IRGON - Independent Research Group Orford Ness

The Railways of Orford Ness

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Background

Over a century ago, military activities began on Orford Ness, taking advantage of its secluded location and secure, controlled access across the River Ore.

Orford Ness (also written as Orfordness and sometimes called just “The Ness”) is the largest shingle spit in Europe. Although technically a peninsula, its connection to mainland Suffolk is a narrow shingle ridge at Slaughden, south of Aldeburgh. At that point, the River Alde turns right sharply and forms the north-western shore of Orford Ness for the next 7 miles (11 km), becoming the River Ore. The only easy access to the main part of Orford Ness is by boat from Orford, so that Orford Ness is also often, incorrectly, called “the Island”.

The only large structure on the Ness at the beginning of the 20th century was the lighthouse, built in 1792. When Orford Ness was chosen as the site for a Royal Flying Corps airfield, all the necessary buildings, hangars, runways and test sites had to be constructed from scratch. Military equipment, weapons and all manner of goods had to be reliably transported to the far-flung sites on Orford Ness in all weathers.

We currently live in the age of the automobile, and we have developed road vehicles that can reach everywhere and move anything. But we sometimes forget that, a century ago, the natural choice for a flexible technology to cheaply and reliably transport goods would have been a narrow-gauge railway. These train systems did not require complex preparations and mostly dispensed with the ballast necessary for the much heavier equipment on standard gauge railways. Narrow-gauge rails could be manually laid down and pulled up very quickly, as might be required by changing circumstances.

Light railways were commonly used in the mining industry, in transporting produce from fields to the farm and in moving bricks from the kilns to the local train station, for example. Networks of light railways were used on large manufacturing sites to move everything and everybody, sometimes with scheduled services. Even for building the first motorways in the 1930s, the first step would have been to lay a narrow-gauge railway to move the large quantities of earth and construction materials that needed to be shifted.

During the World War I, both sides used light railways of near-identical 60 cm (2-foot) gauge to transport huge quantities of ammunition, building materials and supplies over that difficult, final distance from the permanent standard gauge railway stations to the shifting front. The war only accelerated the development of specialised equipment, locomotives and rolling stock.

For references, please click here

In 1915 the Armament and Experimental Flight of the Royal Flying Corps (later known formally as the Aircraft Armament and Gunnery Experimental Establishment) set up a flying field in the King's Marshes. Until well after the World War II, testing of aircraft and aviation-related research was to remain the key military activity on Orford Ness.

The airfield originally occupied a large area in the central part of the Ness. Hangars and other buildings were lined up along a track parallel to Stony Ditch, a tidal waterway that separated the marshes from the shingle to the south. The entire former airfield area has now reverted to nature, the only connection to its previous life beings its new name, the Airfield Marshes.

Military Railways on Orford Ness

The construction of a narrow-gauge railway was therefore a logical first step in developing the aviation infrastructure of the Island. The War Office ordered two locomotives in February 1917 and also started laying a very light (14 lbs./yd.) 60 cm gauge [a] railway in the course of that year, leading initially from the jetty south to Stony Ditch, and then parallel to this waterway northeast along the southern perimeter of the airfield. This row of hangars, workshops, a canteen and other buildings, called The Street, was the centre of activities on Orford Ness at the time. The line terminated at a storehouse beyond the airfield.

Several magazines for storing explosives and other ordnance were erected on the shingle on the southern side of Stony Ditch in 1916, a safe distance from the airfield. These were linked to The Street by a railway spur, crossing that tidal waterway on a wooden trestle bridge.

Following a six-year hiatus after World War I, aerial activities on Orford Ness recommenced in 1924. New activities led to the construction on the shingle, in 1928, of the Navigation Beacon [1], also known as the Black Beacon [2], located at a considerable distance from the airfield activities. In 1933, the Bomb Ballistics Building [3] was erected, also remote from The Street.

Schematic view of known military 60 cm gauge 14 lbs./yd. railway lines on Orford Ness, around the mid-1930s, superimposed onto a Google Earth *image taken 9th May 2020. (Data SIO, NOAA, U.S. Navy, NGA, GEBCO © 2021 Google, Image © 2021 TerraMetrics)*

For references, please click here

These two buildings were also connected by an extension of the railway from the magazines, probably before construction of the Bomb Ballistics Building started.
A further extension of the military railway line was laid past the Bomb Ballistics Building and across to a large lagoon by the shore, from which shingle was being extracted for construction work.

The military railway line was almost entirely removed in the early 1950s and scrapped. Only some short lengths of rusting rails remain today where they were embedded in concrete, e.g. in front of the Bomb Ballistics Building.

