

Aviation Risk Assessment

SSE Plc

Overhead Lines LT: Loch Buidhe-Spittal

August 2025

PLANNING SOLUTIONS FOR:

- Solar
- Telecoms
- Railways
- Defence
- Buildings
- Wind
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- Radar
- Mitigation

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ADMINISTRATION PAGE

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1	August 2024	Initial issue
2	October 2024	Administrative revisions
3	August 2025	Administrative revisions

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EXECUTIVE SUMMARY

Background

Pager Power has conducted an aviation risk assessment for the proposed overhead line network between Loch Buidhe and Spittal, Scotland, to determine its potential impact upon aviation activity.

The risk assessment has been assessed based on the tower heights with the highest tower at 68.67m above ground level (agl).

Overall Conclusions

The proposed development is expected to be operationally accommodatable, subject to consultation with the stakeholders identified. The assessment conclusions and recommendations are presented in the following sections.

Ministry of Defence (MoD)

Radar Line-of Sight Assessment

Sections of the proposed development are within line-of-sight to the RAF Lossiemouth Primary Surveillance Radar (PSR). The towers are not predicted to cause a significant technical impact (i.e. radar clutter due to false returns) compared to wind turbines and buildings, due to not featuring a rotating blade or large areas of flat uniform surfaces (causing reflection or shadowing effects).

Low Flying Zones

The proposed development is located within areas of regular and high priority for military low flying concerns. Consultation with the MoD should be undertaken at the earliest opportunity.

Aviation Lighting

There is no legal requirement for the proposed development to be lit, in accordance with the guidance. However, the proposed development is within regular and high priority areas for low flying and therefore likely required to be lit. Consultation with the MoD is recommended to confirm the lighting requirement.

Civil Airfields

In general, the proposed development will be less easily visible to pilots flying visually (i.e. no navigation aids).

The proposed development is located 200m laterally from the extended runway centreline and 5km from the runway threshold for Rogart Microlights. At this point of the approach/departure, aircraft are predicted to be vertically clear of the proposed development. The proposed development also lies within the recommended distance for consultation. Consultation with the airfield is recommended to confirm their position on the proposed development.

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ABOUT PAGER POWER

Pager Power is a dedicated consultancy company based in Suffolk, UK. The company has undertaken projects in 59 countries within Europe, Africa, America, Asia and Australasia.

The company comprises a team of experts to provide technical expertise and guidance on a range of planning issues for large and small developments.

Pager Power was established in 1997. Initially the company focus was on modelling the impact of wind turbines on radar systems. Over the years, the company has expanded into numerous fields including:

- Renewable energy projects.
- Building developments.
- Aviation and telecommunication systems.

Pager Power prides itself on providing comprehensive, understandable and accurate assessments of complex issues in line with national and international standards. This is underpinned by its custom software, longstanding relationships with stakeholders and active role in conferences and research efforts around the world.

Pager Power's assessments withstand legal scrutiny and the company can provide support for a project at any stage.

1 INTRODUCTION

1.1 Overview

Pager Power has conducted an aviation risk assessment for the proposed overhead line network between Loch Buidhe and Spittal, Scotland, to determine its potential impact upon aviation activity.

The risk assessment has been assessed based on the tower heights with the highest tower at 68.67m above ground level (agl).

The report includes:

- Identification of relevant aviation infrastructure including:
 - Aerodromes (licensed, unlicensed and military);
 - Radar;
 - Radio navigation aids.
- Overview of relevant safeguarding assessment distances;
- Radio line-of-sight assessment for the relevant infrastructure, including:
 - Radar installations;
 - Radio navigation aids.
- Overall risk and key issues.

The aim is to identify and assess the aviation risks associated with achieving planning permission and construction of the proposed development.

2 PROPOSED DEVELOPMENT INFORMATION

2.1 Proposed Development Details

The coordinates (Easting and Northings as per British National Grid) and heights above ground level of towers assessed are presented in Appendix A. The proposed overhead line network, indicated in red, is shown on to aerial imagery in Figure 1 below.



