

Llysun Motte and Bailey

Scheduled Ancient Monument MG072

Completion Report



22 October 2014, IMG_2563 ©AQB Historic Landscapes

Glastir Customer Reference Number (CRN): A0003093
Farm Name: Llyssun, Llanerfyl, Welshpool SY21 0EL

Context

This Completion Report is prepared by AQB Historic Landscapes, on behalf of Mr Richard Tudor, Llyssun, the owner of the Llyssun Motte and Bailey Scheduled Ancient Monument MG072, located at National Grid Reference SJ 032 101.

Mr Tudor entered into a Glastir Advanced agreement with the Welsh Government, as part of which he undertook to meet the requirements of the Scheduled Ancient Monument Management Plan prepared by Dr Fiona Grant, Cadw, in March 2014.

This Completion Report describes repair works undertaken between Monday 22 June and Friday 26 June 2015 to fulfil Mr Tudor's obligations under the Scheduled Ancient Monument Management Plan and his Glastir Advanced agreement.

Scheduled Monument Consent under the Ancient Monuments and Archaeological Areas Act 1979 Section 2 and Schedule 1 was granted by Cadw for the described works on 16 April 2015.

The repair works described were undertaken by Stonewycs Cyf., project-managed by AQB Historic Landscapes.

The Works

Condition prior to repair

The works addressed the requirement for erosion repair and slope reinstatement identified in the Scheduled Ancient Monument Management Plan, and described therein as follows:

Concerns:

1. Grass cover on much of the monument has been entirely removed by stock wear, and there are significant areas of bare earth, erosion and scrapes. These include vertical erosion scars over 1m in height, and an entire lack of ground cover on the southern side of the motte. Vertical erosion scars are unlikely to recover naturally (due to the combination of gravity, wind, rain and stock). The motte summit has been much reduced in area, and archaeologically significant material has been exposed, and undoubtedly destroyed, by the erosion.

Prioritised management works:

- Erosion repair and slope reinstatement.

Topsoil and transport method/route

A screened, graded and blended multi-purpose topsoil was supplied in 750 Kilogram liftable bulk bags by Dandy's Topsoil, Yew Tree Farm, Sealand Road, Chester, CH1 6BS.

125 bags were delivered to site by articulated lorry on 18 June 2015, with a further 25 bags delivered on 24 June 2015 – a total of 150 bags or 112.5 tonnes (see images below). The topsoil was stored in two base locations away from the Monument, but sufficiently close to minimise subsequent vehicle movements in transporting bulk bags to work areas.



Topsoil base location B1, IMG_6984, 23.06.2015



Topsoil base location B2, IMG_6983, 23.06.2015

Lorries were offloaded by Manitou Maniscopic Serie C 9 metres reach telehandler, fitted with pallet forks, at two base locations situated to the north of the Scheduled Ancient Monument.

The telehandler was used to move individual bulk bags to accessible repair areas where the bags, still suspended from the telehandler's pallet forks by their lifting loops, were slit open to enable soil discharge (see image below).



Manitou Maniscopic Serie C telehandler, IMG_6931, 22.06.2015

Limited use was also made of a Kubota KX61-3, 2.6 tonnes, 360°, skid-steer mini excavator to move topsoil on the 'platform' to the west of the motte (see image below)



Kubota KX61-3, 2.6 tonnes, 360°, skid-steer mini excavator, IMG_7000, 23.06.2015

For less accessible erosion scars on the south of the Monument and around the crest of the Motte, a Faun ATF 60-3, 47 tonne all-terrain crane was used to lift bulk bags to their discharge locations (see image below). The crane was capable of lifting two 750 Kilograms bulk bags at a time at 75% boom extension.



