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Why the landscapes of post-war infrastructure matter



Manchester School of Architecture has been researching, analysing and teaching about the landscapes and architecture of post-war infrastructure

Infrastructure is popularly conceived as a form of material production assigned to technological advancement.

However, it is not exclusively a technocentric endeavour, it is constituted by built artefacts designed through collaboration by those with more than simply an interest in its engineering. Infrastructure has the capacity to reveal much about the society in which it was produced – the political economy of infrastructure; the sociocultural effects of infrastructure; the formal and visual impact of

infrastructure and attitudes to its celebration or containment. Rebuilding after 1945 was characterised by numerous large-scale infrastructural schemes, including electrical power generation, water infrastructure and the improved transportation delivered by new motorways. The scale of this development that transformed the perceptibly rural landscapes of Britain, was comparable to the changes caused by the Industrial Revolution. As Sylvia Crowe phrased it the landscape of Britain faced the “greatest crisis of its history”, and

this necessitated a novel approach to design and implementation and a new collaborative practice between architecture, landscape architecture, engineering and planning professionals.¹

The profession of landscape architecture experienced a major shift in the UK after the WW2, in both the complexity and scale of projects. As Crowe claimed, “*Before the war landscape design was confined almost entirely to the creation of gardens and parks; even if some industry called in a landscape architect it was*

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1. Scammonden, the world's first dam motorway hybrid. Landscape design by J. B Blainey.
© Richard Brook, 2018)

2. Eggborough power station. Landscape architects: Brenda Colvin & Hal Moggridge.
© Luca Csepely-Knorr, 2018)

3. Sylvia Crowe: The Landscape of Roads.
Published by the Architectural Press in 1960.

4. Sylvia Crowe: The Landscape of Power.
Published by the Architectural Press in 1958.

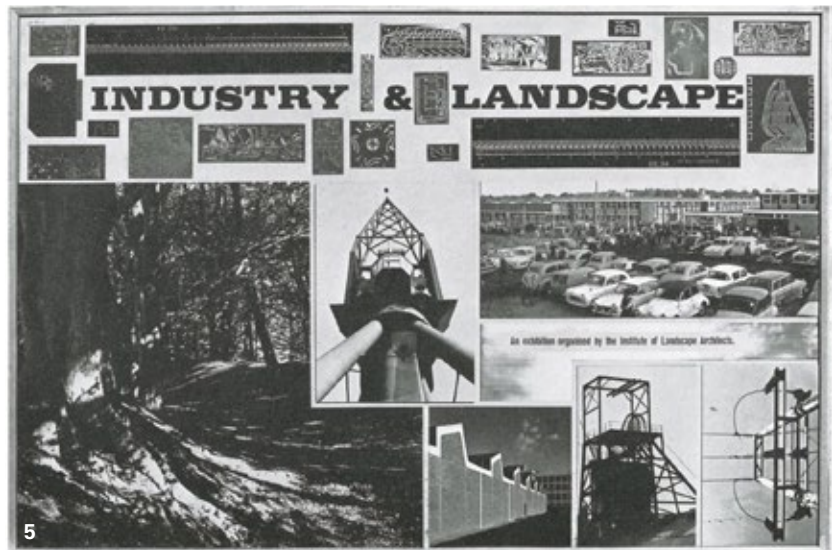
5. The Industry & Landscape Exhibition organised by the Institute of Landscape Architects.

Journal of the Institute of Landscape Architects, no 68, November 1964. P. 15.

with the idea of creating a garden round their buildings. [...] Gradually this is changing: the pressure of population, transport and economics is upsetting the balance of great areas of landscape, and it is evident that positive design is needed to restore them to a state of balance."² This shift from garden design to landscape planning and from the idea of creating a 'garden round the buildings' to designing large scale landscapes that accommodated complex new structures, typologies and activities created new challenges and placed the profession of landscape architecture at the forefront of the evolving field of infrastructural design.