Figure 1 Proposed overhead line network

3 AVIATION RISK ASSESSMENT

3.1 Risk Assessment Results

Figure 2 and Table 2 on the following pages present the aviation risk assessment chart and identified risks.

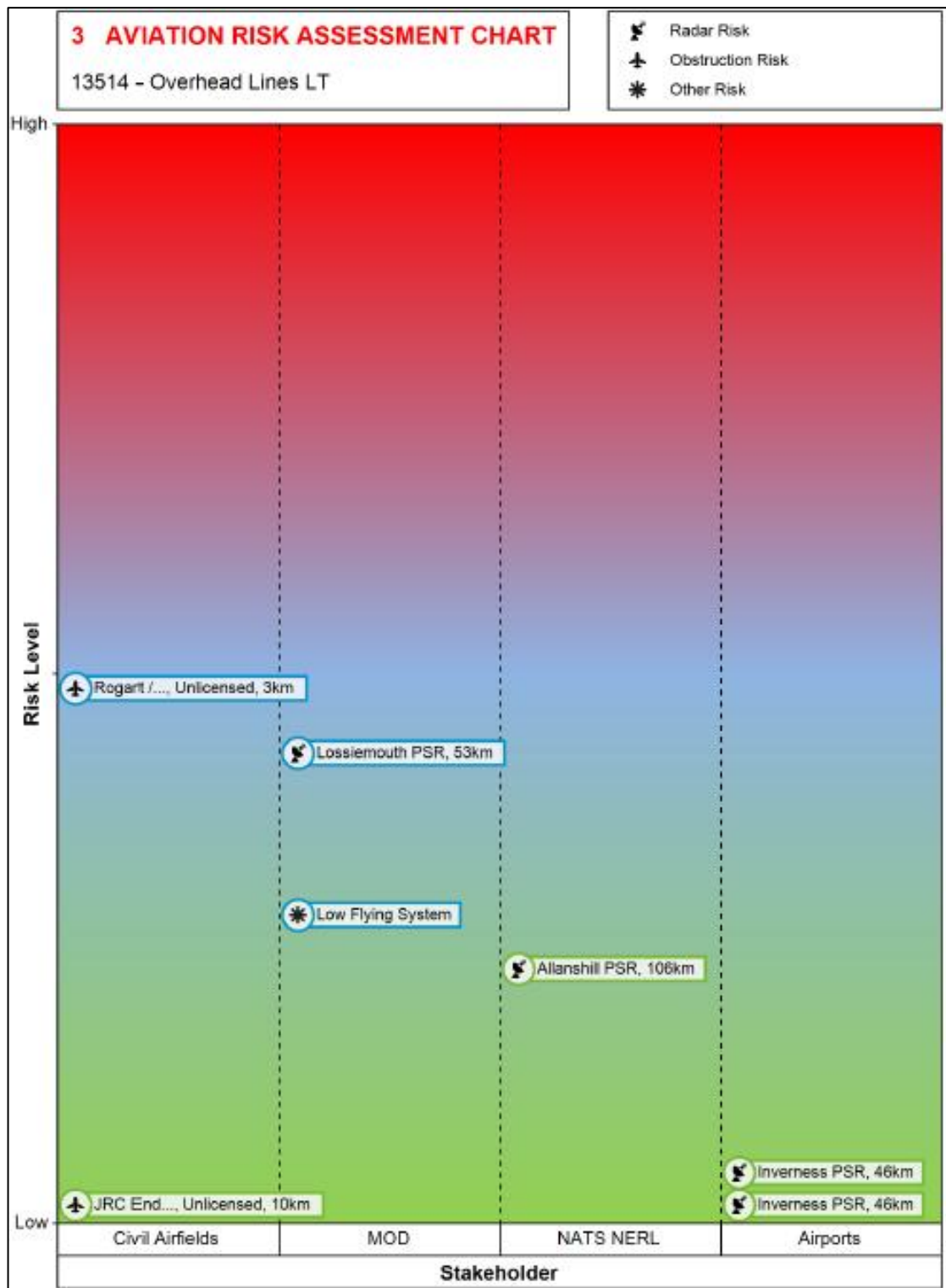


Figure 2 Risk assessment results

Stakeholder	Aviation Risk	Distance	Risk Level
Met Office	None identified		
Licensed Airports and Radar	Inverness Primary Surveillance Radar (PSR)	46.0km	Low
NATS En-Route Limited (NERL)	Alanshill PSR	106.1km	Low
Ministry of Defence (MoD)	Low flying system	-	Medium
	Lossiemouth PSR	53.0km	Medium
Unlicensed Civil Airfields	Dornoch Airfield	12.0km	Low
	Rogart Microlights	2.9km	Medium

Table 1 Identified aviation risks

4 AVIATION RISK ASSESSMENT DISCUSSION

4.1 Overview

The following section presents the results and discussion of the medium and high risks as identified by the risk assessment.

The approach taken for the radar installations is as follows:

- Radar line of sight assessment for the most significant radar and tower;
- Consideration of the distance from the radar;
- Sensitivity of the location in which the development is situated.

Further information regarding the methodology or the additional line-of-sight charts can be provided upon request.

4.2 Ministry of Defence (MoD)

4.2.1 Military Low Flying

Military low flying can take place throughout the UK. The MoD has published a map indicating areas within the UK where military low flying activities are the most likely to cause an objection. The map is colour coded as follows:

- Green – Area with no military low flying concerns;
- Blue – Low priority military low flying areas less likely to raise concerns;
- Amber – Regular military low flying area where mitigation may be necessary to resolve concerns;
- Red – High priority military low flying area likely to raise considerable and significant concerns.

The location of the proposed line network (white outline) relative to the military low flying zones is shown in Figure 3 on the following page. The figure shows that the proposed line network is located within the 'amber' and 'red' zones, which is an area with regular and high priority for military low flying concerns.

