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Appendix 13.1

Mitigation Measures and the Archaeological Resource

Keerglen Wind Farm

Mayo Planning Authority - Inspection Purposes Only

Mitigation Measures and the Archaeological Resource

Potential Mitigation Strategies for Archaeological Remains

Mitigation is defined as features of the design or other measures of the proposed development that can be adopted to avoid, prevent, reduce or offset negative impacts.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse impacts can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse impacts is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved *in situ*.

Definition of Mitigation Strategies

The ideal mitigation for all archaeological sites is preservation *in situ*. This however is not always a practical solution, and a series of recommendations are therefore offered to provide ameliorative measures where avoidance and preservation *in situ* are not possible.

Archaeological excavation involves the scientific removal and recording of all archaeological features, deposits and objects to the level of geological strata or the base level of a given development. Full archaeological excavation is recommended where initial investigation has uncovered evidence of archaeologically significant material or structures and where avoidance of the site is not possible.

***Archaeological test trenching* is a form of excavation where the purpose is to establish the nature and extent of archaeological deposits and features present in a location which it is proposed to develop (though not normally to fully investigate those deposits or features) and allow an assessment to be made of the archaeological impact of the proposed development.**

Archaeological monitoring involves an archaeologist being present in the course of the carrying out of development works (which may include conservation works), so as to identify and protect archaeological deposits, features or objects which may be uncovered or otherwise affected by the works.

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Appendix 13.2

Significance of Criteria

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SIGNIFICANCE OF CRITERIA

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of resources potentially affected. Wind farms and their associated infrastructure can affect the archaeological, architectural and cultural heritage resource of a given landscape in a number of ways:

- Permanent and temporary land-take, associated structures, landscape mounding and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape;
- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery, disturbance by vehicles working in unsuitable conditions, burial of sites thus limiting accessibility for future archaeological investigation;
- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or long-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits;
- Visual and noise impacts on the historic landscape can arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic structures and historic landscape elements as well as their visual amenity value;
- Landscape measures, such as tree planting, can damage sub-surface archaeological features due to topsoil stripping and through the root action of trees and shrubs as they grow;
- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluvium or peat deposits;
- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, service trenches, *etc*; and
- Although not widely appreciated, positive impacts can accrue from permitted developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments and the increased level of knowledge of a site or historic landscape as a result of assessment and fieldwork.

Predicted Impacts on Archaeological, Architectural and Cultural Heritage Remains

There is no standard scale against which the severity of impacts on the archaeological and historic landscape may be judged. The severity of a given level of land take or visual intrusion varies with the type of monument, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

- The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;

- Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected; and
- Assessment of the levels of visual, noise and hydrological impacts, either in general or site specific terms, as may be provided by other specialists.

For this assessment, the significant effects criteria outlined in Table 13-5 is used:

Table 13.5 Description of Effects	
Level of Effects	Significance Criteria
Imperceptible	An effect capable of measurement but without significant consequences
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant Effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment
Profound Effects	An effect which obliterates sensitive characteristics

For this assessment, the duration of effects criteria outlined in Table 13-6 is used:

Table 13.6 Duration of Effects	
Level of Effects	Duration
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year
Short-term Effects	Effects lasting one to seven years
Medium-term Effects	Effects lasting seven to fifteen years
Long-term Effects	Effects lasting fifteen to sixty years
Permanent Effects	Effects lasting over sixty years
Reversible Effects	Effects that can be undone, for example through remediation or restoration