Little military railway infrastructure has survived. The trestle bridge was removed at some date after 1965. It had been thought that the existing agricultural building near the jetty was formerly the locomotive shed, but this is now doubtful.

Temporary Railways on Orford Ness

The shape of Orford Ness has undergone major changes over the centuries as the sea eroded shingle from some parts and deposited it on others. In the 20th century, temporary railway lines were laid for contract work to rebuild sea defences compromised by storms and floods on a number of separate occasions. While these industrial railways were of similar gauge, they were not connected to remnants of the former military network on the southern part of Orford Ness.

Schematic view of temporary 2 ft. gauge railway lines on the northern end of Orford Ness, superimposed onto a Google Earth *image taken December 1984. At the northern end, the line was used to repair sea defences in 1953, and the track along the east of Orford Ness was used to bring shingle to refurbish sea defences around Slaughden and Aldeburgh in 1965 and 1966. The line to the west was used to transport clay to the jetty at the southern terminus around July 1969 for the construction of the* Cobra Mist *site. (Image NASA, Image Landsat / Copernicus, Image © 2021 The GeoInformation Group)*

For references, please click here

After the great flood of 31st January - 1st February 1953, sea defences needed to be rebuilt along the coast around Aldeburgh, especially at the narrowest point of Orford Ness near Slaughden. A 2 ft. gauge track was therefore laid so trains could be used to transport materials to the construction site. At 25 - 30 lbs./yd., this line was more robust than the military lines previously laid further south.

Between 1965 and 1966, a further temporary railway line was laid for the Department of the Environment along the eastern shore of the Ness to transport shingle from the beach to the construction site at the northern end.

In July 1969, a track was laid alongside the river wall from Slaughden to a point adjacent to the Cobra Mist site. This was used to carry materials for repairing the river walls in preparing the site for construction of Cobra Mist. It was also used to transport clay from the northern terminus to a jetty, now gone, to take the materials across the river to Orford.

After being used in a final project to reinforce sea defences in 1971, the narrow-gauge railways, together with locomotives and rolling stock, were abandoned to the elements on Orford Ness.

Equipment used on the Railways of Orford Ness

Baguley Locomotives

The first trains to run by the War Department on the newly laid 2 ft. [a] railway on Orford Ness employed two Baguley Model 677 0-4-0PM [b] locomotives. The locos were works numbers (Nos.) 719 and 720, built by McEwan Pratt in Burton-on-Trent in 1918 and powered by internal combustion two-cylinder petrol engines, developing 10 hp.

More than 50 similar locomotives were used in wartime France, mainly by Canadian troops moving timber in rearward operations. The two Baguleys were delivered to the Ness in January 1918, ten months before the end of World War I.

Baguley BgC No. 760 (Phil Parker [4])

Baguley BgC No.760 at the Tracks to the Trenches *event, Alsagers Bank, Staffs. in 2018 (Chris Allen [5])*

The Baguley locos were a compact design, with a length of 2.7 m (9 ft.) and weighing in at just under two tons. Operating the simple controls required the driver to stand on the open footplate during the entire journey, enduring all weathers that the North Sea threw at him. The Baguley locomotives also featured a fake boiler around the engine with a non-functional funnel, giving it a 'steam outline', harking back to the accepted look of steam locomotives of the era.

Few photographs exist of the Baguley locomotives on Orford Ness [6]. Works No. 720 was scrapped in 1932, but No. 719 continued in service beyond 1935, and was possibly still present during World War II. Its fate is unknown, as are the details of what equipment was used on the military railway lines until they were scrapped in the early 1950s.

For references, please click here

A unique, beautifully restored, fully functional example of a similar Baguley locomotive, No. 760 (re-engined with a diesel) is owned by the Welsh Highland Heritage Railway in Porthmadog. It can also be admired in action elsewhere, such as during the famous "Tracks to the Trenches" events [7,8] organised by the Apedale Light Railway in Staffordshire. Static examples of the Baguley 677 class can be also seen in the Amerton Railway Museum in Staffordshire.

Orenstein & Koppel Locomotives

Following the 1938 East Coast floods, four new Orenstein & Koppel Type RL1c 4wDM [c] locomotives were bought by the East Suffolk and Norfolk River (ES&NR) Board for repairing damaged river banks and controlling beach erosion.

The new diesel locomotives (RL signifying "Rohöl-Lokomotive) were manufactured at Nordhausen in Germany in 1936 and 1937 and supplied via their UK agent, Wm Jones of London. By the mid-1930s, these narrow-gauge locos were being exported to customers around the world, especially to France and the United Kingdom.

