

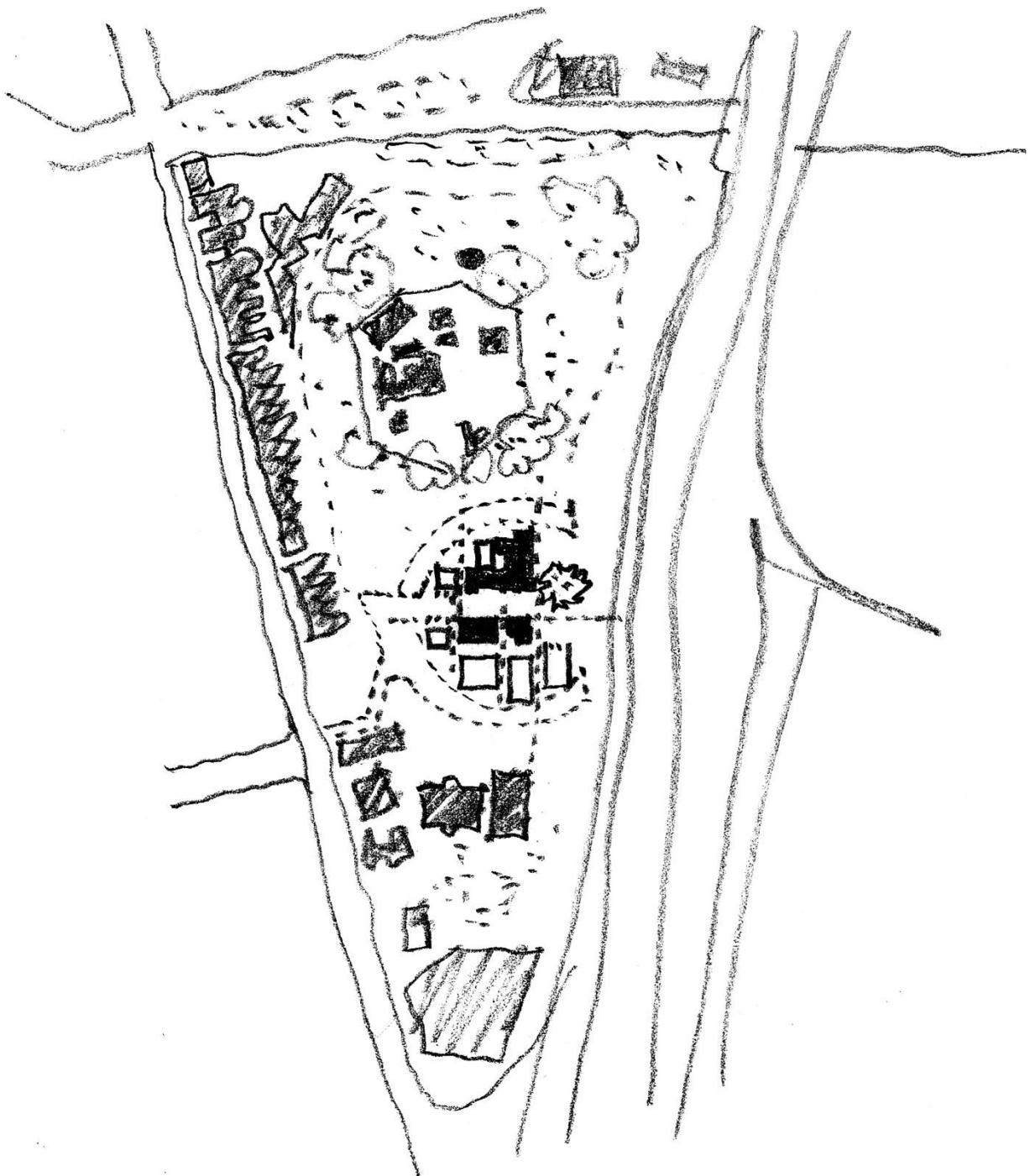
# Fort Street Public School External Lighting Statement

SSD 10340

Prepared by Wood & Grieve Engineers

For School Infrastructure NSW

12 February 2020



# Fort St Public School

## External Lighting

Concept Design Strategy

**Prepared for:** Johnstaff

**Attention:** Sheena Duggan

**Date:** 12 February 2020

**Prepared by:** Peter Mizza

**Ref:** 42255

**Wood & Grieve Engineers now part of Stantec**

Level 6, Building B, 207 Pacific Highway, St Leonards NSW 2065

Tel: +61 2 8484 7000 Email: [sydney@wge.com.au](mailto:sydney@wge.com.au) [www.wge.com.au](http://www.wge.com.au)