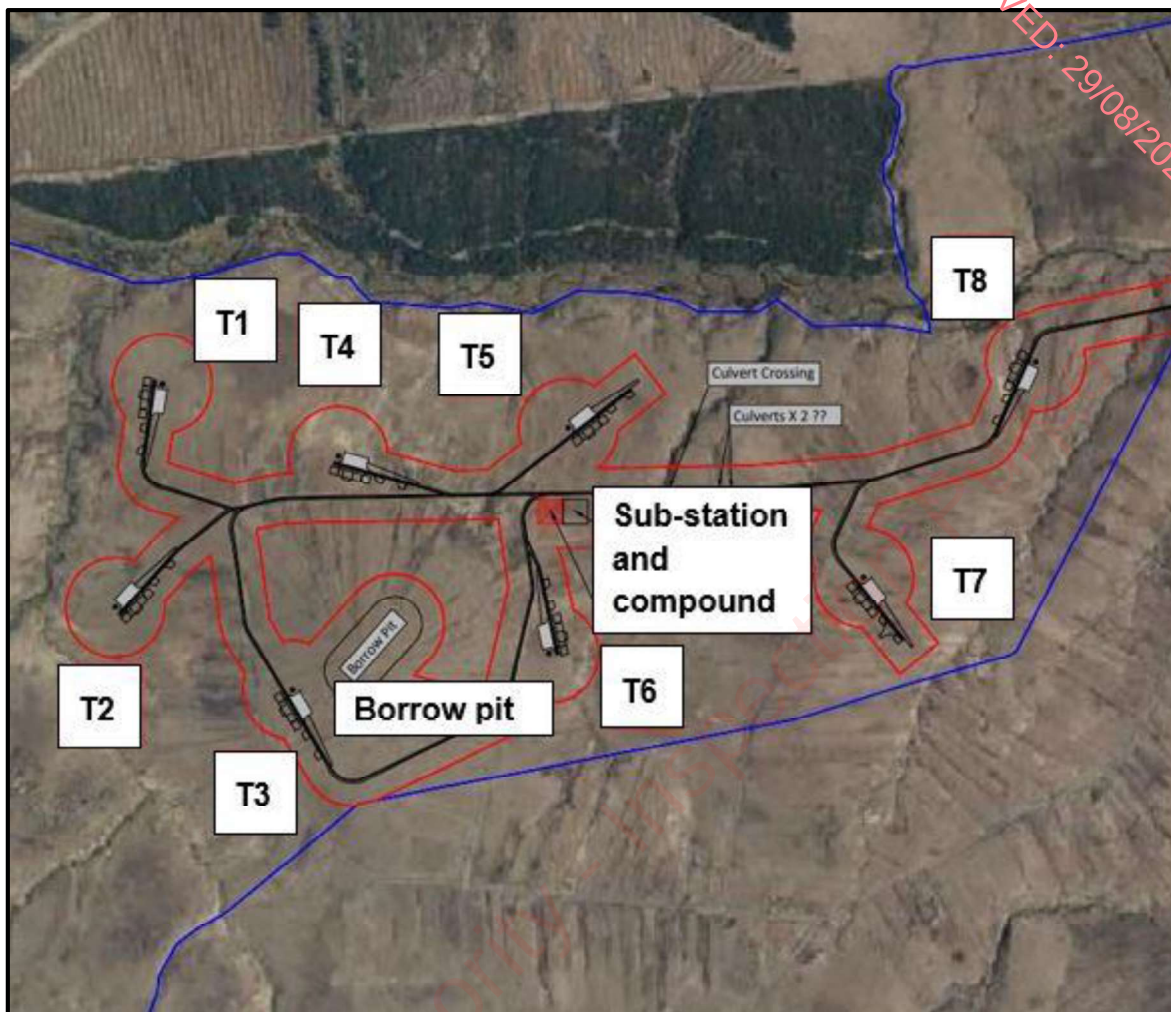


Figure 13.1 Layout of the proposed development showing location of Turbines 1 – 8, sub-station, compound and borrow pit

