

## **BOSTON LODGE**

# ARCHAEOLOGICAL EVALUATION AND RECORDING REPORT





Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust

## **Boston Lodge**

## Archaeological Evaluation and Recording Report

Project No. G2401

Report No. 1288

Prepared for: Festiniog Railway Trust

May 2016

Written by: Dave McNicol

Illustration by: Dave McNicol

Cyhoeddwyd gan Ymddiriedolaeth Achaeolegol Gwynedd Ymddiriedolaeth Archaeolegol Gwynedd Craig Beuno, Ffordd y Garth, Bangor, Gwynedd, LL57 2RT

Published by Gwynedd Archaeological Trust Gwynedd Archaeological Trust Craig Beuno, Garth Road, Bangor, Gwynedd, LL57 2RT

> Cadeiryddes/Chair - Yr Athro/Professor Nancy Edwards, B.A., PhD, F.S.A. Prif Archaeolegydd/Chief Archaeologist - Andrew Davidson, B.A., M.I.F.A.

### **Table of Contents**

1	Int	ntroduction			
2	Archaeological Background				
	2.1	Boston Lodge	2		
	2.2	The Archaeology of Top Yard	3		
	2.3	February 2015 Excavations	4		
	2.4	Gunpowder Sheds	4		
3	Air	nd Objectives5			
	3.1	Tunnel Mess and Britomart Shed Excavation	5		
	3.2	Gunpowder Shed Recording	5		
4 Methodo		thodology	6		
	4.1	Tunnel Mess and Britomart Shed Excavation	6		
	4.2	Gunpowder Shed Recording	6		
5 Fieldwork Results					
	5.1	Tunnel Mess and Britomart Shed Excavation	7		
	5.1	.1 Introduction	7		
	5.1	.2 Top Yard	7		
	5.1	.3 Tunnel Mess	9		
	5.2	Gunpowder Shed Recording	12		
	5.2	2.1 Gunpowder Shed 1	12		
	5.2	2.2 Gunpowder Shed 3	12		
6	Dis	scussion	14		
	6.1	Gunpowder Sheds	14		
	6.2	Tunnel Mess and Britomart Shed Excavation	14		
	6.2	2.1 Phase 1: Pre 1842 (Figure 7)	14		
	6.2	2.2 Phase 2: The Wagon Storage Shed (1842 – 1877) (Figure 8)	15		
	6.2	P.3 Phase 3: The Smithy (1877 Onwards) (Figure 9)	15		

	6.2.4		Phase 4: The Smithy Continued Use (Prior to 1946) (Figure 10)	16						
	6.2 (Fi	2.5 gure	Phase 5: The Smithy and Top Yard Prior to Demolition (1946 – 1962) 11)	16						
	6.2	2.6	Phase 6: Post Demolition (1962 - Present) (Figure 11)	17						
7 Conclusions		onclu	sions	18						
	7.1	Gur	npowder Sheds	18						
	7.2	Feb	ruary and October 2015 Excavations Within Top Yard	18						
8	Re	com	mendations	20						
	8.1	Fur	ther excavations and research	20						
	8.2	Mar	nagement	20						
9	Ac	knov	wledgements	20						
10	) E	Biblic	ography	21						
Fi	gure	1 Sit	e Location	22						
Fi	gure	2 Pla	an of site showing February and October 2015 Archaeological							
Work Areas23										
Fi	Figure 3 Outline Plan of Top Yard in 1847 (John Alexander)24									
Fi	gure	4 Pla	an of Top Yard in 1915 (FR Archives)	25						
Fi 19	gure 963)	5 Bc	oston Lodge Works Indicating Changes Since 1955 (Wilson D.H.	26						
Fi	gure	6 2 <sup>nd</sup>	d Edition 1900 OS Map Showing Gunpowder Shed Locations	27						
Fi	gure	7 Ex	cavation Plan: Phase 1: Pre 1842	28						
Figure 8 Excavation Plan: Phase 2: The Wagon Storage Shed (1842 1877)29										
Fi	gure	9 Ex	cavation Plan: Phase 3: The Smithy (1877 Onwards)3	0						
Fi	gure	10 E	xcavation Plan: Phase 4: The Smithy Continued Use							
(P	rior t	o 19	46)3 <sup>,</sup>	1						
Fi (1	Figure 11 Excavation Plan: Phase 5: The Smithy and Top Yard to Demolition (1946 - 1962), and Phase 6: Post Demolition (1962 - Present)									
Fi	gure	12 P	hase 4 Excavation Plan with Plan of February 2015 Excavation33	3						

Figure 13 Southeast Facing Rear Wall of Smithy 101 Rectified Photograph	34
Figure 14 Northwest Facing Rear Wall of Smithy 101 Rectified Photograph	34
Plates 01 & 02	35
Plates 03 & 04	36
Plates 05 & 06	37
Plates 07 & 08	38
Plates 09 & 10	39
Plates 11 & 12	40
Plates 13 & 14	41
Plates 15 & 16	42
Appendix I: Project Design 1.0 INTRODUCTION	43 45
2.0 SITE BACKGROUND	.46
3.0 AIMS AND OBJECTIVES	47
4.0 METHODOLOGY	48
4.1 Clearance	.48
4.2 Excavation	48
4.3 Data processing and report compilation	.49
5.0 DISSEMINATION AND ARCHIVING	.49
5.1 Historic Environment Record	49
6.0 STAFF AND TIMETABLE	.50
7.0 HEALTH & SAFETY	.51
8.0 INSURANCE	52
Appendix II: February 2015 Excavation Report	54
Appendix III: Gunpowder Shed 1 3D Model	84
Appendix IV: Gunpowder Shed 3 3D Model	.86
BACK PAGE	.88

#### LIST OF FIGURES:

FIGURE 1: SITE LOCATION

FIGURE 2: PLAN OF SITE SHOWING FEBRUARY AND OCTOBER 2015 ARCHAEOLOGICAL WORK LOCATIONS

FIGURE 3: OUTLINE PLAN OF TOP YARD IN 1847 (JOHN ALEXANDER)

FIGURE 4: PLAN OF TOP YARD IN 1915 (FR ARCHIVES)

FIGURE 5: BOSTON LODGE WORKS INDICATING CHANGES SINCE 1955 (WILSON D.H. 1963)

FIGURE 6: 2<sup>ND</sup> EDITION 1900 OS MAP SHOWING GUNPOWDER SHED LOCATIONS

FIGURE 7: EXCAVATION PLAN: PHASE 1: PRE 1842

FIGURE 8: EXCAVATION PLAN: PHASE 2: THE WAGON STORAGE SHED (1842 – 1877)

FIGURE 9: EXCAVATION PLAN: PHASE 3: THE SMITHY (1887 ONWARDS)

FIGURE 10: EXCAVATION PLAN: PHASE 4: THE SMITHY CONTINUED USE (PRIOR TO 1946)

FIGURE 11: EXCAVATION PLAN: PHASE 5: THE SMITHY AND TOP YARD PRIOR TO DEMOLITION (1946 - 1962), AND PHASE 6: POST DEMOLITION (1962 - PRESENT)

FIGURE 12: PHASE 4 EXCAVATION PLAN WITH PLAN OF FEBRUARY 2015 EXCAVATION

FIGURE 13: SOUTHEAST FACING REAR WALL OF SMITHY 101 RECTIFIED PHOTOGRAPH

FIGURE 14: NORTHWEST FACING REAR WALL OF SMITHY 101 RECTIFIED PHOTOGRAPH

#### LIST OF PLATES:

PLATE 01: GUNPOWDER SHEDS 1 AND 2 IN 1957. SOURCE JG GILLHAM FR CO COLLECTION

PLATE 02: GUNPOWDER SHEDS 1 AND 2 IN 1964. SOURCE NORMAN PEARCE

- PLATE 03: RAIL TRACKWAY 108. VIEW FROM THE NORTHWEST
- PLATE 04: RAIL TRACKWAY 114. VIEW FROM THE NORTHEAST
- PLATE 05: RAIL TRACKWAY 102. VIEW FROM THE NORTHWEST
- PLATE 06: STONE BASE 144. VIEW FROM THE SOUTHEAST
- PLATE 07: POSTHOLES 165. VIEW FROM THE SOUTHEAST
- PLATE 08: METAL FIXINGS 122. VIEW FROM THE NORTHEAST
- PLATE 09: PIT 143. VIEW FROM THE NORTHWEST
- PLATE 10: POSSIBLE FORGE 127. VIEW FROM THE NORTHWEST
- PLATE 11: CERAMIC PIPE 106. VIEW FROM THE NORTHWEST
- PLATE 12: PITS 185 AND 186. VIEW FROM THE NORTHWEST
- PLATE 13: STONE BASE 184 IN PIT 179. VIEW FROM THE NORTHWEST
- PLATE 14: SLEEPER TRENCHES 166. VIEW FROM THE SOUTHWEST
- PLATE 15: GUNPOWDER SHED 1. VIEW FROM THE NORTHEAST
- PLATE 16: GUNPOWDER SHED 3. VIEW FROM THE NNE

#### SUMMARY

This report sets out the results of a programme of archaeological excavation and recording undertaken by Gwynedd Archaeological Trust (GAT) in October 2015. The work was carried out as a community project with the help of volunteers at the Ffestiniog & Welsh Highland Railways' Boston Lodge Works (SH 5851 3792) (PRN 7255).

In February 2015, a previous excavation within the Top Yard at Boston Lodge, carried out by GAT had revealed the remains of a stone-built wagon shed dating from 1842, along with the possible partial footprint of the carpenter's shop, built in 1877.

The October 2015 excavations revealed previously unknown phases of activity at Boston Lodge. Linear features were uncovered within the Top Yard, dating to before the construction of the wagon storage sheds in 1842. Unfortunately the function of these features remains unknown.

The rail trackways within the Top Yard were shown to have been replaced, and on a slightly different alignment at some point in the past. Activity within the smithy was also shown to have been concentrated within two phases during its use between 1887 and 1946.

The remains of two gunpowder sheds within Boston Lodge were cleaned and fully recorded using digital photography and 3D modelling.

#### **1** INTRODUCTION

This report was commissioned by the *Festiniog Railway Trust* and forms the report for the archaeological excavation and recording carried out at the Ffestiniog & Welsh Highland Railways' Boston Lodge Works (NGR SH 5851 3792) (PRN 7255) (Figure 1). The work was carried out as a community project with volunteers working on the site under supervision of staff from Gwynedd Archaeological Trust (GAT). This phase of archaeological work followed on from a previous phase of excavation carried out within the Top Yard at Boston Lodge in February 2015 by GAT (Figure 2).

A Project Design was prepared (Appendix I) in response to a request from the *Festiniog Railway Trust* that sets out the framework and background. This report has been prepared in accordance with the Chartered Institute for Archaeologists *Standard and guidance for the collection, documentation, conservation, and research of archaeological materials* (ClfA 2014a), the *standard and guidance for archaeological materials* (ClfA 2014a), the *standard and guidance for archaeological evaluation* (ClfA 2014b), and the *standard and guidance for archaeological investigation and recording of standing buildings or structures* (ClfA 2014c).

#### 2 ARCHAEOLOGICAL BACKGROUND

#### 2.1 BOSTON LODGE

The quarry at Boston Lodge (PRN 7255) was one of the quarries providing stone for the construction of the Cob, a causeway built across the Glaslyn estuary, between 1808 and 1811, by William Madocks. As works progressed, Boston Lodge was developed with the construction of offices, stables and barracks for the workers.

