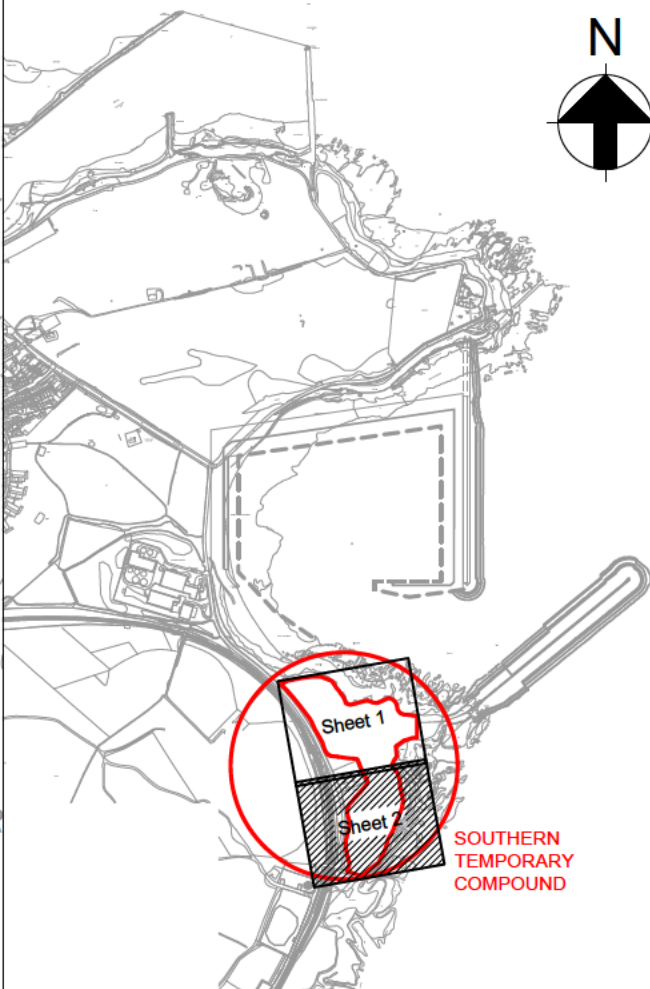
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HEALTH AND SAFETY INFORMATION

SIGNIFICANT OR EXCEPTIONAL RISKS ARE IDENTIFIED BELOW

(Insert Risks Here)



Key Plan

Legend:

- Site Boundary
- Luminaire A Column
- High Mast Luminaire
- Mobile High Mast Luminaire
- Indicative position of proposed Local Authority columns

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ARUP

Scotstoun House, South Queensferry
West Lothian, EH30 9SE
Tel +44 (0)13 1331 1999 Fax +44 (0)13 1331 3730
www.arup.com

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Aberdeen Harbour
Expansion Project

