Cheshire East Local Plan

First Draft

Jodrell Bank Observatory Supplementary Planning Document

November 2021

Cheshire East Council

Contents

1. Part 1: Background and Context

Introduction

1.1 On 7 July 2019, in recognition of its internationally significant heritage, science and cultural impact, Jodrell Bank Observatory (JBO) was awarded UNESCO World Heritage Site (WHS) status and has been inscribed on the World Heritage List.

1.2 Jodrell Bank now joins a prestigious group of sites across the globe recognised by UNESCO's international community as sites of Outstanding Universal Value (OUV). The WHS inscription acknowledges Jodrell Bank's tremendous scientific endeavours and its role in achieving a transformational understanding of the Universe.

1.3 It places the site on an equal heritage footing with places such as Stonehenge and the Taj Mahal, representing an enormous accolade, not only for Jodrell Bank and The University of Manchester (UoM), but also for the region, and the UK as a whole. As a WHS, Jodrell Bank and its Consultation Zone (JBOCZ) are important to us all, and the planning system has a role to play in ensuring that the universal value of the site is protected. By providing guidance on development across the JBO site itself and the JBOCZ, the planning system can make sure development takes place in a way that protects and enhances the significance of the heritage assets here and enables the ongoing functional operation of the telescopes.

1.4 The Outstanding Universal Value of JBO uniquely arises, in part, to its ongoing and continued functional operation as a working scientific facility. The planning system has a vital role in protecting the ability of the observatory to carry out leading scientific research, by ensuring that new development does not create electrical interference that harms the efficiency of the telescopes. The operational efficiency of the telescopes is therefore intrinsically linked to, and inseparable from, the heritage value of JBO and its Outstanding Universal Value.

1.5 Planning policies held in the development plan for Cheshire East seek to protect the heritage value of JBO and this SPD provides further guidance on how those policies will be applied in decision making.

Background

1.6 JBO has been awarded WHS status by UNESCO under three criteria:

i) It is a masterpiece of human creative genius related to its scientific and technical achievements.

ii) It represents an important interchange of human values over a span of time and on a global scale.

iii) It is an outstanding example of a technological ensemble which illustrates a significant stage in human history It directly and tangibly associated with events and ideas of outstanding universal significance.

1.7 Founded in 1945, JBO was a pioneer of a completely new science; the exploration of the Universe using radio waves instead of visible light.

1.8 This transformational development completely opened humanity's understanding of the Universe. The new science of radio astronomy discovered previously undreamt-of things – quasars, pulsars, gravitational lenses and the fading glow of the Big Bang, allowing us to see way beyond our galaxy and back in time almost 14 billion years to the origin of the Universe itself.

1.9 The emergence of radio astronomy has defined the landscape of Jodrell Bank and it is the only remaining site in the world that retains traces of the development of this science from its earliest days to the present. Research at JBO has led to revolutionary scientific discoveries, and advanced engineering.

1.10 Scientific research first began here in 1945 when surplus army radar equipment was used to study meteor showers. Further experiments followed, leaving behind a physical trail of the development of a whole new science.

1.11 Radio astronomers at Jodrell Bank proceeded to build the world's largest radio telescopes in succession. The 66m Transit Telescope made the first ever identification of a radio object outside our own galaxy - the great nebula in Andromeda. It was superseded by the Lovell Telescope (1957), the first act of which was to track the carrier rocket of Sputnik 1 by radar, witnessing the dawn of the Space Age.

1.12 The site has remained at the forefront of radio astronomy since its inception and today, the Jodrell Bank team are world-leaders in pulsar research. Part of The UoM, the site runs state-of-the-art astronomical research programmes on the e-MERLIN array of national facility radio telescopes. Jodrell Bank also hosts the international headquarters of the Square Kilometre Array - a global project to create the largest radio telescope on Earth.

1.13 The site also hosts Jodrell Bank Discovery Centre, which sees over 185,000 visitors every year, including some 27,000 school children, to tell the story of radio astronomy. The discovery centre also hosts the annual BlueDot music and arts festival attracting over 25,000 people, and will host a new exhibition space, the First Light Pavilion, within the Jodrell Bank Gardens.

Purpose and Scope of the SPD

1.14 JBO was designated as a UNESCO WHS in July 2019 and great care must be taken to make sure that development of the site, and within the consultation zone, does not harm the significance and operational functionality of the telescopes.

1.15 The boundary of the WHS extends across the Jodrell Bank site itself and an extensive area of land south, east and west, of the telescopes. This area is

referred to as the JBOCZ and considered to be same as the 'WHS Buffer Zone' (WHSBZ). For the avoidance of doubt, this SPD will refer to the JBOCZ throughout.

1.16 Great emphasis is placed on protecting the OUV of the site. In all instances, new development should not harm the OUV, including the continued operational efficiency of the telescopes, and should positively contribute to further revealing the value of the site itself.

1.17 Four criteria define the OUV of Jodrell Bank:

- Criterion (i): JBO is a masterpiece of human creative genius related to its scientific and technical achievements.
- Criterion (ii): JBO represents an important interchange of human values over a span of time and on a global scale on developments in technology related to radio astronomy.
- Criterion (iv): JBO represents an outstanding example of a technological ensemble which illustrates a significant stage in human history (1940s-1960s) – the transition from optical astronomy to radio astronomy and the associated consequence for the understanding of the Universe through multi-wavelength astrophysics.
- Criterion (vi): JBO is directly and tangibly associated with events and ideas of outstanding universal significance.

1.18 The integrity of the site is well preserved and the consultation zone, and buffer zone of the property is designed to limit development (and therefore electrical interference) in order to protect the scientific capabilities of the Observatory from radio emissions in its vicinity. By limiting development, and electrical interference, these zones are therefore an essential planning tool to ensure the continued functional integrity of the property and are fundamental to the OUV. In this way the harm that may be created by new development to the efficiency of the telescopes, is inextricable from the harm to the heritage significance of the WHS.

1.19 Heritage assets are an irreplaceable resource and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations. The impact of development on a heritage asset can therefore be given great weight in planning decisions, and the weight attributed to the impact on a heritage asset increases with the significance of the heritage asset. As a WHS, the impact of development on the telescopes at Jodrell Bank and their operational capacity will be given very significant weight in decision making on planning applications.

1.20 Both parts one (the Local Plan Strategy) and two (the emerging Site Allocations and Development Policies Document) of Cheshire East Council's Local Plan include policies that address how development should take place across the Jodrell Bank site itself and the JBOCZ. This SPD is therefore a tool to assist applicants and decision makers in understanding how proposals will be assessed against those policies (primarily SE 14 'Jodrell Bank' and emerging

HER 9 ‘World Heritage Site’) and the type of information that will be required as part of a planning application for sites across the JBOCZ.

1.21 Supplementary Planning Documents (SPDs) add further detail to policies contained within the development plan and are used to provide guidance on specific sites or particular issues. SPDs do not form part of the adopted development plan but they are a material planning consideration in decision making.

1.22 An SPD cannot introduce new policy requirements. It must limit its scope to providing advice on the implementation of existing policies held in the development plan. In this case the core polices that this SPD provides further guidance on are SE 14 ‘Jodrell Bank’ and emerging HER 9 ‘World Heritage Site’.

1.23 The SPD sets out an approach that is divided between the JBO site itself, and the JBOCZ as defined on the Policies Map of the Local Plan. The JBO site includes all the operational equipment and buildings that form the functional asset; many of the structures here are subject to individual heritage listings.

1.24 Therefore, the scope of this SPD is to provide further guidance on polices held in the LPS and emerging SADPD, providing guidance to applicants on what type of information they will need to submit and how the policies of the development plan will be applied when determining planning applications across the JBO site and JBOCZ.

1.25 The key policies that this SPD provides guidance on are:

- **Local Plan Strategy Policy SE 14 Jodrell Bank**

  i) *Within the Jodrell Bank Radio Telescope Consultation Zone, as defined on the Proposals Map, development will not be permitted if it:*

  (1) Impairs the efficiency of the telescopes;

  (2) Or. (ii) Has an adverse impact on the historic environment and visual landscape setting of the Jodrell Bank Radio Telescope.

  ii) *Conditions will be imposed to mitigate identified impacts, especially via specialised construction techniques.*

  iii) *Proposals should consider their impact on those elements that contribute to the potential outstanding universal value of Jodrell Bank.*

- **Emerging SADPD Policy HER 9: World Heritage Site:**

  iv) *Proposals that conserve or enhance the outstanding universal value of the WHS at Jodrell Bank will be supported.*

  v) *Development proposals within the WHS at Jodrell Bank (or within its consultation zone) that would cause harm to the significance of the heritage asset (including elements that contribute to its outstanding universal value)*

will not be supported unless there is a clear and convincing justification; and an appropriate heritage impact assessment has evaluated the likely impact of the proposals upon the significance of the asset and the attributes that contribute to its outstanding universal value.

vi) *Where development has a demonstrable public benefit, and harm to the outstanding universal value is unavoidable and has been minimised, this benefit will be weighed against the level of harm to the outstanding universal value of the WHS.*

1.26 Based on policies of the LPS and SADPD that apply to JBO and the JBOCZ, the scope of this SPD is to provide guidance on the following topics:

- The type of development and other factors, such as location of development, that may impair the **efficiency of the telescopes** as well as how and when the UoM will be consulted on this matter.
- How the **historic environment** may be relevant to planning applications and how Heritage Impact Assessments should be prepared.
- The role that the **visual landscape** setting of the WHS plays in the determination of planning applications and the type of information applicants will need to submit to address this.
- How the **OUV** of the WHS should be taken into account and what this means across different parts of the JBO site and JBOCZ
- The type of **conditions** that may be imposed on proposed development, to make sure that the OUV of the site remains protected.

Within the Jodrell Bank Observatory Site

1.27 The JBO site itself is under the ownership and management of the UoM. Alongside the policies of the development plan, the UoM Conservation Management Plan (CMP) for the site forms the primary guidance for development here. The CMP forms part of this SPD and will be treated as a material consideration in the determination of planning applications.

1.28 Further guidance on the CMP is provided below at paragraph section 5.

Within the Jodrell Bank Observatory Consultation Zone

1.29 The JBOCZ protects the scientific capabilities of the Observatory from radio emissions in its vicinity, contributing to maintenance of the functional integrity of the property and its ability to continue research. The JBOCZ is therefore an integral and essential component of the OUV of the WHS, and development that harms this will not be supported.

1.30 Development may require consultation with The UoM, to determine whether the proposal will harm the operational efficiency of the telescopes. This assessment primarily focuses on the level of electrical interference that will be created by a proposal.

1.31 The SPD also sets out a range of mitigation measures that may be employed as planning conditions in instances where development that is otherwise harmful can be made acceptable in planning terms through the application of planning obligations and conditions.

1.32 Interference and mitigation issues are addressed at Section 6 of this document.

Status of the SPD

1.33 The SPD has been prepared in accordance with the Planning Act 2004 and the associated Town and Country Planning (Local Planning) (England) Regulations 2012 (as amended).

1.34 Once finalised and published, this document will be used alongside policies in the Development Plan to inform decision making on planning applications within the JBOCZ.

2. Draft SPD Consultation

2.1 Consultation on the draft SPD will take place between 22nd November 2021 and 20th December 2021. Comments must be received by the Council **no later than midnight on 20th December 2021**.

2.2 The consultation documents can be viewed online at https://cheshireeast-consult.objective.co.uk/portal/planning/spd, and at public libraries in Cheshire East during opening hours (for information about opening hours see www.cheshireeast.gov.uk/libraries or telephone 0300 123 7739).

SEA and HRA

2.3 There is no legal requirement for SPDs to be accompanied by Sustainability Appraisal, and this is reinforced in national planning guidance. However, “in exceptional circumstances” there may be a requirement for SPDs to be subject to Strategic Environmental Assessment (SEA) where it is considered likely that they may have a significant effect on the environment that has not already been assessed within the SEA of the Local Plan. A screening assessment has been undertaken and concludes that such an assessment is not necessary.

2.4 A screening exercise has been carried out to determine whether the document gives rise to the need for Appropriate Assessment (under the Habitats Regulations). This similarly concludes that such an assessment is not necessary.

2.5 These screening assessments have been published (Appendix 1) and you can give your views on their findings too.

Submitting your views

2.6 The council's online consultation portal is our preferred method for submitted responses, but you can also respond by e-mail or in writing using a comment form available online and at the locations listed above. You can respond:

- **Online:** Via the consultation portal at: https://cheshireeast-consult.objective.co.uk/portal/planning/spd/BNG
- **By e-mail:** To planningpolicy@cheshireeast.gov.uk
- **By post:** Strategic Planning (Westfields), C/O Municipal Buildings, Earle Street, Crewe CW1 2BJ

2.7 Please make sure that your comments reach us by **midnight on the 2th December 2021**. We are not able to accept anonymous comments and you must provide us with your name and contact details. Your personal data will be processed in line with our Strategic Planning Privacy Notice, which is available on the council's website (www.cheshireeast.gov.uk). Your name and comments will be published and made available to view on the council's online consultation portal.

What happens after the consultation?

2.8 Following consultation, the council will carefully consider all representations received before deciding whether any amendments to the draft SPD are needed. The final version of the SPD alongside a Consultation Statement summarising the feedback and changes to the SPD will then be published for further comment before the SPD is proposed for adoption by the Council.

2.9 Once adopted the SPD will be formal planning guidance and will be considered as a material consideration when assessing planning applications in Cheshire East.

3. Legal Framework

3.1 In addition to the planning framework that is primarily set out in the Town and Country Planning Act 1990, the legislative framework related to heritage includes the following:

- the Planning (Listed Buildings and Conservation Areas) Act 1990 provides specific protection for buildings and areas of special architectural or historic interest
- the Ancient Monuments and Archaeological Areas Act 1979 provides specific protection for monuments of national interest
- the Protection of Wrecks Act 1973 provides specific protection for wreck sites of archaeological, historic or artistic interest
- the Historic Buildings and Ancient Monuments Act 1953 makes provision for the compilation of a register of gardens and other land (parks and gardens, and battlefields).

3.2 Whilst not part of the legislative framework, the UNESCO Convention Concerning the Protection of the World Cultural and National Heritage 1972 (to which the UK is a signatory) makes provision for the World Heritage List, which is a list of cultural and/or natural heritage sites of outstanding universal value.

3.3 Any decisions where listed buildings and their settings and conservation areas are a relevant factor must address the statutory considerations of the Planning (Listed Buildings and Conservation Areas) Act 1990 (see in particular sections 16, 66 and 72) as well as applying the relevant policies in the development plan and the National Planning Policy Framework.

3.4 In addition to the legislation cited here, the Town and Country (Jodrell Bank Radio Telescope) Direction 1973 requires the Local Planning Authority to consult with The UoM before granting planning permission on any application for development. The Direction sets out exceptions to these requirements and specifies the exceptions that apply to the JBOCZ.

3.5 The Direction, and the exceptions to the Direction, are set out in full at Appendix 3. The schedule of exceptions has been used to inform the approach to the guidance set out in this SPD relating to when The UoM is consulted on planning applications. The Direction is summarised in table format at Appendix 4.

3.6 The conversion or redevelopment of a range of buildings, including dwelling houses may not require consultation with The UoM, subject to the circumstances of the planning application meeting criteria set out in the Direction. However, whilst consultation with The UoM may not be necessary, this does not mean that such proposals should be assumed to be acceptable in planning terms. As such, all proposals will be considered on their own merits and applicants should demonstrate accordance with the Development Plan for Cheshire East. Further advice on this is set out in section 6 of this SPD.

4. Planning Policy Framework

National Policy Context

4.1 The National Planning Policy Framework (NPPF) February 2019 has, at its heart, the core principle of sustainable development and sets out a number of requirements related to heritage. The key section of the NPPF that is relevant to heritage is Section 16: Conserving and Enhancing the Historic Environment, which contains important policy requirements, with the following notable paragraphs:

- "*When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.*" (NPPF 2019, Paragraph 193)
- **"***Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of: 56 a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional; b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and WHSs, should be wholly exceptional.*" (NPPF 2019, Paragraph 194)

Planning Practice Guidance

4.2 The Planning Practice Guidance (PPG) also provides guidance on the historic environment. On WHSs the PPG provides advice on the principles that need to be considered when developing plans and strategies for WHSs (Paragraph: 032 Reference ID: 18a-032-20190723); the approach to the setting of WHSs (Paragraph: 034 Reference ID: 18a-034-20190723) and the approach to be taken to assess the impact of development (Paragraph: 035 Reference ID: 18a-035-20190723).

4.3 It should also be noted that WHSs are considered to be 'sensitive areas' for the purposes of Environmental Impact Assessment and that the threshold that triggers a need for a Design and Access Statement is also lower within a WHS (see Section 12 of this SPD).

Cheshire East Council Local Plan Strategy

4.4 Cheshire East Council's Local Plan is being prepared in two parts. The first part of the Local Plan, the Local Plan Strategy (LPS), sets out several key policies that align to the NPPF (2019) and seek to make sure that development does not harmfully impact the Jodrell Bank site or JBOCZ. The primary policy here is SE 14 'Jodrell Bank' however several other policies are also relevant:

- Policy SE 14 ‘Jodrell Bank’ seeks to make sure that that the telescopes can continue to operate efficiently and that the historic environment and visual landscape setting of the telescopes is not harmed. The policy requires applications to consider their impact on JBO and highlights that conditions may require specialised construction techniques.
- Policy SE 7 ‘The Historic Environment’ recognises the importance of heritage assets and seeks to make sure that their significance is enhanced, managed and protected from harmful development.
- Policy SE 4 ‘The Landscape’, recognises the role that landscape plays in delivering high quality development and seeks to make sure that development protects and/or conserves the historical qualities of an area.

Saved Policies

4.5 Several policies from the legacy local plans for Crewe and Nantwich, Congleton and Macclesfield have been saved. Some of the most relevant to this SPD are listed here:

- Policy GC14 ‘Jodrell Bank’ of the Macclesfield Borough Local Plan establishes the spatial extent of the JBO Consultation Zone (the area to which the 1973 Directive applies) within the former Macclesfield Borough area

- Policy PS10 ‘Jodrell Bank Radio Telescope Consultation Zone’ of the Congleton Borough Local Plan First Review establishes the spatial extent of the JBO Consultation Zone (the area to which the 1973 Directive applies) within the former Congleton Borough area

Cheshire East Council Site Allocations and Development Polices Document

4.6 The council is currently preparing part two of its Local Plan, the Site Allocations and Development Policies Document (SADPD) which, once adopted, will form part of the development plan and provide additional policies related to LPS policy SE 14 ‘Jodrell Bank’, and policy SE 7 ‘The Historic Environment’. Emerging SADPD policies most relevant to this SPD are:

- HER 1 ‘Heritage assets’, which sets out a requirement to provide proportionate information that assess and describes the impact of proposals on the significance of a relevant heritage asset, including WHSs.
- HER 4 ‘Listed buildings’, which requires proposals to preserve and enhance the heritage asset and its setting wherever possible.
- HER 9 ‘WHS’, which supports development that conserves or enhances the outstanding universal value of the WHS and requires applicants to submit an appropriate Heritage Impact Assessment evaluating the

proposals impact on the significance of the asset and on the attributes that contribute to the outstanding universal value of JBO.

4.7 The SADPD will form the second part of the Local Plan. It will set non-strategic and detailed planning policies to guide planning decisions and allocate additional sites for development to assist in meeting the overall development requirements set out in the LPS.

4.8 A revised publication draft version of the SADPD was published for a period of public representations between the 26 October and the 23 December 2020 and was submitted to the Secretary of State on 29 April 2021 for examination.

4.9 Although the SADPD must proceed through public examination before adoption, this draft Jodrell Bank Observatory SPD has been prepared to be consistent with emerging planning policies in the SADPD. Whilst this is not a legal or national planning policy requirement, this approach provides opportunity for this SPD to complement and support the implementation of future development plan policies too.

Neighbourhood Plans

4.10 Relevant neighbourhood plan policies are mapped and available to view on the Council's GIS network. Within the JBOCZ, there are two made neighbourhood plans that may be relevant when determining planning applications; Goostrey and Marton.

4.11 All neighbourhood plans, including those for Goostrey and Marton, can be accessed via the Councils web pages.

5. Part 2: Development within the Jodrell Bank Observatory Site

The Conservation Management Plan

5.1 Within the defined JBO site itself great value will be given to the positive management and development of the site to further enhance and reveal the OUV of the heritage assets, including their settings.

5.2 Toward that aim, a long-term CMP has been produced by The UoM to guide development and ensure successful management of the site. The primary purpose of the CMP is to secure the strategic long term protection of the JBO WHS to make sure that the OUV of the site, and the significance of the heritage assets within it, are protected and enhanced for current and future generations.

5.3 The CMP is included in full at Appendix 5 and its principles will be used to inform decision making on planning applications within the JBO site.

5.4 The CMP:

- contains the location, boundary details and description of the site;
- specifies how the OUV, including the attributes, authenticity and integrity of the site, is to be managed and maintained;
- provides an overview of the current condition of the property and factors which may have positive or negative effects on attributes, authenticity and integrity;
- presents a collective vision for the management of the property over the coming decades, and the policies, objectives and actions over the next five years. This covers descriptions of the various management structures and plans in place and the way that they are coordinated and support each other;
- examines issues affecting its conservation and enjoyment, including development, tourism, interpretation, education and transport; and
- describes an implementation strategy, including monitoring and review.

5.5 The CMP also includes a full list and description of the features of the JBO site. The main components are listed in Table 1 below:

Brief description	CMP Code	Type	Condition	Protection	Note
1. The Lovell Telescope: Radio telescope, standing 89m high, with dish of diameter 76m. First very large radio telescope in the world.	B07	Structure	Good	Grade I listed	Still in use as a radio telescope
2. The Control Building: Principal building in the property, completed in 1955 and housing the Control Room for the Lovell Telescope.	B05	Building	Good	Grade II listed	Later (unlisted) extensions in poorer condition

Brief description	CMP Code	Type	Condition	Protection	Note
3. Helical Antenna base: Concrete pad, approx. 4m x 4m, which was originally the base of the Helical Antenna installed by the US Space Technology Laboratories team in around 1959.	A01	Archaeology	Good		
4. The Green: Landscape at the heart of the property	L05	Landscape	Good-moderate		
5. 30ft Telescope base: Concrete pad, approx. 4m x 4m, originally the footing of the steerable 30ft Telescope that was part of the inspiration for the Lovell Telescope.	A02	Archaeology	Good		
6. Cosmic Noise Hut: Concrete building now known as the Link Hut, originally the control room for the 30ft Telescope, later altered to accommodate solar and optics experiments.	B11	Building	Mixed	Grade II listed	
7. Polarisation Hut: Another typical hut in the style of the ensemble around the Green. Originally used as the base for early experiments in long-baseline interferometry.	B13	Building	Good		
8. Mechanical Workshop	B17	Building	Moderate		
9. Electrical Workshop: Original site of the Main Office for the Observatory, including Lovell's office, lecture room and library.	B19	Building	Good	Grade II listed	
10. Radiant Hut: originally home to the meteor research group	B26	Building	Moderate		
11. Moon Hut: original home to the lunar and planetary radar group	B25	Building	Moderate		
12. Park Royal: Original control building for the Transit Telescope, subsequently used as the control room for the Mark II Telescope	B20	Building	Good	Grade II listed	
13. Powerhouse: location for electrical generators	B23	Building	Moderate		Still in use for original purpose
14. Mark II Telescope: Completed 1964, it was the first large telescope in the world to be controlled by digital computer.	B21	Structure	Good	Grade I listed	Still in use as a radio telescope
15. Remains of searchlight aerial: only the base remains	A05	Archaeology	Good	Grade II listed	
16. Remains of 218ft Transit Telescope: first very large paraboloidal telescope at the site, inspiration for Lovell Telescope	A13	Archaeology	Good		

Table 1: Main heritage components of JBO

5.6 The CMP seeks to achieve the strategic long-term protection of the JBO through setting out a vision for the site, principles for development and non-planning policies that should be used to achieve the identified objectives. The principles set out in the CMP will be a material consideration and should be considered when determining planning applications within the Jodrell Bank Site.

Vision

5.7 The Vision contained in the CMP is:

"The Jodrell Bank Observatory will be a WHS that changes people's lives for the better and demonstrates humanity's ongoing exploration of our place in the Universe. It will bring together stakeholders to continue to protect and develop a site that people from regional, national and global communities can learn about or visit and have a genuinely world-class experience. Visitors will bring a sustainable growth in tourism to local communities, benefiting their quality of life and raising the profile of the region as a place to live, work and invest. This nomination will transform this regional and national icon into an international icon of science, a showcase of international cooperation and endeavour that exemplifies astronomy and engineering at its best."

CMP principles

Principle 1

5.8 **Protection, conservation and maintenance of the OUV, integrity and authenticity of the property, including the identification and promotion of change that conserves and enhances these qualities; and the modification and/or mitigation of development and change that might damage them.**

Principle 2

5.9 **Jodrell Bank Observatory continues to perform its function as a radio astronomy facility. It is important to conserve and enhance the heritage of the site whilst maintaining this role as a world-leading scientific research facility, thus retaining its authenticity of use and function.**

Principle 3

5.10 **Sustainable use for the benefit of the local population and economy.**

Principle 4

5.11 **Commitment to a comprehensive programme of presentation and education, including a commitment to sustainable visitation.**

Principle 5

5.12 **Importance of gathering all stakeholders in a shared understanding of the property; in a commitment to developing and implementing the management plan; and to furthering the obligations of the World Heritage Convention.**

Principle 6

5.13 **Commitment to ensuring effective governance, resources and monitoring are in place to support implementation of the plan, including a commitment to capacity building and to the planning, implementation, evaluation and feedback cycle.**

5.14 A Heritage Impact Assessment (HIA) may be required as part of the submission of a planning application. All HIAs need to consider the impact of any proposed project or change, on the Outstanding Universal Value of a WHS, both individually and collectively and it is essential to link these impacts to the WHS's Management Plan, which itself should be linked to planning arrangements at the national, regional and local level.

6. Part 3: Development in the Jodrell Bank Observatory Consultation Zone (JBOCZ)

6.1 This section sets out guidance on how important matters addressed in policies SE 14 'Jodrell Bank' and emerging SADPD policy HER 9 'World Heritage Site' of the development plan will be considered when assessing planning applications within the JBOCZ.

The Consultation Zone

6.2 The JBOCZ extends south, east and west of the observatory, across a large area of countryside.

6.3 The area is predominantly agricultural but includes the settlement of Goostrey, which is close to the main site and, at a greater distance, Holmes Chapel. Several smaller hamlets, individual homes and farmsteads are also dispersed across the JBOCZ. At the far south east of the JBOCZ lies the northern edge of Congleton, which is subject to significant planned development.

6.4 In addition to policies related to JBO, development in the JBOCZ is controlled by a number of policies, notably PG 6 'Open Countryside', which limits development in the countryside to specific uses.

6.5 Within the JBOCZ full weight will be given to policies in the development plan that relate to the OUV of the WHS. The impact of development on the WHS and its OUV will be given full weight in determining planning applications.

Threats and Risks

6.6 The JBOCZ is a largely agricultural area and development is controlled through several planning policies. Some areas immediately adjoining the JBO site are owned by The UoM, which has more direct control over proposed developments on this land.

6.7 However, there are potential risks across a range of issues that this SPD seeks to provide guidance on. The threats and risks relate primarily to heritage, landscape and the efficient operation of the telescopes (as identified in LPS Policy SE 14) but also include the ability to manage development through a plan led system. The planning system has an important role to play in managing these issues through assessing the impact of development and consenting that which is consistent with the policies of the Local Plan (unless material considerations indicate otherwise). The ability of the LPA to exercise development management is therefore essential to preserving the OUV of the WHS and ensuring that development does not harm the continued operation of telescopes at JBO.

Efficient Operation of the Telescopes

6.8 The continued efficient operation of the telescopes at JBO is a fundamental component of the OUV of the site and inextricable from the heritage significance

of JBO. Protecting the operational efficiency from harm is essential to ensure the continued functioning of the telescopes at JBO and development that harms this capacity, individually or cumulatively will not normally be acceptable.

6.9 The main threat to the continued efficient operation of the telescopes arises from electrical and radio interference generated by development and populations within JBOCZ.

6.10 This issue has been present and has required management since the earliest days of JBO and in 1973 an act of parliament ('the 1973 Direction') was introduced to help manage the proliferation of electrical interference through new building in the vicinity of JBO. However, since then development has occurred in the area, and permitted development rights have expanded to allow development that may otherwise have been prevented by the 1973 Direction. More importantly the proliferation of electrical devices in recent years means that new residential dwellings in particular are able to generate higher levels of electrical interference than previously.

6.11 Radio interference created by electrical equipment across the JBOCZ is harmful to the continued efficient operation of the telescopes. For the Telescopes at JBO, external radio interference to precision timing measurements of pulsars is the most significant concern to the continued efficient operation of the telescope. Within the JBOCZ the level of electrical interference is already substantially too high and on a cumulative basis even small-scale development can have a significant negative impact on the efficient operation of the telescopes and therefore on the OUV of the WHS. External radio interference is significant for the following reasons:

i) Precision measurement of pulsars is the most important and internationally significant research programme carried out by the Lovell Telescope as a single dish and has the greatest potential for breakthroughs in fundamental physics;

ii) this programme relies on continuing to make the most precise timing measurements possible at regular intervals over the coming years and making use of the data gathered over the last 40 years;

iii) these measurements can be degraded and corrupted in an irrevocable manner by interference, especially the type of sporadic broad-band interference caused by domestic and industrial equipment.

6.12 The International Telecommunications Union (ITU) defines the level of interference that should be considered as detrimental to radio astronomy measurements as 10% of the intrinsic thermal noise created by radio astronomy equipment itself, combined with background interference present in the atmosphere.

6.13 Over decades radio astronomers have reduced the intrinsic (thermal) noise in the receivers they use, using cryogenic cooling (typically to -260C) and sophisticated semiconductor technologies. The ITU recommendation simply says that interference should not contribute an additional component of variation

that is more than 10% of this intrinsic thermal noise (including the irreducible noise from the atmosphere etc.).

6.14 Determining if the ITU threshold is exceeded rests on the measurement of the brightness of a radio source, and a measurement that determines its impact on a receiver. JBO is a receiver system that measures data emitted by pulsars and interference creates a scatter in these measurements. Electrical equipment, including the telescopes themselves, and background interference ('noise' from other sources and electrical equipment across the JBOCZ) create a normative baseline of interference which manifests itself as a scatter in the data measurements received by the telescopes. By understanding the baseline, it is possible to establish whether the observed scatter is greater than expected due to normal everyday background noise. Therefore, an increase in background noise is measurable and observable as a deviation from the baseline and may be modelled. The degree to which that deviation increases above the baseline is the core concern when determining the impact of development on the operational efficiency of the telescopes at JBO. The ITU threshold is such that interference should not increase this observed scatter by more than 10% of the baseline amount.

Application requirements and considerations

6.15 **To demonstrate compliance with policy SE14 of the CELPS, within the JBOCZ applicants are expected to submit a Radio Interference Assessment, at their own cost, of the interference likely to be generated by their proposal. This should be carried out by an accredited test lab and include a design review and noise profile of the proposed development. The assessment should also include proposals to mitigate the identified impacts.**

6.16 The UoM will be consulted on such assessments and, in instances where it is

6.17 necessary for the UoM to verify or carry out their own assessments, the following approach will be employed.