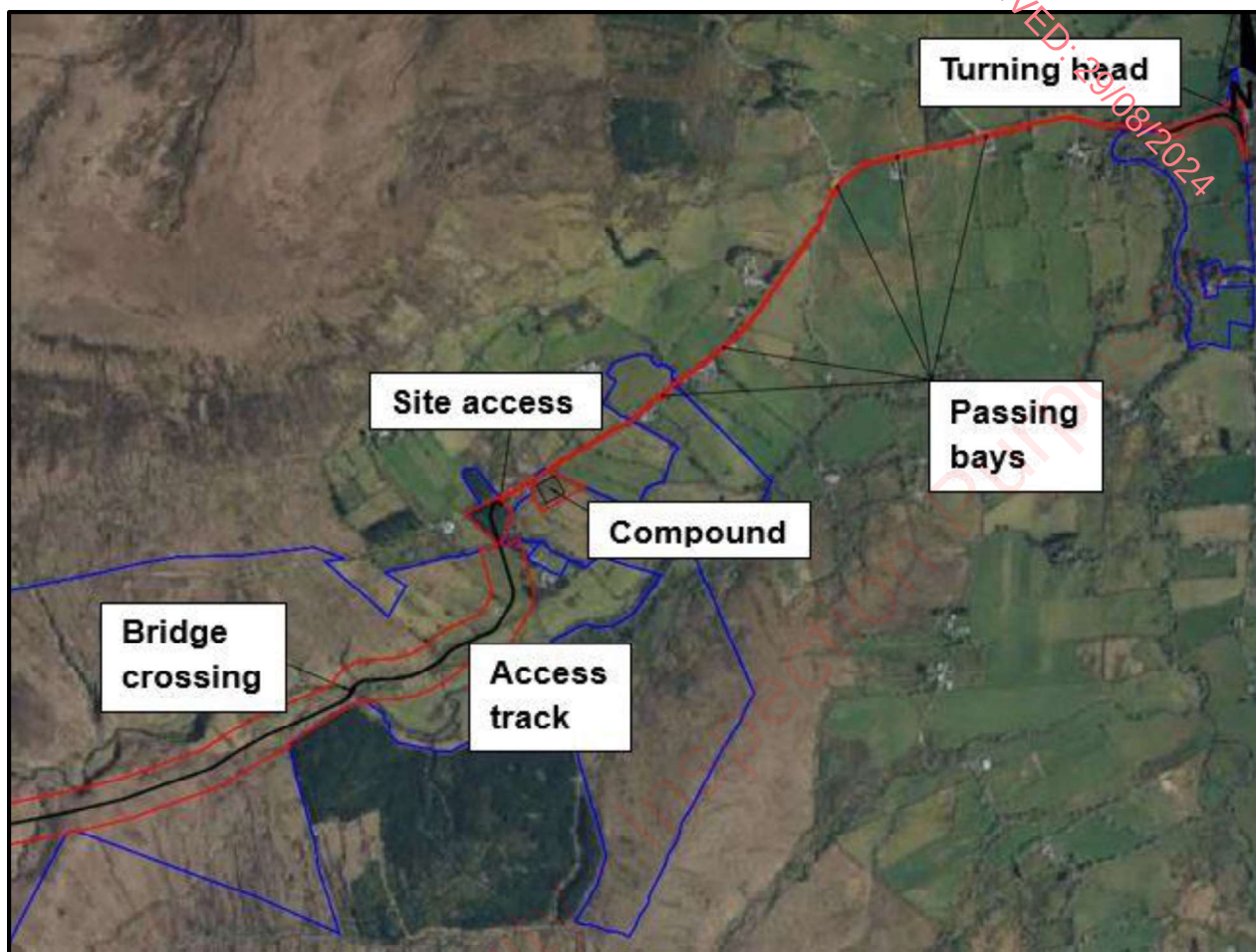


Figure 13.2 Layout of the proposed development showing location of access track, site access, turning head, passing bays, site compound and bridge crossing



Figure 13.3 The Down Survey map showing land divisions in the mid-17th century in the general landscape of the proposed development area

