



# Aberdeen Harbour Expansion Project

Construction Environmental Management Document

AHEP-DRA-APP-0001 Rev 3  
21 October 2019

**DRAGADOS**

# Contents

<b>Chapter 1</b>	Introduction
<b>Chapter 2</b>	Roles and Responsibilities of Staff
<b>Chapter 3</b>	Construction Method Statement
<b>Chapter 4</b>	Archaeology Plan
<b>Chapter 5</b>	Construction Lighting Management Plan
<b>Chapter 6</b>	Construction Traffic Management Plan
<b>Chapter 7</b>	Dredging and Dredge Spoil Disposal Management and Monitoring Plan
<b>Chapter 8</b>	Fish Species Protection Plan
<b>Chapter 9</b>	Habitat Management Plan and Otter Protection Plan
<b>Chapter 10</b>	Landscape Mitigation Compensation Plan
<b>Chapter 11</b>	Marine Mammal Mitigation Plan
<b>Chapter 12</b>	Marine Invasive Non-Native Species and Biosecurity Management Plan
<b>Chapter 13</b>	Noise and Vibration Management Plan
<b>Chapter 14</b>	Piling Management Plan
<b>Chapter 15</b>	Pollution Prevention Plan
<b>Chapter 16</b>	Nigg Bay Site of Special Scientific Interest Management Plan
<b>Chapter 17</b>	Vessel Management Plan
<b>Chapter 18</b>	Waste Management Plan
<b>Chapter 19</b>	Existing Abstractions and Discharges
<b>Chapter 20</b>	Ground Gas and Groundwater Report: Phase II Site Investigation Risk Assessment

# Chapter 5

## Construction Lighting Management Plan

## Revision Log

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Minor updates to formatting have been made throughout the document. The main/significant changes are listed in the table below.

Revision Number	Date	Location of Revision	Revision Details
Rev 2	16/05/2018	Front of Document	Document updated to Rev 2 and date updated
		Section 5.1.2, Table 5.1	Table updated to remove individuals names
		Section 5.3.2	At this time, there is to be no lighting in the Northern Compound. Section updated to reflect this change.
		Appendices	Compound layout and lighting scheme updated. New drawings attached as appendices
Rev 3	21/10/2019	Front of Document	Document updated to Rev 3 and date updated
		Section 5.1.2.1	Cross referencing list updated to include NVMP
		Section 5.2.1	Slightly altered wording with regards to light spill mitigation
		Section 5.3.2	Updated information regarding activities, lighting units and sensitive receptors at the North compound

## Contents

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	Page
<b>5 Construction Lighting Management Plan</b>	<b>1</b>
5.1 Introduction	1
5.1.1 Requirements	1
5.1.2 Roles, Responsibilities and Cross-Referencing	1
5.1.3 Background	2
5.2 General Lighting Guidelines	2
5.2.1 Mitigation Measures	2
5.3 Construction Activities	3
5.3.1 AHEP Site	4
5.3.2 Northern Compound	4
5.3.3 Southern Compound	4
5.3.4 Central Compound	5
5.3.5 Breakwater Lighting Design	5

### **Appendix A**

Lighting Layout Northern Compound

### **Appendix B**

Lighting Layout Southern Compound

### **Appendix C**

Lighting Layout Central Compound

## 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	Responsibilities
Construction Manager	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)	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;
- Noise and Vibration Management Plan;
- 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)<sup>1</sup> 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)<sup>2</sup>, 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 of glare is reduced. The designer and contractor shall ensure that any mobile or

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<sup>1</sup> Management of Health and Safety at Work Regulations 1999.

[http://www.legislation.gov.uk/ukxi/1999/3242/pdfs/ukxi\\_19993242\\_en.pdf](http://www.legislation.gov.uk/ukxi/1999/3242/pdfs/ukxi_19993242_en.pdf). Accessed 09/03/2017.

<sup>2</sup> Waterman and Fugro (2015) Environmental Statement



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 in order to prevent or minimise light spillage into neighbouring properties and surrounding habitats;
- 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 in summer 2019 was also used for the fabrication of T- mass concrete blocks. Though all works will be carried out during the day, adequate lighting may be installed to allow for security inspection of the area during hours of darkness.