6.18 **Noise Assessments carried out by the UoM**

6.19 When consulted, The UoM will undertake an assessment of interference likely to be generated by development proposals and determine the impact of this on the operation of JBO. The methodology for this assessment is set out at paragraphs 7.36 to 7.42 of this SPD.

6.20 The main factors that will be considered by The UoM in determining whether a development proposal is likely to individually, or cumulatively harm the operational efficiency of the telescopes at JBO are:

i) **Location of development** - the closer a proposal is to the telescopes, the more potential there is for harm. Similarly, the more elevated a site the more potential there is for harm.

ii) **Type of development** - interference arises from the proliferation of radio and electromagnetic interference, therefore residential development that increasingly incorporates digital transmission alongside home-based radio

electromagnetic interference has the most scope to introduce proliferation of electrical devices

iii) **Scale** – individual dwellings present a cumulative harm and this harm is increased when the number of dwellings on an application site is increased; more intensive development introduces more risk

iv) **Radio Interference Assessment** – each proposal will generate a degree of electrical interference. An exercise that quantifies what that level of interference may be, and its impact, is carried out by the UoM when proposals trigger the requirement for consultation.

6.21 The likely level of interference generated by a development will be given great weight in decision making on planning applications in the JBOCZ and whether and to what extent a proposal is likely to generate interference that impacts on the efficiency of the telescopes, will be an assessment undertaken in consultation with The UoM and based on the thresholds set out in the 1973 Directive.

6.22 Where consultation with the UoM is carried out, the following methodology will be used.

Methodology

6.23 The following is a summary of the full methodology and technical explanation employed by The UoM, which is included in full at Appendix 7. Applicants are expected to address these matters in their own assessments.

6.24 **Stage 1: Analysis of interference from the proposed development**

- **Single appliance emission**: It is necessary to set out the reduction of interference required to avoid harmful interference from a single piece of domestic equipment. This is known as the ‘minimum coupling loss’.

- **Aggregate emission**: To understand the impact of a dwelling on interference, it is necessary to establish the aggregated level of the emissions from all appliances in that dwelling. This is done through an independent estimate based on published values of ambient man-made radio noise per type of equipment and an estimate of the number of pieces of equipment per dwelling.

- **Path loss**: Path loss is the interference that will be generated between the proposed development and the Lovell Telescope. This is determined by modelling the interference created by the development against mitigating factors that may reduce that impact (such as reduction of interference through wall and other barriers). This analysis also accounts for the profile of the terrain, which may help reduce the impact (if the development is site in a depression) or amplify it (if the development is prominent or elevated in the landscape).

- **Estimated interference compared to ITU threshold**: This is the expected strength of total interference from the proposed development compared to the accepted ITU threshold.

6.25 **Stage 2: Analysis of interference from the proposed development and interference from the wider area**

6.26 It is important to assess the impact of any proposed development in the context of interference already existing in the wider area of JBO. Sky maps are used to plot individual buildings across the JBOCZ and assign each a level of interference. The process identifies how much interference is being generated by location, across the JBOCZ, and highlights that dominant contributions to interference arise from nearby relatively small settlements rather than larger more distant settlements.

6.27 This analysis demonstrates that the baseline level of interference is already high across the JBOCZ. Applying this to analysis of a single development proposal means focusing on the relevant pathway between the proposal and JBO, to establish the background level of interreference on this particular pathway and determine the extent to which the additional interference caused will be individually or cumulatively harmful.

Historic Environment

Introduction

6.28 Most of the heritage assets of the WHS are located within the JBO site and identified as part of the CMP.

6.29 In the wider JBOCZ, it is unlikely (but not impossible) that development will have an adverse impact on the visual setting of the listed assets. However, with the WHS/JBOCZ heritage statements are required providing proportional information on how relevant heritage matters have been addressed. Therefore, a full HIA may not be required for every application.

6.30 Development proposals within the WHS will require a heritage statement (or an impact assessment for minor works), proportionate to the scale and likely impact of development, to support a planning application. Applicants are advised to seek pre-application advice from the Council to determine whether HIA is likely to be required and the level of detail that may be needed.

6.31 Generally, the closer a proposal is to the main Jodrell Bank Observatory, the greater the potential for development to have an impact on heritage assets, particularly in relation to the setting of the WHS. However, the Heritage value of JBO and its OUV are inseparable from the continued functioning and operation of the telescopes. Therefore, the impact of a development on heritage significance manifests not only on impact on buildings, structures and landscapes but in the extent to which a proposal interferes with the operation of the telescopes. Therefore the Radio Interference Assessment is an essential component of understanding a proposals impact on the heritage value of the WHS.

6.32 If a Heritage Impact Assessment is required, the following guidance sets out how this report should be prepared.

Application requirements and considerations

6.33 Paragraph 189 of the NPPF (2019), requires applicants to describe the significance of any Heritage Assets[1] affected by their proposals, including any contribution made by the setting of the asset. Within the WHS (including the JBOCZ) a heritage statement will be required to support planning applications.

6.34 In the context of this SPD the WHS (JBO and its setting - the JBOCZ) are designated heritage assets, and the JBO site itself includes multiple listed buildings. Therefore, most applications within this defined area will be required

[1] Heritage Assets are defined as: “A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage Assets include designated Heritage Assets and assets identified by the local planning authority”.

to submit a Heritage Statement that includes information on the matters set out below.

6.35 Where required HIAs should include:

i) A comprehensive understanding of the WH property and its OUV, authenticity and integrity, condition, context (including other heritage attributes) and interrelationships.

ii) An understanding of the range of impacts arising from the development or other proposal for change;

iii) An objective evaluation of those impacts (beneficial and adverse) on the heritage elements, especially the site's OUV, integrity and authenticity;

iv) An assessment of the risk posed to the retention of OUV and the likelihood that the property may be in potential or actual danger;

v) A statement of heritage benefits which may arise from proposals including better knowledge and understanding and awareness-raising;

vi) Clear guidelines as to how impact can be mitigated or avoided;

6.36 The level of information required should be proportionate to the scale of work proposed and the significance of the Heritage Asset affected. Therefore, smaller scale change proposed for a Heritage Assets of less importance (i.e. a non-designated heritage asset) may enable the Design and Access Statement to be prepared by the applicant, but larger scale change to more significant Heritage Assets will require more detailed evaluation and may also require professional assessment.

6.37 As a minimum, the relevant Historic Environment Record should be consulted, and the Heritage Assets assessed using appropriate expertise where necessary. For minor development we recommend this assessment is provided in the form of a letter and for major development in a Heritage Statement.

6.38 The letter or statement to support the application should incorporate the following sub-headings and make use of at least the Historic Environment Record.

6.39 **Heading 1: Description of Heritage Asset's Significance:**

6.40 Provide a factual description of the Heritage Asset including, but not limited to:

i) the reason it is designated

ii) its age

iii) its character and appearance.

6.41 This information can be found online using the Historic Environment Record.

6.42 **Heading 2: Description of Change Proposed:**

6.43 Describe the works or development proposed and provide justification why it is needed and how it will take place.

6.44 **Heading 3: Assessment of Impact on Significance:**

6.45 Explain how the change proposed will impact upon the reason the Heritage Asset is designated. Use the following to guide the assessment:

i) the nature of the asset's significance and its interest (a modern building of high architectural interest will have quite different sensitivities from an archaeological site where the interest arises from the possibility of human remains)

ii) the extent of the fabric that holds that interest (this can lead to a better understanding of how adaptable the asset may be)

iii) the level of importance of that interest (this guides how protectively policies should be applied)

6.46 **Heading 4: Sources used**

6.47 The heritage statement should detail the sources that have been considered and the expertise that has been consulted.

6.48 Where a planning application is submitted in parallel with an application for Listed Building consent, a single, combined statement should address the requirements of design, access and impact on Heritage Assets. Without this information applications will be invalidated as they will contain insufficient information for the Council to reach a decision.

Visual Landscape

6.49 The landscape across JBOCZ consists of managed farms, some woodlands, and shallow river valleys. It is a mainly flat, at times rolling and undulating, plain interspersed with small settlements and individual farmsteads and dwellings. Whilst the landscape holds an intrinsic visual quality, it is valued for its open and mainly flat typology that allows the telescopes at JBO to transmit and receive signals across pathways that are largely uninterrupted, and beyond into space.

6.50 Threats to the value of the landscape may rise primarily from developments that reduce the openness of the plain through introducing built form and physical clutter that interfere with pathway transmissions. Development that is prominent in the landscape, or that is unusually tall, is most likely to present a threat to the value of the landscape.

6.51 Generally, if a site is more elevated, a development will become more prominent in the landscape and may therefore require further assessment regarding the impact of the development on landscape matters. If this is the case, it is expected that the approach set out below is followed to provide information on this matter to the local planning authority.

6.52 Applicants are advised to seek pre-application planning advise from the council to establish whether a Landscape Value Impact Assessment (LVIA) will be required as part of the application.

Application requirements and considerations

6.53 In assessing a planning application from a landscape design perspective, there are a number of general design principles to be considered whilst taking account of the individual factors relevant for any scheme. The following information should be provided as a minimum for applications within the JBOCZ:

i) drawings showing the location of existing landscape features, including a tree survey if there are significant numbers of trees, and their loss or retention

ii) drawing showing landscape proposals

iii) visuals and photos to demonstrate the visual impact of a development, and a full Landscape and Visual Impact Assessment if the scale of the scheme merits this

iv) levels information or cross sections to indicate any significant changes in levels.

v) measures for the protection of trees and vegetation to be retained.

vi) details associated with temporary access roads, compounds, storage areas for construction

6.54 LVIAs should be carried out by a suitably qualified professional and in accordance with the most recent Guidelines for Landscape Value Impact Assessment produced by the Landscape Institute. In any LVIA, proposals

should describe and explain how the following matters have been addressed in the design process:

6.55 **Evaluation of existing features,** based on accurate site surveys (physical and ecological) and their retention, protection and enhancement as appropriate for trees, hedges, habitats, walls, fences, etc.

6.56 **Respecting local landscape character**, taking account of any character statements, e.g. landscape assessments, village design statements.

6.57 **Designations:** Respecting landscape designations (for example, Public rights of Way, Sites of Biological Importance/Local Wildlife Sites, Conservation Areas, Tree Preservation Orders).

6.58 **Siting:** Appropriate siting of the development to integrate with its surroundings.

6.59 **Density:** Balance of provision for open space and vegetation in relation to density of built development and infrastructure.

6.60 **Impact:** Consideration of the landscape and visual impact of proposals.

6.61 **Mitigation:** Providing landscape mitigation proposals where appropriate, (for example replacement habitats, ponds, new structure planting, screening, boundary planting, acoustic barriers.)

6.62 **Proposals:** Providing new landscape proposals appropriate to the scheme (for example pedestrian access routes, paving, boundary treatments, street furniture, lighting, replacement tree planting, structure planting, hedges, ornamental planting).

6.63 **Quality:** Quality of proposals in relation to their appropriateness to design intent and setting.

6.64 **Access:** Adequate provision for pedestrian and cycle access, including disabled access.

6.65 **Security:** "Secured by Design" principles for crime prevention.

6.66 **Feasibility:** Technical feasibility of a scheme design.

6.67 **Materials:** Appropriate choice of hard (i.e. built elements such as paving, fencing) and soft materials (i.e. plant material and earthworks) throughout.

6.68 **Management:** Adequate provision for maintenance and management of the scheme following completion.

Development Management

6.69 The location of the JBO site was originally selected because of its distance from urban settlements, and therefore the lack of interference from other electrical equipment nearby.

6.70 Managing development across the JBOCZ is essential to preserve the OUV of the WHS. This is primarily achieved through the planning system and the application of national and local planning policies. Guidance set out in the 1973 Direction provides additional requirements on when The UoM should be consulted regarding development proposals. The Direction is reproduced in full at Appendix 3.

6.71 Where development proposals exceed the thresholds set out in Table 1 below, The UoM will be consulted and the impact of the proposal on the efficiency of the telescopes will be assessed. The outcome of this assessment will be a very significant material consideration in determining planning applications.

First Schedule (consultation is not required if development is one of the following and meets the criteria set out)	
Development	**Criteria**
Redevelopment of a building	Redevelopment must be for the same use
	Redevelopment must be on the same site (or substantially the same site)
	The cubic content of the new building is not increased
	The area of land occupied by the new building does not exceed the area of land occupied by the existing building
Redevelopment of a dwelling house	Must currently be in use as a dwelling house
	Redevelopment must be on the same site (or substantially the same site)
	The cubic content of the original dwelling house (as ascertained by external measurement) is not exceeded by more than 914 cubic metres or 30% whichever is greater)
The enlargement improvement or other alteration of any dwelling house which is in use.	The erection of a garage within the curtilage of a dwelling house shall be treated as the enlargement of the dwelling house
Building a new single dwelling house	Occupied by a person employed locally in agriculture
Conversion of a building or buildings to form a single dwelling house	Occupied by a person employed locally in agriculture

The formation, laying out or widening of a means of access	
The erection, construction, improvement or other alteration of gates, fences, walls or other means of enclosure	
The Second Schedule (consultation is not required if development is one of the following and meets the criteria set out)	
Development	**Criteria**
The erection, enlargement or other alteration of a building or buildings	Development must not be for more than one dwelling house
	The erection of a garage within the curtilage of a dwelling house shall be treated as the enlargement of the dwelling house
Operations in connection with the conversion of a single dwelling house for use as not more than two dwelling houses	
The erection, enlargement or other alteration of a shop	The sales area must be confined to the ground floor.
	The gross floor area of the building must not exceed 610 square metres
The erection, enlargement or other alteration of a medical or dental surgery, health centre or office	Limited to two storeys
?	Gross floor area must not exceed 610 square metres
Change of Use	**Acceptable Change**
The change in use of a building or buildings	not more than one dwelling house
single dwelling house	to use as not more than two dwelling houses
The change in use of a building or buildings	Change must be for a shop, medical or dental surgery, health centre or office

Table 1: Development thresholds

Guidance on Design and Access Statements

6.72 A Design and Access Statement (D&AS) is a short report that accompanies and supports a planning application. It illustrates the process that has led to the development proposal and explains the design and the different options considered in the design process.

6.73 Applicants are encouraged to seek pre-application planning advice to determine the relevant planning issues that may need to be addressed in detail within their applications. In some instances, it may be appropriate to address matters of landscape and heritage within a design and access statement, rather than preparing a separate LVIA or HIA. However, where heritage or landscape matters are relevant planning issues that require more detailed information, applicants should prepare their supporting information accordingly.

6.74 D&ASs help to make sure that development proposals are based on a thoughtful design process and a sustainable approach to access. They help us to better understand the analysis that has underpinned the design, which in turn helps negotiations and decision-making and should lead to an improvement in the quality, sustainability, and inclusiveness of the development whilst demonstrating how the proposal meets design related policy criteria of the Development Plan.

When is a Design and Access Statement required?

6.75 A D&AS is required for major development and all developments in Conservation Areas and WHSs.

6.76 In major developments, a D&AS is required for:

i) sites with an area of 0.5 hectares or more and it is not known whether the development relates to dwelling houses

ii) all sites having an area of 1 hectare or more

iii) the provision of 10 or more dwelling houses

iv) A building or buildings where the floor space to be created by the development is 1,000 square metres or more

6.77 Certain major developments are excluded, such as mining operations or waste development, where the form of particular schemes will largely be dictated by their function.

6.78 In areas of historic value, smaller proposals may also have a significant impact on the character of an area. Therefore, D&AS will be required for proposals within the JBOCZ where:

i) the proposal includes the provision of one or more dwelling houses

ii) the proposal includes the provision of a building or buildings where the floor space created by the development is 100 square metres or more

6.79 Developments of this scale can have a greater impact on the immediate surroundings and the wider area and a D&AS can perform a valuable function

in helping the local planning authority and third parties to understand the analysis underpinning the design of a scheme and assess its impact on the WHS.

Content requirements

6.80 In preparing the D&AS, developers need to consider and explain the merit of the design and how it relates to the existing setting. This will include considering:

i) The mass, form and scale of buildings.

ii) The immediate landscape and wider landscape, and how the proposal relates to this.

iii) The impact on heritage, including views to and from the Jodrell Bank site

iv) The level of likely electrical interference likely to be created by the development and the measures proposed to mitigate and contain this.

Design component

6.81 Development proposals within the JBOCZ must be accompanied by a D&AS that must relate to the context of the WHS, identify the specific issues that arise within the proposed development site and explain how those issues have been addressed.

6.82 To agree a suitable approach, proposals within the JBOCZ should submit a Radio Wave Prevention Scheme alongside their proposals, demonstrating how they have sought to minimise interference through design and materials led solutions.

6.83 All D&ASs must:

i) explain the design principles and concepts that have been applied to the development

ii) demonstrate the steps taken to appraise the context of the development and how the design of the development takes that context into account in relation to the proposed use

iii) explain the policy adopted as to access and how policies relating to access in relevant development plan documents have been considered

iv) state what, if any, consultation has been undertaken on issues relating to access to the development and what account has been taken of the outcome of any such consultation

v) explain how any specific issues that might affect access to the development have been addressed

6.84 When preparing a D&AS the following headings should be used:

6.85 **Heading 1: Amount and Type of Development**

6.86 The statement for both outline and detailed applications should explain the amount of development proposed for each use, how this will be distributed

across the site, how the proposal relates to the site's surroundings and what consideration is being given to make sure that accessibility for users to and between parts of the development is maximised. Where the application specifies a range of floorspace for a particular use, the reasons for this should be explained clearly in the D&AS.

6.87 For residential development, this means the number of proposed units for residential use. For all other development, this means the proposed floor space for each proposed use.

6.88 Amount cannot be reserved within an outline application, although it is common to express a maximum amount of floorspace for each use in the planning application and for this to be made the subject of a planning condition.

6.89 **Heading 2: Layout**

6.90 The layout and location of development within a site is an important variable that can impact on the operation of Jodrell Bank's telescopes. Therefore, layout choices can be important in determining whether a proposal is harmful to the operation of the telescopes.

6.91 The D&AS accompanying an outline application should explain:

i) the principles behind the choice of development zones and blocks or building plots proposed and how these principles, including the need for appropriate access will inform the detailed layout.

ii) the underlying terrain of the site and ow the proposal makes best use of low-lying areas for development.

iii) how the layout, relationship between buildings, public and private spaces, will help to create safe, vibrant and successful places

iv) the accessibility of the site in term of travel distances, gradients and topography.

v) how the layout has been used to minimise energy consumption

vi) how the layout creates a safe and accessible environment

6.92 **Heading 3: Scale**

6.93 Scale is the height, width and length of a building or buildings in relation to its surroundings.

6.94 If scale has been reserved at the outline stage, the application should still indicate the upper and lower limits of the height, width and length of each building, to establish a 3-dimensional building envelope within which the detailed design of buildings will be constructed. In such cases the design component of the D&AS should explain the principles behind these parameters and how these will inform the final scale of the buildings.

6.95 The height of buildings can have an adverse effect on the operational functionality of the telescopes. The higher the building, the more adverse effect is likely. As such, proposals should carefully consider building height and explain how this matter has been considered in the process.

6.96 For detailed applications, and outline applications that do not reserve scale, the D&AS should explain the scale of buildings proposed, including why particular heights have been settled upon, and how these relate to the site's surroundings and the relevant skyline. The statement should also explain the size of building parts, particularly entrances and facades, with regard to how they will relate to the human scale.

6.97 **Heading 4: Landscaping**

6.98 Landscaping is the treatment of private and public spaces to enhance or protect the amenities of the site and the area in which it is situated through hard and soft landscaping measures.

6.99 Statements should explain:

i) the function of the landscaping

ii) the principles that will inform any future landscaping scheme for the site.

iii) the purpose of landscaping and its relationship to the surrounding area. Where possible, a schedule of planting and proposed hard landscaping materials to be used is recommended.

6.100 Some development proposals (for example, alterations to an existing building) may include no landscaping element. For such proposals, this section of the D&AS would simply need to state why landscaping is not relevant to the application.

6.101 **Heading 5: Appearance**

6.102 Appearance is the aspect of a place or building that determines the visual impression it makes, including the external built form of the development, its architecture, materials, decoration, lighting, colour and texture.

6.103 If appearance is reserved at the outline stage, the outline application does not need to provide any specific information on the issue. In such cases the design and access statement should explain the principles behind the intended appearance and how these will inform the final design of the development.

6.104 For detailed applications, and outline applications that do not reserve appearance, the design and access statement should explain the appearance of the place or buildings proposed including how this will relate to the appearance and character of the development's surroundings. It should explain how the decisions taken about appearance have considered accessibility. The choice of materials and textures will have a significant impact upon a development's accessibility. Judicious use of materials that contrast in tone and colour to define important features such as entrances, circulation routes or seating for example will greatly enhance access for everyone. Similarly, early consideration of the location and levels of lighting will be critical to the standard of accessibility ultimately achieved.

6.105 **Heading 6: Context**

6.106 An important part of a D&AS is the explanation of how local context has influenced the design. Context should be discussed in relation to the scheme

as a whole, rather than specifically in relation to the five sub-components of amount, layout, scale, landscaping and appearance.

6.107 A D&AS should demonstrate the steps taken to appraise the context of the proposed development. It is important that an applicant should understand the context in which their proposal will sit and use this understanding to draw up the application.

6.108 A good understanding of context includes:

i) Assessment of the site's immediate and wider context in terms of physical, social and economic characteristics and relevant planning policies. This may include both a desk survey and on-site observations and access audit. The extent of the area to be surveyed will depend on the nature, scale and sensitivity of the development.

ii) Involvement of both community members and professionals. Depending on the scale, nature and sensitivity of the proposed development, this might include consultation with local community and access groups and planning, building control, conservation, design and access officers. The statement should indicate how the findings of any consultation have been considered for the proposed development and how this has affected the proposal.

iii) Evaluation of the information collected on the site's immediate and wider context, identifying opportunities and constraints and formulating design and access principles for the development. Evaluation may involve balancing any potentially conflicting issues that have been identified.

iv) Design of the scheme using the assessment, involvement, and evaluation information collected. Understanding a development's context is vital to producing good design and inclusive access and applicants should avoid working retrospectively, trying to justify a predetermined design through subsequent site assessment and evaluation.

6.109 **Heading 7: Use**

6.110 A D&AS should explain how this understanding of the context has been considered in relation to its proposed use. The use is the use or mix of uses proposed for land and buildings. Use cannot be reserved within an outline application.

6.111 D&ASs for both outline and detailed applications should explain the proposed use or uses, their distribution across the site, the appropriateness of the accessibility to and between them and their relationship to uses surrounding the site.

6.112 **Heading 8: Access**

6.113 The access component should explain how you plan to make sure that all users will have equal and convenient access to buildings and spaces and the public transport network.

6.114 For outline applications, where access is reserved, the application should still indicate the location of points of access to the site. Statements accompanying such applications should, however, clearly explain the principles that will be

used to inform the access arrangements for the final development at all scales, from neighbourhood movement patterns where appropriate to the treatment of individual access points to buildings.

6.115 The level of detail provided in the access component of the statement should be proportionate to the nature and scale of the access that will be required to the site. For proposals that will have no public access and only limited maintenance or operational access, the access component need not be long.

6.116 The access component should:

i) Address the need for flexibility of the development and how it may adapt to changing needs.

ii) Explain the policy adopted and how relevant policies in local development documents have been considered.

iii) Provide information on any consultation undertaken in relation to issues of access and how the outcome of this consultation has informed the development proposals. This should include, for example, a brief explanation of the applicant's policy and approach to access, with particular reference to the inclusion of disabled people, and a description of how the sources of advice on design and accessibility and technical issues will be, or have been, followed. Access for the emergency services should also be explained where relevant. Such information may include circulation routes round the site and egress from buildings in the event of emergency evacuation.

6.117 Matters for consideration in relation to access include:

i) Transport links

ii) Disabled parking provision or setting down points or garaging

iii) Approach routes to building – wayfinding signage, gradient, width, surface finish

iv) External hazards/features – hard landscaping, projections, furniture

v) External steps/ramps – gradient, width, guarding and height

vi) Entrances – primary and secondary

vii) Doors – operation, size, level threshold, automatic

viii) Visibility of external signage – size and contrast for people with impaired vision

ix) Spectator seating - number of spaces, choice of viewing point, facilities

6.118 The access component should be amended to reflect any decisions reached on site so that any new owner or occupier can be aware of the rationale used in making decisions which impact on accessibility and their ongoing obligations under the Equality Act 2010.

Mitigation and the Application of Conditions

6.119 Mitigation measures to reduce the impact of interference to radio astronomy are possible and may be useful in certain cases where development is found otherwise acceptable. These measures include control of activities likely to cause interference; installation of shielding to reduce the level of signals emitted; and techniques used in observing and processing radio astronomy data.

6.120 Control measures in place at JBO include restrictions on the use of radio transmitters, mobile phones and Wi-Fi; testing of radio frequency emissions from electronic and electrical equipment. Enhanced restrictions for particular observations have been implemented including complete curfews on the use of all electrical and electronic equipment, except for items in highly shielded 'Faraday cages' for certain periods. None of these control measures would be feasible in a residential setting.

6.121 Shielding measures in place at JBO include the construction of highly shielded rooms made of steel plates riveted to a steel frame with metal gasketting and copper tape over all joints. Such rooms that have no windows and a submarine-type radio quiet door provide up to 80 dB additional attenuation for particular equipment. In other rooms, shielded racks provide typically 50 dB attenuation for computing servers. None of these shielding measures would be feasible, appropriate, or enforceable in a residential setting.

6.122 Simple shielding measures that are appropriate and recommended by JBO for residential buildings include the use of foil backed plasterboard and metallised window glass, both of which are generally required to meet thermal insulation requirements in modern buildings. The mitigation effects of these measures have already been described and considered in the methodology that calculates the impact of interference on the operation of the telescopes.

6.123 It is not practical to build a convenient house with full radio frequency screening, so the proposed solution is to install targeted screening on the roof and those walls that face generally towards Jodrell Bank. Radio emissions travel on a horizontal plane and therefore the objective is to direct any radio emissions generated within the house away from the telescopes, so it is equally important that there should be no screening on walls that face away from the telescopes. A house in which all the walls are built to the same specification would not achieve the required objective.

6.124 In order to avoid unnecessary costs and potential conflicts with normal building regulations, the JBO encourages screening solutions that employ standard building materials, provided these can be shown to have appropriate radio frequency properties. The observatory has conducted tests to identify a selection of suitable materials, as listed below and is willing to conduct further tests on other materials that may be proposed. Ideally, such tests should be completed before a formal planning application is made, so that the design proposed can take account of the test results.

Planning Conditions

6.125 Planning conditions may be applied to make a development proposal acceptable in planning terms. Such conditions could be applied to mitigation measures that will reduce potential electrical interference from a development proposal.

Screening Materials and Design

6.126 Where development is found acceptable, subject to the delivery of measures on the Radio Wave Prevention Scheme, other conditions and having regard to the site and the area in which it is located, and the need to minimise electromagnetic interference that would impact upon the JBO, conditions will be applied to require the delivery of measures agreed in the Radio Wave Prevention Scheme.

6.127 Materials and components with radio frequency screening properties, suitable for use in roofs or external walls facing toward the telescope, should generally incorporate a continuous sheet of metal within them. The following may be used in walls, roofs and elevations facing toward the telescopes:

i) Plasterboard with aluminium foil backing on one or both sides that has been tested by The UoM and found suitable for screening rolls. It would also serve to screen the roof if applied to the ceiling of the top story.

ii) Pilkington K glass that has been tested by the UoM and found suitable for screening windows. This is a proprietary low emissivity glass. Other types of low emissivity glass may provide similar radio frequency screening but would need to be tested before use.

iii) Reflective insulating blanket material intended for use in walls and lofts, a sample of which (incorporating a layer of aluminium foil) has been tested by UoM and found to provide satisfactory screening. Other products that are similar in appearance but contain no metallic film would be ineffective so testing of the exact product to be used is essential. Where a suitable material of this type is used, adjacent strips should be overlapped by at least 100mm for maximum screening.

iv) Doors should be of metallic construction or incorporate an aluminium foil barrier.

6.128 It is essential that the walls facing away from the telescope should permit the radio waves to escape. In general, this means that materials and components incorporating metallic films sheets or meshes must be avoided. Plain glass, standard brickwork, wooden doors and plasterboard with no aluminium foil are acceptable. Large areas of reinforced concrete would be a problem. Or the materials should be tested before use.

Permitted Development

6.129 Whilst the planning system allows the LPA to manage development through the issuing of consents, development that falls within permitted development rights does not require consent and therefore this reduces the ability of the LPA to exercise control of development.

6.130 All electrical equipment within the JBOCZ gives rise to interference that impedes the efficiency of the telescopes at Jodrell Bank. Permitted development rights apply to a wide range of development and are not limited to residential matters, however this category is generally of most concern to The UoM due to the high volume of electrical devices that homes hold, and therefore the risk to increases in electrical interference from this source of development. There is scope for permitted development to cumulatively harm the efficient operation of the telescopes through other matters such as electrical charging points for vehicles, which also fall within permitted development rights, and plant machinery associated with agricultural and other industries.

6.131 The 1973 Direction applies across the JBOCZ and sets out size, scale and use thresholds for development. If development exceeds these thresholds The UoM must be consulted and an assessment of the developments impact on JBO will be undertaken. However, the General Permitted Development Order (GPDO) introduces multiple scenarios that allow development to exceed the thresholds set out in the 1973 Direction, and for which no planning consent is required, and therefore no consultation would take place with The UoM regarding the impact of that development on JBO. Changes of use within a use class generally do not constitute development and therefore are not subject to planning consent.

Removal of Permitted Development Rights

6.132 In addition to conditions regarding screening and the minimization of interference, to ensure continued control over the extent of further building on the site, conditions will be applied that remove future permitted development rights, including changes of use, that are reasonably likely to create electrical or radio interference within the JBOCZ.

6.133 An example condition is:

> “Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) Order 2015 (or any order revoking or re-enacting that order), no development (as defined by Section 55 of the Town and Country Planning Act 1990) as may otherwise be permitted by virtue of Class(es) A, B, C, D, E and G of Part 1 Schedule 2 of the Order shall be carried out.”

7. Appendix 1: UNESCO's criteria for the Assessment of Outstanding Universal Value

UNESCO's criteria for the assessment of OUV (para 77 of the Operational Guidelines):

(i) represent a masterpiece of human creative genius;

(ii) exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;

(iii) bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;

(iv) be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;

(v) be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;

(vi) be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (vii) contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

(viii) be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;

(ix) be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;

(x) contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

8. Appendix 2: World Heritage Committee Decision and Statement of Outstanding Universal Value

Decision: 43 COM 8B.35

Jodrell Bank Observatory (United Kingdom of Great Britain and Northern Ireland)

The World Heritage Committee,

Having examined Documents WHC/19/43.COM/8B and WHC/19/43.COM/INF.8B1,

Inscribes the Jodrell Bank Observatory, United Kingdom of Great Britain and Northern Ireland, on the World Heritage List on the basis of criteria (i), (ii), (iv) and (vi);

Adopts the following Statement of Outstanding Universal Value:

Brief synthesis

Jodrell Bank Observatory was important in the pioneering phase and later evolution of radio astronomy. It reflects scientific and technical achievements and interchanges related to the development of entirely new fields of scientific research. This led to a revolutionary understanding of the nature and scale of the Universe. The site has evidence of every stage of the history of radio astronomy, from its emergence as a new science to the present day.

Jodrell Bank Observatory is located in a rural area in northwest England. Originally, scientific activity was located at the southern end of the site, and from that time activity has moved to the north across the site with many new instruments developed and then abandoned. Remnants of early scientific instruments survive.