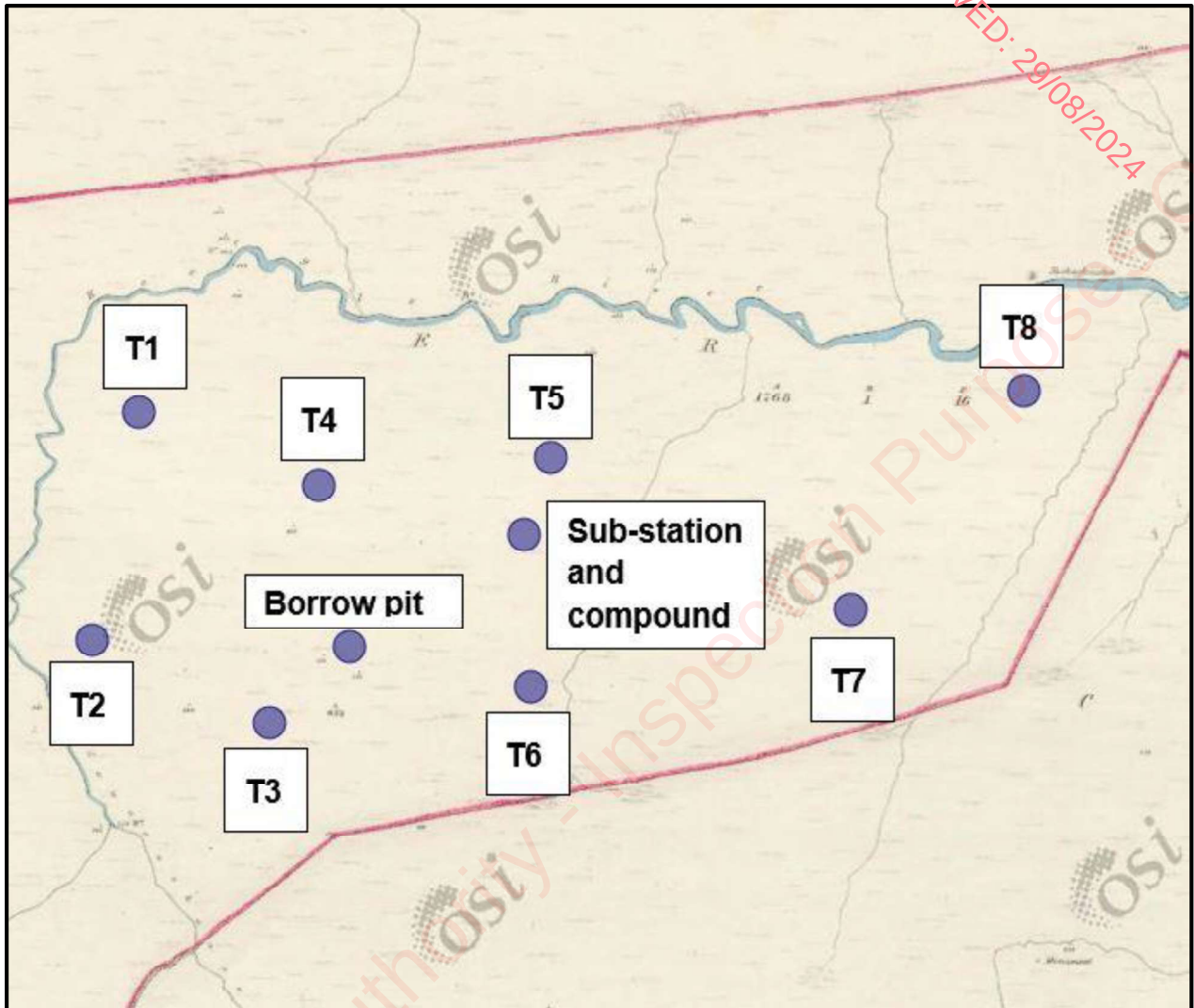


Figure 13.4 Extract from First Edition Ordnance Survey map 1:10,560 (1839) showing location of Turbines 1 – 8, substation, compound and borrow pit