The creation of landscapes around post-war power stations was informed by Section 37 of the Electricity Act (1957), later dubbed the 'Amenity Clause'. It required the minimisation of the impact of generating and transmission sites on scenery, flora and fauna, by creating aesthetic value as well ecologically important assets, and resulted in the appointment of landscape architects on new power station projects. In the same period the 'public relation value' of the landscapes of power stations became a crucial part of government policy that safeguarded the needs of communities and added another layer of cultural value to these landscapes.³ **(1)** In 1961, Michael Porter was appointed as the first Landscape Advisor to the Ministry of Transport. **(2)** The 1973 Water Act also created a duty to promote 'amenity' by the Regional Water Authorities.⁴

Exhibitions and publications of the period, such as a series of articles in the *Journal of the Institute of Landscape Architects* and, most notably, Sylvia Crowe's books *'The Landscape of Power'* (1958) and *'The Landscape of Roads'* (1960) and the *'Industry and Landscape'* Exhibition in 1964 showed the eminence of the question to the professional discourses in the field of landscape architecture. **(3-5)** In addition, they highlighted the prominent role that landscape architecture played in helping to ameliorate the public's perception of infrastructural developments.⁴ This new aspect of the profession was



clearly recognised by Brenda Colvin, when she wrote that "...our power stations, oil refineries, factories and water-works must take their place, in time, with the pyramids, castles and temples of the past".⁵ The idea of the infrastructural and industrial landscapes as iconic undertakings of the period was reinforced by distinguished planner and founding member of the Institute of Landscape Architects, Lord Holford, when he positioned the work of the Central

Electricity Generating Board as "the modern patron of landscaping art" and explained that "...the great landowners of the eighteenth century employed the founders of the profession, William Kent, Capability Brown, Humphrey Repton and their followers. Today the Generating Board engage practising landscape architects of the first rank and a new philosophy of landscape design is emerging, often experimental, sometimes inspired but always seeking a solution to complex problems".⁶

¹ Crowe, S. (1958) *Landscape of Power*, London: Architectural Press. p.10.

² Crowe, S Buckingham Talk, unpublished. MERL AR CRO SP4/2. what year?

³ Goulty, G. (1986) *Landscape Electric*, Landscape Design, August 1986, pp.34-37.

⁴ Aldous, T. & Clouston, B. (1979) *Landscape by Design* London: William Heinemann Ltd. p.79.

⁵ Colvin, B. (1970) *Land and Landscape*. London: John Murray, 344.

⁶ CEGB: *Power and the Countryside*. CEGB London: 1965

The Landscape and Architecture of Post-War Infrastructure Research Centre

The exemplary approach toward the landscapes of infrastructure left us with a rich and particularly valuable designed landscape heritage that is, however, often undervalued and overlooked. Today, when the decommissioning of coal-fired and nuclear power stations is underway, and peri-urban sites which are hosts to multiple forms of infrastructure are under development pressure, the urgency of understanding, mapping and protecting such land assets needs new frameworks and clear methodologies for decisionmakers.⁷

In February 2019, the Manchester School of Architecture hosted a two-day international workshop and conference funded by the Paul Mellon Centre on the *'Landscape and Architecture of Post-War British Infrastructure'*. These events brought together academics from a broad range of academic disciplines and, through its two keynote lectures by Elaine Harwood (Historic England) and Hal Moggridge (PPLI), aimed to compare the views of the historian with the direct experience of the designer.⁸ The conclusion of the conference and the workshop highlighted the necessity of investigating the landscapes of infrastructure for several reasons. The apparent invisibility of landscape design in mature settings means that sites are being redeveloped, or lost, before their values are assessed and understood.