At the south end of the site is the location of the Mark II Telescope and it is bounded by an ensemble of modest research buildings in which much of the early work of the Observatory took place.

To the north of the Green, the site is dominated by the 76 metre diameter Lovell Telescope which sits in a working compound containing a number of engineering sheds and the Control Building. There are spaces open to the general public which include visitor facilities set around the Lovell Telescope. Other visitor facilities are outside the property to the northeast.

Jodrell Bank Observatory is the hub of the UK's national wide array of up to seven radio telescopes (e-MERLIN) including the Lovell and Mark II Telescopes.

Criterion (i): Jodrell Bank Observatory is a masterpiece of human creative genius related to its scientific and technical achievements. The adaptation and development of radar and radio frequency reflectivity to develop radically new equipment, such as

the Transit Telescope and Lovell Telescope, were a key part in the development of entirely new fields of scientific research and led to a dramatic change in the understanding of the Universe. The Observatory was important in the pioneering phase and later evolution of radio astronomy.

Criterion (ii): Jodrell Bank Observatory represents an important interchange of human values over a span of time and on a global scale on developments in technology related to radio astronomy. The scientific work at Jodrell Bank was at the heart of a global collaborative network. In particular, several important technological developments such as very large paraboloidal dish telescopes and interferometer were developed at the Observatory, and were later influential in scientific endeavours in many parts of the world.

Criterion (iv): Jodrell Bank Observatory represents an outstanding example of a technological ensemble which illustrates a significant stage in human history (1940s-1960s) – the transition from optical astronomy to radio astronomy and the associated consequence for the understanding of the Universe through multi-wavelength astrophysics. The property is also associated with the peacetime development of 'Big Science' as a major change in the way in which scientific research was supported and undertaken. The surviving evidence at the property related to the evolutionary development of radio astronomy from the post-war pioneering phase through to sophisticated, large scale research activity in the field makes Jodrell Bank an outstanding example of such a technological ensemble.

Criterion (vi): Jodrell Bank Observatory is directly and tangibly associated with events and ideas of outstanding universal significance. The development of the new field of radio astronomy at the property lead to a revolutionary understanding of the Universe which was only possible through research beyond the possibilities of optical astronomy to explore the electromagnetic spectrum beyond visible light. Understanding of the nature and scale of the Universe has been dramatically changed by research in radio astronomy at the Observatory.

Integrity

The property retains all attributes that document its development as a site of pioneering astronomical research. Practically all stages of development from the very beginning, with improvised, re-used or borrowed equipment, onwards are represented by buildings, physical remains or in some cases archaeological remnants. Some important stages, such as represented by the large Transit Telescope, have not survived intact although traces remain. The later, large scale and far more ambitious instruments are still present at the property. This includes the iconic Lovell Telescope with its Control Building. The property also retains many quite modest structures which are, none the less, important for their research use, or which otherwise supported the work of the Observatory.

In general, all the structures are very well preserved and the property continues to be

dominated by the large scale Lovell Telescope and Mark II Telescope. However, several early wooden buildings have suffered from neglect and dis-use. Their restoration is to be undertaken. The grounds are well cared for. Recent buildings have a simple and subdued character, which do not detract from the overall appreciation of the property.

The Consultation zone, consultation zone of the property, protects the scientific capabilities of the Observatory from radio emissions in its vicinity, contributing to maintenance of the functional integrity of the property.

Authenticity

The location of the property has continued unchanged, and the largely agricultural setting is essentially identical apart from the construction of the Square Kilometre Array building as part of the ongoing scientific use of the Observatory. The form and design has evolved through time reflecting the important development history of the property. This includes the somewhat improvised character of many structures indicative of the priority given to scientific research rather than the quality of buildings. Materials and substance have been mostly retained although there has been some replacement of deteriorated materials over time. The property retains its ongoing scientific use.
Protection and management requirements.

Most of the attributes of Jodrell Bank Observatory have been listed under the Planning (Listed Buildings and Conservation Areas) Act 1990. The two major telescopes have been listed in the highest category, Grade 1. There are some elements which have no listing at the present time, although they are managed for their heritage values as part of the property.

In addition, World Heritage inscription affords all attributes a protection status equivalent to the highest level or Grade 1, in accordance with the National Planning Policy Framework (2012) and the spatial planning system which operates through several pieces of legislation, including the Town and Country Planning Act 1990. Any changes to listed buildings require approval.

The consultation zone is based on the Jodrell Bank Radio Telescope Consultation Zone which has operated effectively to protect the Observatory for many decades. It was established by the Town and Country Planning (Jodrell Bank Radio Telescope) Direction 1973.

The property is managed by the UoM with a committee, the Jodrell Bank Site Governance Group responsible for coordination. This committee includes key internal stakeholders such as the three main site user groups. Each of the site user groups has its own well-developed and independent management and operational structures. Roles managing the heritage of the Observatory are integrated with the daily work of

the Jodrell Bank Centre for Astrophysics, responsible for scientific and engineering research, telescope operations and engineering, and the Jodrell Bank Discovery Centre which is responsible for visitor management and heritage coordination. These user groups are supported by other management groups within the University. The third site user group is the Square Kilometre Array Organisation, located just outside the property within the consultation zone but within the overall Observatory.

The management of the property is based on existing University structures, to be augmented by a WHS Steering Committee which will have oversight of the property and undertake coordination between the University, users and external stakeholders. The Conservation Management Plan (2016) provides an overview of the instruments and procedures for the effective management of the property. The plan, supplemented by an extensive Site Gazetteer, is currently being updated.
The Observatory has a long experience with managing visitors. There is a current tourism management plan and enhanced presentation of the property is ongoing.

Recommends that the State Party give consideration to the following:

- Providing a summary end of project report following completion of the current major conservation project,
- Confirming the timeframe for the conservation of the two Botany Huts,
- Continuing to respect and portray the historical character of the buildings and site development. This character often includes relatively primitive buildings, often with additions undertaken with little regard to aesthetics or quality construction,
- Providing the revised Conservation Management Plan and associated Site Gazetteer when completed, to the World Heritage Centre,
- Considering masterplanning for the property and consultation zone to anticipate possible future development needs.

9. Appendix 3: Jodrell Bank Radio Telescope Direction 1971

THE TOWN AND COUNTRY PLANNING ACT 1971

THE TOWN AND COUNTRY PLANNING GENERAL DEVELOPMENT ORDER 1973

THE TOWN AND COUNTRY PLANNING (JODRELL BANK RADIO TELESCOPE) DIRECTION 1973

The Secretary of State for environment in exercise of the powers conferred on him by paragraph (1) of Article 10 and paragraph (3) of Article 13 of the town and country planning general development order 1973 hereby directs as follows:-

Definitions

'The map' Means a map certified by the Secretary of State to be the map for the purposes of this Direction.

'The radio telescope' means the laboratories, radio telescopes and associated equipment of the Victoria UoM, which are together known as the Nuffield Radio Astronomy Laboratories and are situated at Jodrell Bank in the Parishes of Withington and Goostrey in the County of Chester.

'The inner zone' means the area around the radio telescope which is cross-hatched on the map.

'The outer zone' means the area around the telescope which is hatch to vertically on the map.

'The University' means the Victoria UoM.

Any other expressions of the meanings assigned to them by virtue of the Town and Country Planning Act 1971.

Requirement to Consult

The local planning authority shall consult with the University before granting planning permission on:-

Any application for development within the inner zone (subject to the exception specified in the First Schedule hereto).

Any application for development within the outer zone (subject to the exceptions specified in the First and Second Schedules hereto).

Determination of Applications

Where the local planning authority are disposed to grant consent to an application contrary to the views expressed by the University they shall not do so within a period of 21 days from the date on which they notify the University of their intention to grant permission.

Dated this 6th day of April

1973

SJ heritage

Authorised by the Secretary of State to sign in that behalf

THE FIRST SCHEDULE

Planning applications in respect of which consultation is not required with the University in the inner zone:-

The re-building for the same use on the same or substantially the same site of any building which is in use otherwise than in breach of planning control on the date of the application, provided the cubic content of the new building is not increased and the area of land occupied by the new building does not exceed the area of land occupied by the existing building.

The re-building on the same or substantially the same site of any dwelling house which is in the use as such on the date of the application and the enlargement improvement or other alteration of any dwelling house which is in use as such on the date of application, so long as in either case the cubic content of the original dwelling house (as ascertained by external measurement) is not exceeded by more than 914 cubic metres or 30%, whichever is the greater, provided that the erection of a garage within the curtilage of a dwelling house shall be treated as the enlargement of the dwelling house for the purposes of this direction.

An application for the erection of a single dwelling house or the conversion of a building or buildings to form a single dwelling house where the terms of the application are such that if it is granted the dwelling house will be occupied by a person employed locally in agriculture.

The formation, laying out or widening of a means of access.

The erection, construction, improvement or other alteration of gates, fences, walls or other means of enclosure.

THE SECOND SCHEDULE

Planning applications in respect of which consultation is not required with the University in the outer zone.

(A) Any application which involves:

The erection, enlargement or other alteration of a building or buildings for use as not more than one dwelling house, provided that the erection of a garage within the curtilage of a dwelling house shall be treated as the enlargement of the dwelling house for the purposes of this direction;

Operations in connexion with the conversion of a single dwelling house for use as not more than two dwelling houses;

The erection, enlargement or other alteration of buildings to be used for or in connexion with any of the following purposes:-

A single shop, the sales area of which is to be confined to the ground floor provided the gross floor area of the building does not exceed 610 square metres;

A medical or dental surgery, health centre or office, provided that each building of such types is not more than two storeys in height and the gross floor area of the building does not exceed 610 square metres;

Any application for development in relation to which either before or after the coming into force of this direction the local planning authority have consulted with the University on the question of whether such land should be developed and upon such consultation the University have informed the local planning authority in writing they have no objection to such development provided that this exception shall not apply where the proposal materially differs from that disclosed to the University when such consultation took place.

15.25 (B) Applications in respective development by change of use:-

The change in use of a building or buildings to use as not more than one dwelling house and the change in use of a single dwelling house to use as not more than two dwelling houses;

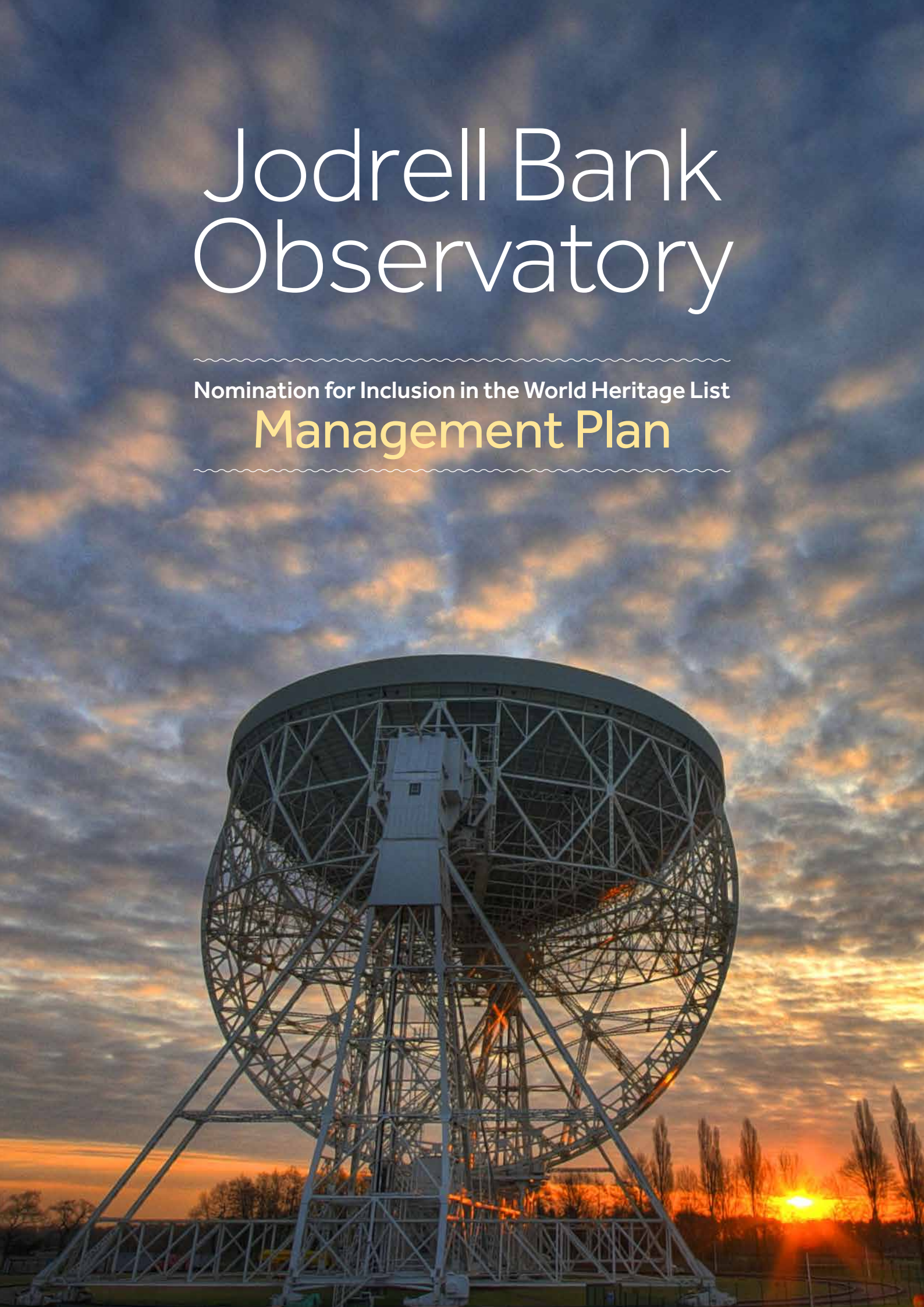
The change in use of a building or buildings to use for or in connexion with any of the purposes specified in paragraph A3 of this schedule (subject to the limitations and other provisions contained in the said paragraph).

10. Appendix 4: Conservation Management Plan

Jodrell Bank Observatory

Nomination for Inclusion in the World Heritage List

Management Plan



Contents

Cover image: Anthony Holloway

Vision

The Jodrell Bank Observatory will be a World Heritage Site that changes people's lives for the better and demonstrates humanity's ongoing exploration of our place in the Universe. It will bring together stakeholders to continue to protect and develop a site that people from regional, national and global communities can learn about or visit and have a genuinely world-class experience. Visitors will bring a sustainable growth in tourism to local communities, benefiting their quality of life and raising the profile of the region as a place to live, work and invest. This nomination will transform this regional and national icon into an international icon of science, a showcase of international cooperation and endeavour that exemplifies astronomy and engineering at its best.

The World Heritage Site Steering Committee aspires towards this ambition and this Management Plan describes the ways in which it might be achieved.

Image: The University of Manchester

1 Introduction

Image: Anthony Holloway

1.1 Summary

The principal objective of this management plan is the strategic long-term protection of the Jodrell Bank Observatory World Heritage Site. It lays out a framework for decision-making and managing change in the context of the World Heritage Site including management goals, objectives and both long-term and day-to-day actions required to protect, conserve and present the Site.

The Jodrell Bank Observatory World Heritage Site Steering Committee, described in Section 1.3 and made up of key representatives from a range of national and local bodies, is responsible for the formulation and implementation of this plan, including public consultation at key stages of its development.

In summary, this plan:

- contains the location, boundary details and description of the site;
- specifies how the Outstanding Universal Value, including the attributes, authenticity and integrity of the site, is to be managed and maintained;
- provides an overview of the current condition of the property and factors which may have positive or negative effects on attributes, authenticity and integrity;
- presents a collective vision for the management of the property over the coming decades, and the policies, objectives and actions over the next five years . This covers descriptions of the various management structures and plans in place and the way that they are coordinated and support each other;
- examines issues affecting its conservation and enjoyment, including development, tourism, interpretation, education and transport;
- and describes an implementation strategy, including monitoring and review.

Given its importance in helping to sustain and enhance the significance of the World Heritage Site, relevant policies in this plan need to be taken into account by local planning authorities in developing their strategy for the historic environment and in determining relevant planning applications.

A Conservation Management Plan for the entire Jodrell Bank site (which encompasses the nominated property) was drawn up while preparing for the nomination process. The latest version of this Plan has been a useful foundation for major elements of this Management Plan.

1.2 Guiding principles

The Management Plan for the Jodrell Bank Observatory World Heritage Site has the following guiding principles:

- Protection, conservation and maintenance of the Outstanding Universal Value, Integrity and Authenticity of the property, including the identification and promotion of change that conserves and enhances these qualities; and the modification and/or mitigation of development and change that might damage them.
- The Jodrell Bank Observatory continues to perform its function as a radio astronomy facility. It is important to conserve and enhance the heritage of the site whilst maintaining this role as a world-leading scientific research facility, thus retaining its authenticity of use and function.
- Sustainable use for the benefit of the local population and economy.
- Commitment to a comprehensive programme of presentation and education, including a commitment to sustainable visitation.
- Importance of gathering all stakeholders in a shared understanding of the property; in a commitment to developing and implementing the management plan; and to furthering the obligations of the World Heritage Convention.
- Commitment to ensuring effective governance, resources and monitoring are in place to support implementation of the plan, including a commitment to capacity building and to the planning, implementation, evaluation and feedback cycle.

The guiding principles lead to a number of Policies, together with an Action Plan designed to meet the policy objectives. These are presented in Section 5 of this Management Plan.

Image: Anthony Holloway

1.3 World Heritage Site Steering Committee

The World Heritage Site (WHS) Steering Committee will bring together all stakeholders in a shared understanding of the property and embody a commitment to further the obligations of the World Heritage Convention.

It will continue to develop and implement the management plan, oversee the delivery of the Action Plan, ensuring that it is fit for purpose and that it contributes to all the policy objectives for the property. The WHS Steering Committee includes representatives of all stakeholder groups, including the site owners and users, local communities, local authorities, national authorities and communities of interest.

The group membership is set out below.

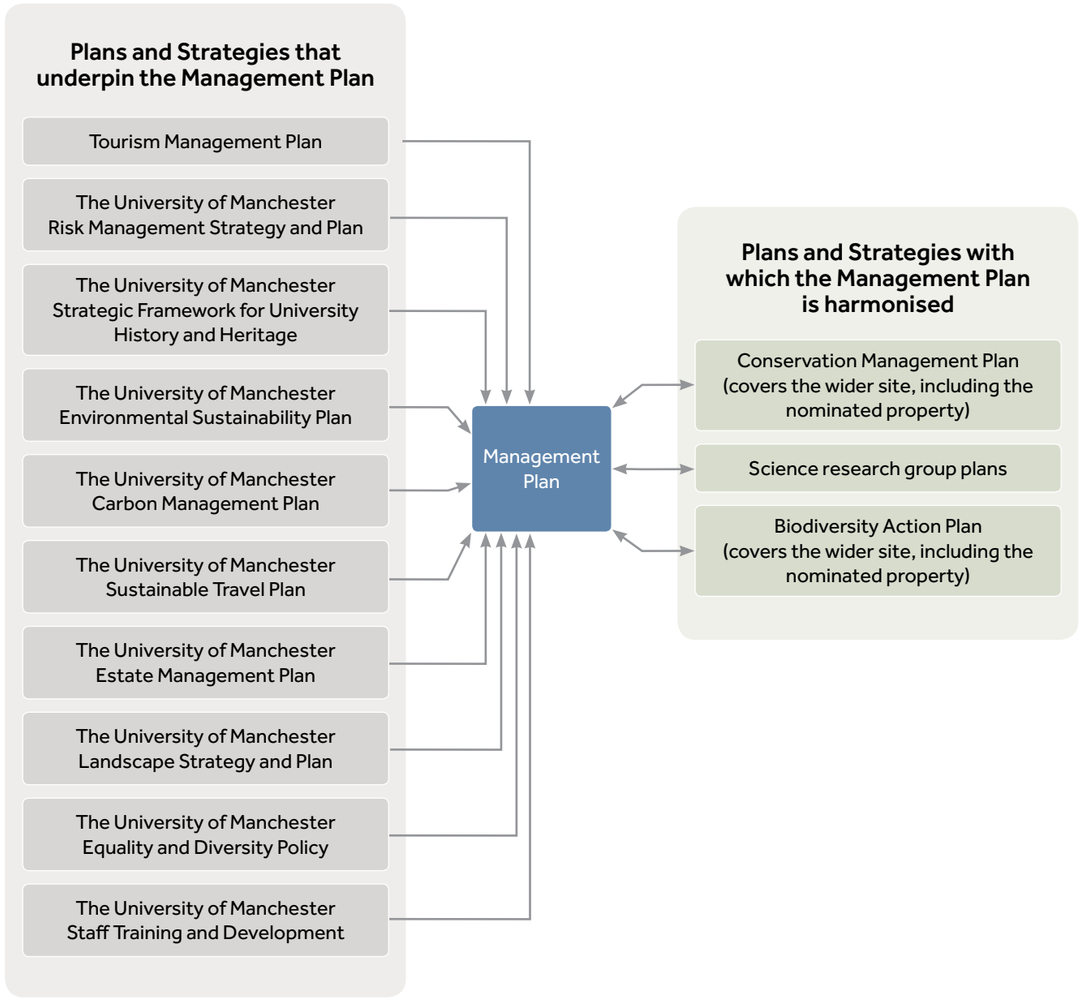
Body	Committee Members
Site owner: The University of Manchester	• University Registrar and Chief Operating Officer (Chair) • Vice President for Social Responsibility • Director of Estates • Director of Communications • University Historian and Heritage Manager
Site user: Jodrell Bank Discovery Centre	• Director of Jodrell Bank Discovery Centre (World Heritage Site Coordinator) • Deputy Director of Jodrell Bank Discovery Centre (coordinating Presentation and Sustainable Visitation) • Head of Education and Interpretation at Jodrell Bank Discovery Centre (coordinating Education and Interpretation)
Site user: The Jodrell Bank Centre for Astrophysics	• Director of Jodrell Bank Centre for Astrophysics, with overall responsibility for science and engineering • Associate Director of Jodrell Bank Centre for Astrophysics (Public Engagement) with responsibility for Scientific Heritage • Associate Director of Jodrell Bank Centre for Astrophysics (Observatory) with responsibility for Observatory operations
Site user: The SKA Organisation	• Director General or their representative
Local Community	• Representative of Lower Withington Parish Council • Representative of Goostrey Parish Council
Local Authority (Cheshire East)	• Executive Director Place or representative • Senior Conservation Officer
Local Authority (Cheshire West and Chester)	• Senior Planning representative
Tourism bodies	• Chief Executive of Marketing Cheshire • Head of Marketing of Marketing Manchester
Historic England	• Principal, Historic Places Team, North West • Head of International Advice
DCMS	• Representative of Heritage team in Government Department for Digital, Media, Culture and Sport
ICOMOS UK	• Representative of ICOMOS UK
UK World Heritage Site Community	• Representative of UK World Heritage Site Community
Astronomy Heritage Community	• Representative of Astronomy Heritage Community (from Heritage Committee of Royal Astronomical Society and/or ICOMOS IAU working group on the heritage of astronomy on the World Heritage list)
UNESCO UK	• Representative of UNESCO UK

1.4 Relation to other plans

Jodrell Bank, with its long history of management by The University of Manchester, already has a number of planning documents in place, such as the Conservation Management Plan, which will continue to have a role in the future management of the property.

Where such plans exist, this Management Plan does not seek to duplicate them but to coordinate their implementation and act as an overarching instrument of coordination.

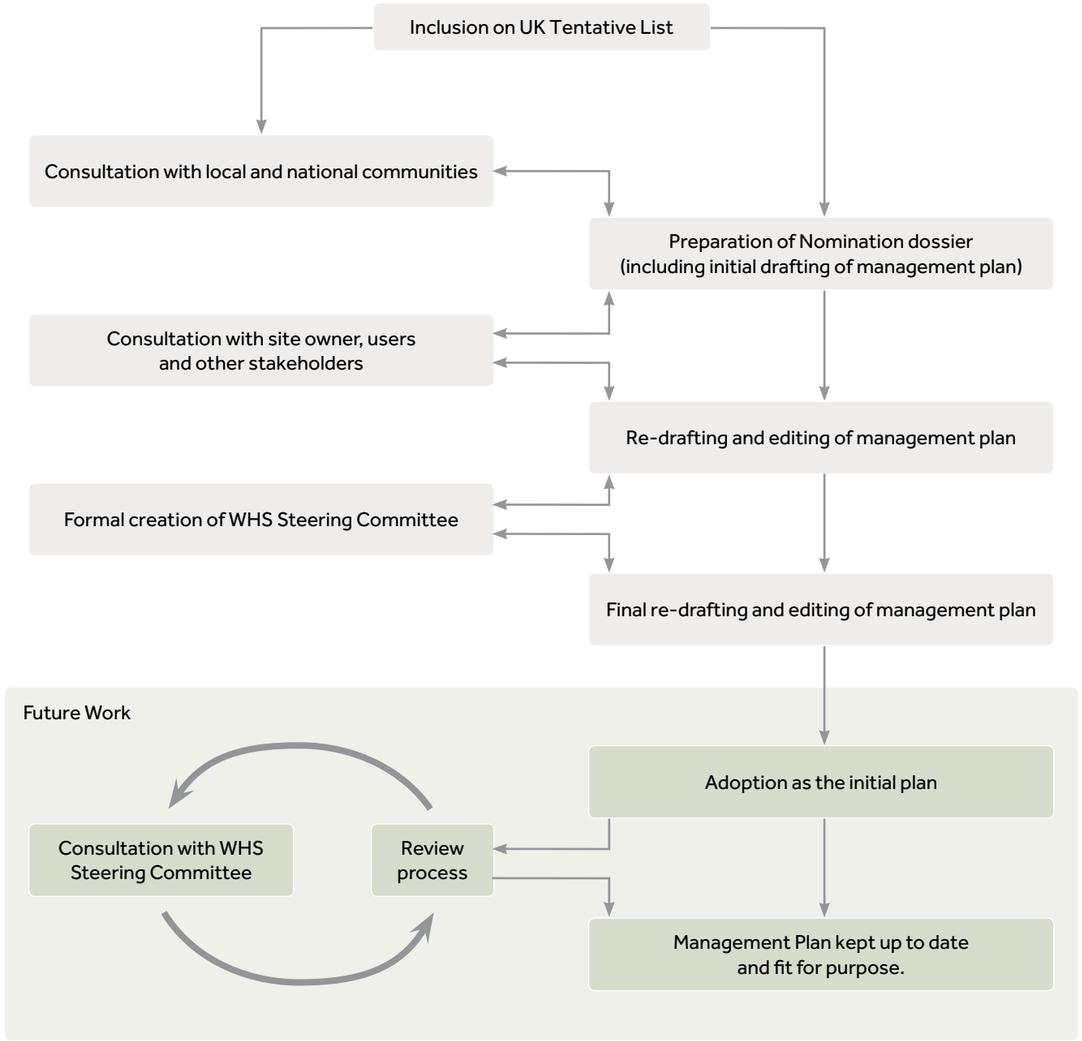
The interrelation between the various plans and strategies is shown in the diagram below:



1.5 Preparing the Management Plan

This plan was prepared in consultation with all major stakeholders and communities, including the site owner, site users, local communities, local authorities, national and international bodies and communities of interest.

The process was managed by Professor Teresa Anderson (Director of the Jodrell Bank Discovery Centre and World Heritage Site Manager) and Professor Tim O'Brien (Associate Director of Jodrell Bank Centre for Astrophysics, Public Engagement and Heritage). This section outlines the process that was used.



2 Description of the property

Image: Anthony Holloway

2.1 Location, Boundaries and Ownership

Jodrell Bank Observatory is located in Cheshire in North West England at geographical coordinates N 53° 14′ 05″ ; W 2° 18′ 18″. (See Figure 2.1).

The area of the nominated property is 17.38 hectares and the area of the proposed Buffer Zone is 18569.22 hectares. (This gives a total area of 18586.6 hectares). (See Figures 2.2 and 2.3). The nominated property lies entirely within the Cheshire East local authority, whilst the Buffer Zone covers both Cheshire East and the neighbouring authority of Cheshire West and Chester. (See Figure 2.6).

The nominated property is entirely owned by the University of Manchester, which also owns land immediately adjoining the property, see Figures 2.4 and 2.5. The total area of the Jodrell Bank site is 35 hectares. The 17.38 hectares of the nominated property sit within this.

The part of the University-owned site outside the nominated property includes area (and a building) leased to the Square Kilometre Array Organisation and an area and buildings that the University uses for the sustainable management of visitors (known as the 'Jodrell Bank Discovery Centre').

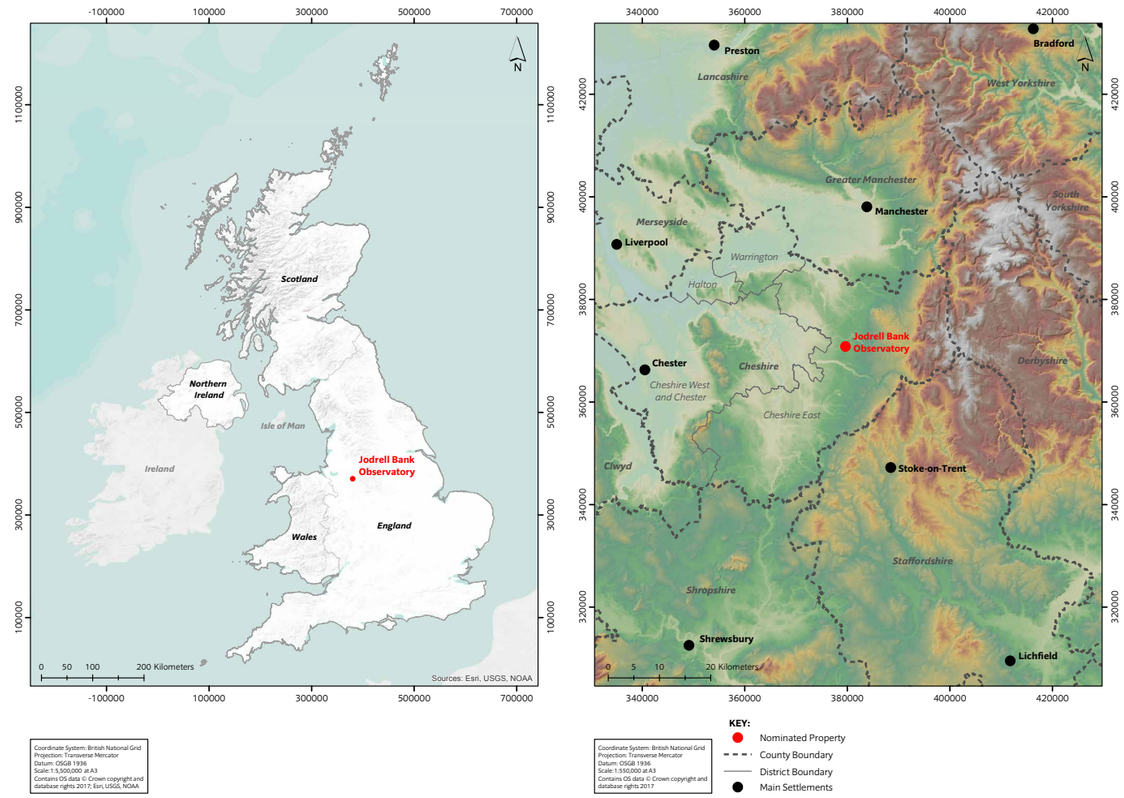
The University's approval is needed for any works, such as new buildings, carried out on any area of its land.