The four identical locos, Nos. 6931, 7373, 7378 and 7734, were quite different in design to the Baguleys. Somewhat shorter and heavier, at around 2.8 tons [a], the O&K locomotives were marginally more powerful than the Baguleys. While still in the open, the driver of these O&K locomotives benefitted from a seat, oriented at right angles to the direction of travel. This was a standard layout for small industrial locomotives, more comfortable than simply facing forward as the driver had to turn less when shunting backwards and forwards.

The four Orenstein & Koppel locos offered decades of service throughout Norfolk and Suffolk, moving equipment and building materials for river bank and sea wall protection from county depots in Haddiscoe and Melton, respectively. While there is no direct evidence of their use on Orford Ness, it is very likely that one or two of them were put to work repairing the damage of the catastrophic floods of early 1953 near Slaughden.

Time finally caught up with the German locomotives, and two were scrapped in 1968. Nos. 6931 and 7734 were intended for use in a quarry, but were eventually put into storage and sold for preservation in the late 1980s. In 1998, they were bought by a private collector in Lincolnshire, where photographs suggest they still survived in 2008 [9,10].

As the O&K RL1 was a very popular and robust locomotive, large numbers are still in working order in open-air museums throughout Europe. For example, four such locomotives are still operational at the Amberley Museum in West Sussex, and one was recently restored at a mining museum in Germany.

O&K RL1a No. 4013 Sonia (l.) of the Amberley Museum in 2014 (Pete Edgeler [11])

O&K RL1c No. 8943 at the Mining Museum in Wiesloch, Germany in 2015 (Feldbahnmuseum Wiesloch [12,13])

For references, please click here

Motor Rail (Simplex) Locomotives

After another breach of the shingle spit by the sea in 1963, the East Suffolk & Norfolk River Authority initially purchased four Simplex class 40S 4wDM [c] diesel locomotives, Nos. 22209 to 22212, together with four sets of 10 side tipper wagons and lengths of rail.

This was the final series of locomotives to be used on the narrow-gauge rails on Orford Ness, for the time being at least. Built by Motor Rail Ltd., a company long established in this market, these industrial locomotives were sold under the Simplex trademark. Like their O&K predecessors, Simplex locos saw service around the world, particularly in British colonies after World War II.

The Simplex class 40S locomotives were larger than the German type and powered by a single-cylinder diesel engine. Two versions of this locomotive were available: the basic 2½ ton [a] variant, and a version with an additional 2 tons of weight for improved haulage capacity, which was the version used on Orford Ness. The driver sat in an enclosed cab, facing to the right in the direction of forward travel.

Following delivery to Slaughden Quay near Aldeburgh in 1964, the four locomotives were put to work on a two-year contract, repairing and strengthening the sea defences at this narrowest point of Orford Ness. For that purpose, 3½ miles of rails had been specially laid from the work site south along the coast to the area, from where over 300'000 cubic yards (230'000 m^3) of shingle was extracted as raw material for this work.

In 1965, a fifth Simplex loco, No. 22253, joined the River Authority project around Slaughden and Aldeburgh. All five locomotives were also used subsequently in a variety of other river bank and sea wall protection work around Norfolk and Suffolk. Once the sea defences had been upgraded by the end of 1966, the five Simplex locomotives were based at Haddiscoe Depot near Lowestoft.

MR Simplex No. 22212 abandoned on the northern tip of Orford Ness in 1973 (Gordon Edgar)

For references, please click here

Around July 1969, three locomotives (Nos. 22209, 22211 and 22212) were acquired by the Department of the Environment (DoE), which was responsible for supporting the secret military nuclear activities on Orford Ness at that time.

One of the three DoE locomotives, No. 22212, was loaned back to the East Suffolk & Norfolk River Authority for civilian work on Orford Ness in 1971.

Once that work had been completed, however, this locomotive was simply left to the elements amongst the dunes of the northern tip of the Ness. In the company of an abandoned side tipper wagon, it was a sad sight to behold there for almost two decades.

In the early 1970s, two other Simplex locos, Nos. 22209 and 22211, were also abandoned in open storage on a siding near the Cobra Mist site, just north of Pig Pail Bridge.

Fortunately, their robust design, as well as increasing public awareness and a desire to preserve these beautiful reminders of a different age, meant that three of the five Simplex locomotives used on the Ness ended up being preserved for future enjoyment.