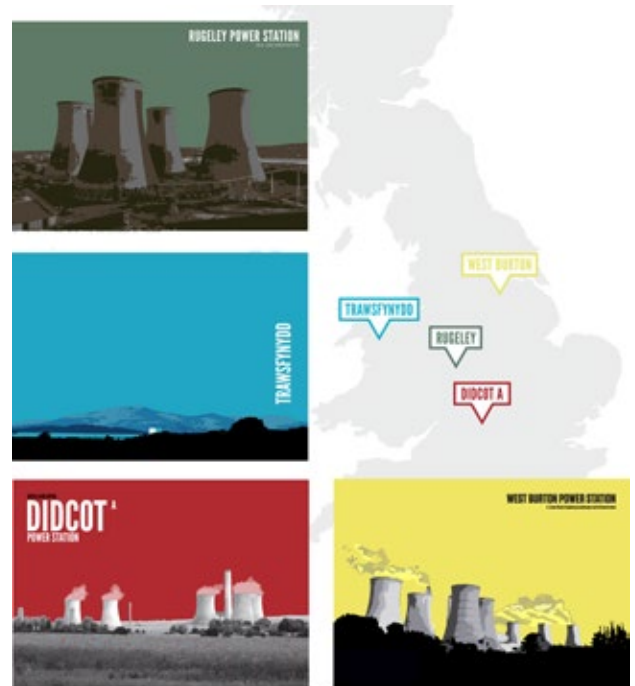
The next steps of the research will be delivered during the next two years, in two major research projects funded by the Arts and Humanities Research Council as part of their special call for 'Landscape Decisions: Towards a new framework for using land assets' programme.⁹ The project is particularly concerned with the temporal aspects of landscape and the relationships between designed space and its assimilation with perceptibly natural and traditionally agricultural landscapes. It aims to understand how time and use can interact with

landscape to create cultural and amenity value as well as valuable ecologies; the way in which policy helped to foster such conditions, and the influence of current policy on the management and development of these landscapes. It will investigate how artistic and creative responses to the landscapes of infrastructure can help to narrate their cultural worth, and will develop means of understanding of their seemingly intangible values by comparing and combining research methods in the arts and humanities. Project Partners include Historic England, The Gardens Trust, the Landscape Institute, Highways England, Natural England, International Council on Monuments and Sites (ICOMOS), Friends of the Landscape Library and Archives at Reading (FOLAR) and the Museum of English Rural Life (MERL).

Research-led teaching at the Manchester School of Architecture

As part of the larger research project, Dr Laura Coucill and Dr Luca Csepely-Knorr coordinate the *Arch. Land. Infra* Research Methods unit for postgraduate students of the Manchester School of Architecture. The overarching aim of the Research Methods unit is to introduce a range of approaches for understanding, interrogating and researching the built environment. Within this framework, *Arch. Land. Infra* focuses on the post-war (1945-1980) histories of the various intersections between architecture and landscape architecture and capitalises on the opportunities research-based and research-tutored pedagogy offers. Through archival research, combined with design analysis techniques, the output of *Arch. Land. Infra* included a series of four detailed case studies of UK Power Stations designed in between 1950 – 1970 by key architects and landscape architects. **(6)** Case studies and accompanying models were exhibited during the workshop and conference on the *'Landscape and Architecture of Post-War British Infrastructure'*.

The case studies were: Didcot A (1965-1968, architect and landscape



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architect Sir Frederick Gibberd), Rugeley B (1964-1972, architects L K Watson and H J Coates, landscape architect Brenda Colvin), West Burton (1961-1967, architect Architects' Design Group – John Gelsthorpe, landscape architect Derek Lovejoy) and Trawsfynydd (1959-1965, architect Sir Basil Spence, landscape architect Dame Sylvia Crowe). Students benefited from archival and exhibition workshops and talks, in addition to an in-depth interview with Hal Moggridge about his experience in designing and delivering plans for large-scale infrastructural landscapes; offering first-hand experience of core research methods and the opportunity to engage with external partners in a professional working context. Students worked directly with the Gibberd Archives in Harlow and the Landscape Institute Archives at MERL, documenting and analysing archival resources. Analysis took creative forms and built on representational and design skills to articulate research findings through diagrams, maps, drawings and models.