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:

- Up to 10no x 9M Tower Lights covering Greyhope Road and access to the North Compound.

Lighting used will be aimed away from the Balnagask lighthouse community where possible to reduce disturbance to local residents.

See Appendix A: Lighting Layout Northern Compound.

### 5.3.3 Southern Compound

#### Primary Storage and Accropode Fabrication

The Southern Compound will house an accropode fabrication plant, laboratory, two boreholes supplying the bathing plant and storage facilities. 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 the site offices for management and engineering staff, and project welfare facilities for operatives and skilled labour. 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 (depending on tidal levels). 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.

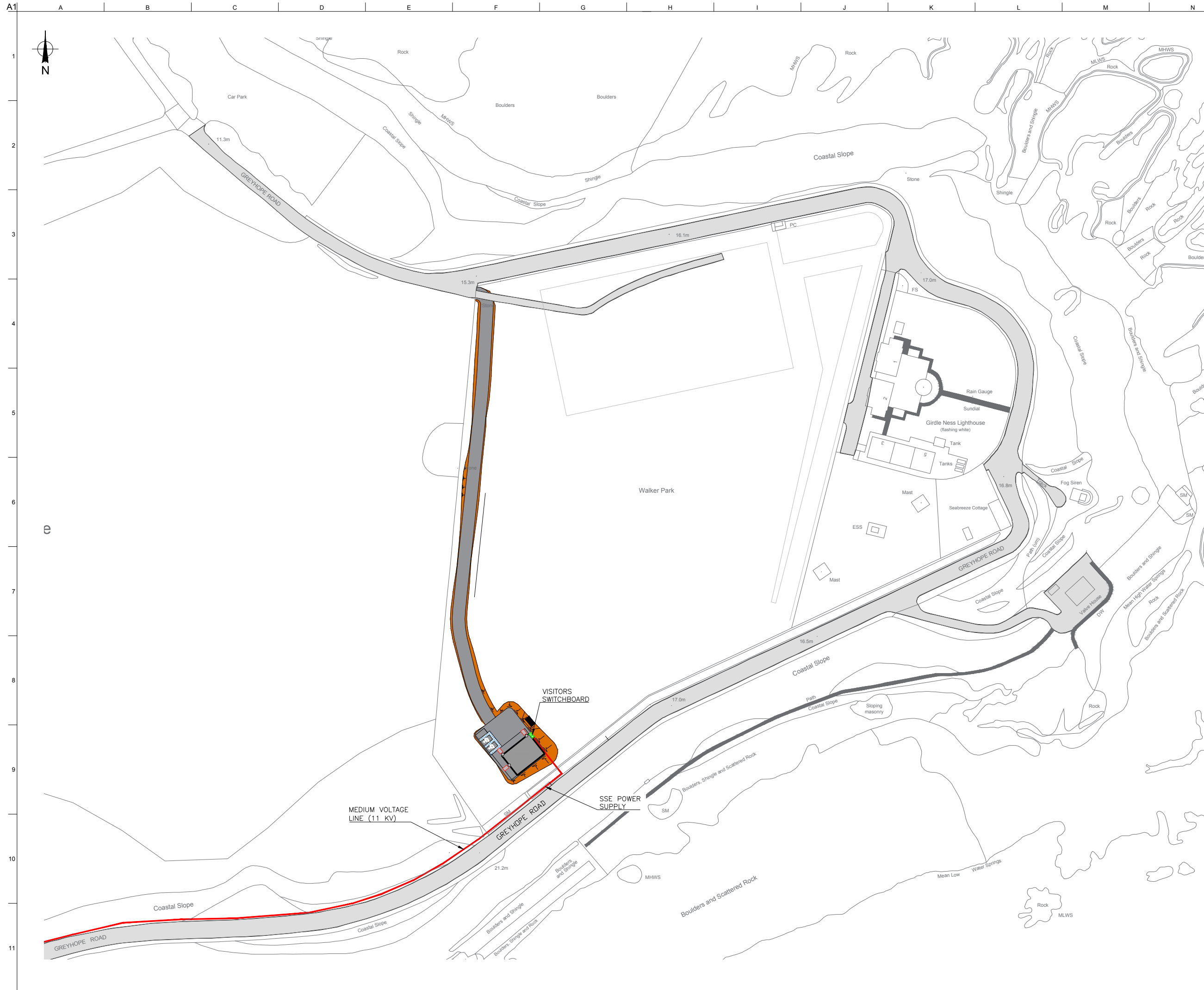
An example of breakwater construction lighting that will be used on site is shown in Figure 5.1.