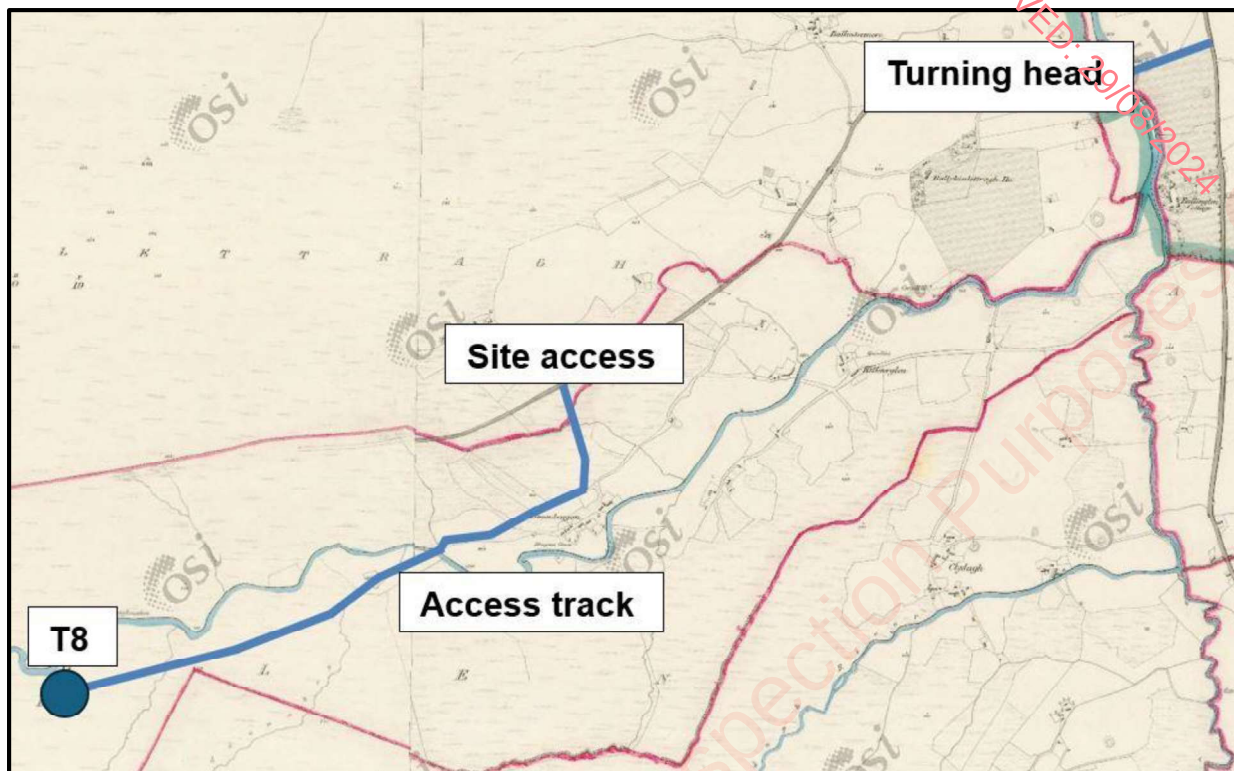


Figure 13.5 Extract from First Edition Ordnance Survey map 1:10,560 (1839) showing location of Turbine 8, turning head, site access and access track