6. Case study locations. Drawing by Arch.Land.Infra Research Methods students at the Manchester School of Architecture.

⁷ This urgency is underlined campaign by Historic England and The Gardens Trust. <https://historicengland.org.uk/listing/apply-for-listing/listing-priorities/modern-gardens-landscapes/>

⁸ For conference abstracts see: www.postwarinfrastructure.org

⁹ <https://nerc.ukri.org/research/funded/programmes/landscape/#xcollapse4>

7. West Burton today.

© Arch.Land.Infra West Burton Group, 2018

8. The Trent Valley Energy Plan.

Drawing by Arch.Land.Infra West Burton Group, 2018

9. Comparison of original design aims with current situation.

Drawings (based on Lovejoy's drawings from 1965 and 1973) and photos by Arch.Land.Infra West Burton Group, 2019

10. Rugeley in 2018.

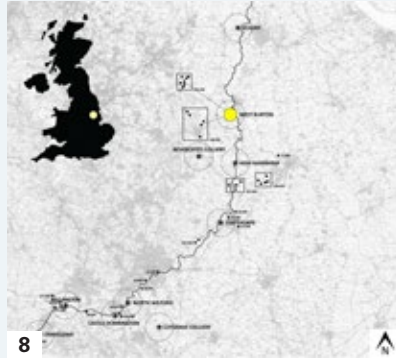
© Arch.Land.Infra Rugeley Group, 2019

11. Diagrams describing "Macro" and "Panoramic" strategies by Colvin.

Analysis and diagrams by Arch.Land.Infra Rugeley Group, 2019

Case study: West Burton

(by Thomas Brunyard, Sahachai Kumalwisai, Tillman Pospischil and Annette Sibthorp)



West Burton power station was the first of CEGB's new generation of power stations based on the 500 MW turbo-generator, as part of the Trent Valley System of power stations. (9) Landscape architect Derek Lovejoy was involved in creating a landscape plan of the whole valley, also known as 'Megawatt Valley',

before designing the grounds of West Burton from 1961 (7). Lovejoy's thorough understanding of the larger, predominantly flat agricultural landscape setting meant that his plans for the area of a three-mile radius around the power station were realistic, not trying to obscure the many views of the station, but instead control them with tactical treeplanting and screening in and around the station's site. Lovejoy aimed to retain the open character of the landscape, with the overall aim to frame and contain the building and structures.

The landscape was created by new and reinforced existing hedgerow planting and extensive tree planting.

The current state of the key views created by Lovejoy were



- 7**
- A - Reinforced Hedgerow Planting
 - B - Flat Agricultural Landscape
 - C - Lozenge Formation
 - D - Hidden Cooling Tower due to Formation
 - E - Line Formation
 - F - West Burton B (Gas Power Station)



Case study Rugeley

(by Jessica Abbott, Florence Booth, Ely Mead and Kelvin Pang)



The landscape of Rugeley power station was Brenda Colvin's fourth landscape for a coal-fired power station and therefore can be seen as a summary of her approach to this particular type of design problem (10). Rugeley 'A' was completed in 1963 and Rugeley 'B' was opened in 1972.

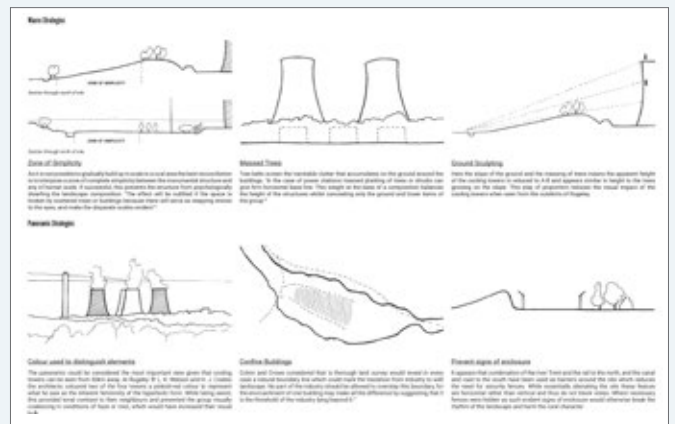
The power station ran on full capacity until 1994, when Rugeley A was first decommissioned and subsequently demolished in 1995.

The analysis of a large number of plans, reports and letters by Colvin, held at the Landscape Institute Archives at MERL, identified key strategies explaining how Colvin dealt with the landscape (11).