Figure 5.1: Example of Breakwater Construction Lighting

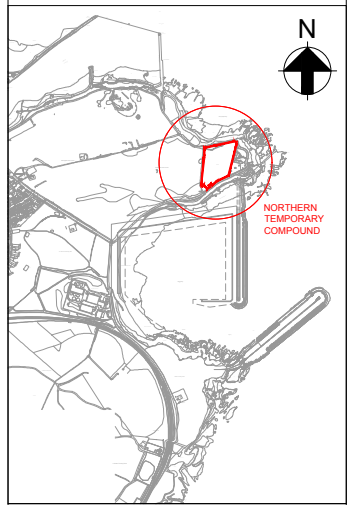
## Appendix A

### Lighting Layout Northern Compound



- NOTES**
- All dimensions are in millimeters unless noted otherwise.
  - All the exiting facility service must be located prior to any excavation.

- KEY:**
- CONCRETE PREFABRICATED SUBSTATION
  - NORTHERN MAIN SWITCHBOARD
  - SWITCHGEAR
  - DISTRIBUTION TRENCH TYPE A
  - DISTRIBUTION TRENCH TYPE B
  - SWITCHBOARD
  - MANHOLE 60x60
  - LUMINAIRE



**Key Plan**

0	12/12/17	JMA	ROL	MEG
Issued for Internal review				
Issue	Date	By	Chkd	Appd



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Job Title  
**Aberdeen Harbour Expansion Project**