\\WGE-SYD-FS-01\PROJECTS\42255\PROJECT DOCUMENTATION\ELECTRICAL\DESIGN\REPORTS\03\_SD\EL\_RE\_EXTLIGHTING-007.DOCX



WOOD & GRIEVE ENGINEERS

NOW PART OF



# Revision

Revision	Date	Comment	Prepared By	Approved By
001	12-11-2019	For SSDA Review	PGM	PGM
002				

# Contents

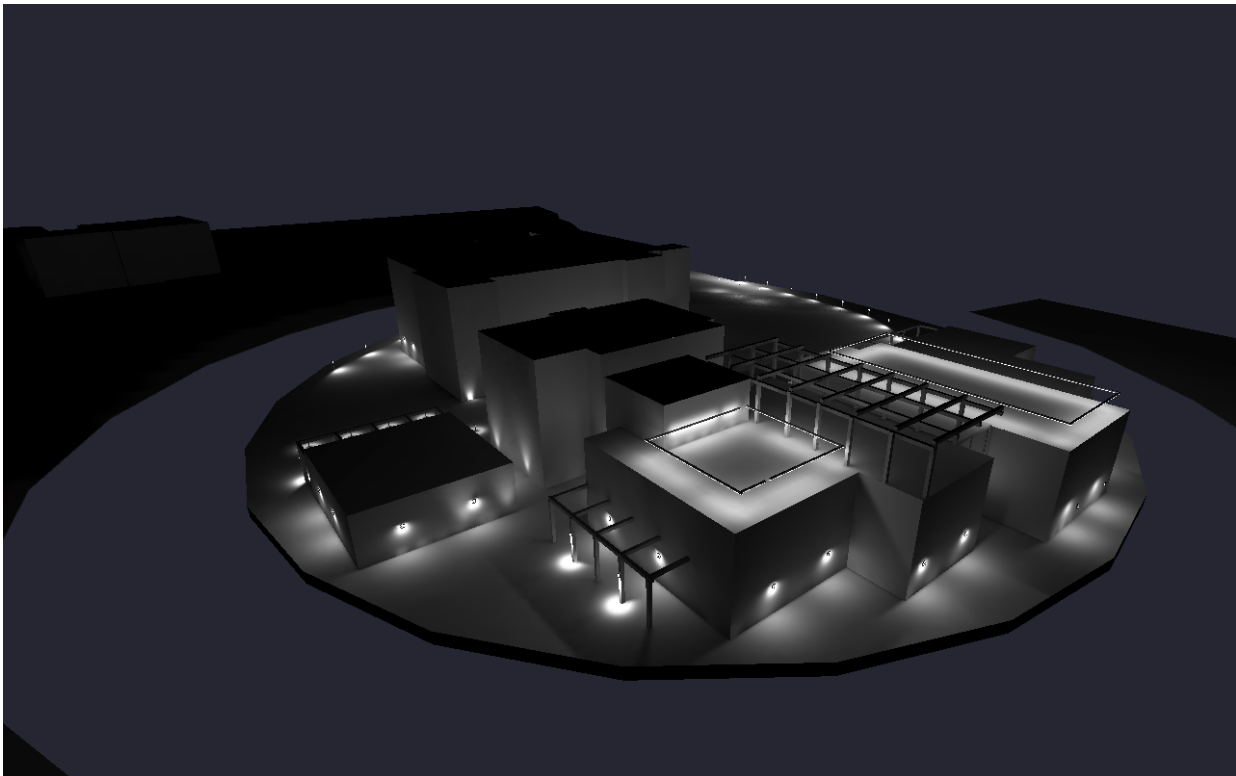
1.	Introduction	1
2.	Lighting Strategy	2
3.	Spill Reduction Measures	3
4.	Conclusion	3
5.	Calculations	4

# 1. Introduction

Wood & Grieve Engineers have been engaged to complete the electrical and lighting design of the Fort St Public School. This report has been prepared to outline the strategy of the external lighting design and measures to reduce spill into the surrounding sensitive areas. This report accompanies the Environmental Impact Statement (EIS) prepared by Ethos Urban in support of State Significant Development Application SSD 10340.

Wood & Grieve Engineers have completed a concept design of the external lighting, in conjunction with FJMT, to assess the suitability of confirming compliance with obtrusive and spill lighting standards and guidelines.

The concept design has been tested against the obtrusive lighting calculations and provides analysis of the compliance and illumination level impact on surrounding properties.