On a macro level, an area (to which Colvin referred as a *zone of simplicity*) was created between the monumental structure of the cooling towers and any human scale activity:

examined in the case study through photographic analysis. This highlighted key developments, resulting mostly from the changing ownership of the landscape where land was not owned by the CEGB, or after privatisation by the energy companies. The maintenance of planting and the original concept has significantly faded. The changing landscapes around West Burton and its approaching decommissioning poses several questions about the future of these carefully designed landscapes. (8)

this aimed to prevent the structure from psychologically dwarfing the landscape composition. She recognised that massed planting of trees or shrubs can give a firm horizontal baseline and screen the inevitable clutter that accumulates on the ground around the buildings. Ground Sculpting together with the mass planting of trees allowed the



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reduction of the visual impact of the cooling towers when seen from the outskirts of Rugeley.

Panoramic strategies could be considered as one of the most important aspects of the design, given that cooling towers can be seen from 50 km away. At Rugeley two of the four towers were coloured to a pinkish red tone, to contrast with their neighbours and to prevent the cluster visually coalescing in conditions of haze or mist, which would have increased their visual bulk. The notion of confining buildings was championed by both Sylvia Crowe and Brenda Colvin: they thought that *“a thorough land survey would reveal*

in every case a natural boundary line which could mark the transition from industry to wild landscape”.¹⁰ This helped in creating a more interlocking arrangement of landscape forms. Natural forms and other infrastructural elements, such as roads or railways were used by Colvin as barriers, to reduce the need for security fences and prevent signs of enclosures. Where necessary, fences were hidden, as such evident signs of enclosures would otherwise break the rhythm of the landscape and harm the rural character. **(12).**

Colvin’s landscape at Rugeley was developed even after completion: in 1986 a nature study centre was

associated with the south-east end of the site, this allowed the public to use the thoroughly designed landscape for leisure purposes: something that characterised all of Colvin’s designs. In 2010 a residential estate was built on the site and in 2011 Amazon opened its 700,000 sq ft warehouse on the old colliery site. In 2016 Rugeley B was closed. The landscape designed by Colvin has significantly altered.



12. Rugeley power station in 1975.

Model by Arch.Land.Infra Rugeley Group, 2019

13. Trawsfynydd in 2013.

© Laura Coucill

14. Comparison of drawings from the 1956 landscape report by Crowe with the current conditions using Crowe’s drawing style.

Arch.Land.Infra Trawsfynydd Group, 2019

15. Analysis of Basil Spence’s and Sylvia Crowe’s drawing techniques, based on archival materials held in MERL and the Basil Spence Archives. The final sketch combines the two drawings to depict the architecture and landscape together.

Drawings by Arch.Land.Infra Trawsfynydd Group, 2019

16. 3D printed model of Trawsfynydd nuclear power station.

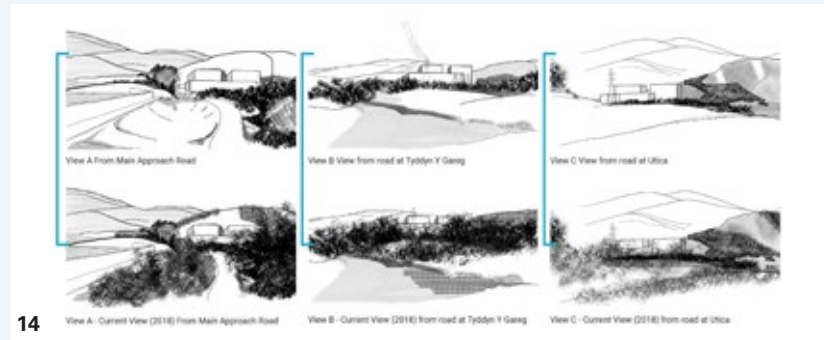
Arch.Land.Infra Trawsfynydd Group, 2019.