The Festiniog Railway Company Works were established on the site in 1847 for the repair of wagons on the horse-drawn railway. The site expanded considerably after the introduction of steam locomotives in 1863 to become an almost self-sufficient production and maintenance facility. In its heyday the works contained a sawmill, foundries, a pattern making shop, a smithy, a carpenters shop, a machine shop, a paint shop and an erecting shop

By the end of the 1870s the railway was designing and building its own Fairlie double engine locomotives. The works were also used for manufacturing shells during the First World War.

The railway went into decline in the 1920s and closed in 1946, but much of the infrastructure was preserved. The company was revived by a group of volunteers in 1954 leading to the foundation of the Ffestiniog and Welsh Highland Railways Trust that holds the controlling interest of all classes of shares of the Festiniog Railway Company and currently runs and maintains the railway. The works at Boston lodge

were brought back into use and many of the original buildings were upgraded, altered or demolished during the 1950s and 60s.

#### 2.2 THE ARCHAEOLOGY OF TOP YARD

The main excavation area is within the area known as 'Top Yard'. It is the northeastern end of the works and in recent years has been an area of rough hard-standing containing stored machinery and the wooden 'Tunnel Mess' shed, which has now been demolished. The only surviving building at the northeastern end of the yard is Plas Smart (grade II listed ref: 14419).

The history of Top Yard was summarised in a paper by John Alexander (Alexander 2014). Much of the historical background provided below has been taken from this paper.

The quarry for the Cob fell out of use after completion and repairs to the embankment in 1814. In 1842 two wagon storage sheds were built along the northeast and southeast sides of the yard (Figure 3). There was an access ramp running to Penrhyn Isaf behind the southeastern shed. By 1856 the northern end of the northeastern shed had been separated off as a store, and was subsequently converted into the Loco Superintendent's office, the pay office and then into a short term residence (Figure 4). The residence now survives as a stand-alone building called Plas Smart named after a former resident lan Smart. The shed was modified in the 1920s to accommodate a siding running through the building immediately to the southeast of Plas Smart. This provided access to the sand pit to the rear (Figure 6).

The northeastern storage shed is thought to have contained two lines of rails fed by sliding or traversing turntable that was in turn fed by a the turntable in the middle of the yard. The derelict shed was unsafe and was eventually demolished at some point between 1956 and 1961.

The southeastern shed is thought to have been of a similar design and probably also contained rails and a sliding turntable. This was demolished in 1877 and the Penrhyn Isaf access ramp was quarried away in order to provide space to build a corrugated iron carpenter's shop. This was subsequently extended next to the extension to the blacksmith's shop. Both were demolished in 1962, with the line of rail feeding into the carpenters shop removed c. 1959. The two other rail tracks within this area still exist, at least in part, today. Only the rear wall of the smithy survives today as an upstanding structure.

One further small building is shown on the northwest side of the yard on the 1888 OS map, possibly a short-lived timber store or carriage shed.

#### 2.3 FEBRUARY 2015 EXCAVATIONS

Gwynedd Archaeological Trust (GAT) carried out a one week excavation within the Top Yard in February 2015 (Figure 2), and the results of this excavation are included in Appendix II. What follows is the summary of those excavations.

The February 2015 excavation uncovered the remains of a stone-built wagon shed dating from 1842. This was one of the first buildings to be constructed on the site after Boston Lodge ceased to function as a quarry. A length of rails, slate floor and wall foundations were found to be well preserved beneath modern hard-standing. The shed appears to originally have been an open fronted store. Most of the original openings were subsequently infilled to produce an office, now preserved as Plas Smart and a workshop. A rail line passing through the building was inserted in 1920 to allow access to sand deposits to the rear.

A second early shed is known to have run along the south-eastern side of Top Yard but no definite traces of this were discovered. The footprint of the carpenter's shop, build in 1877 after the demolition of the early shed, was uncovered along with sleepers indicating the line of rails into the building.

The probable original quarry floor was found to be 0.4m beneath the current ground level.

#### 2.4 GUNPOWDER SHEDS

Three gunpowder sheds (PRN 7256) are marked on the 2<sup>nd</sup> Edition 1900 OS map within the southwestern end of Boston Lodge, within the area known as the 'Glan y Mor Yard' (Figure 6). These gunpowder sheds are believed to have been built in the 1860s to temporarily store the explosives delivered to Boston Lodge by sea by Curtis and Harvey Cliffe in Kent (Gwyn 2015), prior to them being sent on to their final destinations (John Alexander, pers. comm.).

The gunpowder sheds were licensed structures, and as such would have conformed to the Gunpowder Act of 1860 and the Explosives Act of 1875. These acts required that the gunpowder sheds were solidly built with walls of a particular thickness and that the inside was completely dry. This was achieved by lining the inner walls with wooden planking, creating an enclosed inner tinder dry chamber. The detonators were also required to be stored separately from the explosives, and this necessitated the building of small extensions to the gunpowder sheds to house these (Williams 1997).

Boston Lodge closed in 1946 and it is likely that the gunpowder sheds at Boston Lodge fell into disrepair soon after this, if not before. A photo from 1957 shows two of the gunpowder sheds (1 and 2) heavily overgrown with vegetation, and with slates missing from the roof of gunpowder shed 2 (Plate 1). A later photograph from 1964, shows the same two gunpowder sheds with the roof of gunpowder shed 1 partially collapsed (Plate 2). The remains of gunpowder sheds 1 and 3 are still visible today,

however there is no evidence for gunpowder shed 2 and it is likely that if any remains survive of this shed, then they are located underneath the current length of track which runs through this area.

#### **3** AIMS AND OBJECTIVES

#### 3.1 TUNNEL MESS AND BRITOMART SHED EXCAVATION

The aim of the excavation was to record and assess the survival of archaeology in the area of the southeastern shed and within the area immediately to the northwest within the 'Top Yard'. It is not known how much of the area has been disturbed by subsequent events.

The aim of this excavation was also to add to the information gained from the earlier February 2015 excavation within the same area.

#### 3.2 **GUNPOWDER SHED RECORDING**

The aim of the gunpowder sheds recording was to record the remains of the two surviving gunpowder sheds prior to the demolition of gunpowder shed 1.

#### 4 METHODOLOGY

All works were carried out in accordance with the Project Design for the works (Appendix I) and the GAT standard operating procedures as set out in the GAT fieldwork Manual (*in prep*)).

#### 4.1 TUNNEL MESS AND BRITOMART SHED EXCAVATION

- The overburden within the excavation area was removed with a tracked excavator fitted with a toothless ditching bucket, and under the direct supervision of an archaeologist.
- The site was cleaned by hand and all features excavated, with a minimum of 50% of each feature or feature type investigated.
- Plans of each phase of the site and of individual features were produced with the use of 3D photographic modelling using *Agisoft PhotoScan* due to the time constraints on site. These were tied into the national grid and accurate to <2cms.
- Sections, where appropriate, were drawn by hand at an appropriate scale and tied into the national grid.
- A written record of the excavations was completed via GAT pro-formas.
- A running photographic record was maintained, using a digital SLR camera set to maximum resolution (RAW format).

#### 4.2 **GUNPOWDER SHED RECORDING**

- Both of the gunpowder sheds were photographed and accurate models were created using *Agisoft PhotoScan* (Appendix III and IV). Scaled elevations were produced for the gunpowder sheds, and these will be digitally stored with the full project archive under an appropriate project number (G2401) thereby enabling the production of scaled elevation drawings if required in the future.
- The models were tied into the national grid with the use of a Trimble TSC2 controlled GPS receiver (Trimble R6 Unit).
- All photographs were taken with a Nikon D3100 set to maximum resolution (RAW), and archived in TIFF.

#### 5 FIELDWORK RESULTS

See Appendix II for results of the February 2015 excavations.

#### 5.1 TUNNEL MESS AND BRITOMART SHED EXCAVATION

#### 5.1.1 Introduction

Excavation within the Britomart Shed was not possible as it was still in use for storage. However, the section of rear wall of the smithy (**101**) which was located within the shed, was recorded.

A 0.1m thick layer of modern levelling and rough hard-standing (**100**) was removed from an area measuring approximately 15m by 11m within the Top Yard area of Boston Lodge by a mechanical excavator. The southeastern and southwestern extents of this area were determined by the upstanding rear wall of the smithy (**101**) and the existing Britomart Shed, and excavation was kept at a minimum of 1m away from the rear wall of the smithy due to safety concerns. The northeastern extent of the excavation was placed so as to join up with the previous excavation in this area (Figure 2), with the northwestern extent located in approximate line with the original trackway that ran through the Top Yard.

Upon removal of the modern hard-standing (**100**), two distinct areas were revealed. These consisted of the Top Yard and the area of the storage shed and smithy where the Tunnel Mess was located. The features uncovered within these areas will be detailed below by area.

#### 5.1.2 Top Yard

Five pits (110, 112, 137, 139, and 140), a trackway (108), and a modern service pipe trench (160) were uncovered, sealed by the modern levelling layer (100), within the Top Yard area (Figure 11). Pits 110 and 112 were located adjacent to each other and measured 1.38m by 0.72m and 0.61m by 0.4m respectively. They were both filled with deliberately dumped deposits of stone and waste material (111 and 113 respectively), although only pit 110 was excavated. Both of these pits were visible cutting into a thin layer of overburden, consisting of a brownish black sandy silt (109), which in turn sealed pit 141 and trackway 102.

Pits **139** and **140** were located adjacent to each other and formed a line of three similar pits along with pit **141**. All three pits were rectangular in shape and measured 0.68m by 0.4m, 0.8m by 0.58m, and 0.82m by 0.52m respectively. They were all filled with a similar silted up deposit consisting of a dark greyish brown sandy silt and were cut into a sand levelling layer (**107**). Given their close proximity and similar shape and size then it is likely that they are contemporary, however their function is unknown.

Pit **137** was sub-rectangular in shape and measured 0.52m by 0.44m. It was filled with a deliberately dumped deposit consisting of a mixture of concrete and brick (**138**), and was visible cutting into one of the sleeper pits which formed rail trackway **114**.

Rail trackway **108** was aligned northwest-southeast, and consisted of a line of seven rectangular sleeper pits, measuring approximately 0.25m in width and located 0.4m apart (Figures 10 and 11, Plate 3). The pits were all filled with a greyish black silty loam. None of these pits were fully uncovered or excavated as they ran into the unexcavated area of the site.

Rail trackway **114** was aligned southwest-northeast and was located at the northwestern limit of the excavation area (Figures 10 and 11, Plate 4). It consisted of a line of eleven rectangular sleeper pits, measuring on average 1.5m by 0.3m, and placed between 0.3m and 0.4m apart. The sleeper pits were all filled with a greyish black silty loam, and no evidence of wooden sleepers were visible within them.

The third rail trackway (**102**) uncovered within the Top Yard consisted of a curving line of sleeper pits running roughly southwest-northeast, before turning to run northwest-southeast within the smithy building (see below). This rail trackway consisted of 15 sleeper pits, the majority of which still had the wooden sleeper within them, as well as part of the rail track. The rail tracks measured 1½ inches wide by 2½ inches high, and were located 23½ inches apart. The rail trackway was located running on top of nine of the sleepers, mostly within the smithy building, with metal chairs for the rail tracks present on a further two sleepers within the Top Yard area (Figures 10 and 11, Plate 5). The sleeper pits measured 1.4m by 0.35m and were located approximately 0.6m apart.