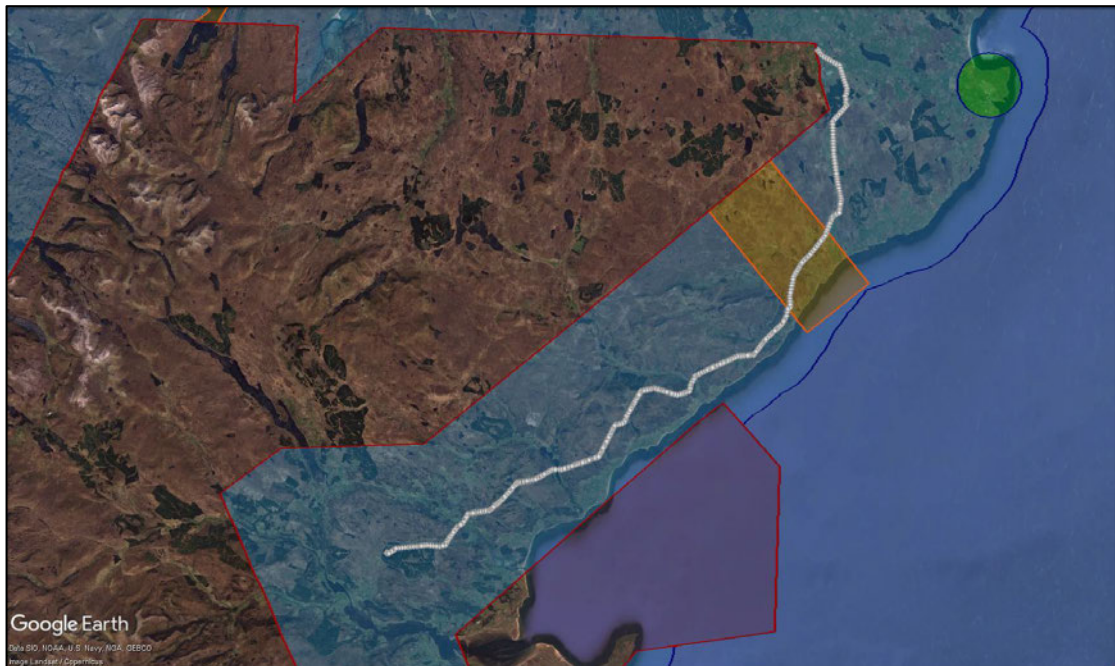


Figure 3 Military low flying zones relative to proposed development

The proposed development is located within areas of regular and high priority for military low flying concerns. Consultation with the MOD should be undertaken at the earliest opportunity.

4.2.2 Aviation Lighting

The guidance for lighting and marking of a fixed obstacle is outlined by the Civil Aviation Publication (CAP) 168, Air Navigation Order (ANO) 222, and the Ministry of Defence (Royal Air Force) – Obstruction Lighting Guidance. Obstacle lights should be used on obstacles between 45m and less than 150m in height, and mandatory for obstacles greater than 150m. Additionally, if a structure is considered an 'aerodrome obstacle', it is the aerodrome licence holder/operator that will assess the potential lighting and marking requirement.

There is no legal requirement for the proposed development to be lit, in accordance with the guidance. However, the proposed development is within regular and high priority areas for low flying and therefore likely required to be lit. Consultation with the MoD is recommended to confirm the lighting requirement.

4.2.3 Radar Line-of-Sight Assessment

The radar line-of-sight analysis has been completed for the proposed development to determine the line-of-sight to the RAF Lossiemouth Primary Surveillance Radar (PSR) at Inverness Airport.

Figure 4 on the following page presents the line-of-sight chart from the RAF Lossiemouth PSR to the most visible tower. The box labelled 'certainty' provides the distance (in metres) by which the proposed development is within line-of-sight to the assessed radar.