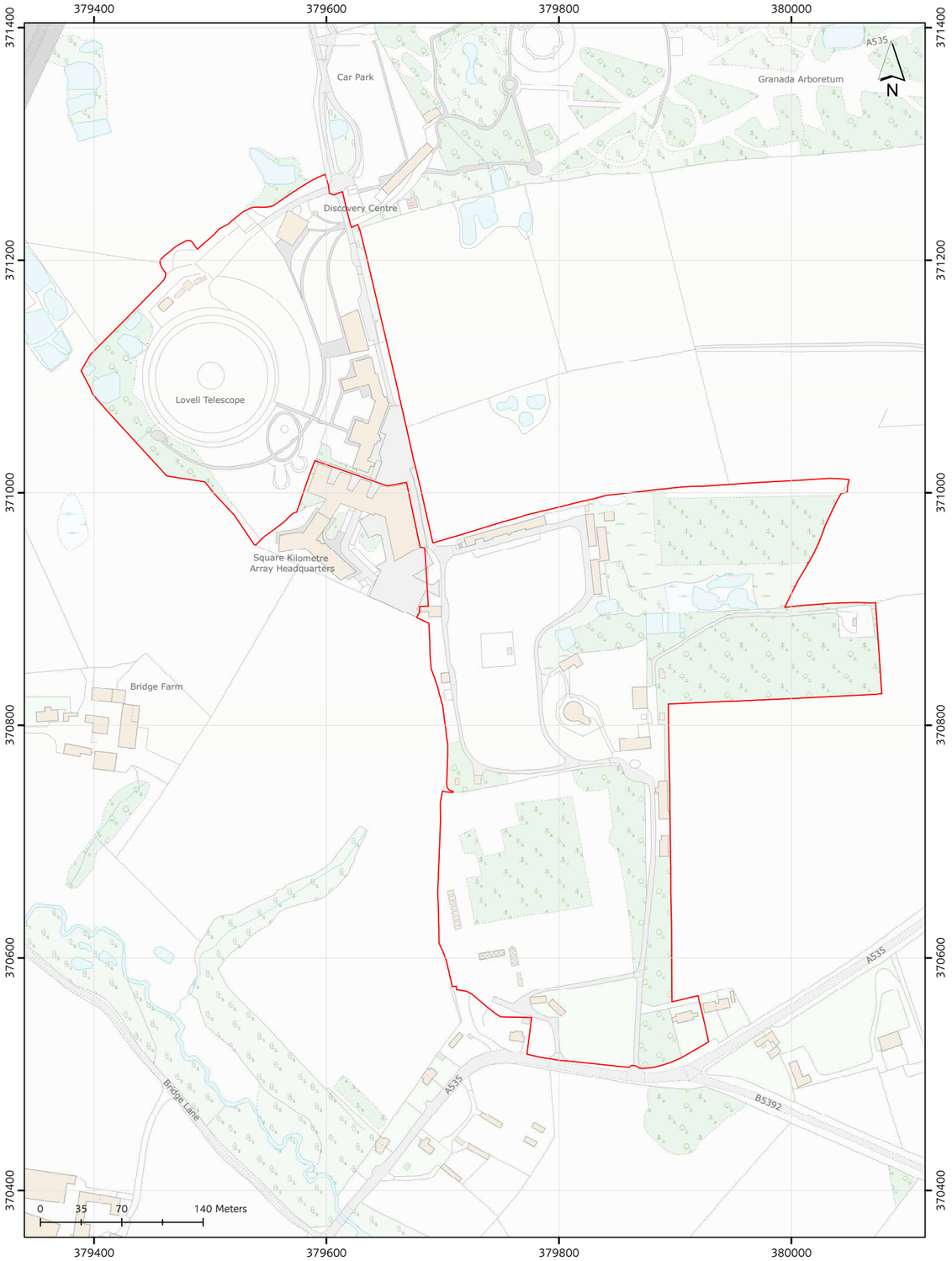
The University's approval would also be needed for any significant changes of use to the farmland owned by them adjacent to Jodrell Bank.

Ownership is a key element of the protection of the OUV of the site. Indeed, the University's ownership since the inception of the Observatory is one of the major factors that has ensured its protection.

A Conservation Management Plan for the entire Jodrell Bank site (which encompasses the nominated property) was drawn up while preparing for the nomination process. The latest version of this Plan has been a useful foundation for major elements of this Management Plan.

Figure 2.1: Map of location in UK





Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Scale: 1:3,000 at A3
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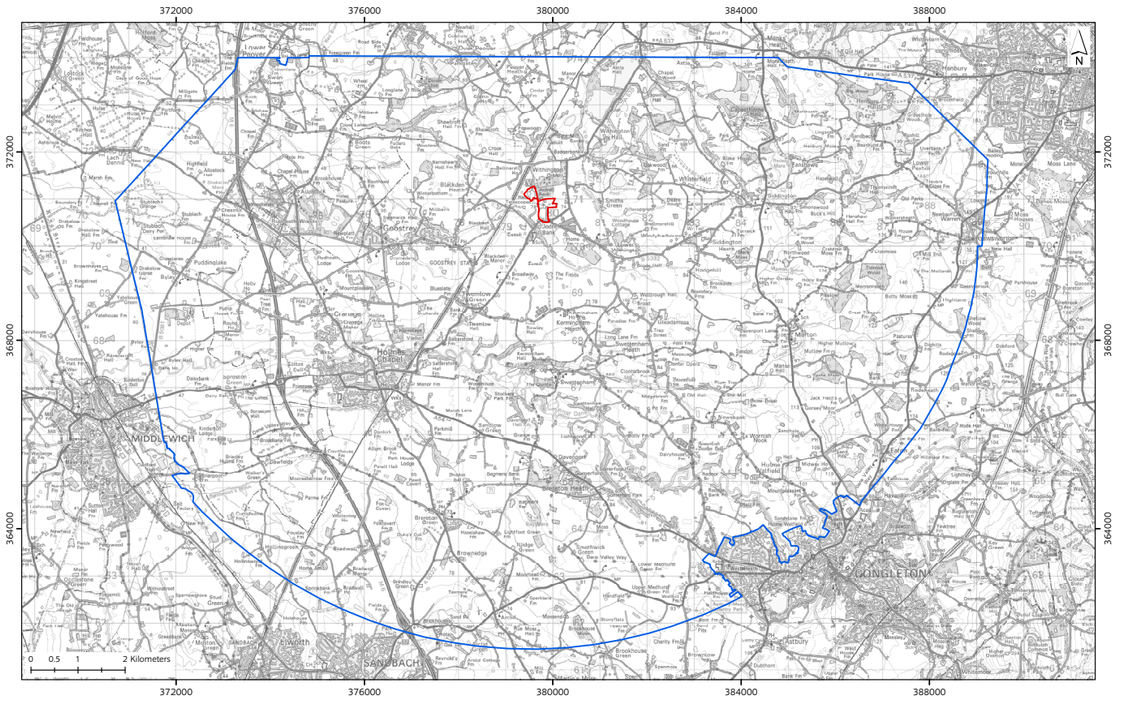
Ordnance Survey 0100031673

KEY:

Nominated Property Boundary

Figure 2.2: Map of site boundaries



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Projection: Transverse Mercator
Datum: OSGB 1936
Scale: 1:60,000 at A3
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Ordnance Survey 0100031673

KEY:

Nominated Property Boundary

Buffer Zone

Figure 2.3: Map of site and buffer zone

2.2 Features of the site

The property, which is part of The University of Manchester, is located in a rural area of Cheshire East in northwest England.

The site is in open countryside and surrounded by agricultural land. There are a small number of residences bordering the site and a number of small settlements or villages within a 5-mile radius. The nearest large settlement is Macclesfield, at a distance of around 8 miles.

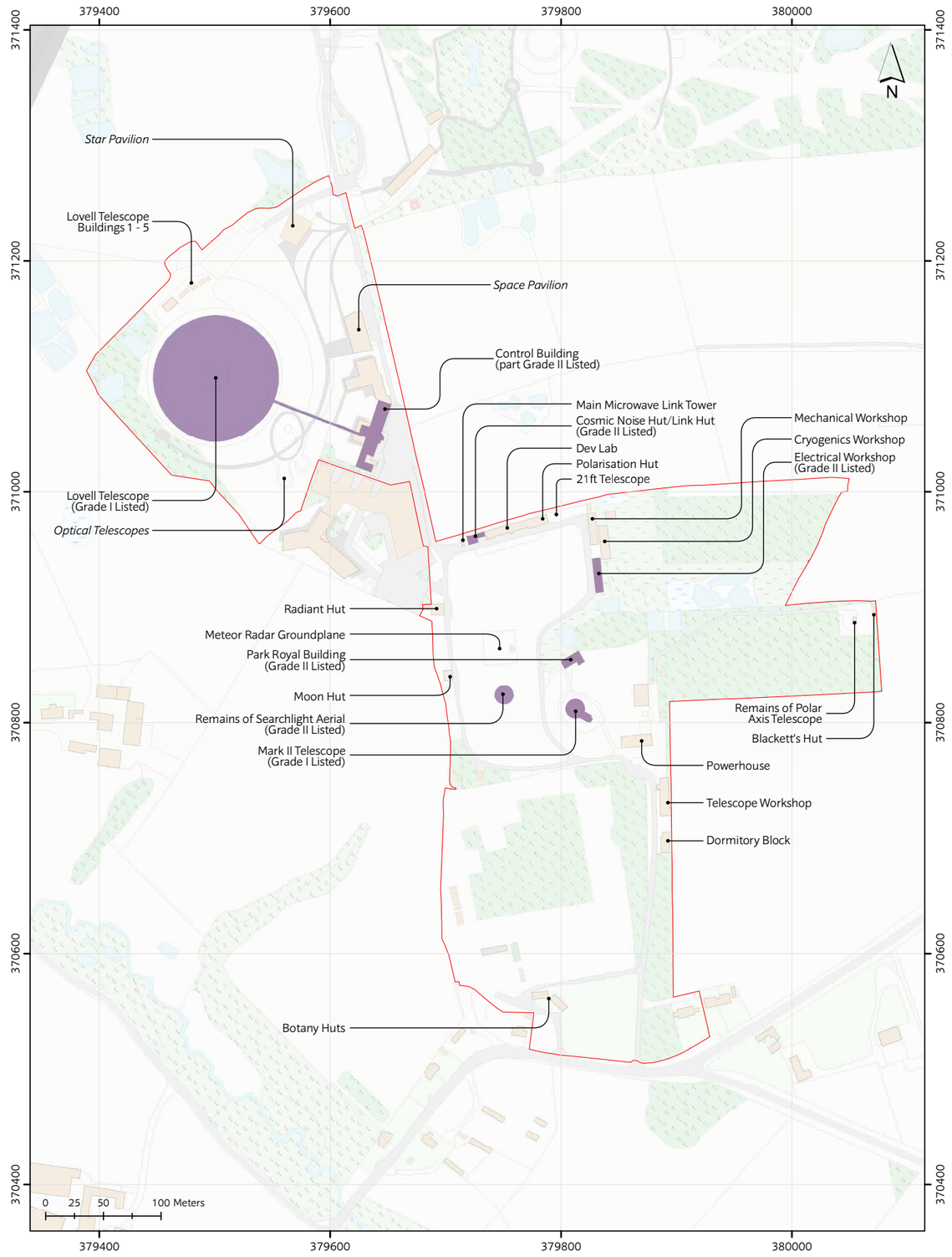
At the south end of the site (see Figure 2.4 for a map with various features labelled) is land formerly used as University Botany research grounds, including wooden gardeners' huts and the remains of glasshouses. A tarmac road through this area provides an entrance route for staff and leads to the Green. This area, which is at the heart of the site, is the location of the Grade I listed Mark II Telescope and is bounded by the ensemble of modest research buildings (some of which are now Grade II listed) in which much of the early work of the Observatory took place. This area also contains remnants and traces of early scientific instruments.

To the north of the Green, the site is dominated by the Grade I listed Lovell Telescope, which sits in a working compound containing a number of engineering sheds, and by its Control Building. This area also includes some of the modern buildings of the Discovery Centre used to welcome visitors and school groups.

The first use of the property for radio astronomy occurred in December 1945, when Bernard Lovell arrived at the most southerly point of the site to begin observations of meteors using ex-army radar equipment. The site was selected because it was in the ownership of the University of Manchester (as it is now) and because it was free from the radio interference caused by trams passing the University campus within Manchester itself.

From that time onwards, scientific activity moved from south to north across the site with many new instruments developed, and then abandoned, as the field of radio astronomy was created.

While much of the early scientific equipment was demolished, or re-used in subsequent instruments, some of the remnants still survive either above or below ground.



Coordinate System: British National Grid
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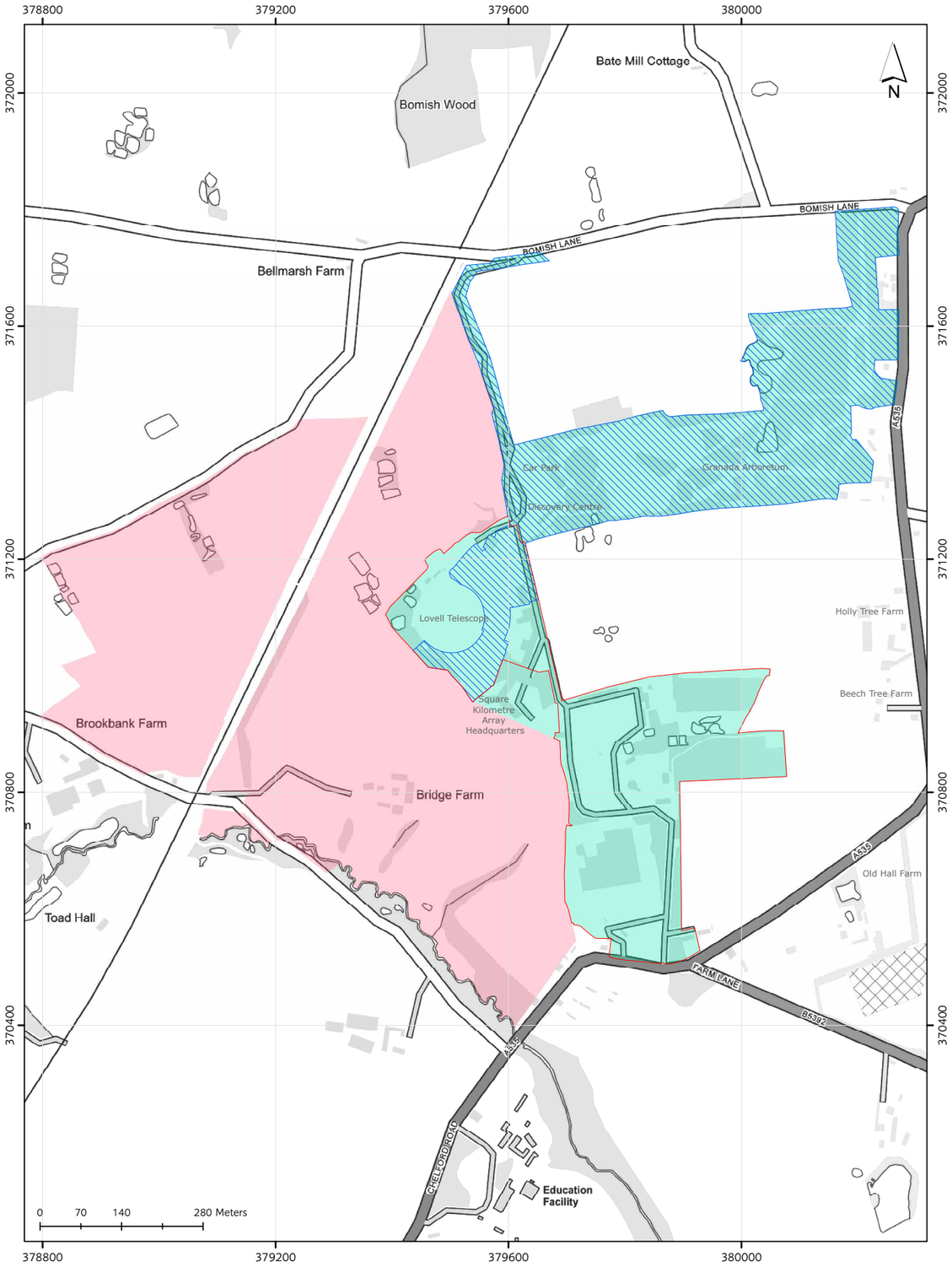
Scale: 1:3,000 at A3

KEY:

Nominated Property Boundary

Listed Buildings

Figure 2.4: Map of site (with features labelled)



Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Scale: 1:6,000 at A3
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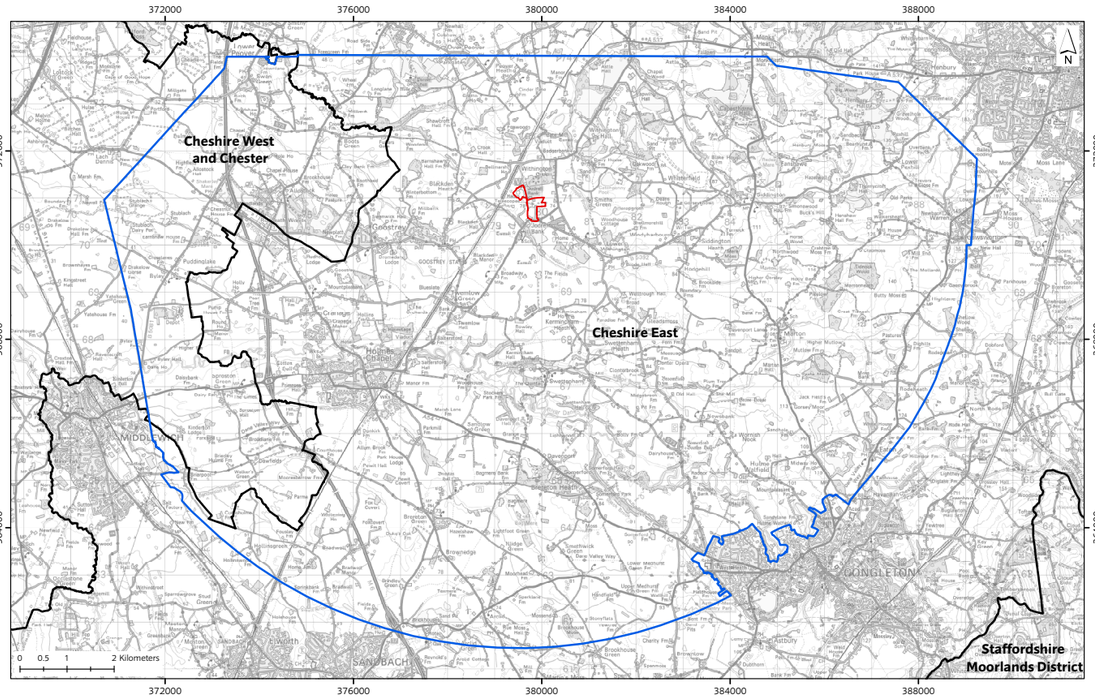
KEY:

- Nominated Property Boundary
- Jodrell Bank Observatory Site
- Areas with Visitor Access
- Other Adjacent University of Manchester Landholdings

Figure 2.5: Map of site with land in university ownership indicated



Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Scale: 1:60,000 at A3
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Ordnance Survey 0100031673

KEY:

- Nominated Property Boundary
- Buffer Zone
- Local Authority Boundary

Figure 2.6: Map of site and buffer zone with local authorities indicated

Jodrell Bank Observatory is now the hub of the UK's national 217-km-wide array of up to seven radio telescopes ('e-MERLIN').

The signals from all seven telescopes are combined at Jodrell Bank so that the array operates as if it is a single Telescope, which has a similar resolving power to the Hubble Space Telescope. The Lovell and Mark II Telescopes are used as part of this array.

Along part of the western border of, and just outside, the nominated property sits the International Headquarters for the Square Kilometre Array Organisation (SKAO), the international project planning the next generation large telescope for the world's radio astronomy community. (This land is also in the ownership of the University of Manchester, but is not part of the nominated property, as it carries no elements of the OUV). The SKA Organisation is due to become an International Treaty Organisation in the near future, a fact that expresses the interchange of ideas that underpins modern astrophysics.

To the north-west of the property, set around the Lovell Telescope, there are spaces open to the general public (part of the 'Discovery Centre') which include visitor facilities. The rest of the visitor facilities (and Gardens that include an Arboretum) sit just outside the property to its north east. These areas exemplify the tradition of Public Engagement at Jodrell Bank and are also essential to the management of visitors. All these facilities are on University-owned land.

The site now comprises a unique combination of attributes, which convey the Outstanding Universal Value of Jodrell Bank Observatory. Taken together, they represent the past, present and future of radio astronomy at Jodrell Bank, effectively laying down the progress of every stage of the history of radio astronomy on the landscape, from its inception to the present day.

In this section, we describe the attributes as follows:

- The Landscape and Layout of the Site
- The Lovell Telescope and the Mark II Telescope
- The Control Building
- The Green and associated Observatory Buildings
- The site of the Transit Telescope
- Sites and remnants of other early scientific instruments
- The Botany Huts

The Landscape and Layout of the Site

The configuration of the site is a key element of its sense of place as a working Observatory. Largely determined by the evolution of the Observatory in the early days of the emergence of radio astronomy, the landscape is much the same today as it was then. In this section, we describe the current state of the landscape zones, moving through the property from the area now most in use (the north) to the area that is now less used (the south). The landscape zones in the nominated property are described in detail in the Conservation Management Plan Gazetteer. The Gazetteer code numbers for each landscape area are given at the start of each paragraph below.

a. **L03 – Landscape around the Lovell Telescope:** The field which once surrounded the Lovell Telescope has now been landscaped and provides public access via a circular tarmac path. Interpretation panels, interactive exhibitions and picnic tables are located across the area. The Control Building and its access path to the Lovell Telescope as well as the area immediately surrounding the base of the Lovell Telescope are fenced off and public access prohibited. Besides hard landscaping, the area comprises grassland with scattered specimen trees.

b. **L05 – The Green:** The Green is an open area of grassland around which circles a tarmac access road, alongside which stand the Observatory buildings created circa 1955, when the permanence of the Observatory was first established. It is the location of many of the attributes of the OUV of the site (e.g. the Mark II Telescope, the site of the Transit Telescope and other instrument sites and remnants, see below) and carries significant OUV in itself.

c. **L07 – Former Botany Grounds:** This area is the location of the Botany Huts, which are a key attribute of the OUV of the property, as the initial arrival point of Bernard Lovell at the site. Work on the emergence of radio astronomy transferred to the Green area quite soon after Lovell's arrival. The majority of this area comprises rough grassland; a recently constructed car park and staff community allotment; and plantations of poplar, ash, and alder with no real shrub layer. The southern access road to the property crosses this area south to north, and the open grassland area is crossed by a track joining the main driveway to the botany department structures in the west.

Image: Anthony Holloway

Jodrell Bank viewed from The Roaches in the Peak District, with the Cathedrals of Liverpool visible on the horizon.

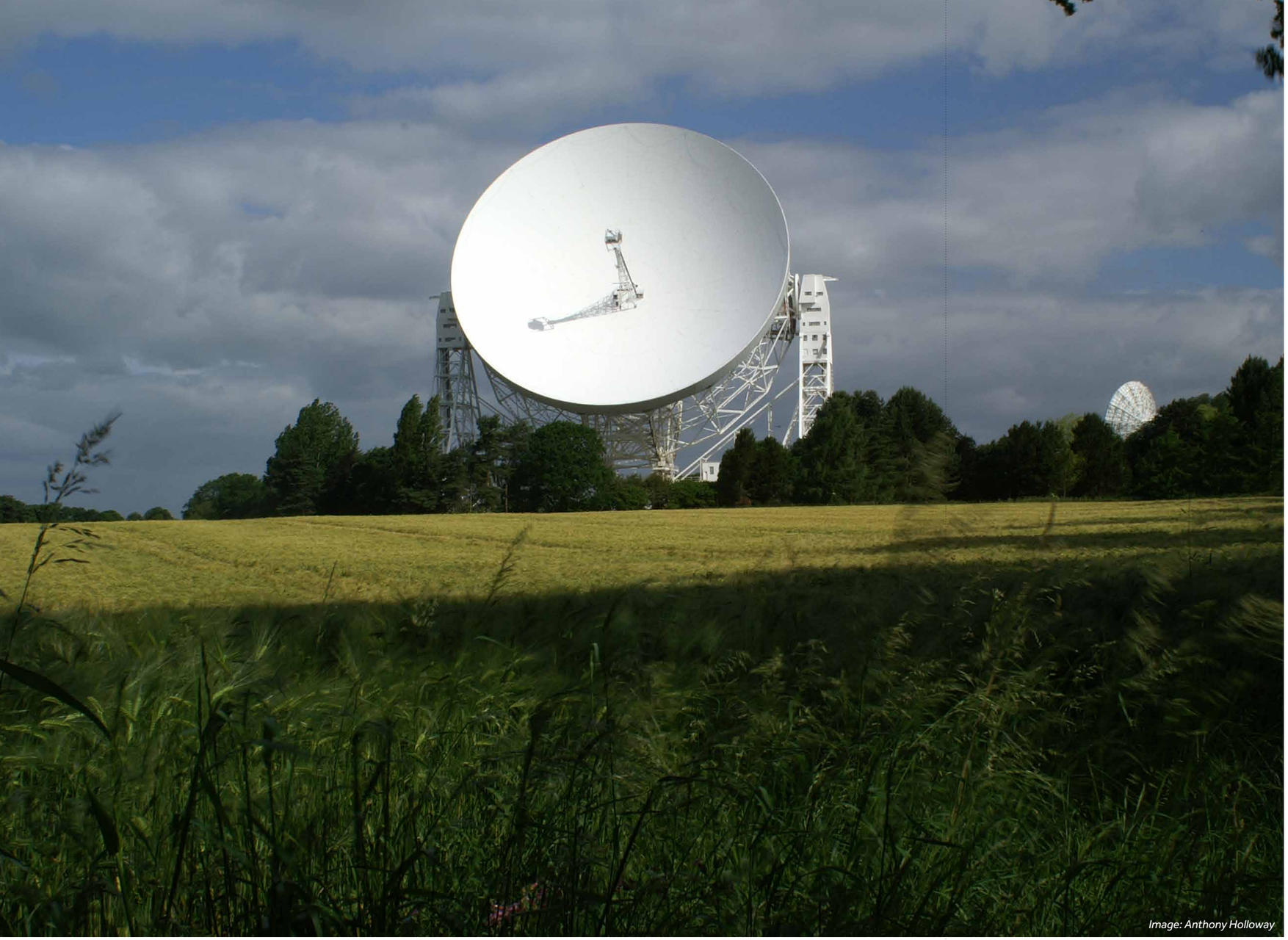


Image: Anthony Holloway

The Lovell Telescope

The most prominent feature of the Observatory is the Lovell Telescope, the largest fully steerable radio telescope in the world on completion in 1957, and which still operates as the third largest on Earth. The Telescope, which is a Grade I listed structure, stands 89m high (around the same height as the Big Ben clock tower in Westminster), dominating the Cheshire plains.

Active in both the dawn of the Space Race and the Cold War, the Lovell Telescope now constitutes a huge, internationally-recognised, public landmark within an area that stretches west from the Pennines out to the Welsh border and is visible for many miles.

However, despite the fact that it is the most publicly recognisable part of the Jodrell Bank site, it effectively represents the culmination of the work that went before it and there are many other elements of the site that are highly important in terms of its heritage.

Parallels can be drawn between Jodrell Bank and Stonehenge in this – both have iconic structures that are generally held to signify the complex as a whole, but both also have a wealth of other elements that are part of the OUV of the property.

The Telescope was conceived by Sir Bernard Lovell, founder of the Jodrell Bank Observatory, and designed by engineer Charles Husband. It is made of steel and is largely painted white, with some sections painted grey. The main reflector dish is a colossal 76 metres in diameter and is paraboloidal in shape. It sits nested within the dish that was installed at the time of construction.

This original bowl of welded sheet steel is still extant in form, although in the process of being replaced, with the guidance of Historic England. The support structure for the later bowl is carried through the earlier bowl to link with the original steel frame.

The dish arrangement is mounted on bearings that were recycled from the gun turrets of two battleships, HMS Royal Sovereign and HMS Revenge. The bearings sit at the top of two triangular steel lattice towers (known as Red and Green Towers) that rest on wheel bogeys running on two concentric tracks of double rails. The head of each tower is enclosed to form a multi-level equipment space containing bearings, racks and drive motors. The towers are accessed by lifts within each tower.

The outer diameter of the rail track is 107m. The track allows the Telescope to rotate in azimuth (horizontally) so that it can point in any direction. The azimuth drive is powered by 50 horse-power electric motors at the foot of each tower.

The bearings allow it to move in elevation (vertically) so that it can be tilted to point at any angle above the horizon, driven by electric motors at the top of the towers. These two movements, in azimuth and elevation, allow it to observe any point in the sky above it.

The dish surface is accessed via lifts in the towers that support the bearings and walkways that run between the towers at high level.

At the centre of the dish a lattice tower supports the radio receiver, which is housed in a cryogenic container in the focus box and reached via a cage lift.

One of the walkways also accesses the original 'swinging lab', a pivoted room beneath the centre of the bowl (currently removed to ground level for maintenance and to allow access to work on the original reflecting surface).

The lifts in the towers have been replaced, but retain their original control buttons. The equipment room at the base of the Telescope retains much original 'Brush' electrical power equipment, and analogue control and monitoring equipment, as well as modern replacements for many of these items. A substantial amount of modern data cabling is also present. The emergency generator house contains a modern diesel generator.

Below the centre of the Telescope is the cable turning chamber. This in turn is connected to the tunnel that links the Telescope and Control Building. The annular chamber has smooth concrete walls and contains modern data and control cabling. Central in the room is the tall metal drum containing the cable-turner, which allows the cables entering the telescope to rotate with it through 420 degrees.

At the southeast, it gives access to the tunnel to the Control Building, along which the cabling runs in wall trays. The tunnel has plain shuttered concrete walls. It is included (up to the point where it joins the Control Building) in the Grade I listing of the Telescope. The curtilage of the Telescope is generally interpreted to encompass its compound (to the east) and up to the line of the Control Building east wall (to the Telescope's west).

Image: Anthony Holloway

The Mark II Telescope

The 'Green' area at the heart of the property is dominated by the Mark II Telescope, which is located to the southeast corner of the area. It is third largest radio telescope in the UK and is characterised by the distinctive concrete mount for the telescope dish, which itself has an elegant elliptical shape. It was Grade I listed in 2017.

The telescope was designed by Husband and Co (the designers of the Lovell Telescope) in 1960 and construction, by Arrol Engineering, took place between 1962 and 1964.

A variant of the Mark II design was also used for the Goonhilly 1 telescope built to receive the first TV signals relayed by the Telstar satellite across the Atlantic.

The parabolic reflecting surface of the Mark II Telescope had an elliptical outline to increase the collecting area over a circular aperture (it was a pilot for a much larger telescope which was never constructed). It was the first telescope of any type in the world to be controlled by a digital computer, the Ferranti Argus 104. This was one of the very first computers designed for real time control and built using germanium transistor logic and a ferrite core store.

The Telescope has a building at its base that houses the mount and engine room, a first-floor central room and bracket. All of these are made of pre-stressed concrete.