Drawing Title
Southern Temporary Compound
Lighting Layout
Sheet 2 of 2

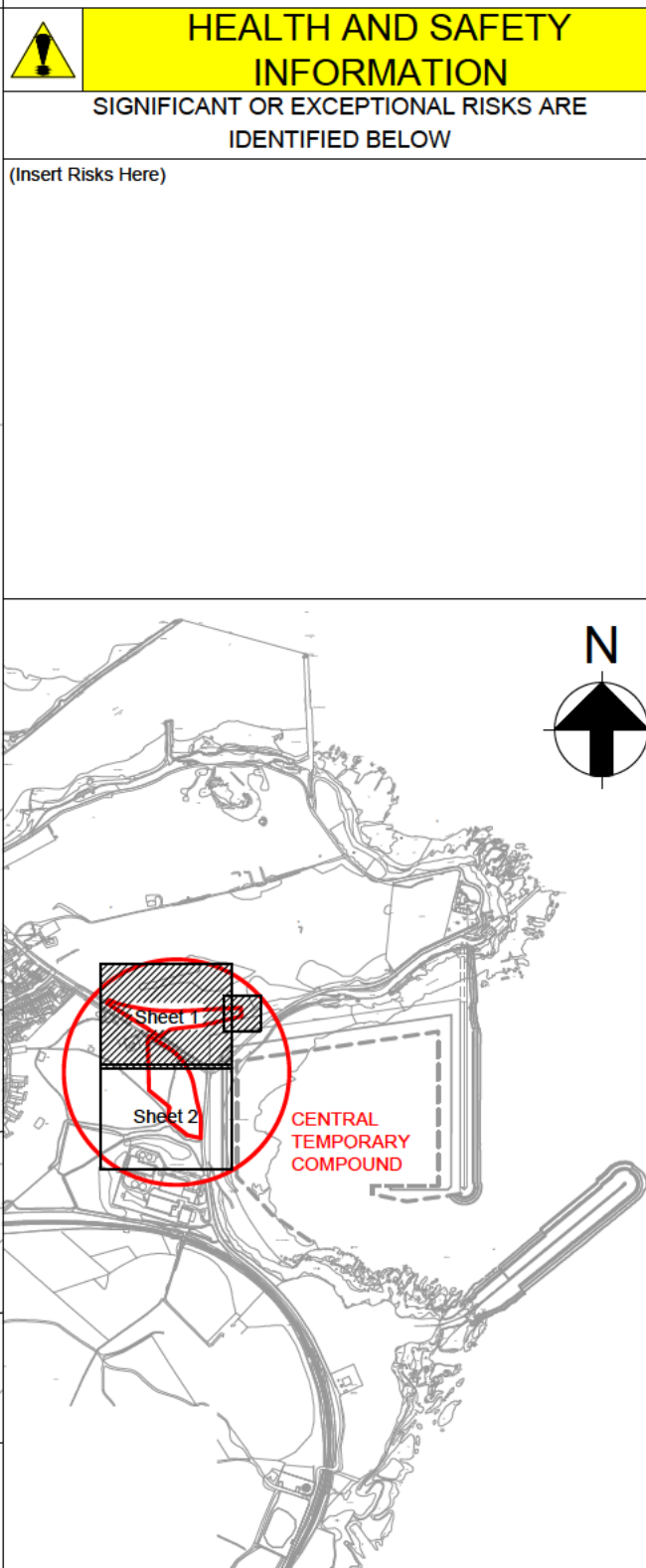
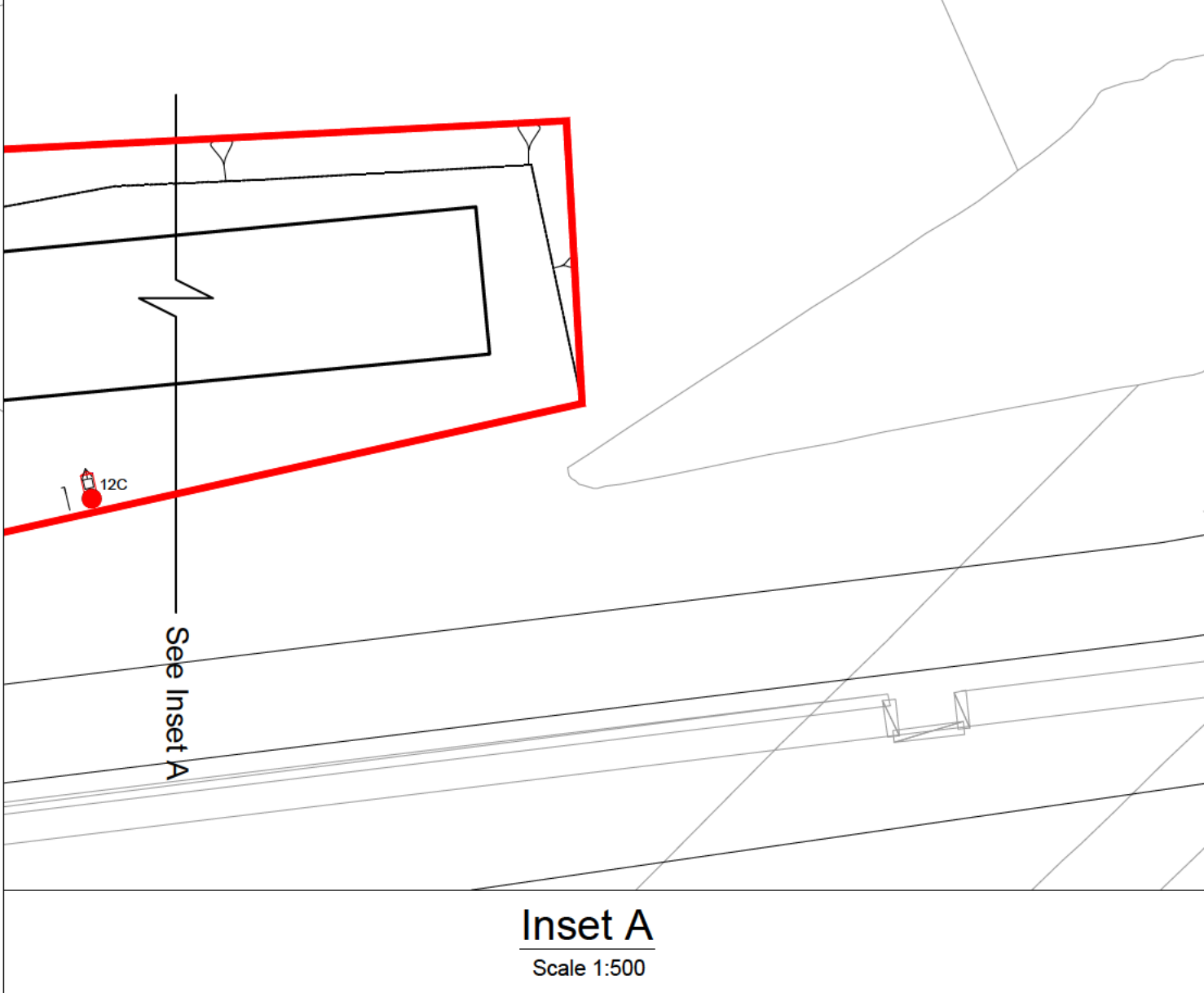
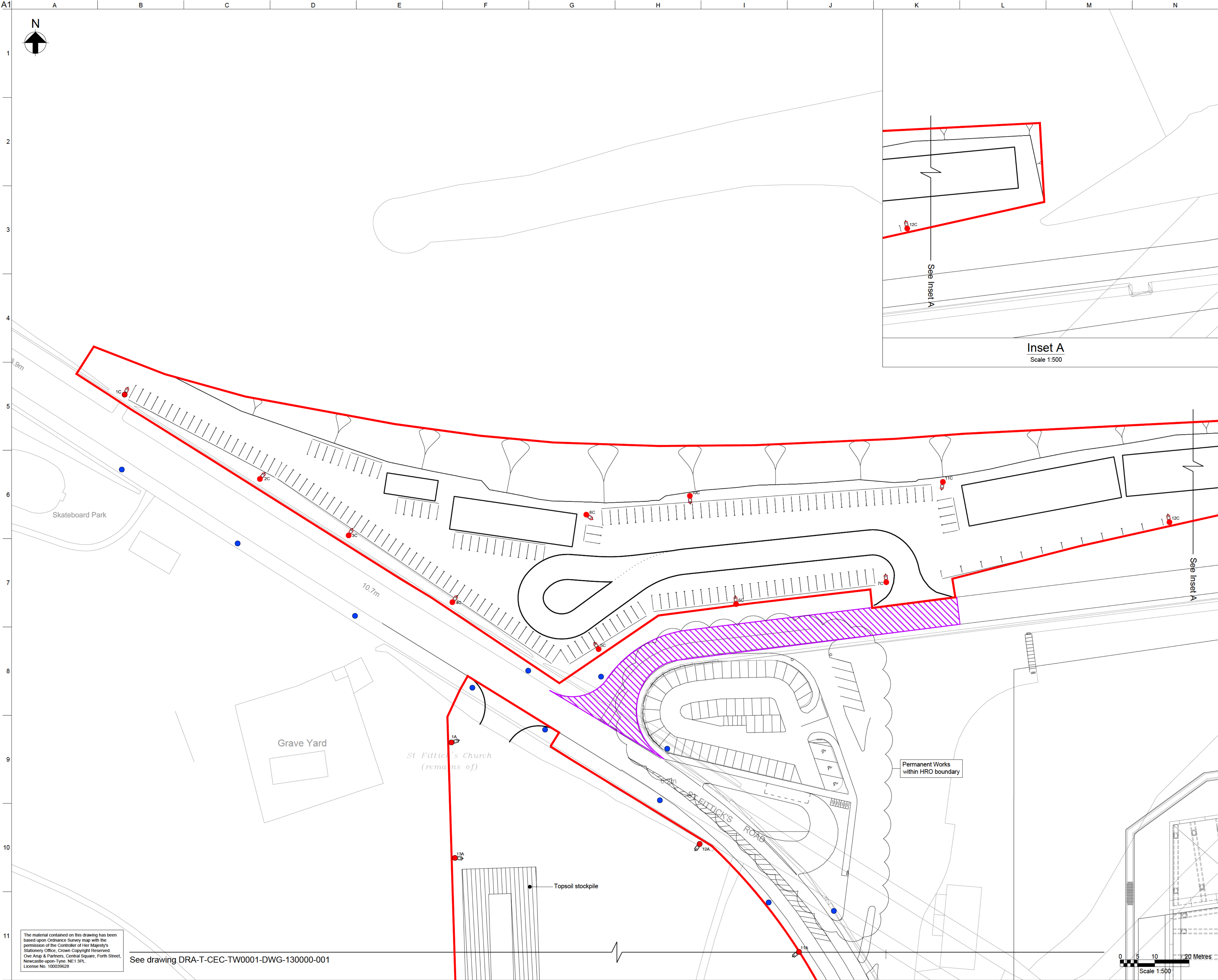
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Appendix C

Lighting Layout Central Compound



- Legend:**
- Site Boundary
 - Luminaire A Column
 - High Mast Luminaire
 - Mobile High Mast Luminaire
 - Indicative position of proposed Local Authority columns
 - Central Access Road

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ARUP

Scotstoun House, South Queensferry
West Lothian, EH30 9SE
Tel +44 (0)13 1331 1999 Fax +44 (0)13 1331 3730
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Job Title
**Aberdeen Harbour
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Drawing Title
**Central Temporary Compound
Lighting Layout
Sheet 1 of 2**

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