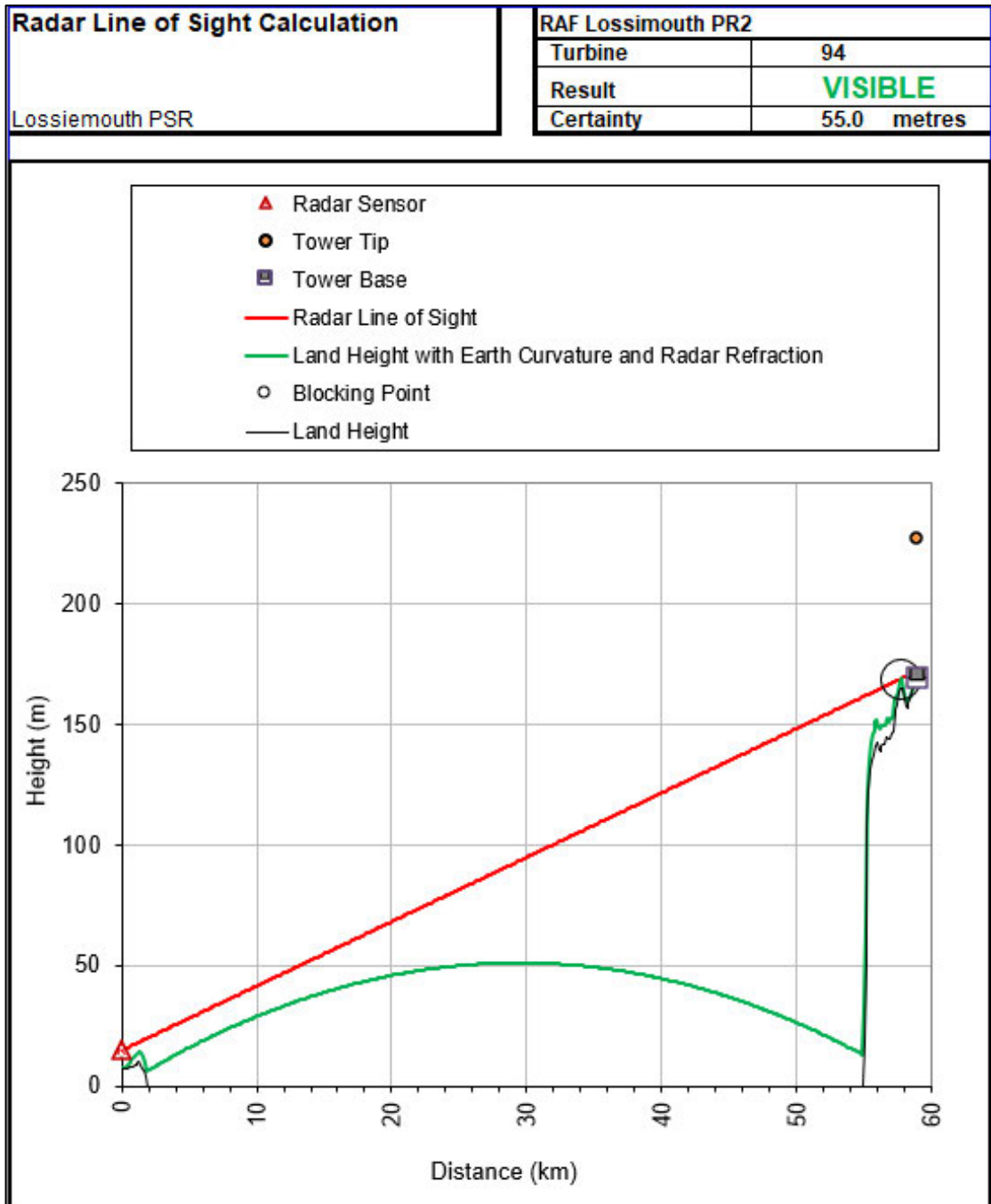


Figure 4 Line-of-sight chart for RAF Lossiemouth PSR

Static obstructions such as the proposed towers for this proposed development are less likely to cause an impact upon radar compared to wind turbines and buildings. The rotating blades of wind turbines move at speeds similar to some aircraft that most Doppler radar are designed to detect, which will not be a feature of the proposed towers. Buildings can impact a radar in two ways:

- Reflections – reflections from a structure can potentially result in genuine aircraft returns being plotted in the wrong place as a result of the structure reflecting signals in a specular (mirror-like) way; and
- Shadowing – large obstructions within a radar's area of coverage can have a 'shadowing' effect, reducing the signal strength immediately behind them.

The proposed towers will not feature a rotating blade or large areas of flat uniform surfaces, and therefore are not predicted to cause significant reflection or shadowing effects. No significant impact upon the PSR at RAF Lossiemouth is predicted. Consultation with the safeguarding team at MoD is recommended to confirm their position.

4.3 Civil Airfields

Unlicensed civil airfields, such as Rogart Microlights as identified in the risk assessment, do not have officially safeguarded Obstacle Limitation Surfaces like licensed aerodromes. Unlicensed aerodromes should take steps to protect their locations from the effects of possible adverse developments.

The most sensitive location for an obstruction is typically along the extended runway centreline. Figures 5 below shows the proposed development relative to the extended runway centreline for Rogart Microlights. The extended runway centreline is shown as the red line within the figure.



Figure 5 Proposed development relative to Rogart Microlights extended runway centreline

The lateral clearance between the closest tower and the extended centreline is approximately 200m. At this point, the distance to the runway threshold is approximately 5.0km. Aircraft are predicted to be vertically clear of the tallest proposed tower, considering the distance to the runway threshold.

The proposed development lies within the recommended distance for consultation¹ and is therefore recommended to consult with the airfield to confirm their position on the proposed development.