Both rail trackways **108** and **114**, as well as rail trackway **102**, were visible cutting through a line of sleeper pits, most likely representing earlier trackway alignments (**115** and **142** respectively). Rail trackway **115**, cut by rail trackways **108** and **114**, was aligned approximately northeast-southwest, and consisted of seven sleeper pits measuring approximately 1.3m by 0.3m. Rail trackway **142** was cut by rail trackway **102** and consisted of ten sleeper pits, three of which were located within the smithy. This rail trackway ran along the same alignment as rail trackway **102**, but was laid approximately 0.7m further south/ southeast (Figures 8 and 9).

A 0.82m wide and 0.31m deep pipe trench (**155**) was uncovered within the western corner of the site, truncated by rail trackways **102** and **114** (Figure 8) A cast iron pipe was uncovered within the trench running north-south under rail trackway **114** before turning approximately east-west and running under rail trackway **102**.

A line of eleven parallel linear features (**116**) were uncovered within the Top Yard cut by rail trackways **115** and **142** (Figure 8). These features measured on average 3.5m in length, 0.35m in width and were 0.06m deep. They were all cut into a sand levelling layer (**107**) and were located 0.9m apart from each other. Their fills

consisted of a firm yellowish brown sand containing fragments of iron. The sand levelling layer (**107**) was uncovered throughout the site and consisted of a sand from the nearby quarry rather than the shore, due to the absence of any shell material within it.

#### 5.1.3 Tunnel Mess

Upon removal of the modern hard-standing (**100**) within this area, the front and side walls of the smithy/ storage shed (**104** and **189** respectively) were revealed along with a dark grey silty sand layer (**103**) which covered the area enclosed by these walls as well as on top of them in places as well. This layer, on average 0.09m thick, consisted of a number of thin and oily laminated layers, and contained a large number of metal objects, the majority of which were rusted beyond recognition. Given the nature of this layer it is likely that it represents the floor layer of the smithy, which grew thicker over time as it was used.

The removal of the modern hard-standing also revealed rail trackway **102** which was visible running through the front wall of the smithy (**104**) towards its northeastern end, and running up to the rear wall (**101**). However, the sleeper pits for the rail trackway were not revealed until removal of the floor layer **103**, suggesting it was laid down first, with the floor building up around it over time. One of the sleeper pits for the rail trackway was visible truncating the front wall of the smithy (**104**), suggesting that this wall had already been built when the rail trackway was laid down.

Five deliberately dumped deposits of waste iron/ rusted objects (**129**, **130**, **131**, **133**, and **135**) were located against the inside of wall **104** and sealed by layer **103**, with a further dumped deposit (**159**) located against the outside wall of **104** and sealed by overburden **100** (Figure 11). All of these deposits most likely represent the deliberate dumping of waste material during the smithy's use.

Three rectangular stone bases (**120**, **132**, and **144** (Plate 6)), all measuring approximately 0.5m by 0.4m, were uncovered within shallow cuts (**145**, **151**, and **152** respectively), located within the southwestern half of the smithy. Bases **120** and **132** were located against the front wall, while base **144** was located towards the rear wall (Figure 10) and was sealed by thin metalled surface measuring approximately 0.75m by 0.65m. This surface, along with stone bases **120** and **132**, were sealed by the smithy floor layer (**103**). It is likely that these stone bases were used as a secure base for machinery or equipment used within the smithy.

A line of six postholes (165) were uncovered running parallel to the front wall of the smithy (Figure 9). The postholes measured 0.35m in diameter and had a depth of 0.33m. The remains of a small wooden post, measuring 0.08m by 0.07m, was revealed in each of the postholes within a light yellowish brown clayey sand fill (188) (Plate 7). Two of these postholes were truncated by the cuts for stone bases 120 and 132 (145 and 151 respectively). The size of the wooden posts and the location

of the postholes against the front wall of the smithy suggest that these were for a workbench set against/ into the wall.

A concentration of metal fixings, sealed by the smithy floor layer (**103**) were uncovered in the area between stone bases **120**, **132**, and **144**, with more fixings continuing throughout the central part of the smithy (Figure 10, Plate 8). These fixings consisted of 23 iron rods, between 0.03m and 0.06m in diameter and most likely represent the supports for machinery used within the smithy.

A shallow pit (**149**) was uncovered at the southwestern edge of the excavation area, truncated by the foundations for the Britomart shed and sealed by the smithy floor layer (**103**) (Figure 11). The pit measured 0.67m by 0.3m and was filled with a single deliberately dumped deposit of rubble and iron waste (**149**), and most likely represents a small waste pit/ dump.

Towards the southern corner of the excavation area, a wooden post (**123**) was revealed, also sealed by the smithy floor layer (**103**). Excavation or investigation of this feature was not possible, due to its close proximity to both the rear wall of the smithy and the Britomart shed.

A large oval pit (143), measuring approximately 1.3m by 0.85m, and with a depth of 0.3m was uncovered towards the rear wall of the smithy (Figures 9 and 10, Plate 9). The base of the pit consisted of a burnt/ metalled surface (153) on top of the natural bedrock. A greyish brown silty sand deposit (147) sealed this surface and formed the main fill of the pit. A 0.05m thick layer of black silty sand (125) sealed the pit and contained two wooden beams, which would have extended over the pit, possibly sealing it. The northwestern half of the pit was filled with a loose black sandy silt (126), representing a dumped backfill. This suggests that something was removed from this half of the pit, and the presence of the burnt/ metalled surface at the base of the pit suggests it was something to do with a forge, however its exact function is unknown.

Directly to the northeast of this pit, a square brick structure (**127**) containing a pipe running towards the rear wall of the smithy was uncovered (Figures 9 and 10, Plate 10). The structure measured approximately 0.45m by 0.4m, with a depth of 0.38m and was located at the very edge of the excavation area. It was therefore impossible to determine what the pipe connected to. However, the remains of a ceramic pipe (**106**) (Plate 11) were uncovered against the rear wall of the smithy, directly to the southeast of this structure, and it is likely that these are connected and form part of a forge.

Pit **185** was uncovered partially truncated by the possible forge (**127**), and in turn was visible truncating pit **186** (Figure 9, Plate 12). Both pits were sub-circular in shape and measured 0.82m by 0.82m and 0.82m by 0.62m respectively. They were filled with a similar dark grey sandy silt (**157** and **158** respectively) and contained fragments of corroded iron objects. The function of these pits is unknown.

All of these features, unless stated otherwise, were cut into a greyish blue sandy clay deposit (136), representing the original floor layer for the smithy. This floor layer extended over the top of walls 104 and 189 in places, sealing a mortar layer (187) into which wooden beams (105) had been set. These most likely represent part of a rebuilding of the wall of the smithy, probably as a wooden and corrugated iron structure. The foundation cut for walls 104 and 189 (167) was also sealed by this floor layer.

Removal of floor layer **136** within the smithy revealed a thin sand levelling layer (**162**) located towards the front of the building which sealed a possible surface consisting of a dark greyish black silty sand (**163**). This surface was cut by the foundation trench for wall **104** (**167**) and sealed a small square pit (**181**), measuring 0.4m by 0.4m. The pit was 0.11m deep and was filled with a single deposit consisting of a light greyish brown clayey sand (**182**) containing fragments of iron objects.

The line of sleepers (**142**) representing an earlier rail trackway (see above) were also revealed upon removal of floor layer **136**. One of these sleepers was visible truncating the top of one of the line of rectangular pits (**179**).

A line of three rectangular pits (179), connected by a thin linear gully (173) were also revealed upon removal of the floor layer (136) cutting into the sand levelling layer 107. These were located running approximately northeast-southwest, on a slightly different alignment to wall 104, suggesting that they represent an earlier feature (Figure 8). The pits measured approximately 1.35m by 0.8m with a depth of 0.38m, and were set roughly 2.2m apart. Only one of the pits was excavated, which revealed a laid stone base (184), approximately 0.1m thick (Plate 13). This was sealed by a dumped deposit of stone (175), 0.1m thick, which in turn was sealed by a loose, deliberately dumped backfill consisting of stone and mortar with fragments of iron objects throughout (180). The linear gully (173) that joined these pits together was 0.15m wide and had a depth of 0.1m. It was filled with a mottled brownish yellow and greyish brown sand (174). The laid stone base within the pits, along with their size, suggest that these may have been foundation pits for a stone fronting of the original storage shed.

The floor layer (136) also sealed three lines of sleeper trenches (166) that ran parallel to the rectangular pits (179) and gully (173) and were also cut into the sand levelling layer 107 (Figure 8, Plate 14). These measured on average 1m in length with a width of 0.15m and the remains of wooden sleepers were visible within them. The sleepers were laid in three rows 0.7m apart, with the sleepers 0.2m apart in each row. They were visible running up to and under rail trackway 102/ 142 but did not continue on the other side, and may represent the foundations for a wooden floor rather than lines of a rail trackway, as no metal fixings/ chairs were visible within any of them.

#### 5.2 GUNPOWDER SHED RECORDING

Of the three gunpowder sheds shown on the 2<sup>nd</sup> Edition 1900 OS Map (Figure 6) only two survive to any extent today (sheds 1 and 3). The third gunpowder shed (shed 2) appears to have been completely demolished at some point after 1964, as it is still visible on the photo of the Glan y Mor Yard taken at that time (Plate 2). If any remains of this shed survive, then they will be underneath the rail trackway which runs alongside gunpowder shed 1.

#### 5.2.1 Gunpowder Shed 1

A large amount of stone rubble was removed from around gunpowder shed 1 as well as within a small section of the interior. Removal of all the rubble from within the interior was not possible due to the danger of collapse.

Removal of the rubble revealed that the northeastern half of the gunpowder shed had been destroyed, most likely when the rail trackway which runs alongside it was laid at some point after 1964. The walls of the gunpowder shed that remained were a maximum of 2.4m high, and approximately 1m wide, with the intact southeastern side measuring 6m in length (Plate 15, Appendix III). At approximately 0.7m above ground level the walls were stepped in by 0.1m around the outside of the shed. As excavation was limited internally, then it is unknown if this was mirrored within the interior. The walls were faced on both sides with a rubble core and were built directly onto the bedrock.

In addition to the gunpowder shed walls, a small section of the southeastern wall of the entrance was revealed (Plate 15). This was abutted against the northeastern side of the gunpowder shed and measured approximately 1.8m in length, with a width of 0.6m, and survived to a height of 0.5m. No rail tracks were visible running into the entrance, although the photograph from 1957 clearly shows a rail trackway running towards the wooden doors of the entrance (Plate 01).