## 2. Lighting Strategy

The lighting concept design looks to incorporate low level lighting, in a layered arrangement, to allow different scenes and modes to be enabled on site. We have balanced the needs of security and accessibility with ambience and in the areas facing the site boundary, a limitation on any upward or outward light spill.

The accent lighting shall be soft and glancing with the intent of revealing the softened heritage and new building's features for subtle appreciation at night, whilst not being so strong that untoward sky glow is added to the night sky. Primary facade elements such as formal brickwork piers and elongated timber COLA structures shall be subtly lit. Areas of landscaping shall be lit with low-level and code-compliant lighting that washes horizontal surfaces with enough light for students and guests to be able to distinguish trafficable surfaces and ramps. Some minimal pole or facade mounted luminaires have been provided to enable CCTV cameras to detect adequate detail.

The lighting concept has been designed with reference to the *Dark Sky Planning Guideline June 2016* and incorporated the general design principles within.

A preliminary calculation of the external lighting has been prepared and the initial calculations show compliance with AS4282:1997 *Control of the obtrusive effects of outdoor lighting*.

The buildings tested include the following:

- National Trust Building
- Sydney Observatory

Further calculations have been undertaken on the following buildings for reference but not included in the preliminary calculation presentation.

- Residential properties on 80-94 Kent St,
- The Langham Hotel
- The S.H. Ervin Gallery

The external lighting will exclusively use a warmer colour temperature (2700-3000°K) to limit the emission of blue light.

The lighting scheme will have several switching modes to allow purely security or ambience or circulation lighting to be provided. The calculation we have completed is with all luminaires on at 100% to show the worst case of the installation, this is not planned to be an applicable mode.

This design is based on preliminary selections on a schematic design layout plan. The final layouts and luminaire selections are subject to change; however, we are providing the calculation as proof of concept of the external lighting and the ability of the concept to achieve obtrusive lighting standards compliance.



### 3. Spill Reduction Measures

The lighting spill has been reduced through the following measures:

#### Positioning

The luminaires have been positioned to direct the light within the site boundaries. Careful attention has been paid to the illumination of reflective structures to ensure the subsequent glow from this effect will not be in excess of obtrusive lighting parameters. The positioning of the luminaires will be subject to the final building form, however the concept design allows for the understanding of the lighting layouts and proof of limited illumination spread beyond the project boundary.

The positioning consideration also extends to the internal spaces of the school. For rooms which have a window facing the site boundary, luminaires shall be positioned to provide a multi-layered option of illuminating internal rooms with lights set back from the window line. This is in addition to other lighting control measures such as blinds.

#### Light Control

The layered arrangement of the lighting design allows for different modes of illumination for the site. The light spill calculation has been provided to show the maximum output of lighting and still be compliant with the Australian Standards for obtrusive lighting. The lighting installation will be provided with dimming and switching control to reduce the illumination levels further, which will be commissioned at the end of the project.

The lighting control extends to the internal spaces of the school. Lights along the windows shall be switched separately to the main space within the internal areas.

#### Luminaires

All the luminaires considered in the concept design have been selected to ensure the suitability for the application, particularly the beam angle and orientation of light to ensure the direction of the light emission is away from the site boundary. The colour temperature of all light sources is proposed to be 3000°K or less to further minimise the emission of high frequency, short wavelengths.

The selected luminaires are of high quality, suitable for coastal corrosive conditions and intended to have the maximum life span of what is available on the market currently. The luminaires are a typical design type and will be able to be replaced with a like for like installation at end of life. This will maximise timeline of the lighting strategy and ensure the design intent is maintained for the life span of the buildings.