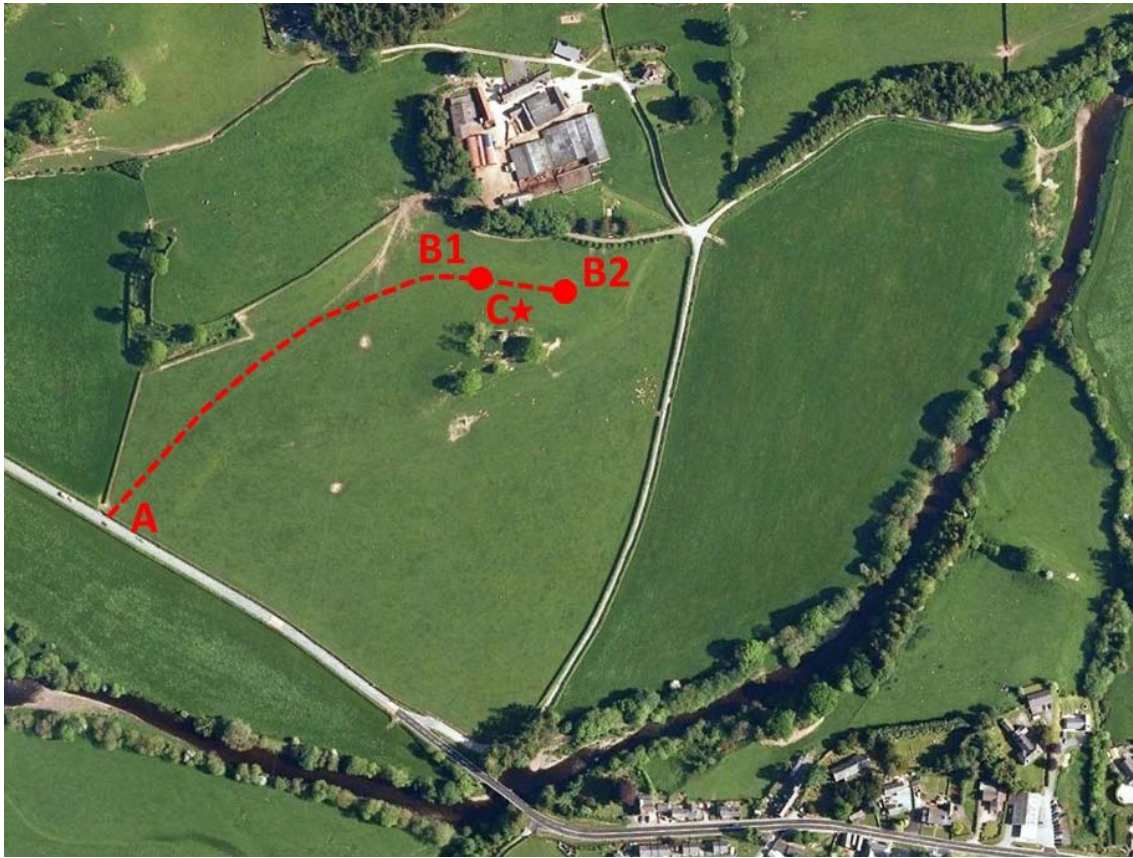
Faun ATF 60-3 Crane, IMG_ 7171, 25.06.2015

The crane was levelled on stabiliser jacks using load- spreading plates (see image below).



Crane stabiliser jack and load-spreading plate, IMG_7138, 25.06.2015

The access route for lorries and crane (A), topsoil base storage locations (B1 and B2) and crane operating location (C) are indicated on the plan below.



*Access route (A), topsoil base locations (B1 & B2), crane operating location (C)
Base Image © 2015 Getmapping plc and Google Earth*

The repairs

At all erosion scar locations where repair was undertaken by infilling (except for the summit of the motte) work was undertaken to the following specification. Scars along the north flank of the 'platform' lying to the west of the motte are used to illustrate the sequence:



Prior to repair, IMG_2517, 22.10.2014



Prior to repair, IMG_2520, 22.10.2014



Prior to repair, IMG_2518, 22.10.2014



Prior to repair, IMG_2523, 22.10.2014

Scars were first infilled with topsoil, the infill material being partially compacted by treading and raking, the final, profiled surface being finished level with the surrounding ground surface. Infill soil was mixed with Broadleaf 4 (see Appendix 1) at a rate not exceeding one Kilogram per cubic metre.