No evidence of the wooden lining or wooden floor, which were an integral part of the majority of gunpowder sheds, was uncovered. This may suggest that as the gunpowder shed was built directly onto bedrock then a wooden floor to keep the powder dry was not needed, although it is more likely that the wooden floor was removed. A large amount of slate rubble was uncovered on the northeastern side of the gunpowder shed, most likely from when the roof was demolished or collapsed, as photos of this shed show a slate roof (Plates 1 and 2)

#### 5.2.2 Gunpowder Shed 3

Only a small amount of rubble was removed from within gunpowder shed 3. This revealed that the gunpowder shed had been built partially on bedrock and partially onto a base of quarried stone, which had been built up from the foreshore to the level of the bedrock in this area (Plate 16, Appendix IV). The southeastern wall of the gunpowder shed was not evident, although it given the location of the cliff face then it is possible that this was used as the wall at this side. The gunpowder shed

measures approximately 6.2m by 6m externally, with walls 0.9m thick. The walls survive to a maximum height of 1.25m. Fragments of slate were uncovered within the rubble suggested a slate roof, similar to those on the other two gunpowder sheds.

The rail trackway runs right up to the northeastern side of the gunpowder shed, but only a small portion of the northeastern wall survives, and no remains of an extension or portico was visible here, although one is shown on the 2<sup>nd</sup> Edition 1900 OS Map.

#### 6 **DISCUSSION**

See Appendix II for discussion of the February 2015 excavations.

#### 6.1 **GUNPOWDER SHEDS**

The results of the excavation of the gunpowder sheds revealed that the sheds most likely went out of use at the same time as Boston Lodge closed in 1946, if not before. One of the sheds (gunpowder shed 2) was demolished at some point after 1964, and it is likely that the northeastern half of gunpowder shed 1 was also removed at the same time. The photograph of gunpowder sheds 1 and 2 taken in 1957 clearly shows the rail trackway leading up to the entrance of gunpowder shed 1 (Plate 01) and given the size of the entrance it is likely that the gunpowder wagons could be stored within this entranceway to keep them protected from the weather. If this is the case then it is unlikely that any detonators would have been stored here, and as these gunpowder sheds would have only been used for the temporary storage of explosives, then it is likely that the detonators would have been stored either elsewhere within Boston Lodge or at the explosives final destination. It has been suggested that the floor level within the gunpowder sheds was raised up to the level of the step shown on the outside wall of gunpowder shed 1 (approximately 0.7m above ground level) which would have coincided with the height of the gunpowder wagons so as to allow for easier transfer of the explosives (John Alexander, pers. comm.). Evidence of an inner step or the existence of an inner floor could not be established archaeologically, and therefore the level of the floor within the gunpowder sheds is unknown. Since the excavation though it has been positively confirmed that there was a floor and that it was at wagon floor level (John Alexander, pers. comm.).

#### 6.2 TUNNEL MESS AND BRITOMART SHED EXCAVATION

The results of the archaeological excavations within the Top Yard can be placed within six general phases: Phase 1: Pre 1842; Phase 2: The Wagon Storage Shed (1842 - 1877); Phase 3: The Smithy (1877 onwards); Phase 4: The Smithy Continued Use (Prior to 1946); Phase 5: The Smithy Prior to Demolition (1946 - 1962); Phase 6: Post Demolition (1962 to Present); and these will be discussed below.

#### 6.2.1 Phase 1: Pre 1842 (Figure 7)

No evidence of the quarry workings, with the exception of the quarry floor revealed at the base of a couple of pits, was uncovered on site. The earliest layer uncovered was the sand levelling layer (**107**) which was visible throughout the entire site and was also uncovered during the previous excavation (**018**). This layer most likely represents the known levelling of the Top Yard in 1836.

The group of eleven linear features (**116**) that were cut into this levelling layer were truncated by the rail trackways associated with Phase 2 (see below), and can

therefore be dated to this phase. The function of these features is still unknown and further research may help to define their purpose.

#### 6.2.2 Phase 2: The Wagon Storage Shed (1842 – 1877) (Figure 8)

The line of three pits (**179**) and connecting linear gully (**173**) are amongst the earliest features within the area of the southeastern wagon storage shed within the Top Yard, and most likely represents the front on the shed. This front structure would most likely have consisted of stone pillars placed within the pits, with either a wooden or corrugated iron 'wall' in between them or these spaces left open. No evidence of these features was uncovered during the previous excavation within the Top Yard.

The sleepers (**166**) uncovered to the southeast may have been used as the foundations of a floor layer (**163**) rather than for a trackway as none of the sleepers showed any evidence of rail fixings/ chairs. Only three lines of sleepers were uncovered within the excavation area. However, as no excavation was able to take place within 1m of the rear wall, and no excavation took place on the southeastern side of this wall, it is possible that as this wall is of a later date, then the original rear wall of the wagon storage shed was set further back and that a fourth line of sleepers did exist. If this is the case these sleepers may well have formed part of a rail trackway within the shed.

The line of sleepers (166) do not continue on the northeastern side of the sleepers for rail trackway 142, which would suggest that these are broadly contemporary. No evidence for a sliding turntable was uncovered in the vicinity of this rail trackway, however as it was replaced by a later rail trackway (102) it may have been removed at this time. As excavation was not possible within 1m of the later rear wall (101), it is also possible that the sliding turntable, or remains of, are located within this area.

The rail trackway (115) uncovered within the Top Yard area is most likely contemporary with rail trackway 142 as it was truncated by two later rail tracks (114 and 108) which are likely to be contemporary with rail trackway 102. This rail track appears to curve round and would have entered the northeastern end of the storage shed, with its other end most likely joining up with rail trackway 142 on a turntable to the southwest.

The small pit (**181**) uncovered just outside of the storage shed also most likely dates to this phase, as it was sealed by the Phase 3 floor layer (**163**). However, the function of this pit remains unknown. The service pipe trench (**155**) located in the southwestern corner of the site may represent a water pipe connected to Plas Smart.

#### 6.2.3 Phase 3: The Smithy (1877 Onwards) (Figure 9)

The smithy extension was built in 1877 and walls **104** and **189** likely represent the foundations of this building. No continuation of wall **104** to the northeast was visible within the previous excavations. The front and side of the smithy would most likely

have been built of corrugated iron, set into the stone foundations with a wood (**105**) and mortar (**187**) base. The rear wall (**101**) was also probably built/ rebuilt at this time (Figure 13). The sand levelling layer (**162**) would have been laid down and then sealed with the clay floor (**136**).

The two pits (**185** and **186**) which are truncated by the possible forge (**127**) would most likely have been dug at the beginning of the smithy's use, although their function remains unknown. The possible forge (**127**) would then have been built after, although still within this first phase of smithy use. The ceramic pipe (**106**) located against the rear wall (**101**) most likely represents the vertical pipe of a blast system for the possible forge (**127**).

Pit **143** is likely to be contemporary with either the two pits (**185** and **186**) or the possible forge (**127**), and together they would have formed the main working areas within the building. The line of postholes (**165**), most likely representing a workbench, would also have been constructed at this time

#### 6.2.4 Phase 4: The Smithy Continued Use (Prior to 1946) (Figure 10)

At some point between the smithy's initial construction and 1946 when it went out of use, the rail trackway leading into the smithy was replaced with a different trackway (**102**) on a slightly different alignment, as evidenced by the sleepers for this trackway truncated the wall foundations (**104**). This realignment of the rail trackways is also visible within the Top Yard where trackway **115** is replaced with trackways **108** (uncovered within the previous excavations (**22**)) and **114**.

Within the smithy, two stone bases (**120** and **132**), most likely for a machine or anvil, were installed adjacent to the inner wall (**104**). These truncated the postholes for the probable workbench, suggesting that this had been removed by this point. A third stone base (**144**) along with the metal fixings for machinery (**122**) may also date to this phase, although it is possible that they date to the initial use of the smithy (Phase 3).

The laminated floor layer (**103**) would have been built up during both Phase 3 and Phase 4 as a working floor, and therefore it is impossible to determine exactly when certain features were first constructed.

It is known that the western part of the smithy formed part of the National Shell factory during World War One, and that the whole of the smithy was used by the Glaslyn Foundry during World War Two (John Alexander, pers. comm). It is therefore likely that these features relate to one or other of these uses.

#### 6.2.5 Phase 5: The Smithy and Top Yard Prior to Demolition (1946 – 1962) (Figure 11)

A number of dumped waste deposits were uncovered from within the smithy (**129**, **130**, **133**, **135**, and **149**), as well as one outside (**159**). These may have been built up during the smithy's use, or been dumped there at the edges of the building when it was used as a storage shed up until it was demolished in 1962.

It is likely that these were dumped towards the end of the smithy's use, although it is possible that some were dumped while it was still being used (Phase 4).

#### 6.2.6 Phase 6: Post Demolition (1962 - Present) (Figure 11)

The remaining features, consisting of a number of pits (**110**, **112**, **139**, **140**, **141**, and **137**) within the Top Yard area, most likely representing waste pits; and a layer of overburden sealing the rail trackway **102** most likely date to after the demolition of the smithy in 1962. The modern service trench (**160**) uncovered running across the site, possibly represents a water pipe for the caravans which were located within this area in the 1960s (John Alexander, pers. comm.). The modern gravel and hardcore surface (**100**) sealed all of these deposits.

#### 7 CONCLUSIONS

#### 7.1 GUNPOWDER SHEDS

The two gunpowder sheds have been fully recorded and 3D models produced. No remains of the third gunpowder shed were found and it is likely that this was completely demolished at some point after 1964.

#### 7.2 FEBRUARY AND OCTOBER 2015 EXCAVATIONS WITHIN TOP YARD

The February 2015 excavation confirmed the extent of the 1842 northeastern wagon shed. The expected second line of rails was not present, at least in the surviving southeastern end of the shed. It had been presumed that the function of the traversing turntable was to transfer wagons between two or more sets of rails in the shed. This now seems unlikely, at least in the latter use of the shed, unless a second line of rails existed only in the northwestern end and their destruction was not recorded. The floor levels appear to have been intact until the 1970s. Given the level of interest in the archaeology of the works it is unlikely that a second line of rails could have been removed without any record having been made.

The function of the northeastern shed appears to have changed fairly early in its history and prior to any currently available photographic or detailed drawn evidence. It appears that the shed in its original form was a largely open-fronted structure, perhaps used as a simple wagon store. Sometime before the 1920s most of the openings were partially infilled and windows inserted. This conversion to a closed shed may have reflected a change in use, perhaps indicating use as a repair shop. It may have been necessary to remove the second line of rails to allow sufficient space to carry out repairs in the narrow shed. The slate-slab floor would therefore be a secondary feature laid after the removal of a second line of rails.

The October 2015 excavation revealed previously unknown phases of activity at Boston Lodge. The linear features uncovered within the Top Yard demonstrate that activity was taking place within this area prior to the construction of the wagon storage sheds. Unfortunately, the limited area of the excavation has not allowed for the function of these features to be determined.

The southeastern wagon storage shed appears to have been either a largely openfronted structure, similar to the northeastern shed, or enclosed, possibly with corrugated iron. The storage shed was also revealed to be on a slightly different alignment to the later smithy, most likely to align with the access ramp behind it. The lack of any rail tracks running lengthways throughout the storage shed, may suggest that it was not in fact used as a storage shed for wagons, but rather for small repairs or storage for something other than wagons. The rail tracks within the Top Yard were replaced on a slightly different alignment at some point after the construction of the smithy in 1842. Unfortunately, the exact date of this realignment and what caused the need for it is unknown.

Two distinct phases of activity were uncovered within the smithy, with the later phase characterised by machine bases and fixings, possibly indicating an updating of the workshop. The two hearths shown on the 1915 plan of the Top Yard within the smithy were not uncovered. However this is likely due to the fact that a 1m buffer zone was left between the rear wall of the smithy and the excavations, which is where these hearths would have been located.