### 4. Conclusion

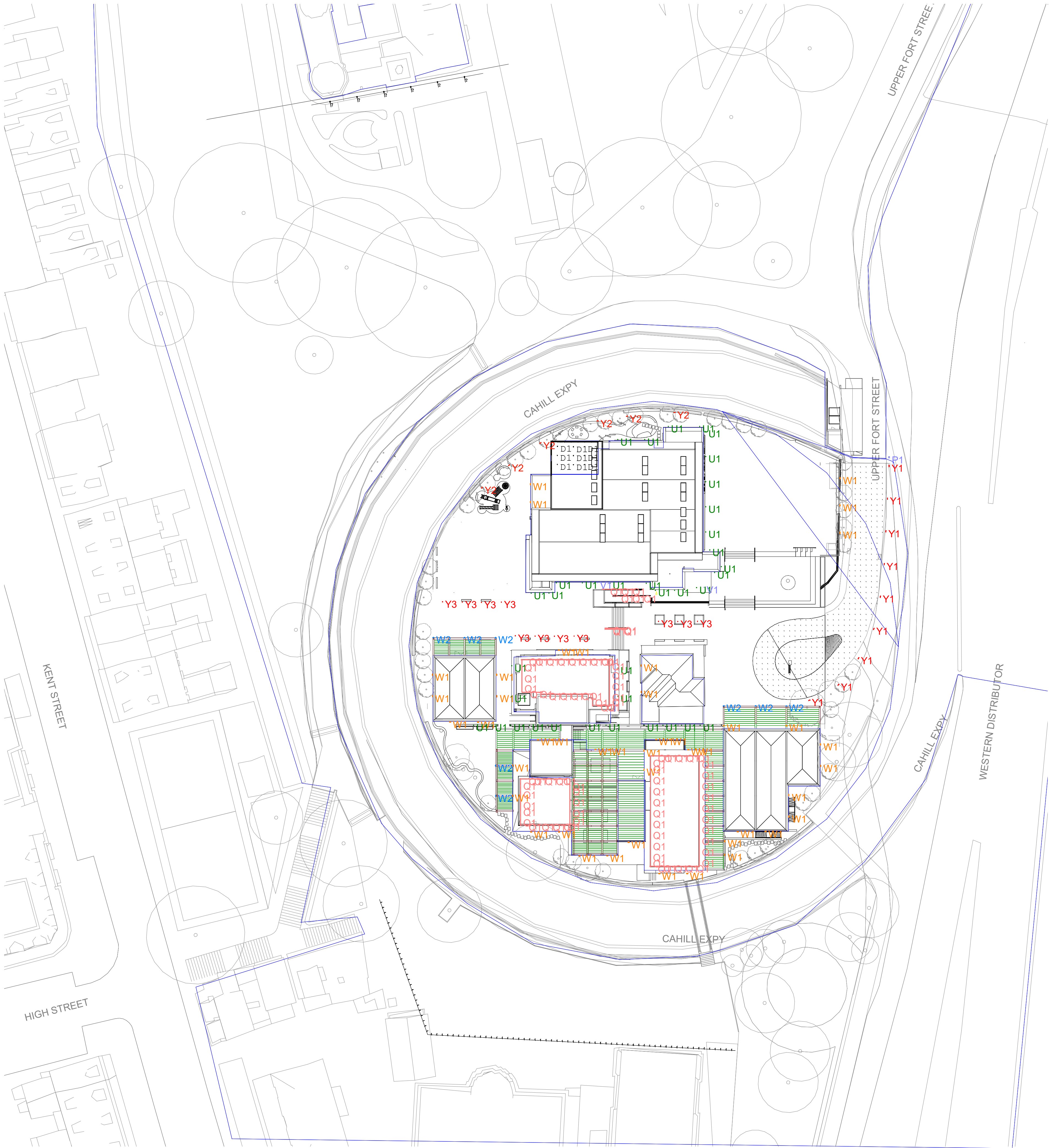
The concept design lighting layout has been provided to show a proof of concept of an external lighting design which shows compliance with AS4282:1997 *Control of the obtrusive effects of outdoor lighting*. The report details the measures taken to reduce the spill light into the surrounding sensitive receivers. The design development stages of the project will detail further design elements to ensure the standards compliance and spill light reduction measures.



## 5. Calculations







Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	9	Y1	SINGLE	N.A.	1.000	Iguzzini Walky LED H900 Round Bollard with Round optic assem
	6	Y2	SINGLE	N.A.	1.000	Iguzzini Walky LED H900 Round Bollard with round optic assem
	11	Y3	SINGLE	N.A.	1.000	Iguzzini iWay Round Bollard Ø90 X610, BG20
	8	W2	SINGLE	N.A.	1.000	Iguzzini Miniwoody LED Spotlight with base, E201
	44	W1	SINGLE	N.A.	1.000	Ligman Sandy Surface facade luminaire SA-31471-W30 Rev_2
	36	U1	SINGLE	N.A.	1.000	Iguzzini Light UP Floor recessed Orbit D=50mm, E080
	2	V1	SINGLE	N.A.	1.000	Iguzzini Palco Outdoor floodlight, Q686
	1	P1	SINGLE	N.A.	1.000	Ligman Mustang 40 Pole Light, MS-90282-T2-W30
	88	Q1	SINGLE	N.A.	1.000	Iguzzini Underscore InOut Side-Bend 10mm version linear ligh
	9	D1	SINGLE	N.A.	1.000	iRoll 65 (mini) Outdoor ceiling-mounted luminaire