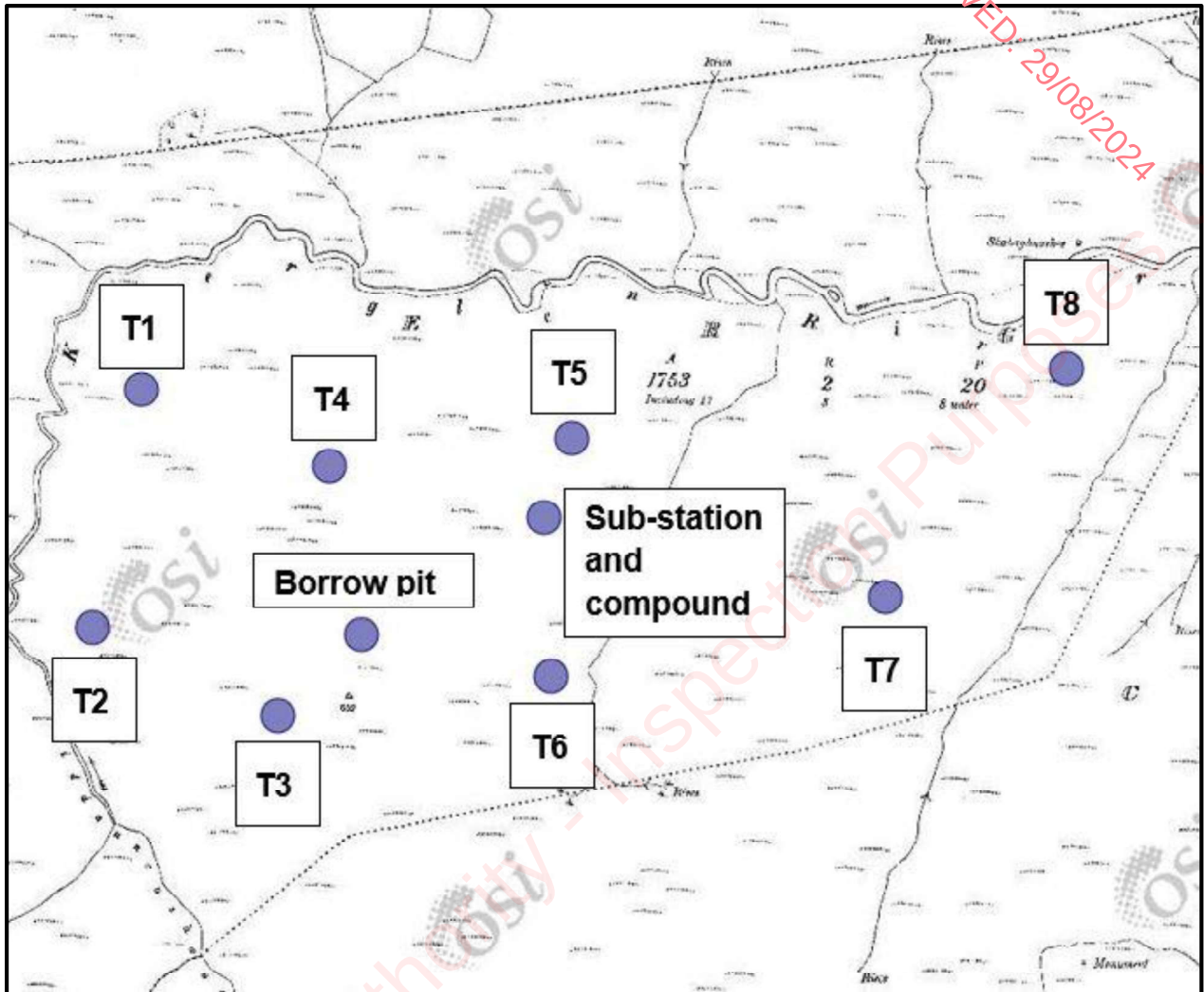


Figure 13.6 Extract from Third Edition Ordnance Survey map 1:10,560 (1917) showing location of Turbines 1 – 8, substation, compound and borrow pit