Little is known about how early or transitional pre-locomotive railways, like the Festiniog Railway, carried out its maintenance, and the information gathered from the two excavations has enabled us to add to this little understood, but important site-type. Having been set out in 1842, the Top Yard is contemporary with the depot at Craig y Dinas, on the Dinorwic Quarry Railway, also designed by the Festiniog Railway's engineers, James and Charles Spooner. Comparison with this yard, and examination of the results of work carried out on depots of other narrower-gauge horse-drawn railways, both in Wales and further afield, would greatly aid our understanding of the Top Yard. The fact that Boston Lodge is still being used in the maintaining of the locomotives and rolling stock of the Festiniog Railway, gives this site even more significance.

#### 8 **RECOMMENDATIONS**

#### 8.1 FURTHER EXCAVATIONS AND RESEARCH

It is not recommended to undertake any further excavations within the Top Yard at this time or any further archaeological investigations of the gunpowder sheds. If the upstanding rear wall of the smithy (**104**) is ever removed however, then excavation on either side of it may aid our knowledge of the area. Outwith the Top Yard, there may be areas within Boston Lodge where excavation would provide further information on its history and development.

The limited scope of this and the February 2015 excavation has meant that no historical research was undertaken as part of the project. Whilst an informative historical summary was provided by John Alexander, it is recommended that the final output from the project, should be a paper suitable for publication in a reputable industrial archaeological journal that includes both the results of the excavations and a detailed historical review including reproductions of primary sources such as plans, maps and photographs. Comparison with other contemporary locomotive facilities, such as Hackworth's workshops in Shildon, should also be undertaken. A non-technical summary should also be produced from this material for wider circulation.

#### 8.2 MANAGEMENT

The creation of a management plan addressing the preservation and utilisation of archaeological remains within the works is strongly recommended. Boston Lodge is a functioning engineering facility, but also contains buildings and archaeology of great importance to the development of steam powered railways, the manufactured landscape of Traeth Mawr, and the infrastructure of the North Wales slate industry. All are of national importance and care should be taken to manage the site accordingly.

#### **9 ACKNOWLEDGEMENTS**

The author would like to thank everyone who volunteered their time to assist with the excavation: John Alexander, C. Beaver Hughes, Peter Hugman, Bethan Jones, Rowena Leyland, Jeff Marples, Rhys Mwyn, Judit Samra, Margaret Shakespeare, and David Ellis Williams. John Alexander is also the site historian and his many years of involvement with the railway and its history provided invaluable background information to the excavation. The excavation was run by the author, Dave McNicol, with assistance from Neil McGuiness.

Finally many thanks go to Valerie Lewin for providing the original photographs from the Ffestiniog Railway Company Collection, and to Dr David Gwyn for setting up the excavation and his expertise. Thanks also to Pete Gray, Tony Williams, Humph Davies and all at Boston Lodge for their support and interest.

#### **10 BIBLIOGRAPHY**

Alexander JL 2014 *Top Yard Archaeology* (unpublished typescript)

Boyd JIC 1975 The Festiniog Railway Volume Two The Oakwood Press

Chartered Institute for Archaeologists (CIfA) 2014a, Standards and guidance for the collection, documentation conservation and research of archaeological materials

Chartered Institute for Archaeologists (CIfA) 2014b, Standard and Guidance for Archaeological Evaluation

Chartered Institute for Archaeologists (CIfA) 2014c, Standard and Guidance for archaeological investigation and recording of standing buildings or structures

GAT in prep Archaeological Site Manual

Gwyn, D 2015 Welsh Slate Archaeology and History of an Industry. RCAHMW

Waters IM 1992 A Traversing Turntable *Festiniog Railway Heritage Group Journal* No 30 pp16-19

Williams, Dr JL 1997 Two Powder Magazines in the Parish of Llanllechid, Bethesda: their significance in the industrial turmoil of the late Nineteenth Century, in *Industrial Gwynedd* Vol. 2, pp. 7-17.

Zeepvat B 2011 *Historic Building Assessment 'Plas Smart' FR Boston Lodge Works* Archaeological Services and Consultancy report 1388/FRC/1r



Gwynedd Archaeological Trust



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's storiency Office & Commospringht. Unauthorised reproduction infinges Crown copyright and may lead to prosecution or civil proceedings. Licence NAA, 10020885





Fig. 3: Outline Plan of Top Yard in 1847 (John Alexander)





Fig. 4: Plan of Top Yard in 1915 (FR Archives)



Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust Fig. 5: Boston Lodge Works Indicating Changes Since 1955 (Wilson D.H. 1963)



Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust

Fig. 6: 2nd Edition 1900 OS Map Showing Gunpowder Shed Locations
















PLATE 01: GUNPOWDER SHEDS 1 AND 2 IN 1957. SOURCE JG GILLHAM FR CO COLLECTION



PLATE 02: GUNPOWDER SHEDS 1 AND 2 IN 1964. SOURCE NORMAN PEARCE







PLATE 04: RAIL TRACKWAY 114. VIEW FROM THE NORTHEAST



PLATE 05: RAIL TRACKWAY 102. VIEW FROM THE NORTHWEST



PLATE 06: STONE BASE 144. VIEW FROM THE SOUTHEAST



PLATE 07: POSTHOLES 165. VIEW FROM THE SOUTHEAST



PLATE 08: METAL FIXINGS 122. VIEW FROM THE NORTHEAST



PLATE 09: PIT 143. VIEW FROM THE NORTHWEST



PLATE 10: POSSIBLE FORGE 127. VIEW FROM THE NORTHWEST



PLATE 11: CERAMIC PIPE 106. VIEW FROM THE NORTHWEST



PLATE 12: PITS 185 AND 186. VIEW FROM THE NORTHWEST



PLATE 13: STONE BASE 184 IN PIT 179. VIEW FROM THE NORTHWEST



PLATE 14: SLEEPER TRENCHES 166. VIEW FROM THE SOUTHWEST



PLATE 15: GUNPOWDER SHED 1. VIEW FROM THE NORTHEAST



PLATE 16: GUNPOWDER SHED 3. VIEW FROM THE NNE

#### APPENDIX I: PROJECT DESIGN

## BOSTON LODGE, MINFFORDD TUNNEL MESS, BRITOMART SHED, AND GUNPOWDER SHEDS

## PROJECT DESIGN FOR ARCHAEOLOGICAL EXCAVATION (G2401)

Prepared for

Festiniog Railway Trust

September 2015

Ymddiriedolaeth Archaeolegol Gwynedd

Gwynedd Archaeological Trust

# BOSTON LODGE, MINFFORDD – TUNNEL MESS, BRITOMART SHED, AND GUNPOWDER SHEDS

#### PROJECT DESIGN FOR ARCHAEOLOGICAL EXCAVATION

Prepared for Festiniog Railway Trust, September 2015

#### CONTENTS

1.0 INTRODUCTION	
3.0 AIMS AND OBJECTIVES	31
4.0 METHODOLOGY	
4.1 Clearance	32
4.2 Excavation	32
4.3 Data processing and report compilation	33
5.0 DISSEMINATION AND ARCHIVING	33
5.1 Historic Environment Record	33
6.0 STAFF AND TIMETABLE	34
7.0 HEALTH & SAFETY	35
8.0 INSURANCE	

## **1.0 INTRODUCTION**

Gwynedd Archaeological Trust (GAT) has been asked by the *Festiniog Railway Trust* to provide a project design for undertaking an archaeological excavation at the Tunnel Mess/ Britomart Shed, and gunpowder sheds, in the Ffestiniog & Welsh Highland Railways' Boston Lodge works. The excavation is to be run as a community project with volunteers working on the site under supervision of two employees from GAT.

The proposed works include:

- Stripping of overburden and recent hardstanding from the Tunnel Mess/ Britomart Shed site;
- Stripping of overburden and backfill from around and within gunpowder sheds 1 and 3;
- Excavation and recording of any surviving buildings, rails, and other machinery within the Tunnel Mess/ Britomart Shed and the gunpowder sheds;
- and basic reinstatement within the Tunnel Mess/ Britomart Shed.

All work will be planned, managed, and undertaken by Gwynedd Archaeological Trust in accordance with the following standards and guidance:

- English Heritage, 1991. Management of Archaeological Projects (MAP2)
- English Heritage, 2006. Management Of Research Projects in the Historic Environment (MORPHE)
- Standard and guidance for the archaeological investigation and recording of standing buildings or structures (Chartered Institute for Archaeologists (CIfA) 2014a)
- Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives (CIfA 2014b)
- Standard and guidance for the collection, documentation, conservation and research of archaeological materials (CIfA 2014c)
- Standard and guidance for field evaluation (ClfA 2014d)

## 2.0 SITE BACKGROUND

Boston lodge was one of the quarries providing stone for the construction of the Cob; a causeway built across the Glaslyn estuary; which was built between 1808 to 1811 by William Maddocks. As works progressed it was developed and offices stables and barracks for the workers were built.

The Festiniog Railway Company purchased the site in 1836 and the main works were established on the site in 1847 for the repair of wagons on the horse-drawn railway. The site expanded for the first time in 1856; again after the introduction of steam locomotives in 1863; and particularly in 1877 by which point the works were producing its own Fairlie double engine locomotives. The railway closed in 1946 but much of the infrastructure was preserved. The company was revived by a group of volunteers in 1954 leading to the foundation of the Festiniog Railway Trust that currently runs the railway. The works at Boston lodge were brought back into use but many of the original buildings were upgraded, altered or demolished during the 1950s and 60s.

## 3.0 AIMS AND OBJECTIVES

The two project areas are the Tunnel Mess/ Britomart Shed site and the gunpowder sheds located at the southwestern end of the works. The Tunnel Mess/ Britomart Shed site is located in the northeastern end of the works and is currently an area of rough hard-standing after the recent demolition of the Tunnel Mess (marked as Wooden shed on Figure 1). The Britomart Shed is still standing and will not be removed. The archaeology was summarised in a paper by John Alexander (Alexander 2014 *Top Yard Archaeology, see appendix 1*). The salient points are as follows:

In 1842 two wagon storage sheds were built along the northeast and southeast sides of the yard. In 1856 the southeastern end of the northeastern shed was separated off as a store and the remainder was subsequently converted into the Loco Superintendent's office, the pay office and then into a residence. This now survives as a stand-alone building Plas Smart.

The northeastern storage shed is thought to have contained two lines of rails fed by sliding turntable that was in turn fed by a the turntable in the middle of the yard. The sliding turntable was excavated in 1970. The storage shed became derelict and was demolished, probably in the 1960s. The southeastern shed was probably of a similar design and probably also contained rails and a sliding turntable. This was demolished in 1877 in order to build a corrugated iron carpenter's shop (see buildings from 1889 OS map on Fig 1). This was subsequently extended to include a blacksmith's shop. Both were demolished in 1962.

The aim of the Tunnel Mess/ Britomart Shed excavation is to record and assess the survival of archaeology in the area of the southeastern shed and within the area immediately to the northwest of the location of the Tunnel Mess. It is not known how much of the area has been disturbed by subsequent events.