The reflector bowl has a lattice-work steel frame, supported on the concrete bracket with concrete counter-weights to the rear. The elliptical, paraboloidal bowl is constructed of welded steel sheet with a major axis of 125ft (38.1m) and minor axis of 83ft 4in (25.4m). Overlaying this is the 1987, circular surface of aluminium panels. The aerial with a focal length of 40ft (12m) is supported by four lattice-work legs standing out from the edge of the bowl structure; the lower, right leg incorporates a narrow flight of steps to access the aerial focal point with a hanging flight of steps to allow access from the roof of the engine house.

The ground-floor engine room contains the original gearbox, with an updated drive system, on a deep concrete engine bed. This powers a vertical driveshaft, original gear chain and cogs which move rollers to control the horizontal position of the alt-azimuth mount in the circular base building. On the east side of the gearbox are the two original motors of the control system for the telescope, now replaced by control cabinets along the south west side of the room. The circular base building contains the alt-azimuth mount, which sits on 54 steel rollers in a 12.8m (42ft) diameter on a concrete foundation block.

There is a narrow walkway around the outside. The first-floor central room contains a central, full-height, circular cabinet of riveted steel panels known as a 'twister' through which the telescope wires are threaded to prevent their tangling. The room also has a small 500kg travelling crane above a trap door in the floor through which the alt-azimuth mount can be reached. The small engine room on the northeast side contains a motor and gearbox, which drives a vertical driveshaft which controls the vertical position of the telescope.

Image: Howard Barlow

The Control Building

The Control Building, built originally for the Lovell Telescope, was completed in 1955. It was subsequently extended in 1961, and again in the 1970s. It is constructed primarily of brown brick in Flemish Bond, window surrounds of concrete and metal casement windows. In plan, it has a linear rectangular shape, roughly aligned north-south. There is a central two-storey block with single-storey wings and some rooftop extensions to the south wing, and ground-floor extensions to the north. The Building stands south east of the Lovell Telescope, to which it is linked, at basement level, by a tunnel (which itself forms part of the Grade I listed Lovell Telescope structure). The Control Building was Grade II listed in 2017.

On approach, its central external feature is the main entrance (which is in the east wall at the centre of the two-storey block), reached by two steps and a modern access ramp with handrails.

The two full-glazed timber entrance doors are set in a glass-block surround and over-sailed by a concrete canopy, all highly characteristic of the period.

The entrance doors lead to the lobby, which is designed as an approach to the most important space in the building, the Control Room. Steps lead to this along the rear wall from left and right to a small central landing, with recessed doorways leading to the left and right, hidden by wing walls. The rear wall of the landing is glazed, with windows leaning away at the top, which afford a view into the control room. This wall, which was the original control room doorway, is removable, so that the original entrance route can be used either for reception of important visitors, or for practical reasons (e.g. during events including television broadcasts).

The steps' inner face is gently concave, and against this, between the columns, is a bespoke curved oak bench whose back follows the profile of the steps with their outward-leaning risers. The metal balustrade with oak handrail carries a plaque recording the construction of the Lovell telescope, and listing the contractors.

From the lobby, stairs also lead to the first floor. The first-floor gallery retains original windows overlooking the control room, although now boarded over.

To the right is a single-storey block with a continuous glazed strip of ten windows. This area houses a mix of offices and laboratory space. To the left of the entrance the ground floor is similar but with only a five-window strip. Both wings were extended towards the front soon after construction to provide additional office space.

Further left, a short section of the original E wall is largely obscured by the concrete podium building of the 42-Foot telescope, and above the original brick wall is a single-storey glazed timber rooftop extension. Again, this area of the building houses a mix of laboratory space and offices, including the Director's office created for Sir Bernard Lovell, which retains its door, parquet flooring and waffle-iron radiators.

The west elevation of the building is dominated by a glazed wall of four vertical lights, which are the windows in the Control Room facing the Lovell Telescope. These provide the Telescope Controller with a full view of the Lovell telescope. The Control Room is dominated by the central U-shaped Control Desk, the structure of which is largely original, with updated internal equipment and control panels.

Below the western wall of the Control Room there is a semi-basement extension that surrounds it, in red engineering brick in stretcher bond. A doorway with open concrete porch is offset slightly to the right, aligned over the tunnel from the telescope and with the south side of the control room.

To the left of this extension is a small timber entrance extension, which is used by Jodrell Bank engineers to move between the Telescope and the Control Room.

The north wall of the original Control Building is obscured by the extension built in the late 1960s, which houses a mix of offices, a library, a lecture room and some general meeting spaces. This structure was excluded from the Grade II listing of the Control Building in 2017.

To the west of that extension is the concrete mounting pad for the helical antenna. This is a concrete bed 4m square, with mounting bolts in each corner, set within the grassed lawn.

Generally, in the control building alterations to the original rooms have largely been to the function and contents rather than to their essential character and finishes, although some room entrances have been adjusted, and the installation of the processing computer (the e-MERLINcorrelator) and its cooling did require some physical works.

The Green and associated Observatory Buildings

The Green is the area at the heart of the property that forms its historic core. This is the area in which Sir Bernard Lovell and his team built up and expanded the Jodrell Bank Experimental Station (today known as the Jodrell Bank Observatory). It continues to perform its intended function, which is to provide an open space upon which to set and carry out scientific experiments. A wide range of experiments were set up there which are vital in the history of Jodrell Bank and its role in the development of radio astronomy.

It comprises mainly a square open area which is predominantly grassland. In the southern part of this there is a small area of developing trees and scrub, including birch, willow and ash. The grassland is separated by an encircling tarmac road to the west of the Mark II Telescope and east of the Moon and Radiant Huts. This road provides access all around the Green. There are mixed native hedges along the western and northern boundaries with mature pedunculate oaks. Buildings in the northeast of the Zone are adjoined by grassland, scrub and trees.

Between the outer edge of the road and the boundary of the property are spaced a group of research and engineering buildings, which largely date back to the early days of the Observatory.

The centre area and the land between buildings is still used, as it has been since the inception of the site, for temporary scientific experiments. The open arrangement of this area is a key attribute of the property.

The important buildings in this area are described below.

The Park Royal Building

Park Royal is a single-storey hut that has been used variously as a control room, to house scientific apparatus, laboratories and research offices. It is currently used as a general store, with some unused areas.

It was built in 1949 of pre-cast concrete construction system with concrete portal frames and walls of large, concrete blocks. The doors and vertical, rectangular windows have pre-cast concrete frames and the majority of windows are multi-paned with galvanised metal frames. A small extension was added in 1963-64. The building was re-roofed in 2016.

The building's name derives from a military trailer which Bernard Lovell acquired in 1946, described as 'a large cabin packed with electronic equipment built onto a prime mover which was commonly known in the service as a Park Royal'. The name originated from Park Royal Vehicles Ltd who were the London coach-builders who built the vehicles. When moving the Park Royal trailer from the original Botany Grounds to the north end of the site (then bounded by the north side of the 'Green' area), it became stuck in the mud. It then remained there, determining the siting of several aerials and then the first purpose-built, permanent buildings. The Park Royal building was constructed specifically to house the apparatus from the trailer and the name transferred to the building along with the equipment.

Originally it was used as the control room for the Transit Telescope which was used to detect radio waves from the Andromeda Galaxy, the first known extragalactic radio source, and the remnant of Tycho's supernova. When the Mark II telescope was built in 1962-64 the Park Royal Building was extended with a small, projecting control room added on the south-east side looking towards the telescope, built in 1963-64. The Mark II was the first telescope in the world to be controlled by a computer and it is believed that this computer was housed in the Park Royal Building.

In 2017, it was awarded Grade II listed status for the following reasons:

- Historic interest: as one of the earliest, purpose-built auxiliary buildings at the Observatory built as the control building for the 218ft Transit Telescope, then adapted for use as the control building for its replacement, the Mark II Telescope, the first telescope in the world to be controlled by computer;
- Development of the site: the control building replaced a temporary military vehicle housing equipment and as such demonstrates the more permanent establishment of the Observatory with financial investment in the site infrastructure;
- Group value: the Park Royal Building has a strong functional link with the Mark II Telescope for which it was the control building, and visually with similar huts around 'The Green' built to support the scientific research Lovell and his team were undertaking into the new discipline of radio astronomy.

Cosmic Noise Hut (Link Hut)

The Cosmic Noise Hut stands at the north-west corner of the Green and is attached by the Development Lab to the 21-foot telescope control room in the Polarisation Hut to its east.

The hut was originally built in 1949, using a standard construction system, as a control and receiving room for the adjacent 30-Foot telescope (a paraboloidal mesh radio-telescope that was sited to the west of the hut). This telescope was designed to investigate 'cosmic noise', ie the background extra-terrestrial radio signals that had been first discovered by Karl Jansky in 1932 and was the first paraboloidal telescope at Jodrell Bank (and for a few years, the largest fully-steerable telescope in the world). Only its concrete mounting pad now remains.

The hut was extended in 1953 with a darkroom to house a spectrohelioscope.

In common with many of the other original buildings at the property, it is constructed of a pre-cast concrete frame, with concrete block walls, metal-framed windows and felt roof.

It was used in the 1950s by Robert Hanbury Brown for the experiments that led to the discovery of the Hanbury Brown and Twiss effect in quantum optics.

In plan, it is a single-storey, L-plan building with the front facing south, and with the concrete pad for the 30ft telescope to the west. The extension is set back at the right, with a large central window and a lower flat roof. The timber Development Lab projects forwards at the right. The eastern wall of the extension is obscured by the attached Development Lab.

Inside the building, the floor is of herringbone parquet throughout, with linear edgings indicating the original location of partitions. Within the extension, two concrete pads within the parquet floor relate to the optics experiments, including the first experiments in optical intensity interferometry, which took place here.

In 2017, this building was awarded Grade II listing status, because of its importance as the site of the first experiments in optical interferometry, its degree of survival and its 'group value' as an example of the first phase of permanent building in the early history of the property.

Electrical Workshop

The Electrical Workshop, was built circa 1949, along with the other buildings around the Green. It stands along the east edge of the Green and is connected to the Mechanical Workshop (see below) by the Cryogenics Workshop.

The building is single storey and made predominantly of concrete, with a pre-cast concrete frame and concrete block walls, in the same vein as the other buildings that stand around the Green. Like them, it has metal window frames set in concrete surrounds.

The construction of this set of new buildings marked the advent of the permanent radio observatory at Jodrell Bank and are the earliest surviving structures built specifically for this.

The Electrical Workshop was originally used as the Main Office for the observatory, and housed the Library, Lecture Room and Sir Bernard Lovell's office (until the Control Building was completed in 1955). It was from this office that Lovell planned and directed the construction of the Lovell Telescope. The building also housed a number of examples of the interchange of ideas – for example, in 1953, over 40 radio astronomers from around the world gathered in the Lecture Room for one of the earliest meetings to discuss the emergence of this new science.

Once the hub of the Observatory transferred to the Control Building around 1955, the building was re-purposed as a workshop and in the 1970s the northeast corner was modified by the addition of the Cryogenics workshop, which now links the Electrical Workshop to the Mechanical Workshop.

In 2017, the building was awarded Grade II listed status, in recognition of its role in the emergence of radio astronomy.

Building 'ensemble' around the Green

The Cosmic Noise Hut and Electrical Workshop are part of an ensemble of buildings around the Green, the construction of which marked the establishment of permanent radio astronomy research body at the property.

Other buildings of the same type in this area include:

- **The Mechanical Workshop:** Stands at the northern end of the east side of the Green and is connected to the Electrical Workshop by the more recent extension known as the Cryogenics Workshop. It has retained its original use since it was built, in 1949. It has been extended to the east and was connected to the Electrical Workshop in the 1970s by the construction of the Cryogenics Workshop.
- **Polarisation Hut:** Located at the eastern end of the north side of the Green, this building is now connected to the Cosmic Noise Hut by the Development Lab. It housed various research offices including those of Roger Jennison and Mrinal Dasgupta who pioneered early experiments in long-baseline interferometry. It is now the control room for the 21-foot telescope (sometimes called the 7m telescope') used in undergraduate experiments.
- **Radiant Hut:** This building is located at the northern end of the west side of the Green. It is of the same construction as the other group of buildings and has a long-standing timber extension at its rear. It originally housed instruments that measured the outputs from arrays of Yagi aerials situated either side of the building used in radar studies of meteors (hence the name Radiant, after the point on the sky from which a meteor shower appears to radiate). It is currently used as an archive store.

- **Moon Hut:** Standing at the southern end of the west side of the green, this building, which is of the same type as the others around the Green, was also constructed in 1949. It originally housed researchers working on radar examinations of the lunar surface.

The Powerhouse

The Powerhouse is at the southeast corner of the Green, adjacent to the Mark II Telescope. Originally built in 1948 to house two 105kW generators, it was the first permanent building of the Observatory. It was extended in 1953 to house an additional 240kW generator to satisfy requirements for the Lovell Telescope then under construction. This generator is still in situ.

It is constructed of cream brick, with concrete window and door-sills and lintels. It has metal window frames and a flat roof.

The building still operates as the Powerhouse for the Observatory. Internally, it consists of a main central space that houses the generators and switchgear. It has two full-width mezzanine floors at either end (East and West). Below the East mezzanine there is a workshop.

To the east there is an area that is used for vehicle maintenance.

Telescope workshop and Dormitory Block

These buildings are located along the southern access road, just south of the Powerhouse.

They were constructed at the same time in the early to mid 1950s, using a concrete portal framework with walls of pre-cast concrete blocks. They have metal window frames, set in concrete window surrounds. Both buildings had new entrance foyers and the Telescope Workshop has a canopy, which were all added in the late 1950s.

The Telescope workshop, which is the northernmost of the two buildings, includes a large abstract mural in its entrance foyer, which is believed to date from 1966. The building was originally constructed in the early to mid 1950s as a staff canteen for the whole site community. The Lounge area at the southern end of the building was the social hub of the site where people would play cards, or hold parties. It was re-purposed as a workshop in around 1970 following construction of a café in the recently constructed visitors centre to the north of the site (now replaced by the Discovery Centre).

Just to the south of the Telescope Workshop lies the Dormitory Block. It was originally designed as an accommodation block (in keeping with many Observatories worldwide) for scientists who were working overnight on site. It retained this use until the early-mid 2000s and is now used for storage.

The two buildings were sited on what was, for many years, the main entrance road to the site, and is now used as the main staff entrance.

The site of the Transit Telescope

In the southeast corner of the Green area lies the area that was once the site of the Transit Telescope, completed in 1947 and used until the early 1960s. This is now no longer present above ground, and the site itself has been built over, in part, in subsequent years. The Mark II Telescope stands at one corner of its former location, but the landscape still indicates clearly where the Transit Telescope once stood.

Geophysical scanning of the area has indicated that archaeological traces of the Telescope and its supporting structures remain underground.

Some elements of the Transit Telescope (including steel support poles and concrete anchor blocks) are also retained here and elsewhere on site.

A full archaeological examination of the area is planned in the near future.

Sites and remnants of other early scientific instruments

In addition to the Telescopes that are currently in use for research and teaching (Lovell, Mark II, 21-ft and 42-ft), there are traces and remnants of a number of early scientific instruments in addition to the Transit Telescope.

The Searchlight Telescope

Standing in the Green, just south of its centre, are the remains of the Searchlight Telescope, an aerial created from the base of a Second World War trailer-mounted searchlight in 1946. These are the earliest remnants of a scientific instrument on the property.

The searchlight base wheels have been removed and the chassis immobilised by a framework of scaffolding poles set into a concrete pad. The mount is now rusted and unlikely to revolve at present (although conservation work may free this up in future). The aerial structures are no longer present.

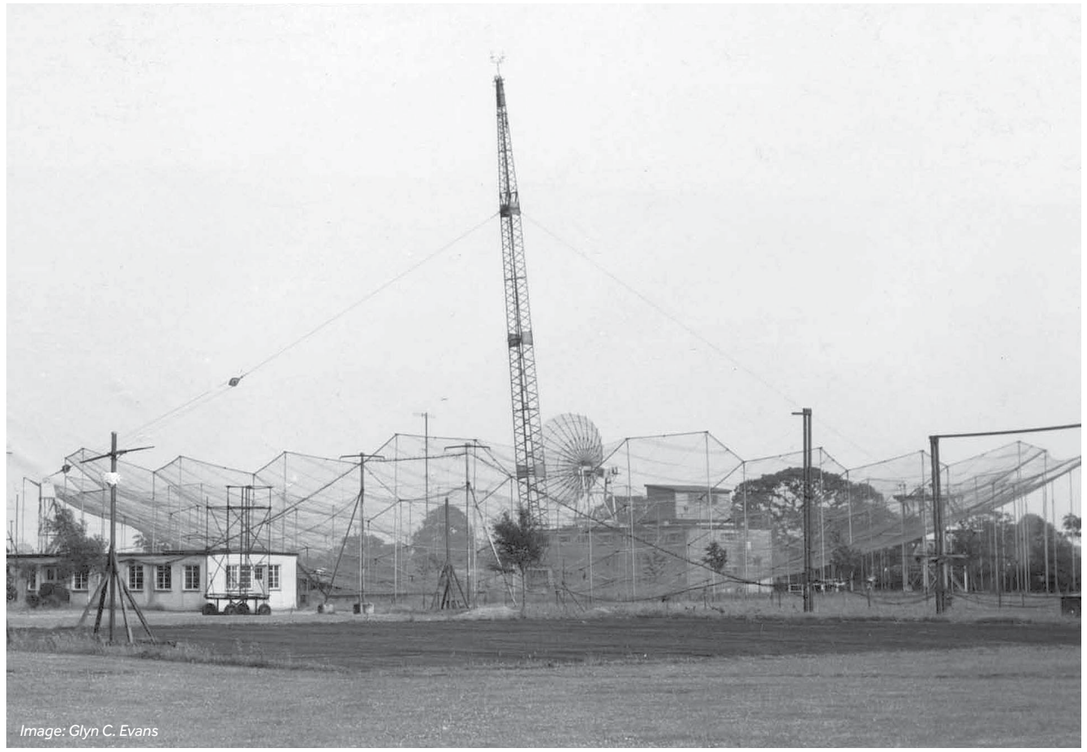


Image: Glyn C. Evans

Two large girders and associated bolted L-shaped girders resting on timbers across the top of the mount do not form part of the original structure.

Around the pad there is an area of partly-obscured hard standing that corresponds to the area used as the turning circle of the telescope when it was in operation

To either side of this area (east and west) run concrete channels that originally housed cabling. These run towards Park Royal and Moon Hut respectively.

The Searchlight Aerial was originally created by John Clegg, who was an expert on radar aerials, in order to observe meteors with more accuracy. The searchlight mount was originally a loan from the army and was placed at its current position near to the (then) location of the Park Royal trailer (see section above). It was subsequently used for several other pieces of research and was used as the backdrop for group photos, including the formal photograph that celebrated the appointment of Bernard Lovell as the world's first Professor of Radio Astronomy in 1951.

In 2017, the structure was Grade II listed, and archaeological and conservation work is planned in the near future.

Helical Antenna Base

This concrete footing lies outside the northern end of the Control Building. It is approximately 4m x 4m in size and stands in the lawn in that area. It was originally constructed as the base of a distinctive helical antenna deployed at Jodrell Bank by the United States' Space Technology Laboratories team in circa 1959 for their spacecraft tracking programme.

30ft Telescope Base

Standing immediately to the west of the Cosmic Noise Hut, this concrete pad is around 4m x 4m in size and is flush with the tarmac that now surrounds it. Originally constructed in circa 1949, it was the footing of the steerable 30ft Telescope that was one of the inspirations for the Lovell Telescope. It contains a circle of mounting bolts (just over 1m in diameter), slightly west of its centre, that indicates the location of the original telescope fixings.

Meteor Radar Ground Plane

In approximately the centre of the Green, this consists primarily of a tarmacadam surface 27m x 27m in size. Its southern edge is delineated by a concrete cable duct, sitting flush with the ground, that runs along the line of a former field boundary (this can be identified clearly by a change in ground level). This was used in tandem with a radar transmitter working at 60 MHz and two receiving aerials at its south edge, in experiments to measure the heights of meteors. When in use this reflecting plane was covered in wire mesh. The surface is still used as an area for experimental apparatus.

Total Rates Antenna Base

This concrete plinth stands approximately 30m south of the remains of the Searchlight Telescope, is around 2m x 2m in cross section and stands around quarter of a metre above ground level. It has 4 mounting bolts at each corner. This was originally the base block for the 'Total Rates' antenna.

The Botany Huts

The Botany Huts stand close to the very south perimeter of the Property. They were built for use by University of Manchester Botanists who, from 1939 (i.e. prior to the arrival of Bernard Lovell in December 1945), used the site as a testing ground.

The buildings are built of timber and are both single-storey. They are unremarkable in themselves, but significant in that they were the first structures used by the scientists who were instrumental in creating the field of radio astronomy.

Both structures, which are set at a slight angle to each other, have one large room plus some smaller rooms. There is some overgrowth by vegetation.

Following the arrival of Lovell at Jodrell Bank in 1945, the two huts became exclusively used by Lovell's team as their base; Lovell says that originally one of the huts had a coke stove where the team thawed out, brewed tea and ate their packed lunches. The botany huts continued to be used for around ten years with former staff recalling that one hut was used for research and storage with a canteen and the other was used as a dormitory. Eventually they were replaced by a purpose-built canteen building (now the telescope workshop) and companion dormitory building constructed in the mid-1950s. Their ownership then returned to the Botany Department, which used them until, it is believed, the early 1990s. Both huts are presently disused.

Image: The University of Manchester

2.3 Gazetteer of Elements of the property

The Conservation Management Plan for the property contains a complete gazetteer of all its elements.

Table 1 lists key elements of the property which contribute to the attributes as described above, together with their Gazetteer codes. Their positions are noted in the map shown in Figure 2.4.

Table 1: Key elements of the property

Brief description	CMP Code	Type	Condition	Protection	Note
The Lovell Telescope: Radio telescope, standing 89m high, with dish of diameter 76m. First very large radio telescope in the world.	B07	Structure	Good	Grade I listed	Still in use as a radio telescope
The Control Building: Principal building in the property, completed in 1955 and housing the Control Room for the Lovell Telescope.	B05	Building	Good	Grade II listed	Later (unlisted) extensions in poorer condition
Helical Antenna base: Concrete pad, approx. 4m x 4m, which was originally the base of the Helical Antenna installed by the US Space Technology Laboratories team in around 1959.	A01	Archaeology	Good		
The Green: Landscape at the heart of the property	L05	Landscape	Good-moderate		
30ft Telescope base: Concrete pad, approx. 4m x 4m, originally the footing of the steerable 30ft Telescope that was part of the inspiration for the Lovell Telescope.	A02	Archaeology	Good		
Cosmic Noise Hut: Concrete building now known as the Link Hut, originally the control room for the 30ft Telescope, later altered to accommodate solar and optics experiments.	B11	Building	Mixed	Grade II listed	
Polarisation Hut: Another typical hut in the style of the ensemble around the Green. Originally used as the base for early experiments in long-baseline interferometry.	B13	Building	Good		
Mechanical Workshop	B17	Building	Moderate		
Electrical Workshop: Original site of the Main Office for the Observatory, including Lovell's office, lecture room and library.	B19	Building	Good	Grade II listed	
Radiant Hut: originally home to the meteor research group	B26	Building	Moderate		
Moon Hut: original home to the lunar and planetary radar group	B25	Building	Moderate		
Park Royal: Original control building for the Transit Telescope, subsequently used as the control room for the Mark II Telescope	B20	Building	Good	Grade II listed	
Powerhouse: location for electrical generators	B23	Building	Moderate		Still in use for original purpose
Mark II Telescope: Completed 1964, it was the first large telescope in the world to be controlled by digital computer.	B21	Structure	Good	Grade I listed	Still in use as a radio telescope
Remains of searchlight aerial: only the base remains	A05	Archaeology	Good	Grade II listed	
Remains of 218ft Transit Telescope: first very large paraboloidal telescope at the site, inspiration for Lovell Telescope	A13	Archaeology	Good		

2.4 Pre-existing Management Framework

The property is fortunate in that it already has a well-established management framework, which has been in existence since its inception.

That said, the management has, to date, prioritised its world-leading science and engineering research, rather than focussing on its heritage. Alongside the management of research activities, visitor management has also been developed in a way that is sympathetic to both scientific operations and heritage. Management of the heritage of the property has, to date, been more informal.

The nomination process has, for the first time, initiated the development and implementation of management practices that bring the three important elements of science, visitors and heritage together. In doing so, the wide group of site stakeholders (both site users and others) has been involved in the process.

This section sets out the pre-existing management framework and external stakeholder relationships at the point of nomination. The management framework, post-nomination, is described in section 6.

2.4.1 Site Users

The Jodrell Bank site is used by three distinct groups:

1. The Jodrell Bank Centre for Astrophysics (JBCA) – a Division of the University of Manchester's School of Physics and Astronomy comprising research activities at Jodrell Bank Observatory and in the Alan Turing Building on the main University campus in Manchester;

2. The Jodrell Bank Discovery Centre (JBDC) – one of the University of Manchester's Cultural Institutions and responsible for visitors to the site;

3. The Square Kilometre Array Organisation (SKAO) – an international research organisation, collaborating with the Jodrell Bank Centre for Astrophysics and many other similar institutions worldwide and leasing land at Jodrell Bank from the University on which their international headquarters is sited (see, for example, Figure 2.5). The SKAO is due to become an Inter□ Governmental Organisation, by International Treaty, in 2018/19.

Of these three groups, only the first two are located on the nominated property, as the SKAO area sits outside its boundary in the Buffer Zone, although its building is accessed through the property. The three groups therefore coexist on the wider University of Manchester-owned Jodrell Bank site, and use facilities and areas in the nominated property on a daily basis.

2.4.2 Management

The current management structure is represented in Figure 2.7 and described below.

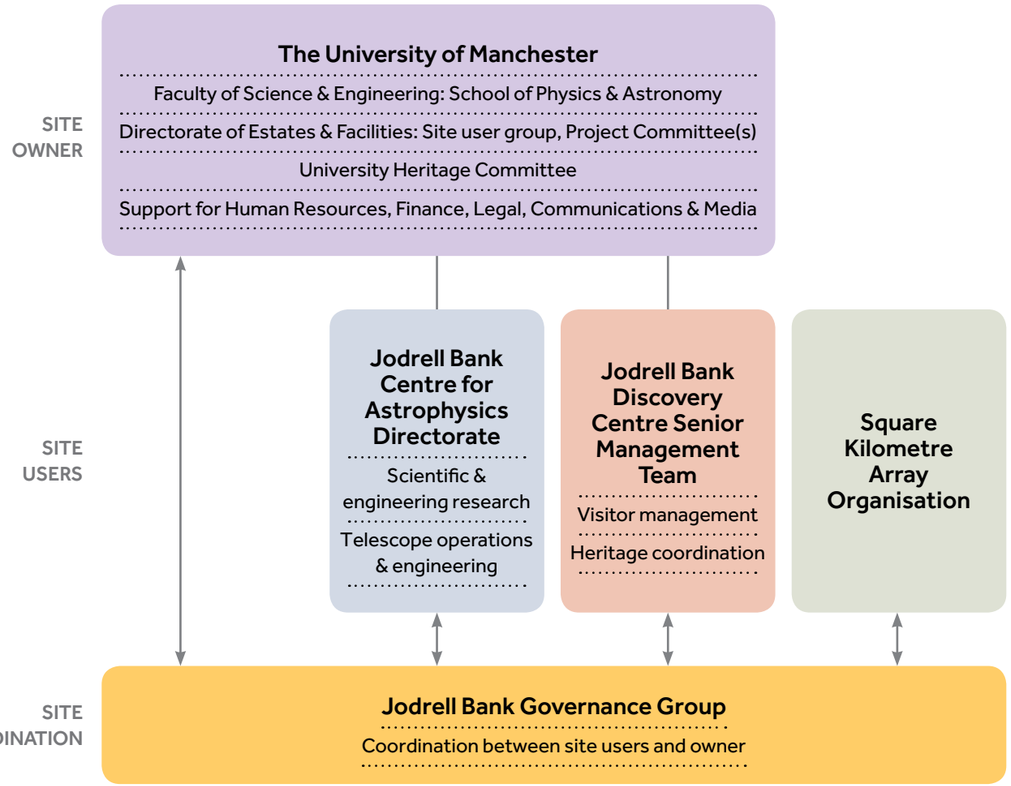
Site Coordination Level

Coordination of activities on the Jodrell Bank property is currently undertaken by a University committee, the Jodrell Bank Site Governance Group, which includes all key internal stakeholders including representatives of the three main site user groups. The Group meets 2-3 times per year and takes a strategic overview of work, events and developments at the Jodrell Bank site with particular focus on where interests of the three user groups overlap. This has, to date, also included discussion of the World Heritage Site process.

Operational Level

In addition to the coordination exercised by the Governance Group, each of the three site user groups has its own well-developed and independent management and operational structures. There are however cross-links between each team and also links from various points to external stakeholders. These management structures are concerned primarily with their function at Jodrell Bank (e.g. scientific research and development, telescope engineering and operations, public engagement etc). Roles managing the heritage of Jodrell Bank are integrated into the day-to-day work of the Observatory element of JBCA and the JBDC, supported by other management groups within the University of Manchester. This ensures that responsibility is taken for the protection and enhancement of the heritage aspects of the site, including the due care of archaeological remains.

Figure 2.7: Current management structure at Jodrell Bank site



These local management structures are:

The Observatory: Managing Science and Engineering

- The Jodrell Bank Centre for Astrophysics Directorate has oversight of the research and engineering functions of Observatory and the wider research division, including the e-MERLIN National Facility and the relationship with the SKA Organisation.
- The JBCA Engineering team is responsible for maintenance and conservation of the Telescopes both at Jodrell Bank and elsewhere in the UK's e-MERLIN network.
- The day-to-day management of the Observatory Estate and buildings is undertaken by the Observatory team working alongside the University's Directorate of Estates and Facilities. These areas include all the major heritage Attributes of the site.
- One of the JBCA Associate Directors is tasked with managing the heritage of the Observatory.
- Academic and Engineering staff also collaborate with the Discovery Centre to deliver Education and public engagement ('presentation') activities.

The Jodrell Bank Discovery Centre: Managing Visitors, oversight of Heritage

- The Discovery Centre team coordinates the World Heritage Site process.
- It has responsibility for management of Estate and Buildings open to the public
- It provides visitor services and support
- The property's Education, Exhibition and Events teams are part of the Discovery Centre
- It takes a lead on managing the gardens, sustainability, green policies and biodiversity on behalf of the University and has a gardens team that focus on this.
- The Heritage Officer for the property is part of the Discovery Centre team.

University support structures

- The University of Manchester Heritage Committee (Chaired by the University's Deputy President and Deputy Vice Chancellor), has representation from all relevant University areas, including Jodrell Bank. The University's Historian and Heritage Manager is also supporting the process of Nomination to UNESCO and will be part of the Steering Committee
- The University Estates site 'User Group' coordinates ongoing Estates matters at the site for all stakeholders.
- Any major capital projects are overseen by a Project Committee established by the University Directorate of Estates and Facilities with senior representation from the site users.
- The University's Sustainability and Green Travel Plan Group provide support on sustainability.
- The University also provides functional support from its Professional Support Services (PSS) team, including the Finance Division; Legal team; HR team; Communications team etc.

2.4.3 University Planning Cycle

In addition to the requirements of the process of maintenance engineering, planning of activities and developments at Jodrell Bank Centre for Astrophysics and the Jodrell Bank Discovery Centre is managed through the University's planning cycle, which combines elements of yearly, 5-yearly and long-term planning. The cycle includes teaching, research and public engagement commitments as a matter of course, and sets out the framework for resourcing all the various activities that take place. Overlaid on this are the planning cycles of other key stakeholders, such as Government research councils (particularly STFC – the Science and Technology Facilities Council which is a major funder of research and observatory operations) and external bodies such as the European VLBI network with which telescope observations are regularly coordinated.