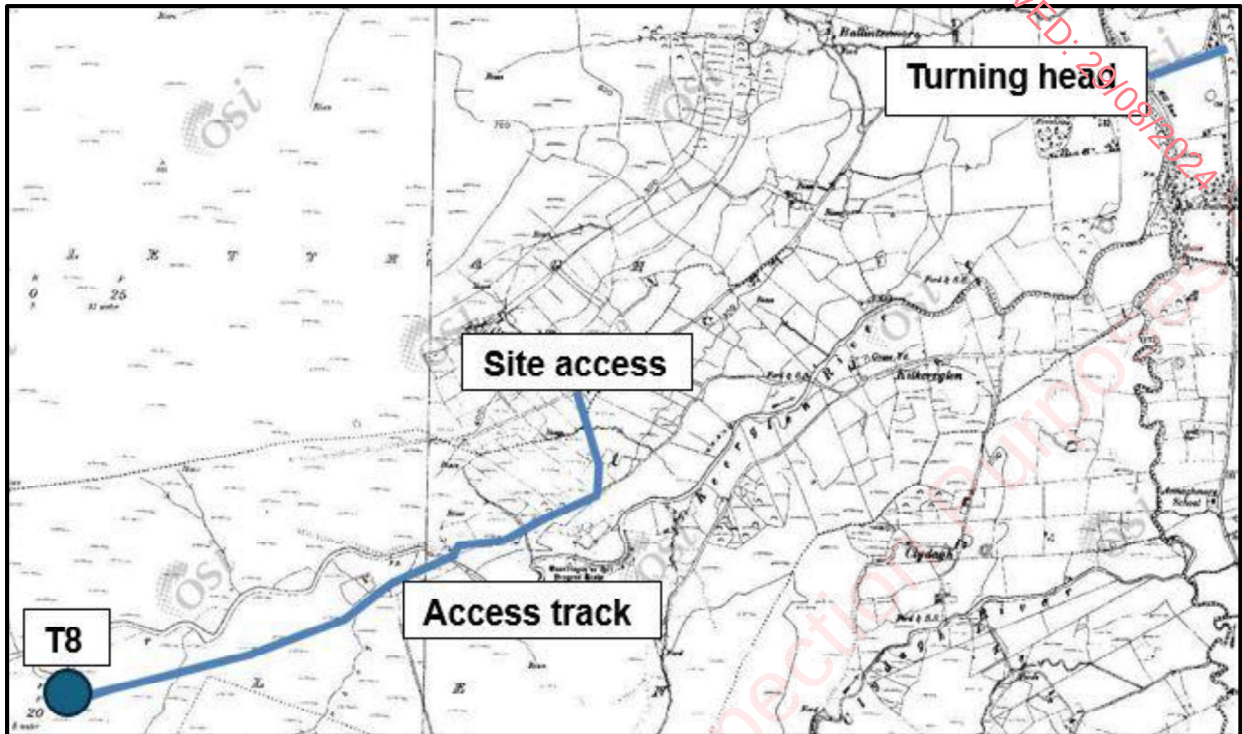


Figure 13.7 Extract from Third Edition Ordnance Survey map 1:10,560 (1917) showing location of Turbine 8, turning head, site access and access track