Three gunpowder sheds are marked on the 1900 OS map (Figure 2), located towards the southwestern end of the site. The remains of gunpowder sheds 1 and 3 are still visible today, however there is no evidence for gunpowder shed 2 and it is likely that if any remains survive of this shed, then they are located underneath the current length of track which runs through this area. The aim of the gunpowder shed excavations is to record the remains of the sheds, prior to their demolition.

### 4.0 METHODOLOGY

#### 4.1 CLEARANCE

The Tunnel Mess/ Britomart Shed excavation area (Figure 1) and gunpowder sheds 1 and 3 (Figure 2) will be cleared of any modern hard standing and overburden using a mechanical excavator provided by Ffestiniog & Welsh Highland Railways. The initial clearance will be carried out under archaeological supervision in advance of the community excavation.

Judging from the levels of nearby extant rails there is unlikely to be more than a few cm of material to be removed from the Tunnel Mess/ Britomart Shed area. It is not known if there are any concrete bases or other material that could be difficult to remove. The area shown on Figure 1 is for guidance only and may be varied according to what is uncovered.

The existing rail tracks will not be touched and a 1m buffer zone will be left around the tracks and the turntable so as to ensure they are not damaged. A 1m buffer zone will also be left against the rear upstanding wall within this area, so as to prevent damage to its foundations and possibly cause it to become unstable.

There is a large amount of backfill, including large roots, within gunpowder shed 1. The internal clearance of this shed may therefore be problematic. If the internal clearance appears to be destabilising the gunpowder shed then clearance will be halted and recording will be limited to the external faces.

#### **4.2 EXCAVATION**

The excavation will be carried out as a community project utilising volunteers from GAT and the Railway. The works will be supervised by two experienced GAT staff and full training will be given to all volunteers.

After removal of overburden the areas will be cleaned by hand and any features that are uncovered will be recorded using a Trimble high resolution GPS survey system. More detailed drawn, written and photographic records will also be kept as appropriate. Standard GAT context and structure recording forms will be used to record the deposits and features. Photographic records will be taken using a digital SLR set to highest resolution.

Photogrammetry will be used for recording any structures, with the results tied into the National Grid and used to create accurate (<2cm) plans and elevations.

If further excavation is necessary the areas will be sampled using smaller trenches.

#### 4.3 DATA PROCESSING AND REPORT COMPILATION

Following completion of the stages outlined above, a report will be produced incorporating the following:

- 1. Non-technical summary
- 2. Introduction
- 3. Aims and purpose
- 4. Specification
- 5. Methods and techniques, including details and location of project archive
- 6. Archaeological Background
- 7. Excavation results
- 8. Summary and conclusions
- 9. List of sources consulted.

### **5.0 DISSEMINATION AND ARCHIVING**

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. All plans, photographs and descriptions will be labelled and cross-referenced, and lodged in an appropriate place (to be decided in consultation with the regional Historic Environment Record) within an agreed submission period.

- Two copies of the paper report plus a digital report and archive on optical disc will be provided to Historic Environment Record, Gwynedd Archaeological Trust; this will be submitted within six months of report completion
- A digital report and archive (including photographic and drawn) data will be provided to Royal Commission on Ancient and Historic Monuments, Wales.
- A paper report(s) plus digital report(s) will be provided to the client.

#### 5.1 HISTORIC ENVIRONMENT RECORD

In line with the regional Historic Environment Record (HER) requirements, the HER must be contacted at the onset of the project to ensure that any data arising is formatted in a manner suitable for accession to the HER. At the onset, the HER Enquiry Form provided by the HER, will be completed and submitted.

### 6.0 STAFF AND TIMETABLE

The work will be managed by John Roberts, Principal Archaeologist at Gwynedd Archaeological Trust, and the work on site will be undertaken by Dave McNicol, Project Officer, who will also provide on-site management and supervision. GAT will also provide an experienced archaeologist to assist with excavation and training.

Gwynedd Archaeological Trust's Equal Opportunity Policy aims to treat everyone equally and to ensure that no job applicant, employee, worker or clients are discriminated against on the grounds of a protected characteristic as defined by the Equality Act 2010.

The work is scheduled to take approximately two weeks, with a start date of the 5<sup>th</sup> October 2015.

## 7.0 HEALTH & SAFETY

The Trust subscribes to the SCAUM (Standing Conference of Archaeological Unit Managers) Health and Safety Policy as defined in **Health and Safety in Field Archaeology** (2006). Risks will be assessed prior to and during the work.

On site GAT will abide by the requirements of the principal contractor (Festiniog Railway Trust) health and safety regulations and will submit a risk assessment and method statement (RAMS) prior to attending the site.

### **8.0 INSURANCE**

#### Public Liability

Limit of Indemnity- £5,000,000 any one event in respect of Public Liability

INSURER Aviva Insurance Ltd

POLICY TYPE Public Liability

POLICY NUMBER 24 7651 01 CHC/000405

EXPIRY DATE 31/03/2016

Employers Liability Limit of Indemnity- £10,000,000 any one occurrence INSURER Aviva Insurance Ltd POLICY TYPE Employers Liability POLICY NUMBER 24 765101 CHC/000405 EXPIRY DATE 31/03/2016

Professional Indemnity Limit of Indemnity- £2,000,000 in respect of each and every claim INSURER Hiscox Insurance Company Limited POLICY TYPE Professional Indemnity POLICY NUMBER HU PI 9129989/1208 EXPIRY DATE 31/03/2016 APPENDIX II: FEBRUARY 2015 EXCAVATION REPORT

## TOP YARD BOSTON LODGE, MINFFORDD

## Archaeological Excavation





Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust

## TOP YARD BOSTON LODGE, MINFFORDD

## Archaeological Excavation

Project No. G2401

Report No. 1235

Prepared for: Festiniog Railway Trust

February 2015

Written by: David Hopewell

Illustration by: David Hopewell

Cyhoeddwyd gan Ymddiriedolaeth Achaeolegol Gwynedd Ymddiriedolaeth Archaeolegol Gwynedd Craig Beuno, Ffordd y Garth, Bangor, Gwynedd, LL57 2RT

Published by Gwynedd Archaeological Trust Gwynedd Archaeological Trust Craig Beuno, Garth Road, Bangor, Gwynedd, LL57 2RT

> Cadeiryddes/Chair - Yr Athro/Professor Nancy Edwards, B.A., PhD, F.S.A. Prif Archaeolegydd/Chief Archaeologist - Andrew Davidson, B.A., M.I.F.A.

#### CONTENTS

Non-Technical Summary	1
1.0 INTRODUCTION	2
2.0 ARCHAEOLOGICAL BACKGROUND	2
2.1 Boston Lodge	2
2.2 The Archaeology of Top Yard	2
3. METHODOLOGY	4
3.1 Aims and Objectives	4
3.2 Clearance	4
3.3 Excavation	4
3.4 Dissemination and Archiving	5
3.5 Personnel	5
4 RESULTS	5
4.1 Introduction	5
4.2 Phase 1: The quarry workings	5
4.2 Phase 2: levelling	6
4.3 Phase 3: The wagon storage sheds	6
4.4 Phase 4: Later uses of the shed	8
4.5 The yard and carpenter's shop	8
4.6 Modern services	
5 CONCLUSIONS	9
6 RECOMMENDATIONS	9
6.1 Further excavations and research	9
6.2 Management	10
7 ACKNOWLEDGEMENTS	10
8 REFERENCES	10

#### **FIGURES**

- Fig. 1 Location of Boston Lodge Railway Works
- Fig. 2 Location of excavation
- Fig. 3 Outline plan of Top Yard in 1847 (John Alexander)
- Fig. 4 Outline plan of Top Yard in 1888 (John Alexander)
- Fig. 5 Plan of Top Yard in 1915 (FR Archives)
- Fig. 6 Boston Lodge Works indicating changes since 1955 (Wilson D.H. 1963)
- Fig. 7 Boston Lodge OS 25" County Series 1889
- Fig. 8 Location of 2015 excavation, features from 1915 plan and features from previous excavations
- Fig. 9 Top Yard, Boston Lodge. Plan of excavations February 2015
- Fig 10 Trench 1: south-west facing section
- Fig 11 Trench 1: north-west facing section
- Fig. 12 Diagrammatic south-west facing elevation of the north-eastern wagon shed c.1930
- Fig. 13 The traversing turntable (from Waters 1992)

#### **PLATES**

- Plate 1 Top yard probably in the 1930s (F R Archive)
- Plate 2 Early fish-bellied track in 1956 (G. E. Baddley in Boyd 1975, Plate1T)
- Plate 3 The sliding turntable 17 October 1970 (John Alexander)
- Plate 4 Orthographic, georeferenced, vertical image of the excavations from 3D model
- Plate 5 Trench 1 excavated down to quarry floor
- Plate 6 Trench 2A showing buried deposits from carpenter's shop with possible
- quarry deposits beneath
- Plate 7 Rails and slate slabs after excavation from the south-east
- Plate 8 The north-western end of the rails with heat-affected deposit and stone sleeper block

#### **EXCAVATIONS AT BOSTON LODGE RAILWAY WORKS (G2410)**

#### PRN: 12,733

#### NGR: SH58513792

Non-Technical Summary

A week-long assessment excavation was carried out in Top Yard, Boston Lodge in February 2015. This was carried out by Gwynedd Archaeological Trust and a team of volunteers as a community excavation.

The first function of the site was as a quarry producing stone for the construction of The Cob, the most important functional element of William Madocks' reclamation of Traeth Mawr between 1808 and 1811. The probable original quarry floor was found to be 0.4m beneath the current ground level.

The excavation uncovered the remains of a stone-built wagon shed dating from 1842. This was one of the first buildings to be constructed on the site after Boston Lodge ceased to function as a quarry. A length of rails, slate floor and wall foundations were found to be well-preserved beneath modern hard-standing. These discoveries allowed previous discoveries of rails and a sliding turntable (in 1956 and 1970) to be set in context and a structural and functional history of the building to be suggested. The shed appears to originally have been an open fronted store. Most of the original openings were subsequently infilled to produce an office, now preserved as Plas Smart and a workshop. A rail line passing through the building was inserted in 1920 to allow access to sand deposits to the rear.

A second early shed is known to have run along the south-eastern side of Top Yard but no definite traces of this were discovered. The footprint of the carpenter's shop, build in 1877 after the demolition of the early shed, was uncovered along with sleepers indicating the line of rails into the building. Surviving floor deposits were identified but there was not time for detailed excavation in this area. Much of the area of the early shed, carpenter's shop and an extension to the smithy are currently beneath a wooden shed known as the Tunnel Mess. Demolition of this building is planned and a second programme of excavation is recommended in order to complete the assessment of this area.

The assessment excavation demonstrated the potential for the preservation of wellpreserved archaeology in Top Yard. In this case the floor of the shed, rails and machinery were preserved for use as hard standing after the building itself had been lost. Much of the subsequent damage to the archaeology occurred as a result of the insertion of services such as electricity cables. This demonstrates a need for a greater awareness of the important archaeological remains at Boston Lodge. The production of a management plan is recommended.

# EXCAVATIONS AT BOSTON LODGE RAILWAY WORKS, FEBRUARY 2015 (G2410)

#### **1.0 INTRODUCTION**

Gwynedd Archaeological Trust (GAT) was asked by the *Festiniog Railway Trust* to undertake an archaeological excavation at Top Yard, in the Ffestiniog & Welsh Highland Railways' Boston Lodge works (Fig. 1).The excavation was run as a community project with volunteers working on the site under supervision of two employees from GAT.