Commencing infilling of scars, IMG_6938, 22.06.2015



Infilling of scars in progress, IMG_6946, 22.06.2015



Compacting and profiling infill topsoil, IMG_6949, 22.06.2015



Infilling and profiling completed, IMG_6960, 22.06.2015

Scars were then seeded with a drought-tolerant grass seed mix comprising 35% tall fescue *Festuca arundinacea*, 35% rhizomatous tall fescue and 30% topgun dwarf perennial ryegrass *Lolium perenne* at a rate of 35 grams per square metre. The repair was then covered with Western Excelsior Turf Reinforcement Matting PP5-12, secured to the substrate using a mix of 200 mm and 300 mm crimped steel pins, at a density not exceeding six per square metre.



Installing Western Excelsior Excel PP5-12 Turf Reinforcement Matting, IMG_7070, 24.06.2015

Finally, the Turf Reinforcement Matting was top-dressed with a thin layer of topsoil, lightly brushed into the matrix of the matting.



Top-dressing installed Western Excelsior Excel PP5-12 TRM, IMG_7097, 24.06.2015



Completed repair, IMG_7108, 25.06.2015

The summit of the motte was similarly treated, but a bespoke, interlocking timber crib (see Appendix 4) was first constructed to help retain the topsoil infill. This was held in place by 1000 mm long by 20 mm diameter steel pins (see images below).



The motte summit, prior to repair, IMG_2524, 22.10.2014



The motte summit, prior to repair, IMG_2525, 22.10.2014



The motte summit, prior to repair, IMG_2526, 22.10.2014



The motte summit, prior to repair, IMG_2527, 22.10.2014



The motte summit, prior to repair, IMG_2529, 22.10.2014



Commencing construction of timber crib, IMG_6956, 22.06.2015



Midway through construction of timber crib, IMG_6979, 23.06.2015



Completed timber crib, IMG_7032, 24.06.2015



Commencing infilling timber crib, IMG_7173, 25.06.2015



Topsoil delivery by crane to timber crib, IMG_7178, 25.06.2015



Compacting infill topsoil, IMG_7185, 25.06.2015



Final profiling of infill topsoil, IMG_7205, 25.06.2015



Western Excelsior Excel PP5-12 Turf Reinforcement Matting installed, top dressing with topsoil in progress, IMG_7288, 26.06,2015



Completed repair to motte, looking east, IMG_7287, 26.06.2015



Completed repair to motte, looking west, IMG_7272, 26.06.2015

Areas on the south side of the Monument, perceived to be eroded natural substrate, were more simply treated (see images below). The areas were first sown by hand broadcasting with the drought tolerant grass seed mix at a rate of 35 grams per square metre. The extent of these areas was then covered with Greenfix Geocoir 900 Matting (see Appendix 3), the matting secured to the substrate using a combination of 200mm and 300mm long steel pins, at a density not exceeding six per square metre.



Prior to repair, IMG_2534, 22.10.2014



Prior to repair, IMG_2535, 22.10.2014



Prior to repair, IMG_2538, 22.10.2014



Immediately prior to repair, IMG_7114, 25.06.2015



During repair, IMG_7214, 25.06.2015



During repair, IMG_7222, 25.06.2015



Completed repair, IMG_7236, 25.06.2015

Overview – before and after



North side, early stages of repair, IMG_6989, 23.06.2015



North side, immediately after completed repairs, IMG_7301, 26.06.2015



South side, prior to repair, IMG_2563, 22.10.2014



South side, immediately after completed repairs, IMG_7274, 26.06.2015

Appendix 1

Broadleaf P4

Broadleaf P4 is a high performance, long lasting, hydrophilic (water and nutrient storing) cross-linked copolymer polyacrylamide which has been specifically developed for agricultural and horticultural applications. It is an environmentally safe, non-toxic organic compound that has been 'engineered' to store extremely large quantities of water and nutrients.

Broadleaf P4 absorbs 100-200 times its weight in water in soil, giving back over 95% of the water stored within it directly to plants as they need it via its reservoir-action. In dry form, P4 takes on water and swells to form odourless, colourless hydrogel particles which plant roots grow through.

Broadleaf P4 is 100% bio-degradable, its by-products being water, carbon dioxide, and minute amounts of ammonia.