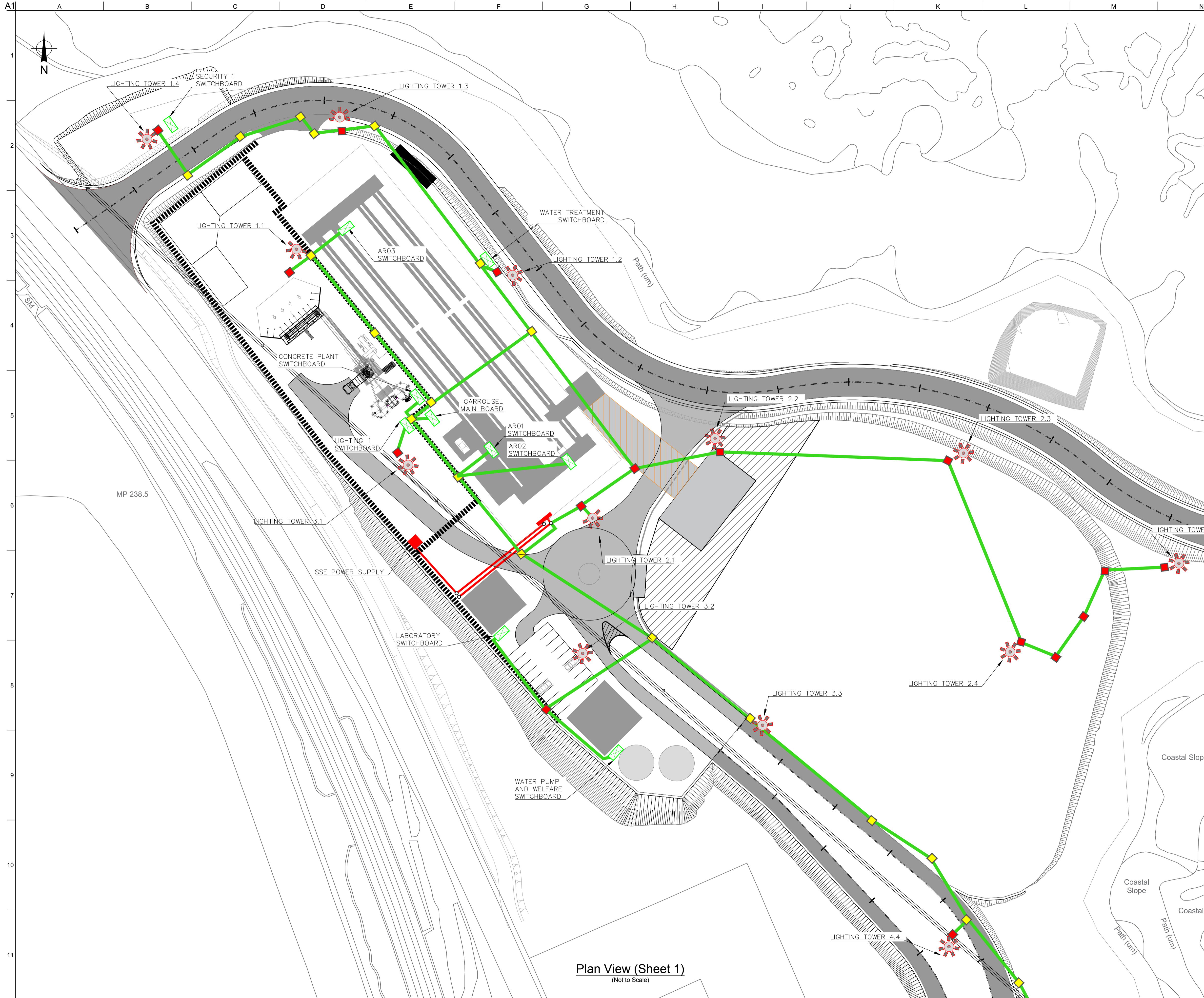
**VISITOR CENTER POWER SUPPLY GENERAL LAYOUT**

Scale at A1	As Shown
Discipline	Civil Engineering
Drawing Status	<b>Internal Review</b>
Drawing No	DRA-T-OHB-TW0004-DWG-630001-001
Issue	<b>0</b>

## **Appendix B**

### **Lighting Layout Southern Compound**





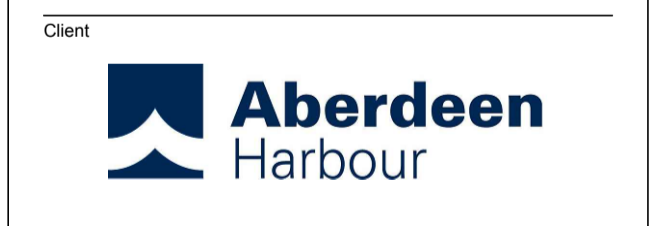
Notes:  
 1. All dimensions are in meters unless stated otherwise  
 2. All levels are in meters to chart datum