This process sits alongside management of the heritage and the attributes that carry the Outstanding Universal Value of the property, which are described later in this Management Plan.

2.4.4 External Stakeholders

The property has a number of external stakeholders. These include local and national communities; the wider scientific community and associated governing bodies and funders; the planning authority and Heritage bodies. The SKAO can also be seen as an external stakeholder. However, it is a special case as it is located adjacent to the property and access to its site is via the property, hence it is dealt with above as a site user.

The main external stakeholders are:

- **Local communities:** These are, in general, represented by local Parish Councils. In the case of Jodrell Bank, the main Parish Councils are those for Lower Withington and Goostrey.
- **Retired and former staff & students:** There is a significant community of people who have worked and/or studied at Jodrell Bank and who have relevant heritage knowledge and experience.
- **National and regional communities of interest:** These include amateur astronomers, history of science and engineering groups etc. The main group linked to Jodrell Bank in this category is the Macclesfield Astronomical Society, which has a strong relationship with the site. Group members participate in astronomy and heritage events at the Jodrell Bank Discovery Centre.
- **The international astronomy research community**, including national/international users of the telescopes operated by Jodrell Bank, the European VLBI Network (EVN), the Large European Array for Pulsars (LEAP) etc. JBCA astronomers are leading members of this community and are in daily contact with others across these networks.
- **UK Science and Engineering Research Councils** (especially the Science and Technology Facilities Council, STFC): JBCA staff are involved in work with the Research Councils at all levels and JBDC staff sit on STFC public engagement panels.
- **Cheshire East Council:** Interactions range from high level strategic links concerned with the benefit to Cheshire of the world leading heritage, research and profile of Jodrell Bank, to more practical links concerned with particular issues (especially planning and conservation).
- Cheshire West Council: Interactions are linked mainly to planning issues.
- **Historic England:** Jodrell Bank and University staff have strong working relationships with Historic England at many levels, particularly relating to listed status of various structures and buildings.
- **The Royal Astronomical Society (RAS):** As the professional body for UK astronomy, the Observatory and Discovery Centre have relationships at several levels of the RAS, including its Heritage Committee.
- **The International Astronomical Union (IAU) and the IAU/ICOMOS Working Group on Astronomy and World Heritage:** Jodrell Bank has already begun dialogue with the Working Group on Astronomy. A 'Case Study' on Jodrell Bank is under preparation for inclusion on the ICOMOS/IAU website on Astronomy and Heritage.
- **Marketing Cheshire:** The Discovery Centre has a strong working relationship with this agency, which is responsible for strategic support and promotion of tourism in Cheshire and for facilitating wider benefits from the visitor economy.
- **Marketing Manchester:** The Discovery Centre also has a strong working relationship with this agency, which is responsible for strategic support and promotion of tourism in Greater Manchester, a significant catchment area for visitors but also the location of the main campus of the University of Manchester.

Consultation about the Jodrell Bank application for World Heritage Site status has taken place with representatives of all stakeholders and dialogue takes place with them on a regular basis.

As described later in this Management Plan, representatives of appropriate groups from the above list are included in the World Heritage Site Committee.

In addition to the groups above, the general public are also key stakeholders of the site. Consultation with them, including general visitors and groups (conservation organisations, bee keepers etc) has taken place over the last 3 to 5 years, while the process of preparing the nomination dossier has been underway. Formal consultation and involvement of these groups will take place at regular intervals in future (see the Action Plan later in this document).

Image: Howard Barlow

3 Significance and Protection

Image: Anthony Holloway

3.1 Outstanding Universal Value of the Property

a. Brief Synthesis

Jodrell Bank Observatory is the earliest radio astronomy observatory in the world that is still in existence.

It is the one remaining site, worldwide, that includes evidence of every stage of the post-1945 emergence of radio astronomy, and, as such, played a pioneering role in a revolution in our understanding of the Universe.

Radio astronomy showed that there is far more to the Universe than meets the human eye, and that entirely new information can be obtained by using radio waves – a revolution exemplified by a range of features across the site.

Located in rural Cheshire in northwest England, the Observatory, which is part of the University of Manchester, is dominated by the iconic Lovell Telescope, the first very large fully-steerable radio telescope in the world. Constructed between 1952 and 1957, its first act was to track the carrier rocket for Sputnik 1, the first satellite ever launched into orbit and humanity's first step into space. The Telescope was the largest of its kind in the world for 15 years and inspired the construction of many other instruments worldwide.

The property encompasses a number of other radio telescopes, including the Mark II Telescope, and functional buildings on a 17.38-hectare site. Many of these are original structures and instruments, while remnants of earlier structures also persist, some of them below ground.

The character of the Observatory has been determined by the evolution of radio astronomy. Scientists first arrived at the southern boundary of the site in 1945, and then moved northwards as they made new discoveries, creating new equipment and experiments, thereby imprinting the development of the science on the landscape of the site.

The Observatory is not solely a scientific monument as it still carries out world-leading research. It currently hosts the UK's national array of 7 radio telescopes, and collaborates with many other radio telescopes worldwide.

The scientific importance of the property is demonstrated by the influence of its work, evidenced by the data and scientific publications in its archive, and its continuing research.

b. Justification for Criteria

Criterion (i) represents a masterpiece of human creative genius

Jodrell Bank Observatory is an outstanding example of supreme scientific and technical achievement, which revolutionised our understanding of the Universe. The post-1945 emergence of the science of radio astronomy was a turning point in the progress of 20th century astronomy. At Jodrell Bank, evidence of every stage of this is present in the property. This includes: the early use of recycled radar equipment; the construction in 1947 of the Transit Telescope (then the world's largest telescope); and the creation of the iconic Lovell Telescope in 1957 (superseding the Transit Telescope as the world's largest). The development of the Observatory, as a whole, was driven by the vision, determination and creative scientific genius of Sir Bernard Lovell and the team that gathered around him.

Criterion (ii) exhibits an important interchange of human values

The Jodrell Bank Observatory contains numerous examples of physical evidence of the international interchange of ideas at a significant time in history, as the new science of radio astronomy and the space age developed during the 1940s-60s. This is epitomised by the structures of the iconic Lovell Telescope and the Mark II Telescope, which dominate the site and effectively 'bracket' the property. It is also embodied in the character of the landscape itself and the structures that housed and exemplify the work that was at the heart of this unique flowering of international cooperation and exchange of values and ideas. These included developments in astronomy, but also extended more widely to include, for example, quantum optics; interferometry; spacecraft tracking and satellite communications.

Image: Anthony Holloway

Criterion (iv): an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history

Jodrell Bank Observatory is the unique technological and landscape ensemble, globally, that exemplifies, through its surviving physical evidence, the transition from traditional optical astronomy to modern multi-wavelength astrophysics that took place during the 1940s and the years that followed. Developments at all stages of this history took place within its boundaries, with many of the earliest features, or their locations, extant and recognisable. This was a significant stage in the history of understanding our place in the Universe.

It was also a significant stage in the peacetime development of 'Big Science', which followed the Second World War, and was characterised by a leap in the scale of projects, paralleled by a leap in scale of funding and in numbers of collaborating scientists and engineers. While the size of the Lovell Telescope means that it is the most obvious feature of the site, it is, in fact, the Observatory as an ensemble that is at the heart of the property. The character of the landscape and the interrelation between buildings and structures speaks of the revolutionary developments that took place there, and represent this significant stage in human history.

Criterion (vi) directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance

Jodrell Bank Observatory is inextricably linked to the fundamental concept underpinning modern astronomy: that we live on a planet orbiting a star, one in a galaxy of several hundred billion stars, itself only one of a hundred billion galaxies in the observable universe.

When radio telescopes were first pointed at the sky, it became apparent that there were whole aspects of the Universe, including exotic objects previously unimagined, which ordinary (optical) telescopes cannot see.

Jodrell Bank Observatory is intrinsically linked to this discovery – that there is far more to the Universe than meets the human eye, and that entirely new information can be obtained by using 'invisible' light, beyond the usual 'rainbow' of visible colours. Modern Astrophysics now uses this 'invisible light' as a matter of course, to examine the Universe, but the first major step towards this was taken by radio astronomy.

c. Statement of Integrity

All the tangible attributes of the property sit within the site boundaries. The nominated property is solely owned by the University of Manchester, and the boundaries of the site are clearly identifiable in the Deeds of Ownership of the land. The property is generally in a good state of conservation. The integrity of some elements of the property is compromised (for example, only 5-10% of some of the original scientific instruments remain, as traces below ground). However, most of the buildings in the property are in good condition and the Grade I listing and continued research use of the Lovell Telescope and the Mark II Telescope has ensured that the integrity and function of the most iconic elements of the property have been retained.

d. Statement of Authenticity

Despite the rapid and continuing developments at Jodrell Bank, the site preserves good evidence for the emergence of the science of Radio Astronomy and retains a high level of authenticity due to its function as an observatory. The character of the Observatory landscape persists, major structures are preserved in working order and sites of all the major phases of development survive, even if in some cases only as archaeological evidence. The authenticity of this is supported by a very strong body of associated documentation, including many thousands of international research papers, a variety of archives and a huge number of archived media reports. The contributions of the property to the science of astronomy are documented extensively in scientific literature from its emergence to the present day.

e. Requirements for Protection and Management

The Lovell Telescope was awarded Grade I Listed status in 1988 and therefore enjoys full statutory protection under this and other Planning regulations. In 2017, the Mark II Telescope was also Grade I listed and five other historical structures at the site were also listed at Grade II. All new developments at the property are also controlled through the spatial planning system. Both local planning authorities have included specific policies for the protection of Jodrell Bank and its buffer zone in their Local Plans.

The Buffer Zone for the property (which is 18569.28 hectares in area) has been set up using the radio telescope protection zone around the Observatory, which was established by the Jodrell Bank Radio Telescope Direction (1973). (This is similar to an area protecting a 'dark night sky' around an optical observatory, and has acted as a de facto buffer zone since 1973).

The Jodrell Bank site is relatively small (17.38 hectares), has clear boundaries and a single owner. All elements expressing the OUV of the site lie within the boundaries of the property.

The property benefits from being solely owned by The University of Manchester, which has a robust and successful management system in place, including a site Governance Group, that takes oversight of all activities. The property has a completed World Heritage Management Plan.

A Steering Group including all stakeholders will oversee the management of the World Heritage Site. It is also planned to establish a strategy of deemed consent with all relevant stakeholders in 2018/19.

The University of Manchester, owner of the property, is investing £15million in conservation of the property, in order to provide a good basis for future management.

The property also benefits from a very successful visitor facility, the Jodrell Bank Discovery Centre, which already attracts 185,000 visitors each year, including 26,000 school pupils on educational visits. The visitor facility has plans in place for the sustainable management of future visitation levels and recently secured funding of £20.5million (from various sources) for a new visitor gallery that will be constricted in the buffer zone.

3.2 Values and Attributes of the Nominated Property

The Outstanding Universal Value of Jodrell Bank Observatory is conveyed by the following attributes:

The Landscape and Layout of the Site

Of all the early radio astronomy sites to develop worldwide, Jodrell Bank Observatory alone retains its original landscape, layout and function.

The Observatory was founded in 1945 when Bernard Lovell, a physicist at the University of Manchester, arrived with army radar equipment on trailers, with the intention of studying cosmic rays.

The Observatory grew from that point, as Lovell gathered a team of scientists around him. Over the two decades following this, they pioneered the new science of radio astronomy, humanity's first step beyond traditional optical astronomy, moving from south to north across the site, laying down all traces of its emergence on the landscape.

Having been used continuously since it was founded in 1945, it is now a technological and scientific ensemble that gives a clear illustration of the evolution of radio astronomy, and is a testament to the collective vision, determination and creative scientific genius of the people who founded it.

The landscape and layout tells the story of the emergence of this new science. Early work with innovative instruments gave way to permanent buildings, built in arrangements to serve the science, culminating in the spectacular telescopes that are the emblems of the Observatory today.

The Lovell Telescope and Mark II Telescope

The nominated property is dominated by two very large radio telescopes: the Lovell Telescope and the Mark II Telescope, which are both Grade I listed buildings.

The largest, and most iconic, of these is the Lovell Telescope. The world's biggest telescope when it was completed in 1957, its collecting area was almost 10 times more than any similar instrument. It inspired the construction of many other very large paraboloidal telescopes across the world, and six decades on, it remains the third largest fully-steerable telescope in the world.

The Mark II Telescope is the site's second large-scale fully steerable radio telescope and the first in the world to be controlled by a digital computer. Completed in 1964, its design was used as the basis for the world's first paraboloidal satellite communications antenna, Goonhilly No 1 in Cornwall.

Standing 89 metres above the Cheshire plain, the Lovell Telescope is both an international icon of science and engineering and a popular landmark that dominates the surrounding area, looming above the trees and hedgerows of its largely agricultural surroundings and visible for many miles. Its unique design stands today as a symbol of the emergence of a new science and the peak of a particular movement in post-war science, and in radio astronomy in particular, which will never be repeated or surpassed.

The Control Building

The Control Building was completed in 1955, a decade after the inception of the site. It houses the control room, purpose-built for the Lovell Telescope, and is still the hub of Observatory operations. The first use of the building was for a Symposium of the International Astronomical Union in August 1955, attracting astronomers from around the world to discuss the latest developments in radio astronomy.

It was the site of several landmark achievements in the space race, including the point from which the Lovell Telescope was driven to track the carrier rocket for the soviet Sputnik 1 satellite (the world's first extra-terrestrial vehicle) on 11 October 1957, and where signals were received from the Luna 2 rocket on 13 September 1959 (the first spacecraft to reach the surface of another celestial body).

These early instances of the international interchange of human values exemplify the way in which this permeates the whole site, including not only developments in astronomy but also quantum optics; interferometry; spacecraft tracking & communications; and wider culture. Many of the structures on the site housed, and embody, the work that was at the heart of this flowering of international co-operation and exchange of values and ideas.

The Green and associated Observatory buildings

This series of modest concrete-framed huts, arranged around an open central space (appropriately called 'The Green'), was built in 1949. Its creation marked the transition of the Observatory from a place that was simply the location of experimental equipment, mostly housed in ex-army trailers, to a permanent research station.

The buildings, some evocatively named after the research carried out by the occupants – Moon Hut, Radiant Hut, Cosmic Noise Hut – still remain. Several have now been Grade II listed: the Park Royal building (the control room for the Transit Telescope and later the Mark II Telescope); the Electrical Workshop (before the Control Building, this was the 'Main Office' housing the site's library, lecture room and Bernard Lovell's office); the Link Hut, originally Cosmic Noise Hut (the control room for a 9.1m telescope used to investigate 'cosmic noise' and interstellar hydrogen.

Arranged so that they were interspersed with space for a range of experimental aerials and telescopes, the ensemble gives the site a very particular character, which exists to the present day.

Image: The University of Manchester

The Green in 2015, showing original research buildings and the Mark II Telescope (on the site of the Transit Telescope).

The site of the Transit Telescope

In 1947 the Jodrell Bank team built what was then the world's largest radio telescope – the 218-foot (66.4m) diameter Transit Telescope, a mesh bowl fixed to point directly upwards at the sky passing overhead as the Earth turns. Its size was, rather practically, determined by the space between hedgerows and on-site roads that are still in existence. Although it was dismantled in the early 1960's, some remnants of the telescope still exist in concrete footings, below ground archaeology and steel poles recycled for use elsewhere on site. The Mark II Telescope now stands on one edge of its location.

It was the largest telescope in the world from 1947 to 1957 (when it was superseded by the Lovell Telescope) and, in 1950, was used to make the revolutionary first identification of radio waves originating from an object outside our own galaxy, the Andromeda Galaxy.

Sites and remnants of other early scientific instruments

As scientific questions changed and technology developed, instruments were built for specific uses and then set aside, modified or dismantled to be recycled into something new. This characteristic evolution in practice has left a trail, across the Observatory, of locations of early instruments and some physical remains.

These include the remnants of the earliest example of a permanent radio-astronomical instrument at Jodrell Bank, the Searchlight Aerial, built in 1946. When observations of the Giacobinid meteor storm made with this were presented at the December 1946 meeting of the Royal Astronomical Society, the President of the Society announced it as the birth of "an entirely new field of astronomical research". Radio Astronomy had arrived.

The Botany Huts

Bernard Lovell arrived at the University of Manchester's Botany Grounds at Jodrell Bank in December 1945, with two trailers of army radar equipment, with which he proposed to study cosmic ray trails in the atmosphere. The iconic first photograph of that day shows him, with the trailers, standing outside the two wooden Botany Huts, which were then used by the gardeners.

The Botany Huts remain, now unoccupied, in the abandoned botany grounds, as a tangible reminder of those first days at Jodrell Bank, the first days of the Observatory itself. It was from these modest beginnings that a completely new way of understanding the Universe developed.

Value of science research

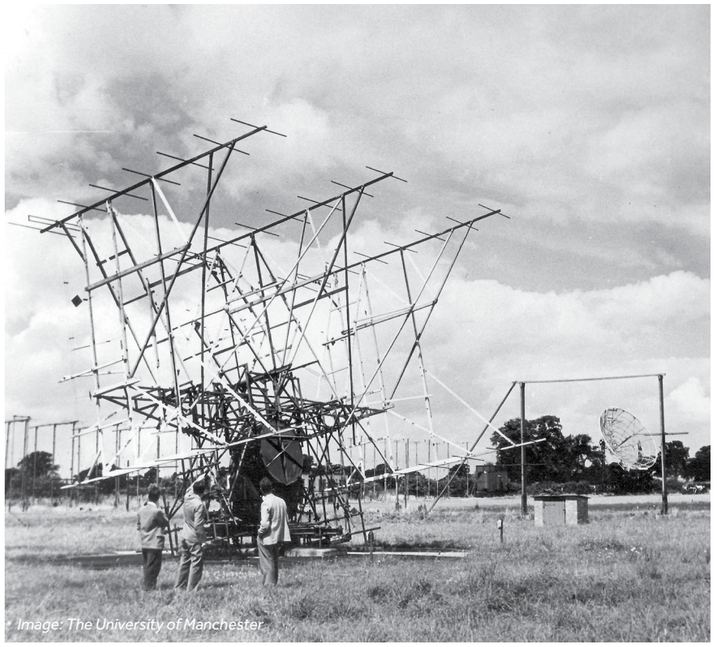
In addition to the Attributes of OUV described above, the site is a location for world-leading science research. While this has high value in itself, it also contributes to the Authenticity of Function of the nominated property and the records of scientific endeavour are a key element of the Integrity of the property as a whole.

Value as a Centre for Education and Tourism

The nominated property and the wider site around it also have a high value as a centre for Education and for Tourism. At the time of writing, the Education programme welcomes over 26,000 school pupils per year, and this is set to rise to over 30,000 in the next 3-5 years. The visitor facilities welcome around 185,000 people per year in total, and there are plans to widen this to 250,000 visitors in a sustainable way in the next 3-5 years.

Value of Biodiversity and the wider environment

The nominated property and the wider Jodrell Bank site puts a high value on maintaining, promoting and enhancing the biodiversity of the site. The University of Manchester has a biodiversity action plan for the site, which supports these aims.



The Searchlight Aerial on the Green in around 1951.

3.3 Heritage Protection

The nominated property is fully protected through ownership, legislation and planning policy.

3.3.1 Ownership

The whole nominated site, together with much of the land around it, is owned by The University of Manchester who are committed both to continuing the scientific use of the site and to the conservation of its heritage interest (see Section 2.1 above for details and map). What happens within the nominated property is entirely controlled by the University. The University also controls much of the land around the nominated property either directly or through legal agreements with the occupiers. This gives a strong level of protection and proactive management. The way in which the planning system works to protect the nominated property in practice is described in Section 4.2.1 of this document.

3.3.2 Legal protection

In England there are two interlocking legal approaches to the protection of heritage – designation, and spatial planning policy.

Designations

Heritage designation applies to specific assets. These can be scheduled ancient monuments, listed buildings, conservation areas, historic parks and gardens, and battlefields. These are designated under varying powers and consent must be granted for works to be carried out to them.

Ancient monuments are scheduled under the terms of the 1979 Ancient Monuments and Archaeological Areas Act (as amended). Consent for works to them is granted by the Secretary of State for Culture, Digital, Media and Sport, advised by Historic England, the government's statutory advisor on the historic environment.

Listed Buildings and Conservation Areas are designated under the Planning (Listed Buildings and Conservation Areas) Act 1990. Listed Buildings are buildings of special architectural or historical interest and can be graded I, II*, or II. Listed Buildings are listed by the Secretary of State for Culture, Digital, Media and Sport, advised by Historic England. Once a building is listed, consent is needed from the relevant local authority for any works that might change its character. For a building listed at Grade I or II*, the local authority should seek the comments of Historic England when considering an application for listed building consent.

Conservation Areas are designated by the relevant local authority, or in exceptional circumstances by the Secretary of State for Communities and Local Government.

The only designated assets within the Jodrell Bank nominated property are a number of listed buildings. The Lovell Telescope has been listed at Grade I since 1988. In August 2017 further buildings were listed: The Mark II Telescope (Grade I); The Control Building (Grade II); The Cosmic Noise Hut (Grade II); The Electrical Workshop (Grade II); The Park Royal Building (Grade II) and the remains of the Searchlight Telescope (also known as the Searchlight Aerial) (Grade II). This establishes a high level of control since listed building consent is required for any changes to the structure. This consent is normally granted by the local authority who should seek the advice of Historic England on any listed building consent application for a Grade I or II* structure. Developments within the setting of the Lovell Telescope also have to be considered with regard to their impact on its character. Setting is discussed further below. Here it should be noted that the scale and height of the Lovell Telescope mean that its setting is extensive.

Designation	Component	Date of designation
Grade I	The Lovell Telescope	1988
Grade I	The Mark II Telescope	2017
Grade II	The Control Building	2017
Grade II	Cosmic Noise Hut	2017
Grade II	Electrical Workshop	2017
Grade II	Park Royal	2017
Grade II	Remains of the Searchlight Aerial	2017

World Heritage properties are not in themselves designations under English law and there is therefore no specific consent procedure similar to that for listed buildings. They are therefore protected through the spatial planning system and through the designation of specific assets within them. National planning advice (see below) says that, as an international designation, they should be treated as the equivalent of national designations of the highest significance and that they should be protected to a high level.

3.3.3 Spatial Planning system

England has a plan-led spatial planning system. The basic legal powers are provided by primary legislation.

The legal framework is established principally by four Acts of Parliament:

- Town and Country Planning Act 1990 – this consolidated previous town and country planning legislation and sets out how development is regulated
- Planning and Compulsory Purchase Act 2004 – this made changes to development control, compulsory purchase and the application of the Planning Acts to Crown land.
- Planning Act 2008 – this set out the framework for the planning processes for nationally significant infrastructure projects and provided for the community infrastructure levy
- Localism Act 2011 – this provides the legal framework for neighbourhood planning powers and the duty to cooperate with neighbouring authorities.

National Planning Policy

In 2012 the Government consolidated virtually all national planning policy guidance into one National Planning Policy Framework (NPPF). This is supported by national Planning Practice Guidance (PPG), first published online in 2014 and updated as necessary. At the local level, policies for protection of the historic environment are set in the local development plan. The nominated property is in the Cheshire East local authority area. The Buffer Zone lies in both Cheshire East and in the neighbouring local authority area of Cheshire West and Chester (See map in Figure 2.3).

Cheshire East Local Plan and Strategy

The principal plan currently affecting the nominated property is the Cheshire East Local Plan Strategy, which was adopted in July 2017, having been in draft for several years before that.

This builds on the policies of the previous Congleton and Macclesfield Local Plans to provide clear protection for Jodrell Bank and its setting. This is contained in Policy SE14:

Jodrell Bank

1. *Within the Jodrell Bank Radio Telescope Consultation Zone, as defined on the Proposals Map, development will not be permitted if it:*

   i. *Impairs the efficiency of the telescopes; or*

   ii. *Has an adverse impact on the historic environment and visual landscape setting of the Jodrell Bank Radio Telescope.*

2. *Conditions will be imposed to mitigate identified impacts, especially via specialised construction techniques.*

3. *Proposals should consider their impact on those elements that contribute to the potential outstanding universal value of Jodrell Bank.*

Note the Radio Telescope Consultation Zone has been taken to define the Buffer Zone around the Property. In addition, there is general protection for heritage sites in Policy SE7, which covers the Historic Environment.

The Cheshire East Local Authority also proposes to adopt this Management Plan, including the specification of the Buffer Zone, into a Supplementary Planning Document for Cheshire East Council (this is likely to occur after inscription, if the nomination is successful).

Cheshire West and Chester Local Plan

The Cheshire West and Chester local plan, adopted in 2015, is also relevant as part of the Jodrell Bank Consultation Zone lies within its boundaries. The Consultation Zone is proposed as the nominated property's Buffer Zone.

The Cheshire West and Chester Local Plan (part 1) Strategic Policies has a saved policy from the Vale Royal Local Plan BE20 on Jodrell Bank which continues the policy to protect the Referral Zone around Jodrell Bank on its territory. This policy says:

JODRELL BANK

Policy BE20

WITHIN THE JODRELL BANK RADIO TELESCOPE CONSULTATION ZONE, AS DEFINED ON THE PROPOSALS MAP, DEVELOPMENT WHICH CAN BE SHOWN TO IMPAIR THE EFFICIENCY OF THE JODRELL BANK RADIO TELESCOPE WILL NOT BE ALLOWED.

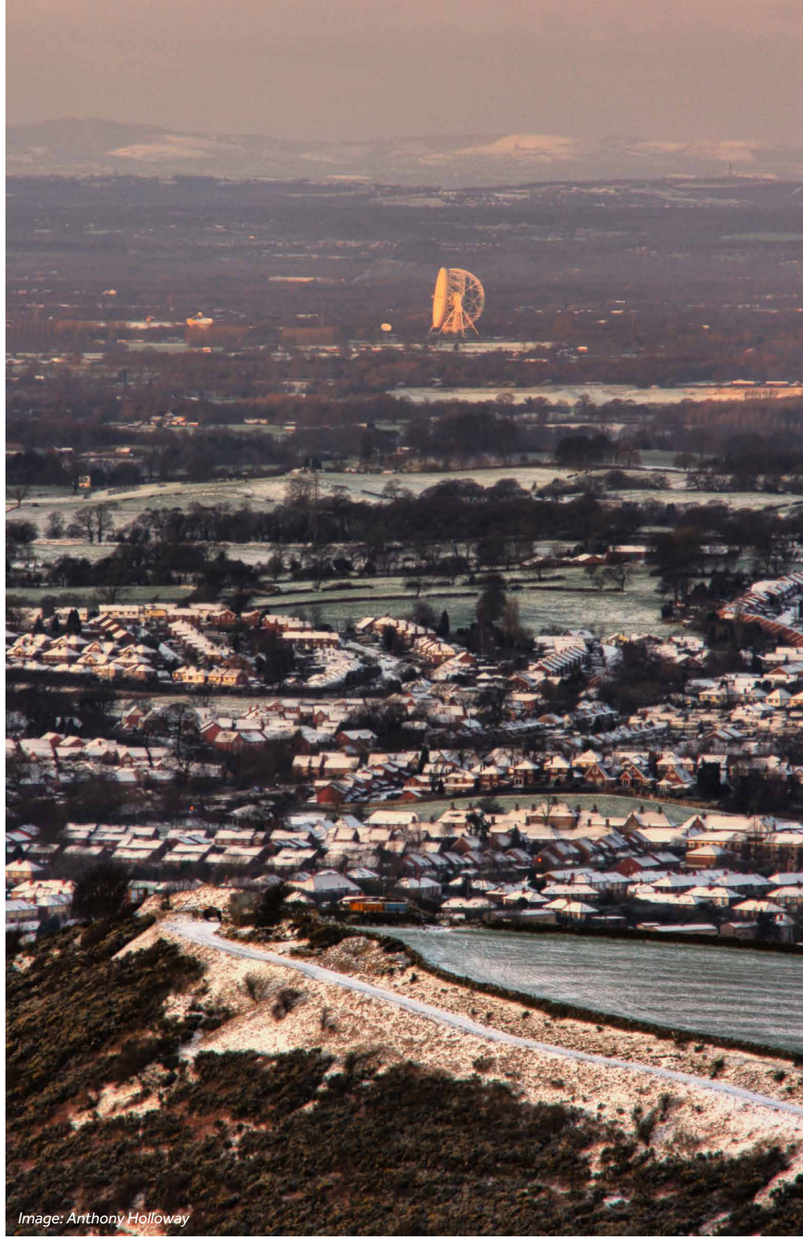
Reasons and Explanations

(i) The radio telescopes at Jodrell Bank are of international importance for Radio Astronomy. Their value depends upon being able to receive radio emissions from space with a minimum of interference from electrical equipment. Despite technological advances, protection from local sources of interference is still of utmost importance.

(ii) The Town and Country (Jodrell Bank Radio Telescope) Direction 1973 requires the Local Planning Authority to consult with the University of Manchester before granting planning permission on any application for development (subject to the exceptions specified in the schedule).

3.3.4 Developing a strategy of deemed consent

The site managers plan to establish a strategy of deemed consent using powers identified in the Enterprise and Regulatory Reform Act of 2013. These are aimed at making the planning system more efficient without reducing heritage protection. These could be in the form of, for example, establishing a Heritage Partnership Agreement involving all stakeholders setting out works for which listed building consent is granted (excluding demolition), or developing a certificate of lawful proposed works (valid for 10 years) that categorically confirms that the works described in it do not affect the character of the listed building and do not therefore require consent. The shared understanding (based on OUV and the significance of the site) that will be enhanced by developing this strategy will help to make the management of the site more efficient and effective for the future.



Jodrell Bank viewed from Teggs Nose near Macclesfield.

4 Key Issues

Image: The University of Manchester

4.1 Baseline Condition

4.1.1 Introduction

The attributes of OUV of the nominated property fall into a number of different groups. Some are scientific instruments, such as the Lovell Telescope and Mark II Telescope. These are still very much in use as scientific research instruments and are maintained, in excellent condition, primarily for that purpose. A number of the buildings are also still in use and are therefore well-maintained.

Other buildings are used less frequently, or not at all, and will need some intervention to maintain them. The Transit Telescope and some other features survive only as archaeological monuments. The overall layout of the site, which is an important attribute of the OUV of the property since it shows how research developed at the location, remains very clear.

Some structures on the site are not attributes of OUV, either because they are very recent, or because they were not associated with radio astronomy, (such as the vehicle shed, or Blackett's Hut). Decisions on whether to retain or remove these buildings will be taken on the basis of whether or not they have a useful function.

A full Conservation Management Plan (CMP) was completed in 2016 and provides a baseline assessment of the condition of the property and its attributes. It will also provide guidance on future management. In general, this review showed that the overall state of the nominated property is satisfactory. However, the condition of individual components, summarised in the CMP Gazetteer does vary from excellent to moderate or even poor for some unused structures. (The CMP and CMP Gazetteer are included in this Nomination Dossier).

In particular, the CMP sets out 4 main policy aims:

1. Conserve and enhance the site's science heritage and maintain its role as a world leading centre for scientific research.
2. Conserve and enhance the site's innovative public engagement with scientific discoveries and the site's heritage.
3. Conserve and enhance the site's spirit of place.
4. Ensure effective governance, resources and monitoring are in place to support implementation of the plan

The aims cover the entire University estate at the site, which is larger than, but encompasses the nominated property.