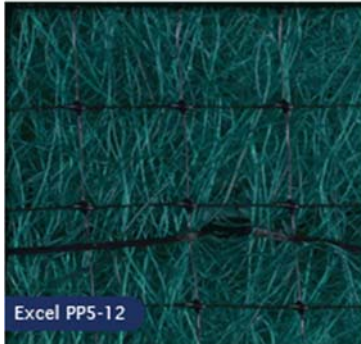
It is mixed with infill soils at a rate not exceeding 1 kilogram per cubic metre.



*Broadleaf P4. Image source:
www.baldur-nederland.nl*

Appendix 2

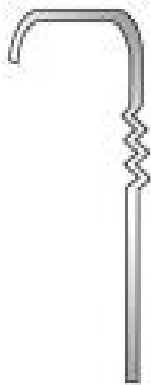
Western Excelsior Excel PP5-12 Turf Reinforcement Mat



Western Excelsior Excel PP5-12 Turf Reinforcement Mat (TRM) is composed of 100% synthetic components. A matrix of green polypropylene fibres is mechanically (stitch) bound between two UV stabilised, heavy duty synthetic nets. Stitching is secured on 50 mm centres using UV stabilised, heavy duty polypropylene thread.

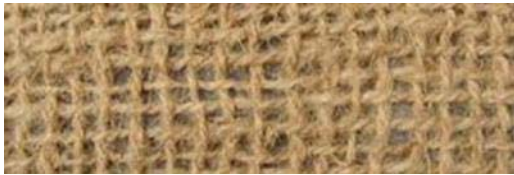
Western Excelsior Excel PP5-12 TRM is a permanent, three dimensional, Turf Reinforcement Mat that provides immediate erosion protection and long term turf reinforcement; and, is intended for slope applications requiring erosion protection for greater than thirty-six months.

The Mat is fixed to the substrate surface using a combination of 200 mm and 300 mm long mild steel pins, illustrated below, at a density not exceeding six per square metre.



Appendix 3

Greenfix Geocoir 900 Mat

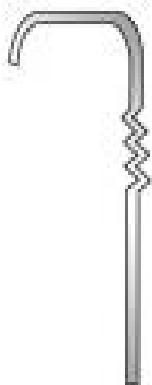


Manufactured from 100% high quality bristle coir (coconut) fibres, Geocoir erosion control netting is produced from spun coir twine and provides a strong and durable short- to mid-term protection with an anticipated decomposition longevity of over 5 years.

Geocoir provides surface stability to steep and aggressive applications and offers shade and protection from the sun and drying effect of the winds to assist in the establishment of grasses and to reinforce the root system until it has reached full bio-mass.

'Heavy' grade Geocoir matting is specified, with a weight of 900 grams per square metre, mesh size of approximately 15 mm x 12 mm and an open area of approximately 40%.

The Mat is fixed to the substrate surface using a combination of 200 mm and 300 mm long mild steel pins, illustrated below, at a density not exceeding six per square metre.



Appendix 4

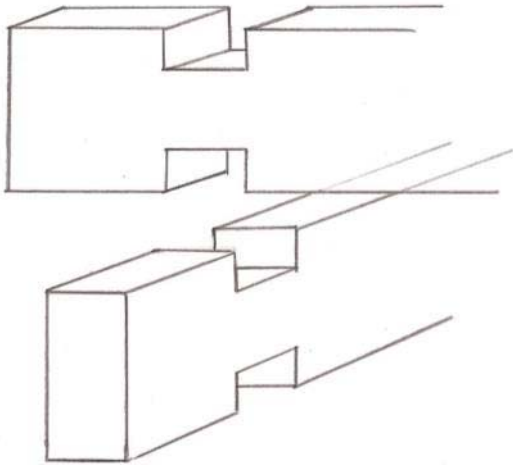
Specification for timber crib

Timber - pressure-treated softwood and rough-sawn throughout; all sizes nominal.

100 mm x 50 mm cross-section (4 inches x 2 inches) rails, cut to length on-site, as necessary.

Rails bespoke 'notched' on-site to create interlocking sections, as required, avoiding the need to use nails or screws to achieve fixing.

Timber crib in sections, four in number, each section resting on the substrate surface and retained in place using 20 mm x 1000 mm round steel pins, hammered into the substrate to a maximum depth of 600 millimetres.



Detail of interlocking