The works included:

- 1. Stripping of overburden and recent hard-standing from the area
- 2. Excavation and recording of any surviving buildings, rails and other machinery in the area.
- 3. Basic reinstatement
- 4. Production of a report and archive

#### 2.0 ARCHAEOLOGICAL BACKGROUND

#### 2.1 Boston Lodge

Boston Lodge was one of the quarries providing stone for the construction of the Cob, a causeway built across the Glaslyn estuary, between 1808 and 1811, by William Madocks. As works progressed it was developed and offices, stables and barracks for the workers were built.

The Festiniog Railway Company Works were established on the site in 1847 for the repair of wagons on the horse-drawn railway. The site expanded particularly after the introduction of steam locomotives in 1863 to become an almost self-sufficient production and maintenance facility. In its heyday the works contained a sawmill, foundries, a pattern making shop, a smithy, a carpenters shop, a machine shop, a paint shop and an erecting shop

By the end of the 1870s the railway was designing and building its own Fairlie double engine locomotives. The works were used for manufacturing shells during the First World War. The railway went into decline in the 1920s and closed in 1939 but much of the infrastructure was preserved. The company was revived by a group of volunteers in 1954 leading to the foundation of the Festiniog Railway Trust that currently runs the railway. The works at Boston lodge were brought back into use but many of the original buildings were upgraded, altered or demolished during the 1950s and 60s

#### 2.2 The Archaeology of Top Yard

The project area is known as "Top Yard". It is the north-eastern end of the works and in recent years has been an area of rough hard-standing containing stored machinery and the wooden "Tunnel Mess" shed (Fig. 2). The shed was due for demolition before the excavation

but this was postponed and the excavations were limited to the north-eastern end of the yard. The only other surviving building at the north-eastern end of the yard is Plas Smart (grade II listed ref: 14419).

The history of Top Yard was summarised in a paper by John Alexander (Alexander 2014). Much of the following historical background was taken from this paper. Figs 3 and 4 are also from this paper and illustrate the early development of the area.

The guarry for the Cob fell out of use after completion and repairs to the embankment in 1814. In 1842 two wagon storage sheds were built along the north-east and south-east sides of the yard (Fig. 3). There was an access ramp running to Penrhyn Isaf behind the southeastern shed. In 1856 the south-eastern end of the north-eastern shed was separated off as a store and the remainder was subsequently converted into the Loco Superintendent's office, the pay office and then into a residence. This is shown on a plan of 1915 (Fig. 5 provided by John Alexander). The residence now survives as a stand-alone building called Plas Smart named after a former resident Ian Smart. The shed was modified in 1920 to accommodate a siding running through the building immediately to the south-east of Plas Smart. This provided access to the sand pit to the rear (Fig. 6 shows this phase and gives a general overview of the works in 1963). A photograph from the Ffestiniog Railway archives shows the shed after this insertion, probably in the 1930s (Plate 1). The shed can be seen to have a mono-pitched roof. The south-eastern end used the former quarry face as a back wall, the north-western end a mortared stone wall. Later photographs (Ronald D 1958 Corley D J 1959 in Zeepvat B. 2011) show that the wall adjacent to the sand-pit siding access was made of wood.

The storage shed is thought to have contained two lines of rails fed by sliding or traversing turntable that was in turn fed by a the turntable in the middle of the yard. Photographs from 1956 show an excavated length of fish-belly rail apparently in the, by this time, derelict shed (Plate 2). The exact location of the rails not recorded but the wooden wall adjacent to the sand-pit siding access is visible in the photographs showing that the length of rail was in the north-western end of the surviving shed. It is thought that the rail was taken up and stored after it was recorded. The derelict shed was unsafe and was eventually demolished, probably in the 1960s. The sliding turntable survived the demolition and clearance of the building. This was excavated and removed in 1970 (Plate 3, see also P9 below and Fig. 13).

The south-eastern shed is thought to have been of a similar design and probably also contained rails and a sliding turntable. This was demolished in 1877 and the Penrhyn Isaf access ramp was quarried away in order to provide space to build a corrugated carpenter's shop. (See Figs. 7 and 8). This was subsequently extended to include an extension to the blacksmith's shop. Both were demolished in 1962. Only the rear wall of the smithy survives and the wooden Tunnel Mess now occupies part of the site.

One further small building is shown on the north-west side of the yard on the 1888 OS map, possibly a short-lived timber store or carriage shed.

#### 3. METHODOLOGY

#### 3.1 Aims and Objectives

The aim of the excavations was to assess the survival of archaeology in the area of the former sheds. It was not known how much of the area had been disturbed by subsequent events. The ground adjacent to Plas Smart is currently buried beneath an access ramp and is inaccessible but was probably previously disturbed by the construction of the siding in the 1920s.

The only area available for excavation was between the former quarry face, which also formed part of the rear wall of the north-eastern shed, and the "Tunnel Mess" (Fig. 2). This encompassed the area of the north-eastern shed and some of the yard in front of it. It was also hoped that elements of the south-eastern shed would be present.

#### 3.2 Clearance

The excavation area comprised a subrectangular area with dimensions of 16.5m x 11m (Fig. 2). This was cleared of the modern hard standing and overburden using a mechanical excavator provided by Ffestiniog & Welsh Highland Railways under archaeological supervision and after location of services including a 11Kv buried cable.

#### 3.3 Excavation

The excavation was carried out as a community project utilising volunteers from GAT and the Railway between 9<sup>th</sup> and 13<sup>th</sup> February 2015. The works were supervised by experienced GAT staff and training, appropriate to their level of experience, was given to all volunteers.

After removal of overburden the areas were cleaned by hand and the features that are uncovered were recorded using a Trimble high resolution GPS survey system. Detailed drawn, written and photographic records were also produced. Standard GAT context and structure recording forms were used to record the deposits and features. Photographic records were taken using a digital SLR set to highest resolution. In view of the limited 5-day period available for both the excavation and recording of the site much of the detailed context planning was produced from a detailed 3D photographic model produced using Agisoft PhotoScan. The software allows multiple photographs taken from a range of viewpoints to be synthesised into a georeferenced 3D model that can then be used to produce detailed orthographic projections (Plate 4). This technique has the advantage of eliminated parallax error produced by most other photographic recording techniques. The model can then be used in the production of a conventional site plan.

The limited time and available and the need to preserve structures *in situ* determined the subsequent sampling strategy. The site was cleaned down to the upper archaeological horizons comprising a series of structural elements and rough surfaces. The structural elements were preserved *in situ* and the surfaces were sampled in two small sub-trenches.

The site records were synthesised into the present report.

#### 3.4 Dissemination and Archiving

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. All plans, photographs and descriptions will be labelled and cross-referenced, and lodged in an appropriate place within an agreed submission period. A full digital archive will be provided for the Ffestiniog Railway Archive. Gwynedd Historic Environment Record will be provided with a copy of the report.

#### 3.5 Personnel

The work was managed by David Hopewell, Senior Archaeologist GAT Contracts Section, who also provided on-site management and supervision. Neil McGuiness provided additional site supervision and produced the 3D model.

#### 4 RESULTS

#### 4.1 Introduction

A variable depth, typically 0.05m to 0.2m, of modern levelling and rough hard-standing was removed using a mechanical excavator prior to the main excavation. This comprised clean, grey, graded, dust to coarse gravel quarried ballast, overlaid by fine road scalpings. Modern material sealed beneath these layers indicated that they were laid since c.1995.

Floor levels and foundations of the wagon storage sheds along with various surfaces were preserved beneath the hard-standing. These were hand-cleaned and recorded. Several phases could be recognised. Modern service trenches could be seen to cut the earlier deposits in several places.

Context numbers, indicating the individual features and deposits that were excavated, are included in the text that can be related to the site plan (Fig. 9) and drawn sections (Figs. 9 and 10).

#### 4.2 Phase 1: The quarry workings

The site originated as one of two quarries for the stone used in building the Cob from 1808 to 1811 and probably during repairs to a breach in 1812 to 14. The rock face forming the northwest side of the excavation marked the limit of the quarry in this direction. The level of the quarry floor was unknown but presumed to be close to or above the level of the Cob. Two small sub-trenches in the excavation (Trench 1 and Trench 2 Fig. 9) aimed to investigate the early deposits. Trench 1 identified a layer of compacted shattered stone and larger rocks (28 and Plate 5) at 7.05m OD. This was 0.35m below the level of the floor of the wagon storage sheds. This appeared to be the working level of the quarry although excavation down to bedrock was not possible in the small trench. The lowest excavated level contained fibrous organic matter, probably preserved roots and grass dating from the period between the abandonment of the quarry and the levelling of the site for Boston Lodge works. It was noted that the organic material was sealed by hard infill with no apparent root penetration suggesting that the material was not a product of the development of weeds during the 20<sup>th</sup> century abandonment; sections are shown on Figs 10 and 11.

A layer of compacted stone was identified at the base of trench 2 at a similar depth (Plate 6) but there was not time to further investigate this.

#### 4.2 Phase 2: levelling

The shattered rock in trench 1 was sealed by a layer of compacted, clean, yellow redeposited glacial till (27: silty gravel and sand), presumably quarried from nearby deposits. An almost totally decayed rectangular-section piece of timber was visible as a brown stain and wood fibres in this deposit. This was in turn sealed by a layer of clean compact, but not cemented, yellow sand (018). The sand appears to have been widely used across the excavation area to level the site before the sheds were built in 1842. The sand was found to be clean and without marine inclusions such as shell fragments, suggesting that it was derived from the "sandpit" area to the north-east as opposed to the estuary.

#### 4.3 Phase 3: The wagon storage sheds

An area of slate flooring and a length of rails were uncovered immediately beneath the modern overburden (Plate 7). The slab floor was bounded on the south-east (02) and south-west (10) by the somewhat fragmentary remains of the foundations and lower courses of a stone wall. The wall corresponds to the limits of the north-eastern wagon shed as shown on the 1889 25" OS map and 1915 plan. The south-western wall was also, having once been part of the same structure, aligned with the front of Plas Smart. The wall foundations were not investigated in detail.

There appeared to be at least two entrances into the front of the shed. Fig. 12 shows a scaled interpretive elevation of the shed, after the alterations of the 1920s, drawn from photographic evidence. The entrance corresponding to the line of the incoming rails (29) is clearly visible, as is the entrance (37) to the south-east of this. The 1920-30s photograph shows a window or door in the latter entrance which had gone by 1956 (photograph 15 Sept 1955 - J Halsall). Probable straight joints in the masonry and in the interior walls indicate that the other two windows to the north-west had formerly been entrances into the building that had been subsequently partially blocked with masonry (Plates 1 and 2 and also see Fig.13). This suggests that the shed in its original form had been largely open-fronted, with sections of wall c.1.3m to 1.5m long alternating with c.1.8 to 1.9m wide openings.

There were no *in situ* foundation stones in trench 1. This initially suggested that it had been cut through an entrance. No entrance is however visible on the photographs of the standing building although there is a straight joint in the masonry in alignment with the north-western side of the trench. This could indicate that the wall was a secondary structure infilling an opening and thus had less substantial foundations. The north-west facing section (Fig. 11) shows some *in situ* stones set into the sand infill (18). The wall was built from a variety of stones ranging from angular but unshaped quarried material to occasional larger rounded field-stones with a few surviving traces of mortar.