Calculation Summary								
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min	
ObtrusiveLight_National Archives	Obtrusive Light - Cd	N.A.	?	?	?	N.A.	N.A.	
ObtrusiveLight_National Archives	Obtrusive Light - Cd	N.A.	?	?	?	N.A.	N.A.	
ObtrusiveLight_National Archives	Obtrusive Light - Ill	Lux	?	?	?	N.A.	N.A.	
ObtrusiveLight_National Archives	Obtrusive Light - Ill	Lux	?	?	?	N.A.	N.A.	
ObtrusiveLight_Observatory Cd Se	Obtrusive Light - Cd	N.A.	?	?	?	N.A.	N.A.	
ObtrusiveLight_Observatory Ill S	Obtrusive Light - Ill	Lux	?	?	?	N.A.	N.A.	
UPPER FORT ST ROADWAY	Illuminance	Lux	?	?	?	N.A.	N.A.	

Obtrusive Light - Compliance Report

AS 4282-1997, Post-Curfew, Residential - Light Surrounds  
Filename: Fort St PS-v6 - Removed EEC  
12/02/2020 1:51:52 PM

Illuminance

Maximum Allowable Value: 2 Lux

Calculations Tested (3):

Calculation Label	Test Results	Max. Illum.
ObtrusiveLight_National Archives_Ill_Seg1	PASS	1.1
ObtrusiveLight_National Archives_Ill_Seg2	PASS	1.3
ObtrusiveLight_Observatory_Ill_Seg1	PASS	0.2

Luminous Intensity (Cd) At Vertical Planes

Maximum Allowable Value: 1000 Cd

Calculations Tested (3):

Calculation Label	Test Results	
ObtrusiveLight_National Archives_Cd_Seg1	PASS	
ObtrusiveLight_National Archives_Cd_Seg2	PASS	
ObtrusiveLight_Observatory_Cd_Seg1		PASS