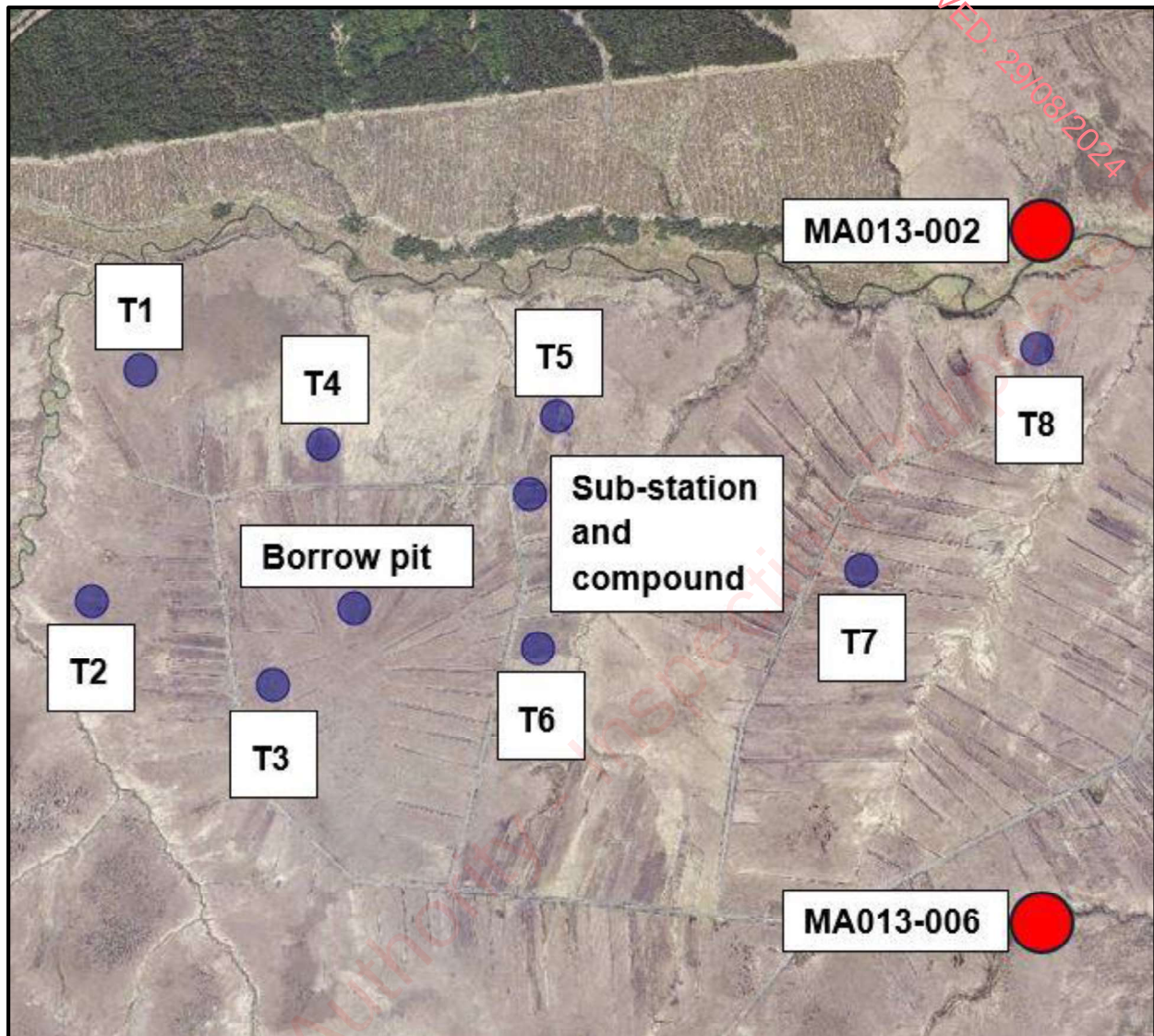


Figure 13.8 Aerial photograph showing location of Turbines 1 – 8, substation, compound and borrow pit and 2 no. RMP sites within the 1km study area



Plate 13.1 Location of Turbine 1, looking north-east



Plate 13.2 Location of Turbine 2, looking west



Plate 13.3 Location of Turbine 3, looking east



Plate 13.4 Location of Turbine 4, looking north-west



Plate 13.5 General location of Turbine 5, looking north



Plate 13.6 Location of Turbine 6, looking west



Plate 13.7 Location of Turbine 7, looking south



Plate 13.8 General location of Turbine 8, looking north-west



Plate 13.9 Location of Substation, looking south-east

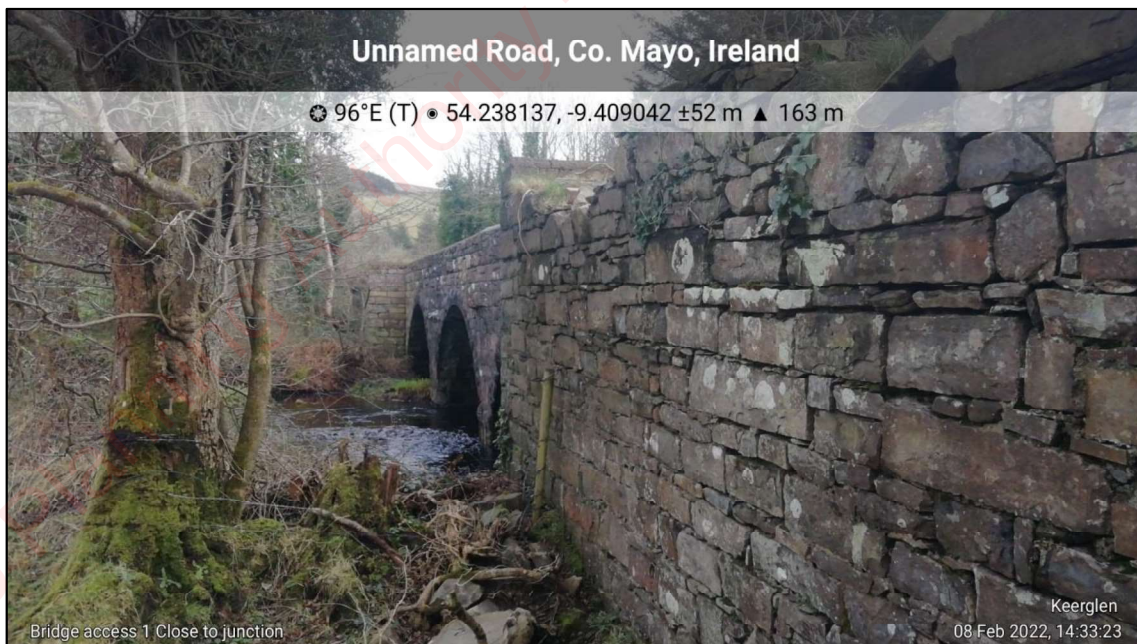


Plate 13.10 Ballinglen Bridge located approximately 85m west of the temporary roadway connecting the R315 and the L51723. This bridge is listed on the National Inventory for Architectural Heritage (Reg. No. 31301403)