Drawing Status:  
**FOR INFORMATION ONLY**  
**NOT VALID FOR CONSTRUCTION**

0	12/12/17	CW	ROL	ROL
Issued For Information				
Issue	Date	By	Chkd	Appd



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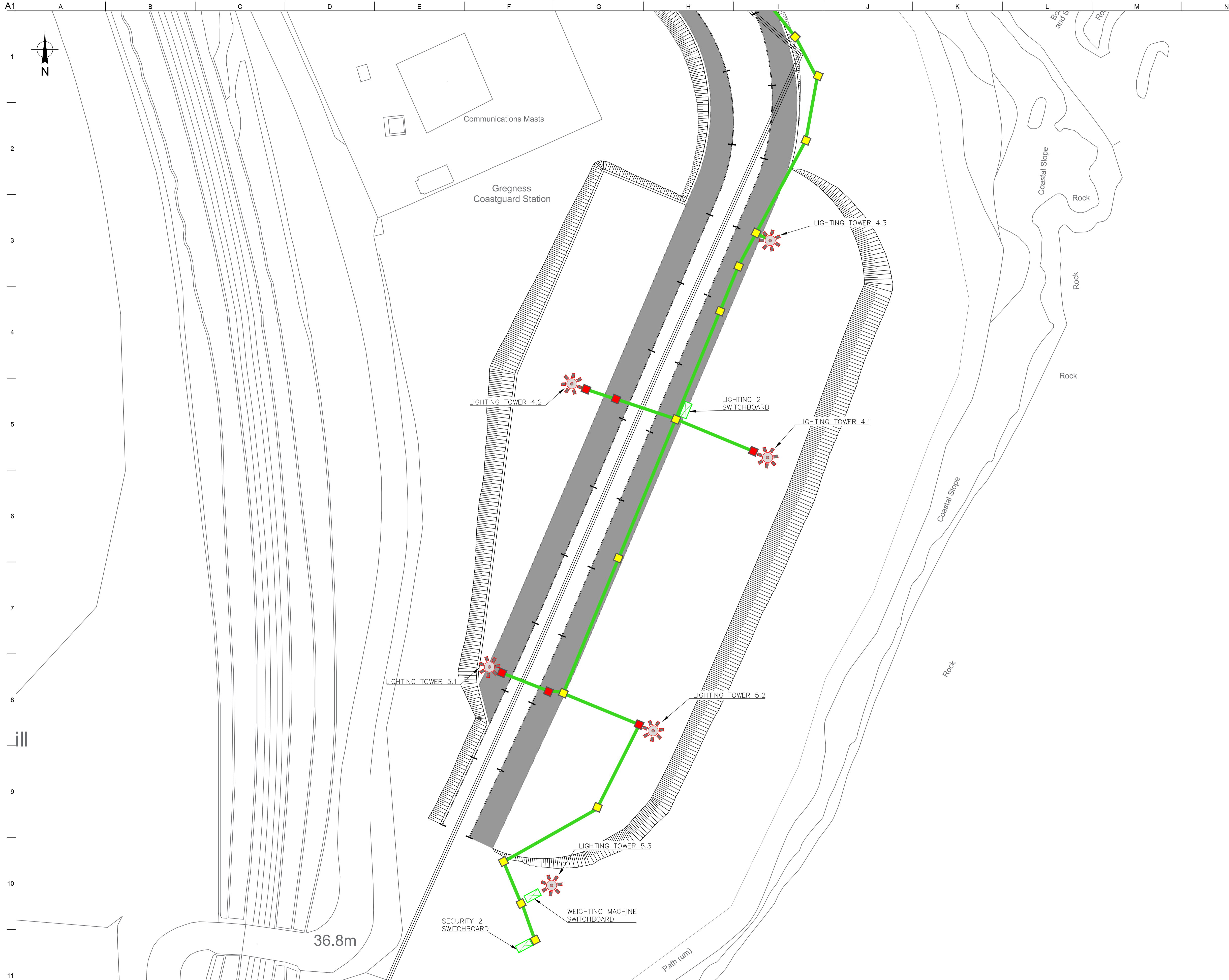
Job Title  
**Aberdeen Harbour Expansion Project**

**South Compound Power Supply & Lighting General Arrangement Sheet 1 of 2**

Scale at A1	Not To Scale
Discipline	Civil Engineering
Drawing Status	Issued For Information
Drawing No	AHEP-DRA-SKE-0188-001
Issue	0

Plan View (Sheet 1)  
 (Not to Scale)





Plan View (Sheet 2)  
(Not to Scale)

Notes:  
1. All dimensions are in meters unless stated otherwise  
2. All levels are in meters to chart datum

Drawing Status:  
**FOR INFORMATION ONLY**  
**NOT VALID FOR CONSTRUCTION**

0	12/12/17	CW	ROL	ROL
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Issue	Date	By	Chkd	Appd



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Job Title  
Aberdeen Harbour  
Expansion Project