Aims 1, 3 and 4 are key to the management of the nominated property, while Aim 2 relates to responsible visitation, visitor facilities and infrastructure, and the presentation and promotion of the property.

The current inspection and maintenance regime is well-established. Its two primary functions, in line with the two primary aims of the CMP, are:

1. to maintain the function of Jodrell Bank as a working scientific establishment concentrated on research in radio astronomy

2. to maintain evidence of Jodrell Bank's history and role in development of radio astronomy.

Within these two primary objectives, it is recognised that the best way to conserve a building or structure is to keep it in beneficial use. This means that a degree of change to these is accepted, provided that the contribution of each attribute to OUV is not diminished (e.g. office interiors can be redecorated etc; office equipment can be changed; instrument racks will be updated). In fact, this is entirely within the spirit of place of Jodrell Bank, which is one of pioneering science and engineering, where scientists conceive new research projects that then set high aspirations for new engineering developments.

The site's raison d'être lies in exploring the frontiers of knowledge by carrying out world-leading radio astronomy research. This is reflected in the southern half of the Site having evolved in an ad hoc fashion, which responded to no considerations other than those associated with the implementation of different scientific experiments (e.g. space and associated equipment, buildings and structures needed).

The removal, adaptation and re-use of scientific structures and equipment strongly echo the spirit of innovation and modification that are traditional and essential in science and the development of technology.

In some cases, maintaining the function of an attribute of OUV may therefore mean accepting changes to its fabric e.g. the refurbishing of the dish of the Lovell Telescope, replacement of broken bearings, updating of electronics. This practice is well-established at the Observatory, with the guidance of Historic England particularly with regard to the Lovell Telescope which has been Grade I listed since 1988. In fact, change to building interiors and the structure of scientific instruments has happened throughout the history of the site, while maintaining the elements of external appearance that give a clear picture of the site as it has developed. Continued use of the property is as a key element of the property's authenticity.

Some building interiors are iconic, especially the Control Room at the heart of the Control Building, This will therefore be maintained at least visually, even if electronic instrumentation is modified.

Image: John Kitching

4.1.2 Present state of conservation of attributes

The following paragraphs summarise the state of conservation of the attributes of OUV.

The attributes are summarised into groups, as similar measures apply to similar structures.

The sections used here are:

- The Landscape and Layout of the Site
- The Lovell Telescope and The Mark II Telescope
- The Control Building
- The Green, associated Observatory buildings and the Botany Huts
- The site and remnants of the Transit Telescope and other early scientific instruments

Fuller descriptions of each attribute, together with plans and illustrations, can be found in the Site Gazetteer of the Conservation Management Plan. A summary is provided in Section 2 of this Plan.

The Gazetteer reference numbers for each group of attributes are listed in each section to enable easy reference to these longer descriptions. In addition to a description of each attribute, the CMP Gazetteer comments in detail on its state of repair and on desirable works.

Landscape of the nominated site

(Gazetteer reference numbers: L03, L05, L06, L07, L08)

1. A particular feature of Jodrell Bank is the way in which radio astronomy developed across the site from south to north. This has greatly aided the survival and retention of evidence of the development of the site.
2. When Bernard Lovell first arrived at the site 1945, the land was largely in use for agriculture and botanical research. Adaptation and development of landscape has resulted in differing character of landscape units across the site. These are classified in the Conservation Management Plan Gazetteer into eight landscape units (L01 to L08). Of these, L03, L05, L06 – L08 constitute the nominated property. The remaining zones in University ownership are part of the buffer zone.
3. The different zones have developed in very different ways. Some are intensively used, others less so. Over the years, there has been much tree planting on areas not required for operational work.
4. The maintenance policy is to maintain the differing characters of these various landscape zones, while recognising that landscapes change continuously, and with due regard for the conservation and enhancement of the site's natural heritage. A particular priority is to maintain the landscape of the Green in keeping with its character as a key element of the Observatory.

The Lovell Telescope and Mark II Telescope

(Gazetteer reference numbers: B07; B21)

1. An important part of the overall significance of Jodrell Bank Observatory is the authenticity of its use and function as a radio astronomy research facility.
2. The property has two major radio telescopes which, despite being Grade I listed structures, operate at the forefront of radio astronomy research, improving human understanding of the Universe. This in itself is a tribute to the designers, builders and users of these instruments, as it has proved possible to adapt them to changing observational needs. It is also a glowing testament to the engineering team and their maintenance programme, which have kept the Telescopes operating in peak condition.
3. Function and use is a strong component of the authenticity of these instruments; to maintain functionality and use requires changes and repairs and these are carried out with full regard for maintaining, as far as possible, the historicity of the telescopes and their control processes. For example, the installation of a new working surface for the Mark II Telescope in 1987, refurbishment of the concrete mount of the Mark II Telescope in 2015-16, and the like-for-like replacement of some of the Lovell Telescope wheels in 2007 and subsequently.
4. A major programme of conservation of the Lovell Telescope, funded from the University Estates Masterplan and intended to ensure its function as a radio telescope, is currently underway. This has various elements including: like-for-like replacement of the 1957 surface; maintenance of foundations; repairs to wheel-girder. This is in addition to the regular programme of maintenance and repair.
5. In addition to such necessary changes, working instruments and their control facilities are maintained to very high levels.

The Control Building

(Gazetteer reference number: B05)

1. The Control Building, which houses the Control Room (for the Lovell and Mark II Telescopes, as well as others on site and in the wider e-MERLIN network), offices and laboratories is well-used and therefore well-maintained and generally in good condition.

2. Regular maintenance schedules are in place and in use as part of the routine maintenance of the University Estate.

3. The Control Building has had modest changes many times over the years, in response to changing needs in the operation of site. Since 1988, when the Lovell Telescope was Grade I listed, modifications to the building have been done with due regard to its historicity. This practice will continue in future, especially as the original core of the building was itself awarded Grade II listed status in 2017.

4. Some later wooden-framed extensions to the original core are in poorer condition and their status is being reviewed.

The Green, associated Observatory buildings and the Botany Huts

(Gazetteer reference numbers: L05, B11, B13, B17, B19, B20, B23, B25, B26, B28, B29, B30)

1. Jodrell Bank Observatory has a large number of buildings of historic interest and attributes of OUV, which are spread across the property. As working practices have changed and evolved, some of these buildings have become underused or even unused. Inevitably this means the condition of some of these have deteriorated, although recent surveys have indicated that they are still in good condition.

2. The CMP Gazetteer and Section 2 of this Plan summarises their condition, which is good, overall, for the landscape, but mixed elsewhere. The CMP itself makes proposals for their conservation and for more sustainable use, including conservation works on the Botany Huts.

3. Several of the historic buildings around the Green now benefit from protection following their listing at Grade II in 2017.

4. A major programme of repair and maintenance will be carried out in 2018, in order to put the buildings into good condition as a basis for future maintenance. After this point, the buildings will continue to be maintained as part of the University's rolling programme of repair and maintenance of its estate.

5. As part of this programme of review and repair, modern additions of low historical value to some buildings may be removed. Appropriate experts at Historic England and Cheshire East Council will be consulted on such proposals.

The site and remnants of the Transit Telescope and other early scientific instruments

(Gazetteer reference numbers: A01, A02, A04, A05, A06, A11, A13, A25)

1. A number of items of early scientific equipment survive only as archaeological sites, whether entirely buried, or as reinforced concrete. The Transit Telescope is an example of the former and the base of the 30ft Telescope of the latter.

2. These remains are important attributes of OUV since they are often the only tangible record of early phases of the development of radio astronomy at Jodrell Bank.

3. Sites of below-ground remains have been largely identified in the CMP Gazetteer. They will be protected from disturbance by new development. Some non-intrusive survey to establish their full extent may be needed. Appropriate conservation measures will be taken, as will work on presenting these important locations on the site to visitors.

4. Above ground concrete features are largely stable. Vegetation affecting them will be controlled/ removed as appropriate and their condition will be regularly monitored. A walking tour of these features will be created, perhaps using appropriate technologies to marry the existing physical elements of the site with the historical structures of which they are relics.

5. A plan will be developed for the conservation of the remains of the Searchlight Telescope, which was given Grade II listed status in 2017.

University Estate outside the boundaries of the nominated property

(Gazetteer reference numbers: L01, L02, L04, B01, B02, B04, B04a, B09, B09a)

1. A significant part of the University of Manchester's land at Jodrell Bank is outside the boundaries of the nominated property, but included within its buffer zone. This includes two parcels of land:

a. Landscape Zone L04 which is leased to the Square Kilometre Array Organisation and managed by them under an agreement with the University;

b. Landscape Zones L01 and L02 which occupy the northern part of the University property and contain the main access route on to the site for visitors, visitor facilities and the Gardens and Arboretum.

2. It is important that these areas are managed so that they remain harmonious to the character of the property. Any new buildings in both areas will respect the character of the property. L01 and L02 also need to retain their landscape character, in part created by Sir Bernard Lovell, to complement the OUV of the property.

3. The University also owns all the farmland adjoining the Jodrell Bank estate along its western boundary. It therefore has control over change of use of that land (from farming to other uses) through the tenancy agreements with its tenants.

Image: Ed Swinden

4.2 Threats and Risks

4.2.1 Development Pressures (e.g. encroachment, adaptation, agriculture, mining)

The candidate property has a single owner, the University of Manchester, and has been in this ownership since its inception. This affords it good protection from development pressures in general. Specific risk factors are examined below.

Potential future alterations/ additions to the nominated property

Jodrell Bank Observatory is still, and will remain, an operational research establishment. This will mean that it is likely that there will need to be changes to individual buildings and that there may be a need for new buildings and facilities to provide new functions or support to research activities. New structures may also be needed to support public access and interpretation of the property, although these are likely to be created in the area that the University owns in the Buffer Zone, rather than in the property itself.

The addition of new buildings and facilities has been happening throughout the site's history. With virtually no exception these have been of one or two stories at most and, as such, they have fitted well into the overall character of the property. This approach is enshrined in the needs of the scientific priorities of the site, as taller buildings would obscure parts of the sky, making them impossible to observe with the telescopes, so are not desirable. The nature of the site itself therefore affords it an additional level of protection.

All new buildings and facilities will require planning consent and will be subject to the policies of the newly adopted Cheshire East Local Development Plan which contains a specific policy for the protection of the proposed World Heritage property. They will also be subject to national policies on new construction within the setting of a Listed Building since the Lovell and Mark II Telescopes are listed Grade I, and the Control Building, Cosmic Noise Hut, Electrical Workshop and Park Royal are all listed Grade II, as are the remains of the Searchlight Aerial. This is simply an extension of existing practice relating to the setting of the Lovell Telescope, which has been Grade I listed since 1988. All proposals for new development will be the subject of Heritage Impact Assessment according to the methodology proposed by ICOMOS (REF: ICOMOS 2011).

Proposals for alterations to existing buildings will also be subject to a level of Heritage Impact Assessment appropriate to the proposed change. Changes and additions to buildings will in many cases require planning consent and be subject to national and local planning policies. Any proposals for change to a listed historic building (such as the Lovell Telescope) will require Listed Building Consent.

As far as possible, new buildings will be sited away from the areas with the largest concentrations of attributes of OUV. As with the new headquarters of the Square Kilometre Array Organisation, it may well be possible to place new buildings outside the actual nominated property but still on land belonging to the University. The southern and eastern parts of the nominated property contain wooded areas which could conceal necessary new build or other facilities such as parking, which are required for operational reasons. New visitor facilities, if required, are likely to be sited in the publicly accessible area at the north end of the University estate close to the existing facilities (i.e. at some distance from the attributes of OUV).

New development within the Buffer Zone

New development is always possible outside the boundaries of the Jodrell Bank estate. This is, however, a largely agricultural area and pressure for development is unlikely to be great. Some areas immediately adjoining the Jodrell Bank estate are owned by the University, which therefore has more direct control over proposed developments on that land.

In particular, a new extension to the existing visitor car park and upcoming additions to the visitor facilities are being developed in the Buffer Zone (on land owned by the University) in a way that is entirely under the University's control. In recent years, for example, the new HQ for the SKA Organisation has been located in an area of the site owned by the University, but which does not contain any of the attributes that carry the OUV of the site.

As described in Section 2 of this Plan, developments to date have been controlled by national planning policies and by the policies of the Cheshire East Local Development Plan, which includes a specific policy to protect both the efficiency of the Lovell Telescope and the historic environment and visual landscape setting of Jodrell Bank. This will continue in future. Cheshire West and Chester also has a policy to protect the part of the Jodrell Bank Radio Telescope Consultation Zone, which falls in its territory.

The property is in any case well-screened by woodland around its boundaries. Views of the site from outside are principally of the Lovell Telescope and, from some angles, of the Mark II Telescope. The likelihood of development outside the property having an adverse impact on the visual setting is low.

Lack of maintenance and decay of attributes of OUV

Overall the property is well maintained and in good condition. The condition of individual structures is more varied.

Operational elements such as the telescopes are maintained to the highest standard because they remain in use.

At the other extreme, elements which are now archaeological require comparatively little maintenance since they are largely in a stable condition. Some of the surviving buildings are, however, in relatively poor repair because they have been under-used or not used at all.

The University has been successful in its application for a large Heritage Lottery Fund grant, totalling £12 million, towards its £20 million *First Light at Jodrell Bank* project. This project is now fully funded and will be delivered over the period 2018-21. Part of this project is to put attributes of OUV into good order where necessary. This is in addition to the £15 million of its own resources which it has committed towards the conservation of the Lovell Telescope described above. These programmes of work are currently underway and will ensure that all attributes of OUV are in good condition for the foreseeable future.

Image: Anthony Holloway

4.2.2 Environmental Pressures (e.g. pollution, climate change, desertification)

No major environmental pressures pose a threat to the fabric of the OUV of the nominated property.

Weather-related impacts

There are no major weather-related threats to the OUV of the site. Weather monitoring (wind speed and direction, temperature, precipitation) has been carried out at the site for many years (and continues) and is assessed for increased risk. To date, there is no evidence of increased risk due to extreme weather. This will be monitored in case of change.

The Lovell Telescope, one of the key attributes of the property, is an immense steel structure exposed to the elements, which inevitably cause corrosion. However, its management and operation are predicated on this, and the fact that it is still operating, having had a forecast lifetime of 10-15 years at the time of construction, is testament to the outstanding and sensitive maintenance and inspection programme that it receives.

The Lovell Telescope is also managed in order to minimise the risk of damage in high winds, see table. A Controller is on duty in the Control Room at all times (24 hours a day, every day of the year) tasked with managing the safe operation of the telescopes.

Vegetation Management

There are no significant issues with vegetation management, although there is some encroachment by invasive species (principally Himalayan Balsam) in some of the less-used landscape areas.

These are not a threat to the OUV of the site and are addressed by the Action Plan.

Wind limits for the Lovell Telescope

Wind regime	Action
Continuous wind speed over 30miles/hour (48km/hour)	Operate the Lovell Telescope above 30degrees elevation
Persistent gusts over 35miles/hour (56km/hour)	
Continuous wind speed over 35miles/hour (56km/hour)	Park the Lovell Telescope at the zenith
Persistent gusts over 45miles/hour (72km/hour)	

4.3 Opportunities

A number of specific opportunities have been identified, pre-nomination, and will be explored by the site managers in the next 5 years (see the Action Plan table in Section 5 for a more detailed plan).

These opportunities will be further addressed by the First Light at Jodrell Bank project, part-funded by the national Heritage Lottery Fund, which will be delivered from 2018.

These opportunities are listed briefly below:

Specific conservation projects

A number of specific conservation projects have been identified to date. These include:

- The Searchlight Aerial (which is Grade II listed)
- The Botany Huts
- The site of the Transit Telescope
- The 'Concrete Pad Trail' (looking at the mounting bases of early scientific instruments)

This work will need inputs/oversight by professional archaeologists, management of volunteers, funding etc.

Archaeological surveys/ improving knowledge about the site

A good example, is further analysis of the site of the Transit Telescope. Again, this work will require specialist inputs, and will need resources assigned to it.

More research into the authenticity/ heritage of the site

University of Manchester colleagues are interested in this area, for example:

- the John Rylands University Library of Manchester, which hold the National Jodrell Bank Archive and is working with the site management team to conserve and interpret the archive;
- the Historian and Heritage Manager who has oversight of collections not in the Manchester Museum and Whitworth Art Gallery;
- the possibility of PhD projects and MA placements (with the School of Arts, Languages and Cultures).

Visitor Access to the heritage area around the Green

At present, this is not possible, as the area with the highest concentration of Attributes of OUV is part of the working Observatory, and is therefore not suitable for visitors. Developing access to this area will take place as part of the *First Light at Jodrell Bank* project.

Specific interpretation/signage/ temporary exhibitions

There are several opportunities to deliver improved interpretation and signage, both in the property itself and in the visitor area that is alongside it. This work must of course be delivered in a way that does not impair the attributes of the property.

Opportunities in this area identified so far include:

- signage around the Green at specific locations;
- Small exhibition in Radiant Hut in refurbished meeting space alongside archive store;
- augmented reality trail (showing views from particular times at particular locations using old photographs, film, audio etc).

The first two of these will be delivered as part of the First Light at Jodrell Bank project.

New galleries and visitor facilities

This opportunity is a central part of the First Light at Jodrell Bank project. It will deliver a new gallery, exhibition and projection space, with new interpretation and a new Education programme for schools. Its focus will be on presenting the heritage story of Jodrell Bank to a wide audience. This gallery will be located outside the property in the area managed by the Discovery Centre.

A draft Tourism Action Plan has been prepared in order to promote sustainable visitations.

5 Policies and Actions

In Section 1 of this Management Plan, the Vision and a number of guiding principles were defined. We set them out again below for the sake of clarity.

Vision

The Jodrell Bank Observatory will be a World Heritage Site that changes people's lives for the better and demonstrates humanity's ongoing exploration of our place in the Universe. It will bring together stakeholders to continue to protect and develop a site that people from regional, national and global communities can learn about or visit and have a genuinely world-class experience. Visitors will bring a sustainable growth in tourism to local communities, benefiting their quality of life and raising the profile of the region as a place to live, work and invest. This nomination will transform this regional and national icon into an international icon of science, a showcase of international cooperation and endeavour that exemplifies astronomy and engineering at its best.

The World Heritage Site Steering Committee aspires towards this ambition and this Management Plan describes the ways in which it might be achieved.

Image: The University of Manchester

5.1 Guiding principles

The Management Plan for the Jodrell Bank Observatory World Heritage Site has the following guiding principles:

- Protection, conservation and maintenance of the Outstanding Universal Value, Integrity and Authenticity of the property, including the identification and promotion of change that conserves and enhances these qualities and the other significant values of the site; and the modification and/or mitigation of development and change that might damage them.
- The Jodrell Bank Observatory continues to perform its function as a radio astronomy facility. It is important to conserve and enhance the heritage of the site whilst maintaining this role as a world-leading scientific research facility, thus retaining its authenticity of use and function.
- Sustainable use for the benefit of the local population and economy.
- Commitment to a comprehensive programme of presentation and education, including a commitment to sustainable visitation.
- Importance of gathering all stakeholders in a shared understanding of the property; in a commitment to developing and implementing the management plan; and to furthering the obligations of the World Heritage Convention.
- Commitment to ensuring effective governance, resources and monitoring are in place to support implementation of the plan, including a commitment to capacity building and to the planning, implementation, evaluation and feedback cycle.

In the following sections, we list the policies relating to each principle and the actions required to meet the objectives of each of these policies.

Image: Anthony Holloway

5.2 **Policies**

Principle 1.

Protection, conservation and maintenance of the Outstanding Universal Value, Integrity and Authenticity of the property, including the identification and promotion of change that conserves and enhances these qualities; and the modification and/or mitigation of development and change that might damage them.

The protection and enhancement of the Outstanding Universal Value, Authenticity and Integrity of the property is at the heart of the Management Plan. It is also important that other significant values of the property are protected and conserved.

Policy 1a – Appropriate management practices should be developed and implemented in order to maximise the protection of all attributes of OUV.

Policy 1b – The condition of all Attributes of OUV should be reviewed regularly in order to guide future priorities and actions.

Policy 1c – Archaeological features of the site should be conserved and/or made more visible without detracting from their intrinsic form and character.

Policy 1d – Appropriate risk management strategies should be kept under review and updated as necessary.

Policy 1e – Further research into the authenticity and of the site should be promoted.

Policy 1f – Maintain and enhance the site's biodiversity and environmental management procedures.

Principle 2.

Jodrell Bank Observatory continues to perform its function as a radio astronomy facility. It is important to conserve and enhance the heritage of the site whilst maintaining this role as a world-leading scientific research facility, thus retaining its authenticity of use and function.

Policy 2a – Ensure a strong partnership between the Jodrell Bank Observatory World Heritage Site Steering Committee and the site's scientific community (who will be represented on the Committee).

Policy 2b – Combine the requirement to conserve and enhance the site's OUV with the needs of the scientific research in order to ensure its sustainable use for science.

Policy 2c – Continue to protect the Jodrell Bank Consultation Zone/ WHS Buffer Zone with the support of the relevant Local Authorities.

Principle 3.

Sustainable use for the benefit of the local population and economy

Policy 3a – The economic benefits of tourism and visitation should be spread as widely as possible to local and regional communities.

Policy 3b – Management of local impacts (such as traffic circulation and parking etc) should be organised in order to minimise disruption for the local community and residents.

Policy 3c – Sustainability considerations (including biodiversity, green transport, mitigation of greenhouse gas emissions, recycling etc) should be included in all decisions made about the management of the WHS.

Principle 4.

Commitment to a comprehensive programme of presentation and education, including a commitment to sustainable visitation

Policy 4a – Management of visitors should be of the highest standard and comply with relevant national and international guidance on sustainable tourism

Policy 4b – Develop new visitor arrival facilities and interpretation spaces, with due regard for the site OUV.

Policy 4c – Develop arrangements for managed and sustainable access to the area of the property around 'the Green' (Landscape area L05).

Policy 4d – Involve local communities and communities of interest in the WHS via initiatives such as volunteering programmes, community access days and particular events for special groups.

Policy 4e – Develop new, high quality, interpretation and presentation both on and off site, in order to promote an understanding of the OUV of Jodrell Bank and its attributes, along with the values of the WHS convention and enhance the enjoyment and appreciation of the site by the widest possible range of people.

Policy 4f – Develop and deliver high quality learning facilities, materials and programmes for education groups, in order to provide learning opportunities for local, regional and national schools

Principle 5.

Importance of gathering all stakeholders in a shared understanding of the property; in a commitment to developing and implementing the management plan; and to furthering the obligations of the World Heritage Convention.

Policy 5a – Ensure that the WHS Steering Committee is representative of all relevant stakeholder groups

Policy 5b – Reflect the needs of the stakeholder group in the WHS site Management Plan

Policy 5c – Develop a Heritage Partnership Agreement between the site owners, users and relevant stakeholders

Policy 5d – Develop an understanding of the obligations of the World Heritage Convention together with all partners.

Principle 6.

Commitment to ensuring effective governance, resources and monitoring are in place to support implementation of the plan, including a commitment to capacity building and to the planning, implementation, evaluation and feedback cycle.

Policy 6a – Coordinate the implementation of the management plan and liaise with stakeholders to ensure a joint approach for the benefit of all.

Policy 6b – Ensure that appropriate resources are available for the delivery of the Plan. Seek adequate funding for particular projects for the World Heritage Site.

Policy 6c – Ensure that appropriate skills and advice are available for the effective management and monitoring of the World Heritage Site.

Policy 6d – Ensure regular monitoring of the World Heritage Site.

5.3 Actions to meet policy objectives

This section describes the Action Plan for delivery of each Policy; the way in which delivery will be implemented; the indicative timescales for delivery; and the way that delivery will be resourced.

The Action Plan is designed to work with the requirements of the standard reporting cycle to UNESCO for World Heritage Sites. It organises the relevant actions into areas that are related to the particular Guiding Principles and Policies set out in the previous section. The Action Plan will be revised as necessary when new evidence, or new needs, arise.

Policy Number	Action	Timescale/ Delivery Group
Outstanding Universal Value, Integrity and Authenticity		
1a	i. Provide briefings and training for all staff and stakeholders on the OUV, Integrity and Authenticity of the WHS and on this Management Plan and Action Plan	Year 1/ JBO, JBDC and University colleagues
	ii. Implement protocol for undertaking heritage impact assessments (compliant with ICOMOS process)	Year 1/ JBO, JBDC and University colleagues
1b	i. Establish process for annual review of the condition of the Attributes of OUV (part of the Monitoring Programme and Plan)	Year 1/ Coordination Team
1c	i. Develop archaeology programme for property	Year 1/ C JBO, JBDC and University colleagues
	ii. Remove and control vegetation growth on extant archaeological features	Short-medium term/ Coordination Team to organise
	iii. Update grounds maintenance specification to reflect archaeological considerations	Short-medium term/ JBO, JBDC & University Division of Estates
	iv. Undertake programme of non-intrusive surveys on sites of known historic experiments	Short-medium term/ Coordination Team to organise
	v. Accurately survey/locate identified extant archaeological remains where not currently mapped	Short-medium term/ Coordination Team to organise
	vi. Undertake magnetometer survey on the site of the former Transit Telescope to identify possible extant features	Short-medium term/ Coordination Team to organise
	vii. Ensure that existing and new information on archaeological features is shared with all staff and stakeholders	Short-medium term/ JBO, JBDC & University Division of Estates
1d	i. Annual review of Risk Register and Management Strategies	Ongoing / Steering Committee, The University
1e	i. Develop a research programme to better understand different aspects of the property's history, use and development	Short-medium term/ Coordination Team to convene
	ii. Undertake Community History research, both for local communities and for communities of interest	Ongoing/ Coordination Team
	iii. Undertake scientific history research	Medium term and Long Term/ JBO, JBDC and University colleagues
	iv. Conserve and enhance collections and archives related to the property, using best practice	Short-medium term/ JBO, JBDC and University colleagues
1f	i. Maintain the existing high level of biodiversity within the property and on the surrounding Jodrell Bank site as a whole	Ongoing/ JBO, JBDC and University colleagues
	ii. Develop an integrated site-wide Landscape and Ecology Maintenance Plan, based initially on the existing Biodiversity Survey	Medium term/ JBO, JBDC and University colleagues
	iii. Align the Grounds Maintenance Specification with the Landscape and Ecology Maintenance Plan	Medium term/ JBO, JBDC and University colleagues
	iv. Implement an Invasive Species Control Programme	Short- medium term/ JBDC and University colleagues
	v. Formalise the current strategy for monitoring and controlling pests and diseases	Short- medium term/ JBDC and University colleagues
	vi. Develop a Climate Change mitigation and adaptation strategy	Longer term/ JBO, JBDC and University colleagues

Policy Number	Action	Timescale/ Delivery Group
Combining Conservation & Enhancement of Heritage with Scientific Research		
2a	i. Ensure senior scientific research and telescope engineering representation on the World Heritage Site Steering Committee (currently via both Director and Associate Directors JBCA)	Ongoing/Steering Committee/JBCA
	ii. Ensure senior heritage representation on the Directorate of Jodrell Bank Centre for Astrophysics (currently via Associate Director Public Engagement & Heritage)	Ongoing/JBCA
2b	i. Continue to implement repair and maintenance programme for telescopes/ scientific equipment	Ongoing/JBO and University colleagues
	ii. Continue to make detailed records of modifications to telescopes	Ongoing/JBO
	iii. Continue to carry out conservation and maintenance works on the Lovell Telescope and Mark II Telescopes	Ongoing (major conservation work programme on the Lovell Telescope in progress)/ JBO and University colleagues
	iv. Further develop and implement detailed induction processes which educate staff and contractors about their personal and professional responsibilities to sustain the heritage significance of the Observatory in order to ensure these requirements are taken into account when considering any change.	Ongoing/JBO/University estates
2c	i. Work with local, regional and national agencies to ensure that tourism and visitation benefits are aximized for local and regional communities	Ongoing/JBO and Local Planning Authority
Sustainable Use		
3a	i. Work with local, regional and national agencies to ensure that tourism and visitation benefits are aximized for local and regional communities	Ongoing/ JBDC and appropriate Agencies
3b	i. Work with the local authority and appropriate agencies to mitigate disruption to local communities and residents	Ongoing/ JBDC and appropriate Agencies
	ii. Develop new onsite parking facilities for visitors	Year 1/ JBDC and University colleagues
3c	i. Implement the site-wide sustainable Transport Plan	Short-medium term/ JBO, JBDC, SKAO and University colleagues
	ii. Continue to manage waste using the University of Manchester's Sustainable Waste Plan	Ongoing/ JBO, JBDC, SKAO and University colleagues
Presentation, Education, Visitation		
4a	i. Maintain the site's high standard of visitor management, ensuring national quality accreditation is achieved each year	Ongoing/ JBDC
	ii. Undertake regular visitor surveys and evaluation in order to generate information on which to base developments of the management of the visitor experience	Ongoing/ JBDC
	iii. Publish the Tourism Action Plan following review in 2-3 years	Ongoing/ JBDC
4b	i. Create new arrival facilities in order to mitigate queuing at busy times and provide a more rounded visitor experience	Year 1/ JBDC and University colleagues
	ii. Create a new gallery and projection space, in which visitors can engage with the stories of the history and heritage of the property	Short-medium term/ JBDC and University colleagues
4c	i. Develop programme of guided visits to the Green	Short-medium term/ JBDC and JBO
4d	i. Develop volunteering programme	Year 1/ JBDC
	ii. Hold regular community access days, for both local communities and communities of interest	Ongoing/ JBDC
	iii. Hold regular events for special groups	Ongoing/ JBDC
4e	i. Develop new exhibition and projection content for new gallery and projection space, promoting the OUV of the property and its attributes, along with the values of the World Heritage convention	Short-medium term/ JBDC and JBO
	ii. Develop new outdoor interpretation and audio guide system for the Lovell Telescope	Short-medium term/ JBDC and JBO
	iii. Develop new outdoor interpretation for the guided tour of the Green	Short-medium term/ JBDC and JBO
	iv. Develop AV tour for the guided tour of the Green	Medium-Long term/ JBDC and JBO
	v. Redevelop website in order to promote engagement with the property amongst people who are unable to visit	Short-medium term/ JBDC
4f	i. Create new education facilities in the new gallery and projection space	Short-medium term/ JBDC
	ii. Develop new education material to engage schools groups with the heritage of the property	Short-medium term/ JBDC
	iii. Embed engagement with the heritage of the property within the existing successful schools programme	Short-medium term/ JBDC
	iv. Provide learning opportunities for special groups and bodies	Short-medium term/ JBDC

Policy Number	Action	Timescale/ Delivery Group
	Shared Understanding	
5a	i. Review the membership of the Steering Committee every 3 years, in order to ensure that all relevant stakeholder groups are represented.	Ongoing/ Steering Committee
5b	i. Review the WHS Management Plan on a 5-year cycle, including updates on the needs of the Stakeholder group as relevant	Ongoing/ Steering Committee
	ii. Develop a Heritage Partnership Agreement between the site owners, users and relevant stakeholders	Short-medium term/ Historic England, Local Planning Authorities, JBO, University colleagues
5c	i. Develop a strategy of deemed consent	Ongoing/ Steering Committee
5d	i. Review and share information on the obligations of the World Heritage Convention	Ongoing/ Steering Committee
	Governance, Resources, Monitoring	
6a	i. Oversee and coordinate the implementation of this Management Plan	Ongoing/ Steering Committee
6b	i. Ensure adequate resources are available for the delivery of this plan	Ongoing/ JBDC with University colleagues
	ii. Identify fundraising opportunities for specific conservation, maintenance and engagement projects and secure funding for these	Ongoing/ JBO & JBDC with University colleagues
6c	i. Appoint a Heritage Officer	Short-medium term/ JBDC with JBO
	ii. Expand JBDC Education and Interpretation team to support delivery of Education, engagement and volunteering plans	Short-medium term/ JBDC
	iii. Review staff training needs and provide relevant training	Short-medium term/ JBO and JBDC
	iv. Explore the possibility of developing formal apprenticeship schemes for various aspects of the conservation, maintenance, visitor management and visitor engagement work undertaken at the property	Short-medium term/ JBO and JBDC
	v. Seek funding to support staffing initiatives where appropriate	Short-medium term/ JBO and JBDC
6d	i. Develop full Monitoring Programme and Plan for the WHS, including timetable and budgets etc	Year 1/ JBDC, JBO, and Steering Committee, with support from Historic England and UNESCO UK
	ii. Prepare biennial monitoring report on implementation of this Action Plan	Ongoing/ Steering Committee
	iii. Review priorities and progress on this Action Plan at regular meetings	Ongoing/ Steering Committee
	iv. Review and update this Action Plan on a 5-year basis	Ongoing/ Steering Committee

Key to terms

Short-term: within 3 years of inscription
Short-medium term: within 5 years of inscription
Medium term: 5-10 years after inscription
Long term: > 10 years after inscription
The University: The University of Manchester, the site owner and manager
JBCA: Jodrell Bank Centre for Astrophysics, research division in the School of Physics and Astronomy of the University
JBO: Jodrell Bank Observatory, within JBCA
JBDC: Jodrell Bank Discovery Centre, one of the University's Cultural Institutions
SKAO: The SKA Organisation, an international research organisation with strong links to JBCA based at Jodrell Bank outside the Property
Local Planning Authorities: Cheshire East Council and Cheshire West and Chester Council

5.4 Timetable for first year

Timeframe	Action
	2018
January	Submit Nomination Dossier to UNESCO World Heritage Centre
Autumn	Site visit/ Inspection
Autumn	Begin process of setting up Heritage Partnership Agreement
Autumn	Implement new parking and arrival facilities in visitor area near to property
Ongoing	Steering Committee members will be updated on developments, invited to comment upon issues and invited to attend and participate in relevant events at the property.
Ongoing	JBDC team develop plans for new visitor facilities, Education, Interpretation and Presentation materials
Ongoing	Fundraising for specific projects
	2019
July	Decision of World Heritage Committee
July	Presentation and celebration of inscription
Autumn	Set up regular programme of Ongoing/ Steering Committee meetings
Autumn	Develop Monitoring Programme and Plan and begin implementation
Autumn	Provide briefings and training for all staff and stakeholders on the OUV, Integrity and Authenticity of the WHS and on this Management Plan and Action Plan
Autumn	Develop and implement protocol for undertaking heritage impact assessments (compliant with ICOMOS process)
Autumn	Establish process for annual review of the condition of the Attributes of OUV
	Late 2019 / 2020
	Begin to develop Archaeology programme with guidance from HE and external experts
	2020
Feb/March	Implement new volunteering programme for communities and special groups

6 Implementation

Image: Anthony Holloway

6.1 Financial Resources

Overview

Existing areas of activity at Jodrell Bank are resourced from a variety of sources. The science and engineering research under the management of the Jodrell Bank Centre for Astrophysics is currently funded by the UK Science and Technology Facilities Council, the European Commission, the University of Manchester and various other bodies. Resourcing for visitor facilities and engagement is part-funded by the University of Manchester and part-funded by the operation of the Discovery Centre as a not-for-profit business.