Case study Trawsfynydd

(Ziwen Cai, Karolina Dudek, Erin Edmondson, Olivia Marshall, Ben Miller)



The only nuclear power station among the case studies, Trawsfynydd in Snowdonia National Park in Wales was the first inland nuclear power station, constructed by CEBG in 1965. The project built on the expertise of renowned designers Dame Sylvia Crowe and Sir Basil Spence **(13)**. Based on archival materials from the National Archives, Welsh National Library, Landscape Institute Archives at MERL, Basil Spence Archive and the RIBA Library, the case study aimed to analyse and understand the nature of the design methodology of the landscape and architectural collaborative design process. Furthermore, the drawings and physical models demonstrated the relationship between the architectural

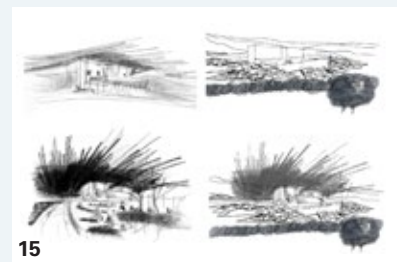


design and the existing and proposed landscape of Snowdonia National Park.

By using analytical drawing methodologies, the case studies uncovered the collaborative approach of the designers and how Crowe’s approach influenced both the visual appearance and architectural design of Spence and vice versa, which resulted in an exemplary project. Combining the drawings of the two designers, both in terms of drawing style and content, created exciting representations of this collaboration **(15)**. By recreating Crowe’s drawings and adding the layer of landscape change to it, the work analysed how the intended strategies defined by Crowe as ‘Design Actions’ worked in a matured landscape setting 45 years after it was designed **(14)**.

The decommissioning of Trawsfynydd began in 1991, with the power station closing in 1993. The landscape of Trawsfynydd became Grade 2* listed in the Register of Landscapes, Parks and Gardens of

Special Historic Interest in Wales. **(16)** In 2011 the Twentieth Century Society unsuccessfully campaigned for the building to become listed. The decommissioning process is expected to be completed by 2083, but the exact future of the complex and the landscape is still unsure.



¹⁰ Crowe, S (1958) *The Landscape of Power* London: Architectural Press. 50.

17. Didcot power station in late 2018.
© David Jeffrey Wilkinson

18. Design development diagrams based on Gibberd's drawings.

Redrawn by Arch.Land.Infra Didcot Group, 2019

19. Interactive model showing the design development and final layout.

Arch.Land.Infra Didcot Group, 2019

Case study Didcot A

(by Abbas Afsar, Connor Forecast, Caterina Emma Pini, David Wilkinson, George Sims)



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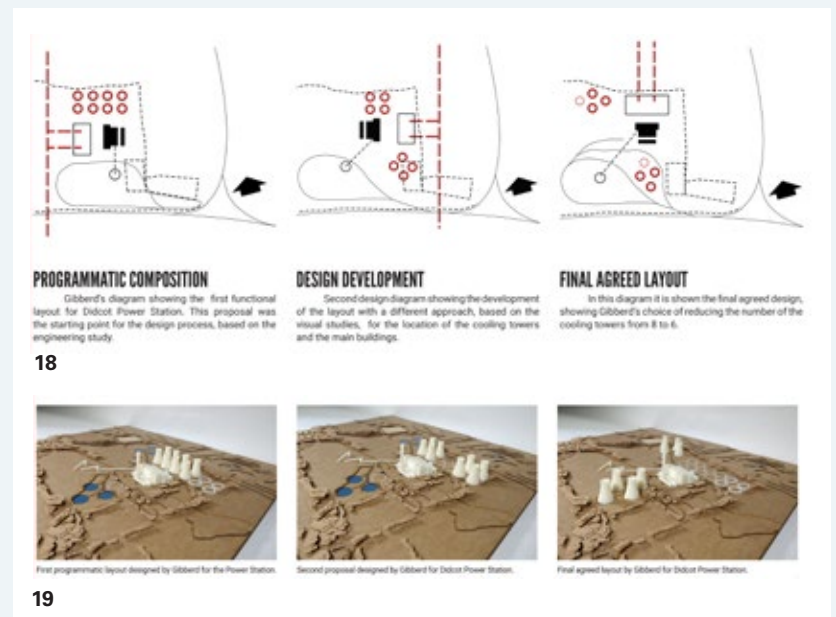
The coal and gas fired power station, Didcot A, operated from 1968 to 2013 supplying an average capacity of 2000 MW, making it the second most powerful individual power station ever built in the UK. Commissioned by the CEBG and designed by Sir Frederick Gibberd, Didcot A embodied a bold attitude towards infrastructure in the post-war period. (17) On 18th August 2019 the last three remaining cooling towers were demolished, and the chimney was demolished on 9th February 2020 reminding us that recording and analysing these sites while they are relatively intact is crucial and highly timely if we want to understand the effect of design