South Compound  
Power Supply & Lighting  
General Arrangement  
Sheet 2 of 2

Scale at A1: Not To Scale  
Discipline: Civil Engineering  
Drawing Status

Drawing No	Issue
AHEP-DRA-SKE-0188-002	0

## Appendix C

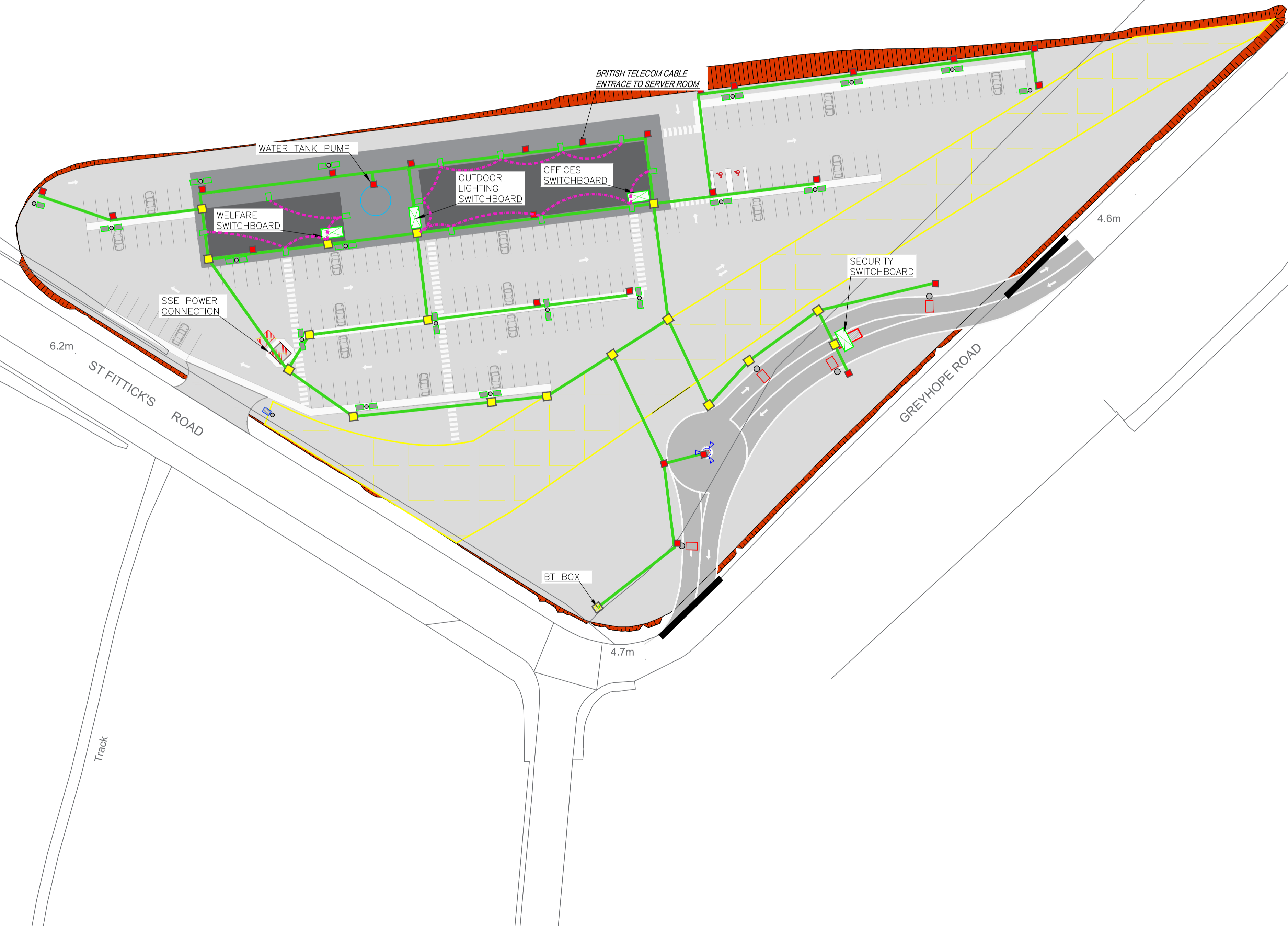
### Lighting Layout Central Compound



A1 A B C D E F G H I J K L M N



1  
2  
3  
4  
5  
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10  
11



Notes:  
1. All dimensions are in meters unless stated otherwise  
2. All levels are in meters to chart datum

Drawing Status:  
**FOR INFORMATION ONLY**  
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0	12/12/17	CW	ROL	ROL
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Job Title  
Aberdeen Harbour  
Expansion Project

Central Compound  
Power Supply & Lighting  
General Arrangement

Scale at A1  
Not To Scale  
Discipline  
Civil Engineering

Drawing Status  
**Issued For Information**  
Drawing No  
**AHEP-DRA-SKE-0188-003** Issue  
**0**

**Central Compound Plan View**  
(Not to Scale)