¹ Based upon the guidance laid down in CAA Publication CAP 764 Policy and Guidelines on Wind Turbines, Version 6 dated February 2016; Civil Aviation Authority (2019), CAP 168 Licensing of Aerodromes, Edition 11; Civil Aviation Authority (2018), CAP 777 Licensing of Aerodromes, Version 5; ICAO (2006), Procedures for Air Navigation Services, Aircraft Operations, Volume II Construction of VISUAL AND Instrument Flight Procedures, Fifth Edition and NATS AIP (digital resource, various publication dates).

5 OVERALL CONCLUSIONS AND RECOMENDATIONS

5.1 Ministry of Defence (MoD)

5.1.1 Radar Line-of Sight Assessment

Sections of the proposed development are within line-of-sight to the RAF Lossiemouth Primary Surveillance Radar (PSR). The towers are not predicted to cause a significant technical impact (i.e. radar clutter due to false returns) compared to wind turbines and buildings, due to not featuring a rotating blade or flat and opaque surfaces (causing reflection or shadowing effects).

5.1.2 Low Flying Zones

The proposed development is located within areas of regular and high priority for military low flying concerns. Consultation with the MOD should be undertaken at the earliest opportunity.

5.1.3 Aviation Lighting

There is no legal requirement for the proposed development to be lit, in accordance with the guidance. However, the proposed development is within regular and high priority areas for low flying and therefore likely required to be lit. Consultation with the MoD is recommended to confirm the lighting requirement.

5.2 Civil Airfields

In general, the proposed development will be less easily visible to pilots flying visually.

The proposed development is located 200m laterally from the extended runway centreline and 5km from the runway threshold for Rogart Microlights. At this point, aircraft are predicted to be vertically clear of the proposed development. The proposed development also lies within the recommended distance for consultation. Consultation with the airfield is recommended to confirm their position on the proposed development.

APPENDIX A – TOWER COORDINATES

The coordinates (Eastingings and Northings as per British National Grid) and heights above ground level of towers are presented in the table below.

Reference	Easting	Northing	Height (m agl)
Banniskirk gantry 15m_draft_right	316073.06	956859.055	15.00
AS4 AD55 200m +3	318643.128	955049.713	57.22
AS4 AD55 200m_+3	319305.425	951427.107	57.22
AS4 AD 200m +6	317823.06	948091.863	60.56
AS4 AD 200m +6	318043.156	943808.178	60.56
AS4 AD 400m	318705.402	939796.902	54.56
AS4 AD 200m +9	317769.61	937019.774	63.56
AS4 AD 200m +12	315730.467	933388.286	66.56
AS4 AD 200m	313386.749	930365.915	54.56
AS4 AD55 200m +3	312849.756	926511.604	57.22
AS4 AD10 200m +6	311044.361	923700.957	58.52
AS4 AD10 200m +9	308690.178	921053.098	61.52
AS4 AD10 400m +12	305450.585	920143.48	64.52
AS4 AD 400m +6	302761.101	918913.457	60.56
AS4 AD10 400m	300574.025	916411.566	52.52
AS4 AD10 400m +9	297300.553	916724.37	61.52
AS4 AD10 400m +9	294695.53	915664.914	61.52
AS4 AD 200m +6	292660.15	912601.457	60.56

Reference	Easting	Northing	Height (m agl)
AS4 AD10 400m +3	290867.477	910034.871	55.52
AS4 AD10 400m	288842.194	908299.538	52.52
AS4 AD25 200m	285883.743	907243.721	54.02
AS4 AD25 400m -3	282789.56	906098.74	51.02
AS4 AD10 400m +3	279857.167	904834.811	55.52
AS4 AD10 400m +9	277513.257	902570.99	61.52
AS4 ADTE 200m +9	274310.309	901036.683	68.67
AS4 AD10 200m +12	272283.682	898598.679	64.52
AS4 AD10 400m +9	268769.179	898133.159	61.52
Carnaig 15m_draft	265236.851	897358.652	15.00

Tower coordinates and heights



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