The resourcing required for the management of Jodrell Bank as a World Heritage Site is in addition to this and includes both investment (pre-nomination) and ongoing running costs (post-nomination). This section examines this in the context of the resourcing of existing operations.

Observatory – Operations and Maintenance

The bulk of the management, operation and maintenance of the Observatory, and of the telescopes are already borne by the research budgets at the property. These include funds for the operation of the e-MERLIN network, which includes the Lovell and the Mark II Telescopes, and funds for specific use of the Lovell Telescope e.g. in observations of pulsars.

In addition to this, the University of Manchester contributes circa £200,000 per annum to the 'heritage' costs of the site, which include non-staff costs related to particular repairs and painting etc. This sum is largely spent on the Lovell Telescope, which is the major structure on site,

The University has also committed £15million to a major project to carry out work on the Lovell Telescope, other heritage elements of the site and improve infrastructure, in order to put these on a firm basis for future operation, conservation and maintenance. This project, which will take several years to deliver, is now underway.

Discovery Centre – Presentation, Education and Sustainable Visitation

The Discovery Centre is responsible for managing visitor access to Jodrell Bank, which it facilitates on a 7-day/week basis. The Centre is open most days in the year, with the exception of Christmas and New Year's days. It has a closure week just prior to Christmas to allow for essential maintenance.

The Director oversees around 50 staff (allowing for seasonal variation), who work on a rota basis, covering around 29 FTE roles. Additional staff will be recruited in the near future as part of the University's strategy to manage the heritage of the site in a planned way.

The Discovery Centre is a not-for-profit visitor facility and is part-funded (around 20%) by the University of Manchester. It generates the remainder of its operating income from ticket sales, Cafe commission, shop revenue and event hire etc. The Centre opened in April 2011 and since then (at the time of writing) has increased visitor numbers from around 60,000 (prior to opening) to around 185,000 per annum. This includes just over 26,000 school pupils per annum, who all receive high quality curriculum-linked learning sessions when they visit. The revenue the Centre generates is directly related to visitor numbers, as are the Centre's operating costs.

Further details are provided in the separate draft Tourism Action Plan.

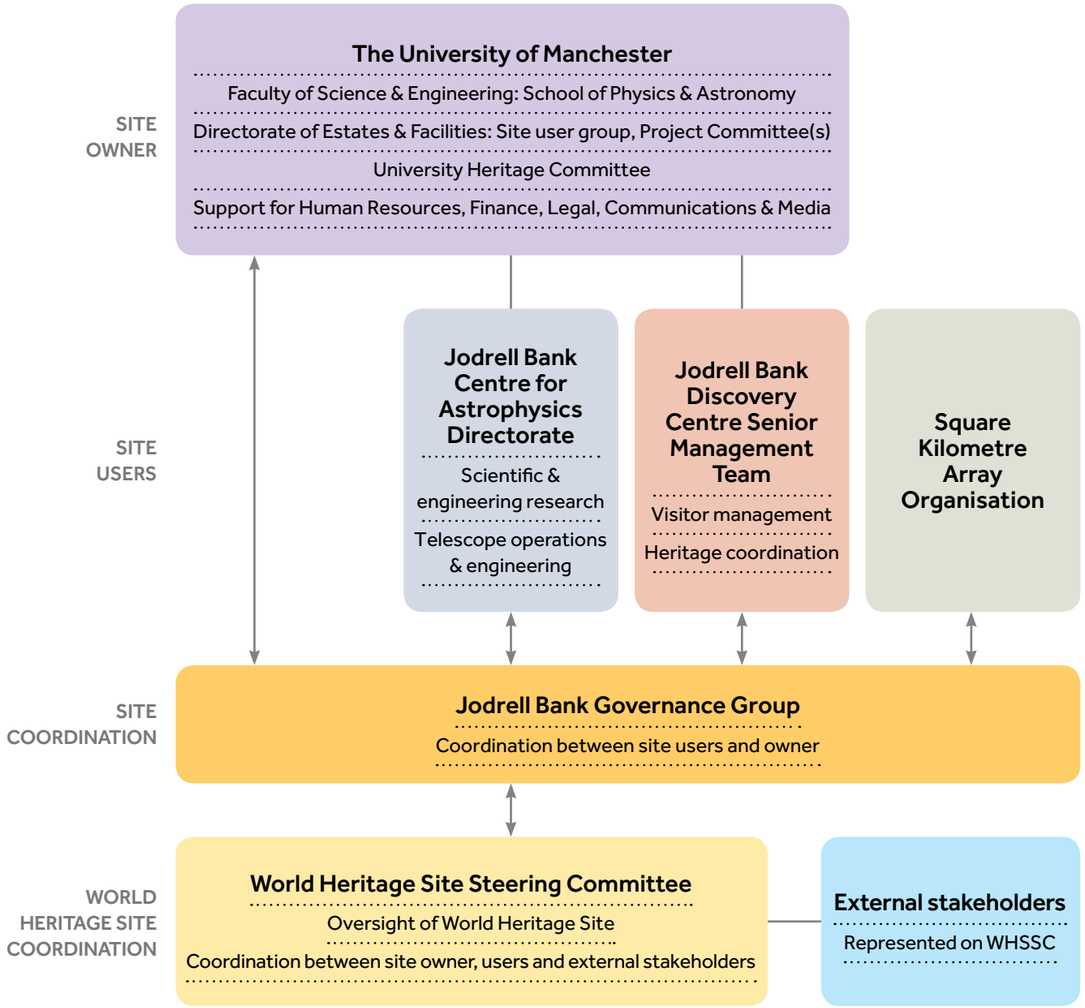
Future Management of the nominated property

The future management of the property will be taken forward by existing University structures described in Section 2.4, augmented by the World Heritage Site Steering Committee (See Figure 6.1).

WHS Coordination will be managed by the Director of the Discovery Centre and an appropriate Steering Committee as described in Section 1.3, that will include all stakeholders, will oversee the way in which the site is managed. It is expected that additional costs of management will be managed via existing budget structures, offset in part by increased revenues generated by increased visitor activity.

It is not anticipated that visitor numbers will increase due to inscription to the extent that major works will be required on the local highways etc. However, an estimated increase of around 30-50% will be accommodated in the new visitor facilities funded by the national Heritage Lottery Fund, UK Government, the University of Manchester and other donors. The operation of this will be supported via a full Business Plan (see Tourism Management Plan) based around visitor numbers in a similar way to the current operation, ensuring its sustainability.

Figure 6.1: Post-inscription management structure at Jodrell Bank site



Major Capital Expenditure

As mentioned above, the University has committed £15million capital investment into the Jodrell Bank site. This is funding a major conservation and restoration project on the Lovell Telescope, as well as some work on the Control Building and other elements of the property.

In addition, in 2018 an investment of £1.8million will be made in extending the current car park, creating a new arrivals plaza and new ticket booths. These are being created in an area in the Buffer Zone, adjacent to the property.

The University is also now working on a major project ('First Light at Jodrell Bank') to create new visitor facilities. The new facilities will also be in the Buffer Zone, near to the new car park and arrivals area. It will also include some conservation work on buildings around the Green on the property itself.

The project has an overall value of around £20.5 million. The project is fully funded, including £12 million from the UK's Heritage Lottery Fund, £4 million from the UK Government and £2.5 million donated from Trusts and Foundations.

The 'First Light' project will deliver further development of the management of the site; will resource 'heritage' staff to work on overseeing the property's heritage assets and engage visitors in appropriate history projects; underpin the development of a new heritage education offer, enable visitors to engage with the area of the property around the Green and, most importantly, create a new gallery in which visitors will be able to learn about and engage with the heritage of the property for the first time.

Artist's impression of the foyer of the proposed First Light Pavilion, a visitor facility focused on the heritage of Jodrell Bank.

6.2 **Teams**

The WHS Steering Committee

As part of the preparation for the submission of the Nomination Dossier, the WHS Steering Committee was constituted in 2017. Steering Committee members (listed in Section 1.3) have made inputs to this Management Plan as it was developed.

Following the submission of the Nomination Dossier in January 2018, the Steering Committee will remain in place until the decision of the UNESCO Heritage Committee in 2019. Steering Committee members will be updated on developments, invited to comment upon issues and invited to attend and participate in relevant events at the property.

If the World Heritage Committee decide that the property should be inscribed on the World Heritage List, the Steering Committee will then begin its programme of work and regular meetings.

If the application for inscription is deferred, referred (to the State Party) or rejected, the group's purpose and membership will be reviewed.

Development team for a strategy of deemed consent

As described in Section 3.3.4, the site managers plan to establish a strategy of deemed consent in order to make the planning system more efficient without reducing heritage protection. The shared understanding (based on OUV and the significance of the site) will build upon the excellent working relationship that already exists between JBO, Historic England, the University of Manchester Division of Estates and the Local Planning Authority. Representatives of these bodies will be convened in 2018 in order to begin the process. Once it is established, oversight of the strategy will revert to the WHS Steering Committee.

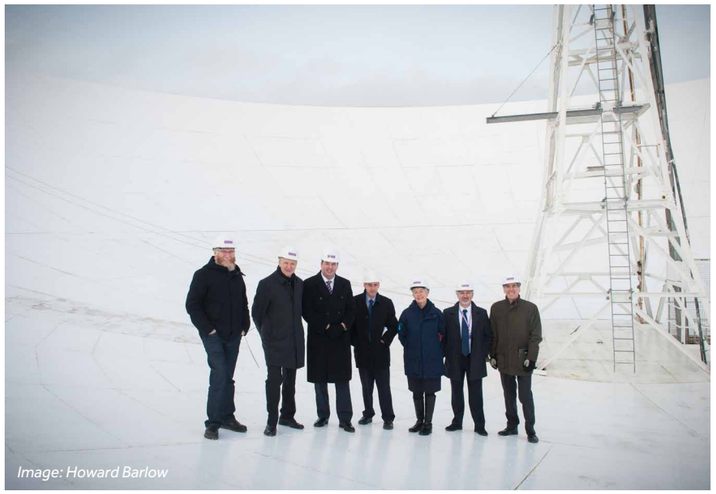


Image: Howard Barlow

The Jodrell Bank Observatory Team

The Observatory is responsible for the management, maintenance and conservation of the telescopes on the property (the Lovell, Mark II, 42ft and 21ft telescopes). They are also responsible for the telescopes at remote e-MERLIN sites (Pickmere, Darnhall, Knockin, Defford and Cambridge) which are also part of the Observatory's current operations.

Observatory staff comprise approximately 60 technicians, engineers and astronomers who work directly on or with the telescopes at the site on a daily basis. Their maintenance and conservation regimes have been developed over decades, and the fact that the telescopes are in superb condition is evidence of the high level of skill in this team.

In addition to this, there is a group of academic astronomers in the Jodrell Bank Centre for Astrophysics (JBCA, of which the Observatory is part and which has around 150 members), some of whom also use the telescopes for their research. Astronomers worldwide also use the Observatory instruments, either on their own or in collaboration with Jodrell Bank scientists. Time on the telescopes is allocated competitively between the various potential users. Operations are typically carried out by observatory staff with data being accessed remotely by astronomers across the world. The team also maintains and manages associated scientific equipment (e.g. signal processing equipment, supercomputers etc).

The Directorate of JBCA meets monthly and decides on the prioritisation and allocation of resources, the development of strategic objectives, operational planning, communication and institute policy. The Directorate includes the Associate Director for the Observatory and the Associate Director for Public Engagement & Heritage.

Weekly Observatory engineering meetings are chaired by the Associate Director of the Observatory and attended by all lead engineers. This team is responsible for the maintenance and conservation of telescopes, all of which are inspected and maintained regularly. Conserving and enhancing the authenticity/ integrity of telescopes and scientific equipment, as far as practicable, is key to management and maintenance regimes, alongside their scientific priorities.

The Lovell Telescope is inspected daily during operations by highly specialised staff (this is critical to prevent damage). A more detailed inspection and regular maintenance is carried out weekly (involving approximately 8 hours downtime) and reported to weekly engineering meetings.

A rolling programme of repairs, upgrades and maintenance is in place for all telescopes on site (covering weekly, monthly, three-monthly schedules etc). Major proactive and reactive maintenance tasks and painting are planned on an annual basis. The Lovell Telescope is taken out of service for up to 2-3 months each summer so that major tasks can be delivered when the weather and daylight conditions are most favourable.

The University Estates team manage the non-technical 'Observatory' estate and buildings, in collaboration with Observatory staff. Contractors currently maintain the landscape elements according to a Grounds Maintenance Specification. Buildings are maintained and inspected on a continuing basis.

As the ICOMOS/IAU Thematic Study on Astronomical Heritage describes, it is essential that 'the specificities of astronomical heritage management' are addressed in the Management Plan for an astronomical property.

In the case of Jodrell Bank Observatory, this is relatively simple to address. The JBCA 's Associate Director for Public Engagement & Heritage takes oversight of these on behalf of the Observatory as a whole, while the expert team of engineers, technicians and astronomers who work at the site address the delivery of these as a matter of course. This is a significant advantage stemming from the property being a working Observatory.

The Observatory team also works closely with advisors at Historic England and Cheshire East local authority. These external experts provide advice and guidance on maintenance and conservation of the fabric of the site. They also provide advice on 'addressing the gaps' in terms of skills needed as the property implements its action plan for the future.

The Jodrell Bank Discovery Centre Team

The staff team in the Jodrell Bank Discovery Centre has all the appropriate expertise required for managing visitors to the site, as well as its presentation and delivery via education programmes. The team, which now numbers around 50, has a high level of education in the sector, including first degrees in appropriate subjects, alongside post-graduate and professional qualifications in public engagement, education, marketing etc, as well as many years of experience working in this sector.

New staff are recruited to very high standards and training is provided for any new staff members with skills or experience gaps. The University has a well-developed and diverse Staff Training and Development scheme.

The new 'First Light at Jodrell Bank' project includes the recruitment of a specialist heritage manager.

The Director of the Discovery Centre will act as overall Coordinator of the World Heritage Site process. The Discovery Centre's Deputy Director will oversee Presentation and Responsible Visitation and the Discovery Centre's Head of Education and Interpretation will oversee Education and Interpretation.

The wider team at The University of Manchester

The skills required for managing archives and collections, as well as training, advice and support, are provided by colleagues within the University. Chief amongst these are the University's Historian and Heritage Manager, the Keeper of Collections at the John Rylands University Library and Curators at Manchester Museum (which is part of University). The National Jodrell Bank Archive is kept in archive conditions in the University Library and Manchester Museum has some objects related to Jodrell Bank kept in its storage spaces.

In addition to this, the University provides support in a number of key areas, including financial and legal oversight, HR, Communications and Fundraising.

Specialist Structural expertise

Significant repairs to the Lovell Telescope are typically carried out by external teams of specialist structural engineers, working to specifications defined by the Observatory's team of engineers and astronomers.

All painting of the Lovell Telescope is carried out by an external project team, which works in planned phases each summer.

External contracts are overseen by the University's Directorate of Estates, which engages a full project team including contract administrators, CDM coordinators, principal contractor and sub- contractors.

Industrial and Technological Archaeology

The most significant 'gap' in terms of the skills required to uncover, conserve, maintain and celebrate the heritage of the property is in Archaeology. In order to address this, the property managers, with the advice of Historic England and Cheshire East Conservation Officers, commission archaeologists as needed, to provide advice; supervise and carry out activities (e.g. the survey of the Transit Telescope site); and document progress and findings. This area will be developed further I the action plan.

Image: Howard Barlow

School students work with the education team at the Jodrell Bank Discovery Centre and The University of Manchester's School of Arts, Languages & Culture to explore the site's heritage.

7 Monitoring plan

Image: Anthony Holloway

Jodrell Bank Observatory has the advantage of having been in single ownership since its inception. The property owner, The University of Manchester oversees all activities within its boundaries, and is responsible for the maintenance and upkeep of all its elements. This means that all Attributes that carry the OUV of the property are within its control and have already been monitored for decades.

A staff of approximately 60 technicians, engineers and scientists work directly on or with the Lovell Telescope and Mark II Telescope on a daily basis. Both are inspected daily during operations by highly specialised staff (this is critical to prevent damage). A more detailed inspection and regular maintenance is carried out weekly (involving approximately 8 hours downtime) and reported to the weekly engineering meeting. A rolling programme of repairs, upgrades and maintenance is in place (covering weekly, monthly, three-monthly schedules etc). Major proactive and reactive maintenance tasks and painting are planned on an annual basis and carried out every summer, when the Lovell Telescope is taken out of service for up to 2-3 months, dependent on the nature of the work being undertaken.

All significant repairs to the Lovell Telescope are carried out in consultation with external structural engineers and all painting is carried out under the aegis of the University's Estates Directorate, who engages a full project team including contract administrators and CDM coordinators to manage the principal contractor and their sub- contractors.

The Observatory also works alongside the University Estates team to manage the 'Observatory' Estate and buildings. Contractors currently maintain the landscape elements according to a Grounds Maintenance Specification. Buildings are maintained and inspected on a continuing basis.

Working with the University Directorate of Estates, the Jodrell Bank Discovery Centre (JBDC) manages and maintains the estate and buildings open to the public. Contractors carry out maintenance works relating to buildings and look after part of the soft landscape (including boundary hedges, grassed areas, weed control and litter clearance). Other soft landscape features (e.g. the gardens) are managed and maintained by members of the Discovery Centre Team. Landscape infrastructure components (fences, interpretation boards, pathways etc.) are currently managed and maintained on an informal basis. Staff from the University of Manchester's Arboricultural Team inspect trees onsite and carry out and/or commission necessary arboricultural works.

A condition survey for the property, which will use the original Conservation Management Plan and Gazetteer as a baseline, will be commissioned every 5 years from external consultants.

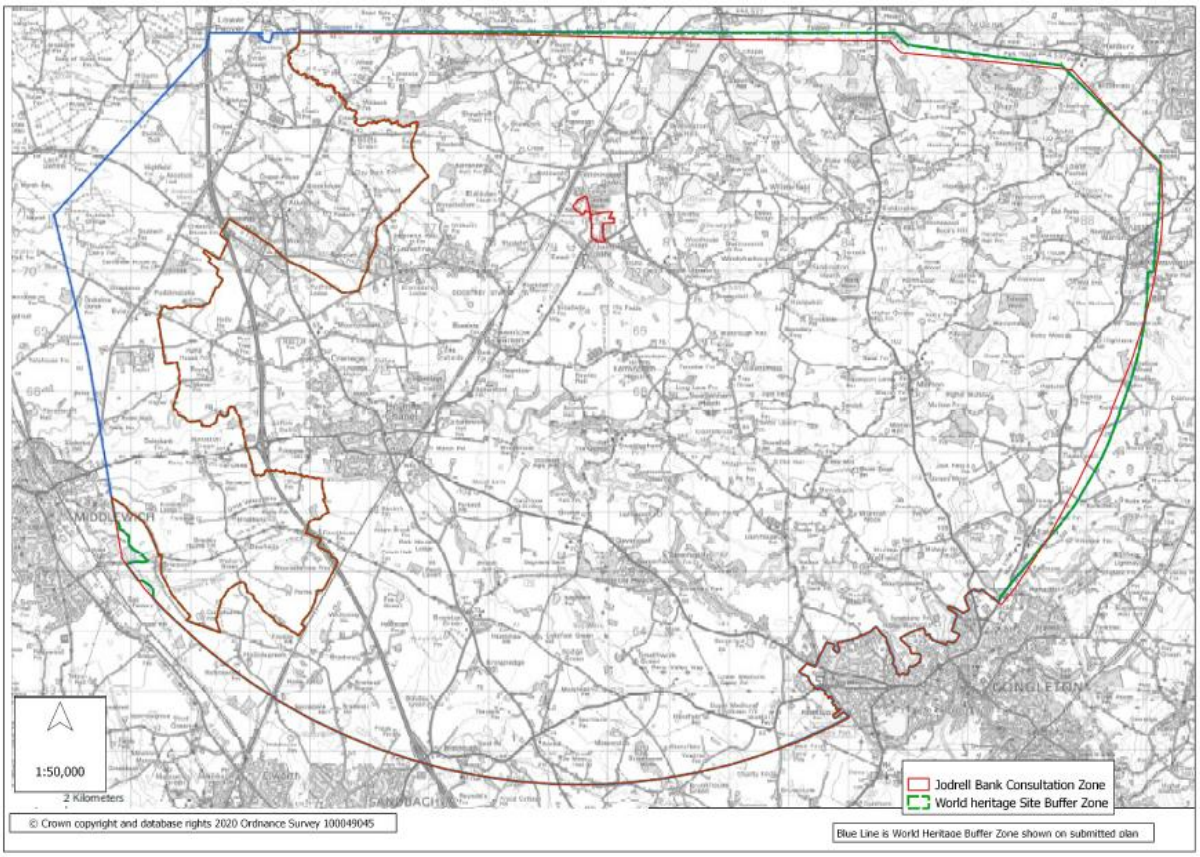
7.1 Indicators

A table of key indicators is provided below categorised according to the elements of the property being addressed. The periodicity of the review of each of these indicators is also included.

Category	Periodicity	Indicator
Condition of the Lovell and Mark II Telescopes	Annually	• Days lost to planned maintenance • Days lost to unplanned maintenance • Days lost to high wind • Days lost for other reasons (to be specified) • Description of maintenance tasks undertaken, including engineering specification if relevant, budget, time taken, illustrated by photographs as appropriate, comments by conservation officer and Historic England as appropriate
Any major conservation projects on the Lovell and Mark II Telescopes	Annually	• Reports on any major conservation projects underway, to include: - Description of work including extent of structure concerned, engineering specifications - Heritage Impact Assessments - Comments from conservation officer and Historic England as appropriate - Time before the project is due to be completed - Estimated budget required - Illustrated by photographs as appropriate • Reports on any major conservation projects which appear likely to be required in future, to include: - Description of work including extent of structure concerned, engineering specifications - Comments from conservation officer and Historic England as appropriate - Estimated timescale before work to start - Estimate of time required to complete - Estimate of budget required
Repairs and maintenance to Observatory Buildings	Annually	• General update on use of building • Description of any works carried out, including budget, estimate of time taken, illustrated by photographs as appropriate • Relevant Heritage Impact Assessments • Report from conservation officer on any works to listed buildings (Control Building, Cosmic Noise Hut, Electrical Workshop, Park Royal) • Description of any future work identified to be required, including estimated budget and time required, illustrated by photographs as appropriate • Photographs of building from several specified external and internal locations, for comparison to previous years
Conservation and maintenance to archaeological remains	Annually	• Description of any works carried out, including budget, estimate of time taken, volunteer days, illustrated by photographs as appropriate • Relevant Heritage Impact Assessments • Report from conservation officer on any works to listed building (Searchlight Aerial) • Description of any future work identified to be required, including estimated budget and time required, illustrated by photographs as appropriate • Photographs of remains from several specified locations, for comparison to previous years
Maintenance to Landscape areas	Annually	• Description of any works carried out, including budget, estimate of time taken, volunteer days, illustrated by photographs as appropriate • Description of any future work identified to be required, including estimated budget and time required, illustrated by photographs as appropriate • Photographs of landscape from several specified locations, for comparison to previous years • Heritage Impact Assessments
Level of visitation	Annually	• Visitor numbers, • Evaluation of visitor satisfaction • Education programme numbers • Evaluation of education programme • Assessment of level of impact on property
Condition survey of property	5 yearly	• Condition survey report to collate the annual reporting and provide update to the conservation management plan
Conservation	5 yearly	• Updated version of Conservation Management Plan
Conservation Management Plan		

Image: Anthony Holloway

11. Appendix 5: Defined JBO Consultation Zone



12. Appendix 6: Schedule of Relevant Appeal Decisions

12.1 Land Off Main Road, Goostrey. Planning Appeal Reference: APP/R0660/W/15/312954. Appeal dismissed.

12.2 Brickbank Farm, Boothbed Lane, Goostrey. Planning Appeal Reference APP/R0660/W/21/3267030. Appeal dismissed.

12.3 Rose Bank, Twemlow Lane, Cranage, Crewe CW4 8E. Planning Appeal Reference: APP/R0660/W/19/3224057. Appeal dismissed.

12.4 Over Peover Methodist Church, Cinder Lane, Over Peover. Planning Appeal Reference: APP/R0660/W/19/3226479. Appeal dismissed.

12.5 Macclesfield Road, Holmes Chapel. Planning Appeal Reference: APP/R0660/W/18/3214286. Appeal dismissed.

12.6 Maintenance Shed at the Coach House, Peover Lane, Chelford. Planning Appeal Reference: APP/R0660/W/18/3204248. Appeal dismissed.

12.7 Coachman's Cottage, Macclesfield Road, Jodrell Bank. Planning Appeal Reference: Appeal Ref: APP/R0660/W/18/3206533. Appeal dismissed.

12.8 Crossmere Farm, Davenport Lane, Brereton Heath. Planning Appeal Reference: Appeal Ref: APP/R0660/W/18/3202847. Appeal dismissed.

12.9 Moss Nook, Moss Lane, Brereton Heath. Planning Appeal Reference: Appeal Ref: APP/R0660/W/18/3206467. Appeal allowed.

12.10 51 Main Road, Goostrey. Planning Appeal Reference: Appeal Ref: APP/R0660/W/18/3218817. Appeal dismissed.

13. Glossary

Development	Defined by the Town and Country Planning Act 1990 as “the carrying out of building, engineering, mining or other operation in, on, over or under land, or the making of any material change of use of any building or other land.” Most forms of development require planning permission, unless expressly granted planning permission via a development order.
Development Plan	This includes adopted Local Plans and Neighbourhood Plans and is defined in Section 38 of the Planning and Compulsory Planning Act 2004
Design and Access Statement	A short report accompanying and supporting a planning application. They provide a framework for applicants to explain how a proposed development is a suitable response to the site and its setting, and demonstrate that it can be adequately accessed by prospective users An exaplanation of
Habitats Regulations Assessment	The process that competent authorities must undertake to consider whether a proposed development plan or programme is likely to have significant effects on a European site designated for its nature conservation interest.
Heritage Impact Assessment	An assement of a proposal on heritage matters
Jodrell Bank Consultation Zone	The area around Jodrell Bank Observatory within which Policy SE14 of the CELPS applies
Landsacpe Value Impact Assessment	An assesment of the landscape value of an area and detemrination of a proposals impact on that landscape
Local Plan	The plan for the development of the local area, drawn up by the local planning authority in consultation with the community. In law this is described as the Development Plan Documents adopted under the Planning and Compulsory Purchase Act 2004. Current core strategies or other planning policies, which under the regulations would be considered to

	be Development Plan Documents, form part of the Local Plan. This term includes old policies which have been saved under the 2004 Act.
Local Plan Strategy	Development Plan Document setting out the spatial vision and strategic objectives of the planning framework for an area, having regard to the Community Strategy.
Local Planning Authority	The local authority or council that is empowered by law to exercise planning functions. In the case of this SPD, the Local Planning Authority is Cheshire East Council.
Neighbourhood Plan	A plan prepared by a parish council or neighbourhood forum for a particular neighbourhood area (made under the Planning & Compulsory Purchase Act 2004).
Radio Interference Assessment	Technical assessment of the mpact of a propsoals electrical devices on the efficeiny of JBO telescopes
Site Allocations and Development Policies Document	Part of the Local Plan which will contain land allocations and detailed policies and proposals to deliver and guide the future use of that land.
Supplementary Planning Document	A Local Development Document that may cover a range of issues, thematic or site specific, and provides further detail of policies and proposals in a 'parent' Development Plan Documents.
Sustainability Appraisal	An appraisal of the economic, environmental and social effects of a plan from the outset of the preparation process to allow decisions to be made that accord with sustainable development.
Strategic Environmental Appraisal	SEA is a process and a tool for evaluating the effects of proposed policies, plans and programmes on natural resources, social, cultural and economic conditions and the institutional environment in which decisions are made.
Viability Study	A report, including a financial appraisal, to establish the profit or loss arising from a proposed development. It will usually provide an analysis of both the figures inputted and output results together with other matters of relevance. An assessment will

normally provide a judgement as to the profitability, or loss, of a development.