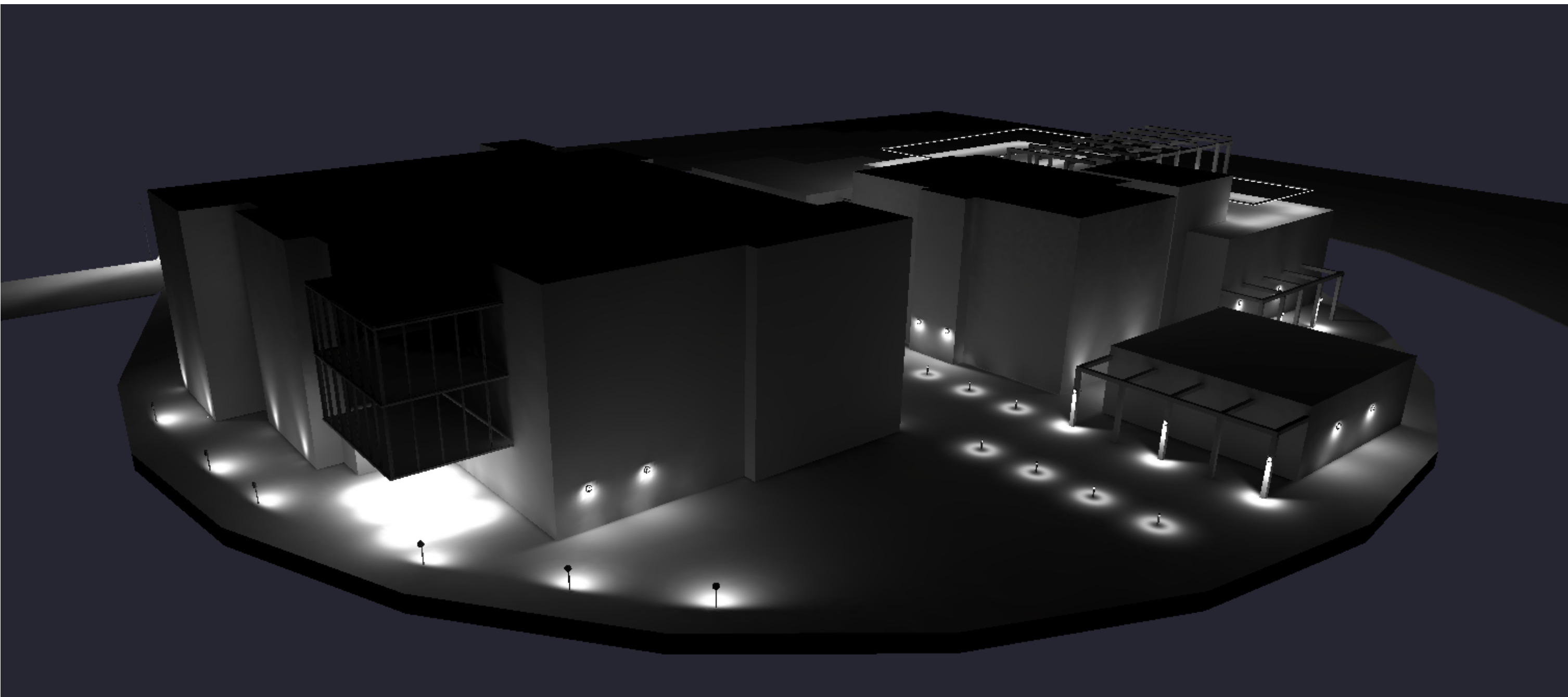
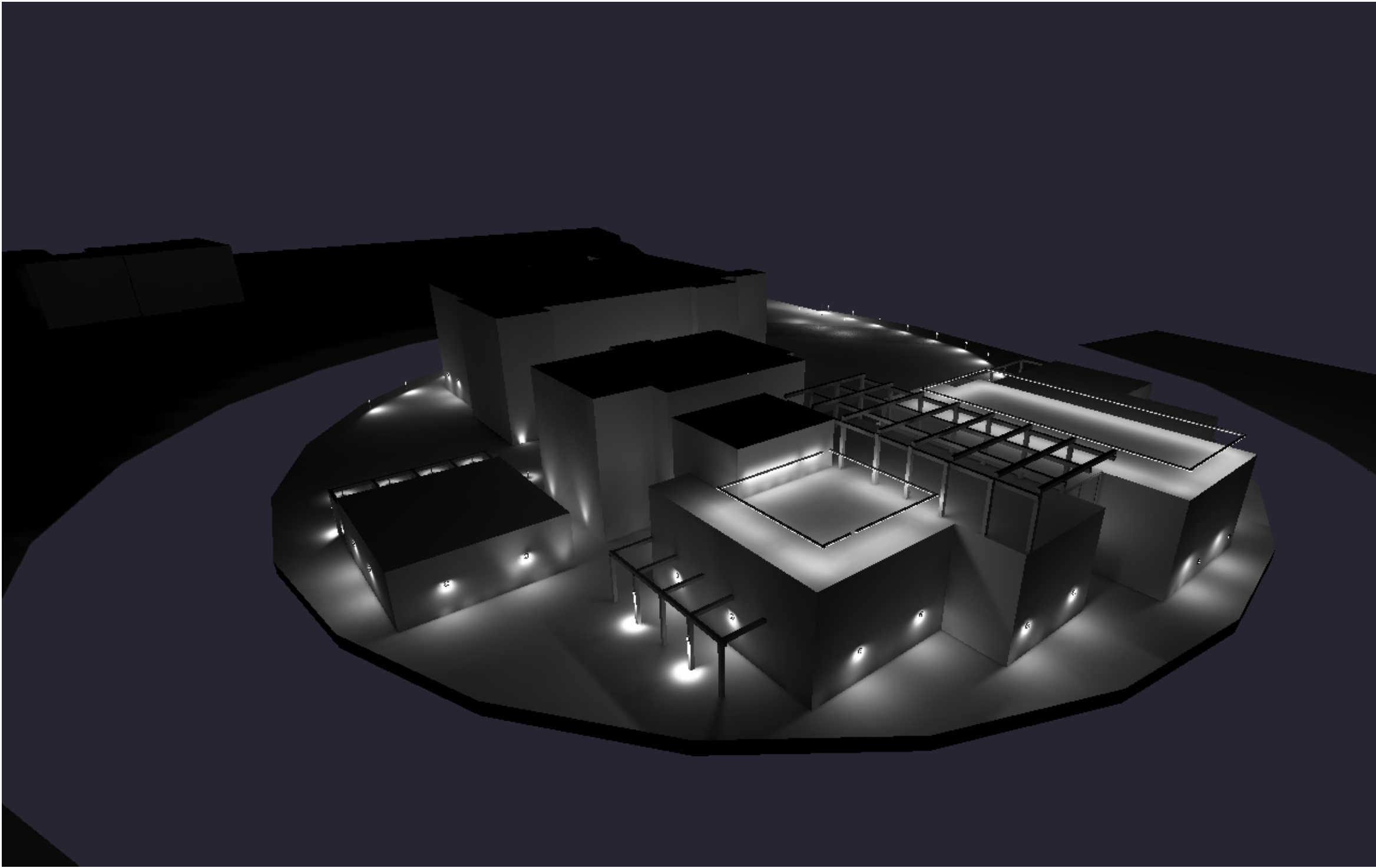
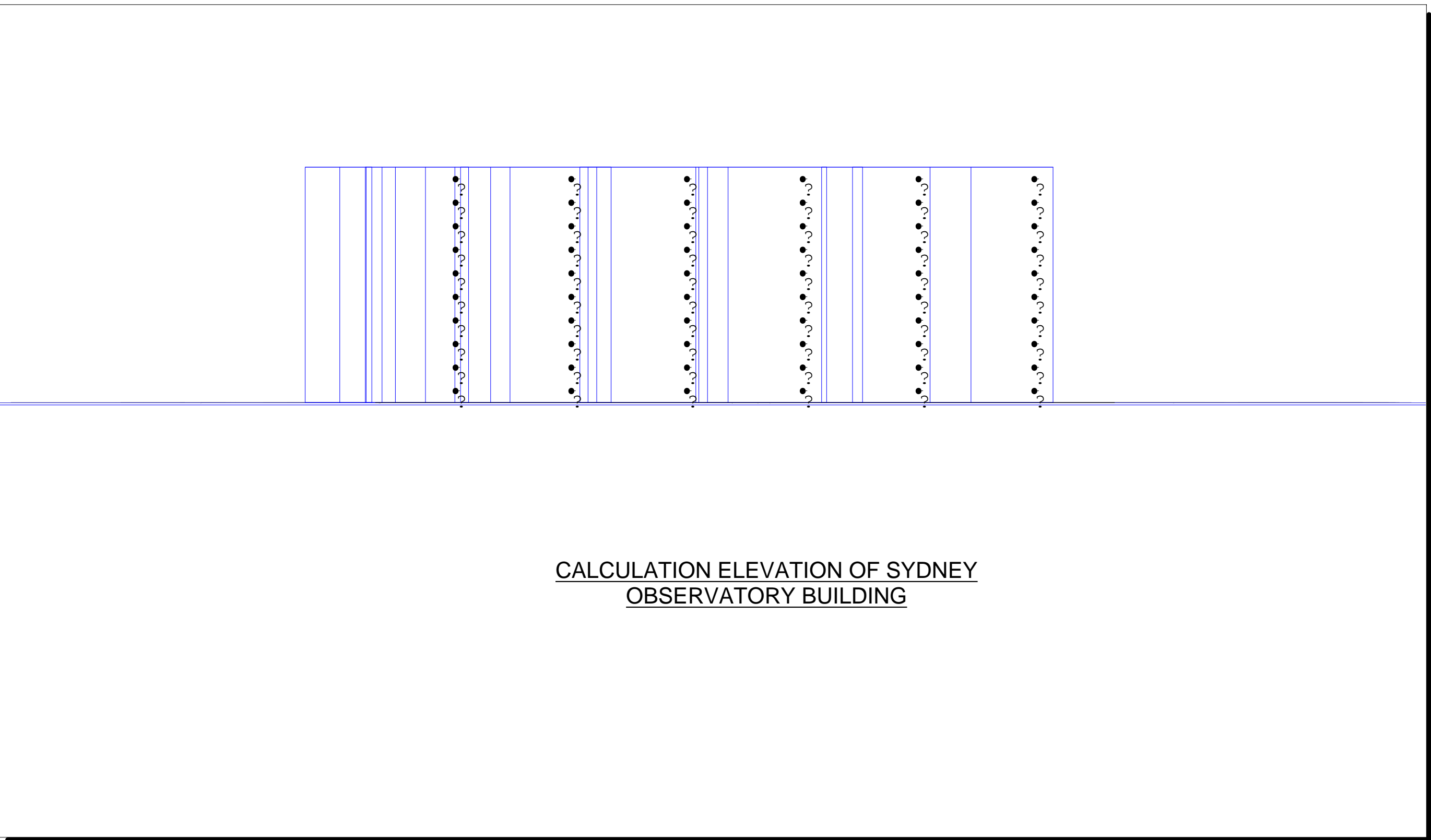
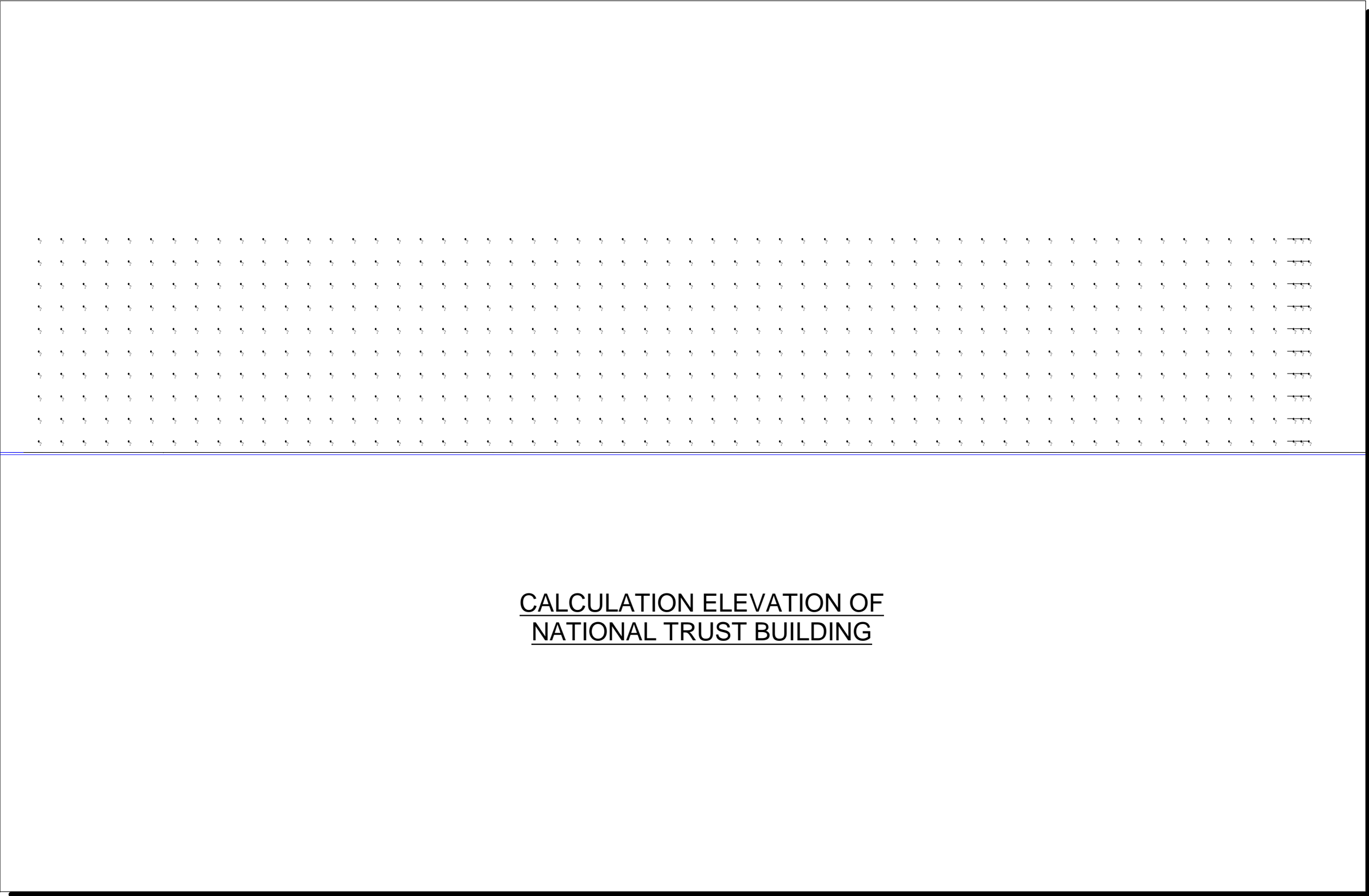


WOOD & GRIEVE ENGINEERS  
NOW PART OF  


SKETCH TITLE BY: matthew.hardwick  
FORT ST PUBLIC SCHOOL  
CONCEPT EXTERNAL LIGHTING

42255	SK-102	12/02/2020	B
PROJECT No	SKETCH No	DATE	REV





Design with  
**community** in mind

Level 6, Building B  
207 Pacific Highway  
St Leonards NSW 2065  
Tel +61 +61 2 8484 7000  
E [sydney@wge.com.au](mailto:sydney@wge.com.au)

For more information please visit  
[www.wge.com.au](http://www.wge.com.au)



WOOD & GRIEVE ENGINEERS

NOW PART OF