decisions especially in the field of landscape architecture in case of large-scale infrastructural designs.

The analysis of Gibberd's design process through a set of diagrams and an interactive physical model uncovered how the final design – with special emphasis on the siting of cooling towers in relation to the landscape design – evolved through testing and modelling (18 & 19). Understanding the stages of the design process and the decisions uncovered how Gibberd aimed to reduce the impact of the power station on the surrounding landscape by keeping the cooling towers down to a height of 325 ft and distributing them in two groups of three.

Didcot and the landscapes around it had much publicity, being featured

in the Architectural Review and winning the 1968 Civic Trust Award, demonstrating the importance of infrastructural projects during that period. As well as Gibberd's own accounts about his work, the design was reviewed by the leading designer of coal-fired power stations of the time, Brenda Colvin, in the same journal. The comparison of Gibberd's design with Colvin's design for Rugeley and the analysis of Colvin's criticism, revealed contrasting approaches to how to balance large industrial objects with the surrounding landscape: while Colvin recommended "a sinuous flow of vegetation", Gibberd opted for a more geometrical approach when choosing rectangular groups of trees for both screening and opening up preferred views.¹¹



PROGRAMMATIC COMPOSITION

Gibberd's diagram showing the first functional layout for Didcot Power Station. This proposal was the starting point for the design process, based on the engineering study.

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First programmatic layout designed by Gibberd for the Power Station.

DESIGN DEVELOPMENT

Second design diagram showing the development of the layout with a different approach, based on the visual studies, for the location of the cooling towers and the main buildings.

18



Second proposal designed by Gibberd for Didcot Power Station.

FINAL AGREED LAYOUT

In this diagram it is shown the final agreed design, showing Gibberd's choice of reducing the number of the cooling towers from 8 to 6.

18



Final agreed layout by Gibberd for Didcot Power Station.

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¹¹ Colvin, B. (1974) 'Power Station, Didcot, Berkshire. Criticism by Brenda Colvin' The Architectural Review, 930, 92.

¹² <https://www.topuniversities.com/university-rankings/university-subject-rankings/2019/architecture>; Csepely-Knorr, L. (2019) "To Broaden the Outlook of Training". The first landscape course in Manchester, UK" Gao L & Egoz S (eds) (2019) Lessons From the Past, Visions From the Future. Celebrating One Hundred years of Landscape Architecture Education in Europe. As: Norwegian University of Life Sciences, pp 163-165.

The School

The Manchester School of Architecture (MSA) is a collaboration between Manchester Metropolitan University and the University of Manchester, and has been ranked in the world's top 10 architecture schools in the last 5 years, with a long history in teaching landscape architecture.¹²

Collaboration and multidisciplinary teaching remain core in the pedagogical methodology of MSA.

The School offers a variety of courses and elective units throughout its under- and postgraduate curriculum, and landscape architecture comprises a key part of this. Currently the School has a two-year, 300 credit programme in landscape architecture, accredited by the Landscape Institute and leading to an internationally recognised qualification. The Masters in Landscape Architecture places emphasis on an understanding of landscape as a dynamic and adaptive

phenomenon. Projects promote a focus on the interfaces between the landscape as a human, cultural construct and as a reflection of underlying natural and environmental processes. To strengthen the links between research and teaching, the School hosts two collaborative doctoral studentships in the field of landscape architecture, one with the Landscape Institute Scotland and one with Historic England.