Two *in situ* chairs (29) and a few slate fragments indicate the line of the rails running to the entrance from the turntable in the middle of the yard. Wagons were presumably then transferred to the sliding turntable that ran on 4 ft. 3 ½ in gauge rails set below the level of the floor This is shown on Fig. 13 (from Waters 1992); the entrance to the shed is at the top of the drawing. The building floor was heavily disturbed on this alignment by modern service trenches and presumably as a result of the turntable being removed in 1970 (36). The rails running parallel to the front wall of the shed that are shown on Water's drawing had also been removed, presumably during the installation of the 11kV cable. A stub of mortared masonry on the north-western edge of the excavation crosses the projected line of the rails and may indicate the edge of the turntable pit. The second entrance (37) was identified about 0.13 m to south-east of the entrance containing the rails. This had been partly disturbed by the 11kV cable trench but a brown stain in the sand appeared to mark the position of a wooden door sill.

The south-eastern wall (02) was generally well-preserved although the north-eastern end, as it approached the rock face, contained loose and randomly orientated stones, either indicating a doorway or an area of deeper disturbance.

The interior of the south-eastern end of the shed was better-preserved. A 7.5m x 3.25m area of slate flooring (04 and 05) and a 6.5m length of 1 ft. 11  $\frac{1}{2}$  in (597 mm) gauge rails (06) were preserved directly beneath the modern overburden (18). The south-west facing section in trench 1 (Fig. 10) demonstrates that a sleeper (23) and probably the rail and slabs were laid directly onto the sand infilling (19 appears to be modern material under the edge of the top of the rail). The rails were badly corroded and apart from their upper surface, mostly hidden beneath the slab floor. They were T-shaped in section, about 28mm wide and 61mm deep. Measurements are approximate because, the rails were both corroded and covered with concretions of rust and sand. The south eastern end had been slightly disturbed by a modern service duct (13) but the mains of chairs and a wooden sleeper could be identified. As noted above, a second wooden sleeper (23) was present in trench 1. The north western end of the length of rail (Plate 8) was resting on a stone sleeper block about 22cm deep, and again sitting on sand. A second stone sleeper (30) block was recorded 0.8m to the north-west of the end of the rails.

The slate-slab floor (04) comprised closely fitted, but somewhat irregular, sub-rectangular slabs up to 1.2m in length (Plate 7). Slabs were carefully fitted around and between the rails and in the narrow 0.23m wide gap between the rails and the south-western wall of the shed. At least one of the slabs was sawn, the rest were roughly shaped. The floor did not run up to the rock face at the rear, leaving a 0.6m wide gap in most places perhaps in order to accommodate a drain. The north-west end of the slate flooring (05) consisted of smaller slabs and was somewhat fragmentary. A discrete area of heat affected material (09: mostly sand with some charcoal), filled the gap between the two rails at their north-western end. This was not excavated. Its origin was unclear, it could have been a result of a process carried out in the shed, or could have been imported from another building such as the foundry to infill a hole in the floor.

#### 4.4 Phase 4: Later uses of the shed

The shed was allowed to decay, photographs from the 1950s show that the roof had mostly gone by this time. Later plans mark the shed as a store or timber store. A neat stack of bricks (08) designed to mark cable trenches, marked S.E. (Southern Electricity) and made by Baldwin Brickworks (Nottinghamshire) was stacked against the rear wall and a few appeared to have been laid to fill in the gap between the slate floor and the rock face. Three cast iron covers (15) covered a slight hollow against the foot of the rock face further to the north-west. Two lengths of wood (40), again at the base of the rock-face, may have been left over from the shed's use as a wood store.

#### 4.5 The yard and carpenter's shop

The area to the south and south-west of the shed was a spread of hard-standing that had been used as a yard and an access road to the rear of the buildings in recent years. A line of three wooden sleepers (22) and a few displaced rail chairs marked the line of the rails running into the former carpenters shop. The yard surface in this area consisted of yellow sand, presumably, as elsewhere, a levelling layer, with post 1970s material (stones coal rubbish etc.) pressed into the top of it. A large patch of burnt material (11) marked the site of a bonfire.

A somewhat irregular line of stones (17) appeared to be a continuation of the south-eastern wall (02) of the shed. This was initially interpreted as the front of the early south-eastern wagon store. This was investigated by trench 2 but was found to be part of a surface (25) covering the southern corner of the site. The surface was made up of compacted angular stones with modern material pressed into the surface. A roughly rectangular patch of superficially similar, compacted, bluish slate in smaller pieces (24) was found to overlie surface 25 in trench 2. A small sondage, about 0.15m deep was cut through layers 24 and 25 (Trench 2A) revealing a layer of oily broken wood, discarded ironwork and stones, sitting on shattered rock (see Plate 6). Surface 25 roughly corresponds to the area of the former carpenter's shop. The layer beneath it, identified in trench 2A, seems to be a result of activity in the building; the upper stony layer 025 was probably levelling material added in 1962 after the demolition of the carpenter's shop and smithy.

#### 4.6 Modern services

An 11kV cable (33) was laid across the site in 1975 (info from Manweb drawing). A 240v supply (13 and 14), some of which runs in a plastic duct, was added in the last decade. The laying of these services resulted in fairly substantial disturbance to the north-west end of the site. A recent land-drain (12) runs to a manhole; the contents of a further trench (42) are unknown.
### **5 CONCLUSIONS**

The present excavations confirmed the extent of the 1842 north-eastern wagon shed. The expected second line of rails was not present, at least in the surviving south-eastern end of the shed. It had been presumed that the function of the traversing turntable was to transfer wagons between two or more sets of rails in the shed. This now seems unlikely, at least in the latter use of the shed, unless a second line of rails existed only in the north-western end and their destruction was not recorded. The floor levels appear to have been intact until the 1970s. Given the level of interest in the archaeology of the works it is unlikely that a second line of rails could have been removed without any record having been made.

The function of the shed appears to have changed fairly early in its history and prior to any currently available photographic or detailed drawn evidence. It appears that the shed in its original form was a largely open-fronted structure, perhaps used as a simple wagon store. Sometime before the 1920s most of the openings were partially infilled and windows inserted. This conversion to a closed shed may have reflected a change in use, perhaps indicating use as a repair shop. It may have been necessary to remove the second line of rails to allow sufficient space to carry out repairs in the narrow shed. The slate-slab floor would therefore be a secondary feature laid after the removal of a second line of rails.

The survival of other buildings was less clear. The outline of the former carpenter's shop could be recognised as an area of later infilling and deposits were shown to be sealed beneath this. The limited time available for excavation did not, however, allow for further investigation. No remains of the second early wagon-store were identified. The best remaining potential for deposits or structures from this phase are beneath the hard-standing in the area of the former carpenter's shop and beneath the Tunnel Mess.

The excavation demonstrated a good potential for the survival of early remains at Boston Lodge. After the demolition of buildings the floor levels had been re-used as the basis for hard standing and preserved. Subsequent damage was caused by the insertion of service trenches and archaeological excavation, where *in situ* rails and a turntable were removed for safe keeping.

### **6 RECOMMENDATIONS**

#### 6.1 Further excavations and research

The excavation examined about half of the area occupied by the early wagon sheds. Further excavation is recommended after the planned removal of the Tunnel Mess. A basic record should be made of the building before demolition. The 2015 project comprised a brief assessment excavation with little time for historical research. An informative historical summary was, however, provided by John Alexander. The final output from the project, preferably to be produced after a second phase of excavation, should be a paper suitable for publication in a reputable industrial archaeological journal that includes both the results of the excavations and a detailed historical review including reproductions of primary sources such

as plans, maps and photographs. A non-technical summary could also be produced from this material for wider circulation.

### 6.2 Management

The development of a management plan addressing the preservation and utilisation of archaeological remains within the works is recommended. Boston Lodge is a functioning engineering facility but also contains buildings and archaeology of great importance to the development of steam powered railways, the manufactured landscape of Traeth Mawr and the infrastructure of the slate industry. All are of national importance.

# 7 ACKNOWLEDGEMENTS

Thanks are due to everyone who volunteered on the excavation, John Alexander, John Burman, C. Beaver Hughes, Margaret Shakespeare, David Ellis Williams, Jeanine Lewis, Rhys Mwyn and Peter Hugman. John Alexander was the site historian and his many years of involvement with the railway and its history provided invaluable background information to the excavation.

Neil McGuiness assisted with the excavations, site supervision and technical aspects of the excavations for GAT.

Finally many thanks to Dr David Gwyn for setting up the excavation and to Pete Gray, Tony Williams, Humph Davies and all at Boston Lodge for organisation, support, information and interest.

## **8 REFERENCES**

Alexander J. L. 2014 Top Yard Archaeology (unpublished typescript)

Boyd J. I. C., 1975 The Festiniog Railway Volume Two The Oakwood Press

Waters I. M., 1992 A Traversing Turntable *Festiniog Railway Heritage Group Journal* No 30 pp16-19

Zeepvat B. 2011 *Historic Building Assessment 'Plas Smart' FR Boston Lodge Works* Archaeological Services and Consultancy report 1388/FRC/1r



Fig. 1 Location of Boston Lodge Railway Works



Fig. 2 Location of excavation



Fig. 3 Outline plan of Top Yard in 1847 (John Alexander)



Fig. 4 Outline plan of Top Yard in 1888 (John Alexander) 70



Fig. 5 Plan of Top Yard in 1915 (FR Archives)



Fig. 6 Boston Lodge Works indicating changes since 1955 (Wilson D.H. 1963)



Fig. 8 Location of excavation, features from 1915 plan and previous excavations



Fig. 9 Top Yard, Boston Lodge. Plan of excavations February 2015



Fig 10 Trench 1: south-west facing section



Fig 11 Trench 1: north-west facing section



Fig. 12 Diagrammatic south-west facing elevation of the north-eastern wagon shed c.1930



Fig. 13 The traversing turntable (from Waters 1992)



Plate 1 Top yard probably in the 1930s (F R Archive)



Plate 2 Early fish-bellied track in 1956 (G. E. Baddley in Boyd 1975, Plate1T)



Plate 3 The sliding turntable 17 October 1970 (John Alexander)



Plate 4 Orthographic, georeferenced, vertical image of the excavations from 3D model



Plate 5 Trench 1 excavated down to quarry floor



Plate 6 Trench 2A showing buried deposits from carpenter's shop with possible quarry deposits beneath



Plate 7 Rails and slate slabs after excavation from the south-east



Plate 8 The north-western end of the rails with heat-affected deposit and stone sleeper block



Gwynedd Archaeological Trust Ymddiriedolaeth Archaeolegol Gwynedd



Craig Beuno, Ffordd y Garth, Bangor, Gwynedd. LL57 2RT Ffon: 01248 352535. Ffacs: 012**83** 370925. email:gat@heneb.co.uk APPENDIX III: GUNPOWDER SHED 1 3D MODEL

APPENDIX IV: GUNPOWDER SHED 3 3D MODEL



Gwynedd Archaeological Trust Ymddiriedolaeth Archaeolegol Gwynedd



Craig Beuno, Ffordd y Garth, Bangor, Gwynedd. LL57 2RT Ffon: 01248 352535. Ffacs: 012**88** 370925. email:gat@heneb.co.uk