As the three Simplex locomotives languished on Orford Ness, Simplex No. 22210 was the first to be given a new lease of life. In June 1980, it was withdrawn from service and (in spite of being manifestly not steam-powered) joined the large collection of exhibits at the Bressingham Steam Museum and Gardens near Diss in Suffolk. With a wooden box-like shell, it was converted to represent the popular *Toby the Tram Engine* and provided much joy to the youngest generation on the Nursery Line for many years. In 2013, it was retired from active service and put on static display at the museum, where it can still be admired today, resplendent in the same disguise.

MR Simplex No. 22210 (centre left) heavily disguised as Toby the Tram Engine at *Bressingham Steam Museum in 2007 (Oxyman [14])*

MR Simplex No. 22210 masquerading as Toby the Tram Engine *on static display at the Bressingham Steam Museum (photoverulam [15])*

The fifth Simplex loco, No. 22253, had been used on a variety of tasks for the East Suffolk and Norfolk River Authority, including work at Strumpshaw in Norfolk in October 1966. It was sold to a dealer at the British Car Auction in Chelmsford in March 1981, from where it passed to Alan Keef Ltd. the following month.

Alan Keef Ltd. is a firm that took over the sales and maintenance of Motor Rail locomotives, after their production ceased in 1987. The company, located near Ross-on-Wye, continues to support Simplex operators with spare parts and still develop narrow-gauge equipment to this day.

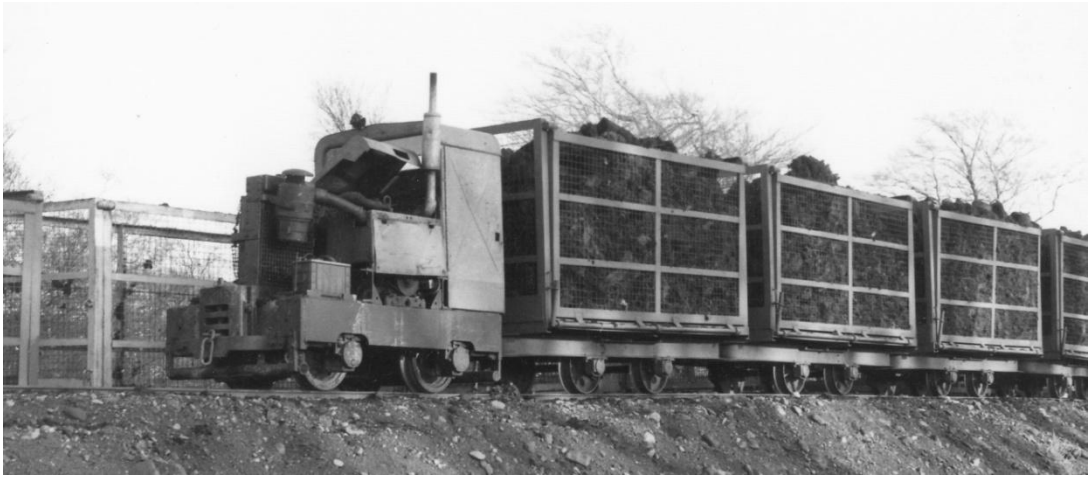
Later in 1981, the newly refurbished Simplex No. 22253 was leased to the Surrey Canal Society and took part in restoration of the Basingstoke Canal. The same year, the loco then started work transporting peat harvested in Midlothian for Norit Klasmann. It continued employment in the peat industry for Boothby & Penicuik, a company near Leadburn in the Scottish Borders.

For references, please click here

MR Simplex No. 22253 used by the Surrey Canal Society in 1981 (Alan Keef)

MR Simplex No. 22253 working for Norit Klasmann in peat works on Springfield Moss (Alistair Ness)

This was in fact the very last narrow-gauge railway peat operation in the UK. Simplex No. 22253 was still operational there in 2000 [16], reduced to a more basic state without a roof, until it was scrapped at Penicuik in around 2010.



Motor Rail Simplex No. 22253 hauling peat wagons near Penicuik in 1982 (Alan Keef)

Around November 1989, the three locomotives still languishing on Orford Ness, Nos. 22209, 22211 and 22212, were acquired by John Appleton Engineering in Leiston, Suffolk, together with a large amount of equipment and scrap cleared from Orford Ness.

Like Simplex No. 22253, the remains of No. 22212 were also acquired by Alan Keef Ltd. But its exposure to the sea air and weather had led to excessive corrosion of its aluminium and steel components, so it was only suitable as a source of spare parts. After its frame was briefly used as a transmission test bed at Alan Keef, its remains were scrapped in 1994.

The better condition of Simplex Nos. 22209 and 22211, however, enabled Appleton Engineering to restore them to full working order in 1991. Painted in the original olive green colour of the ES&NR Board, No. 22209 was named *Thorpeness No. 6* and No. 22211 - very appropriately - became *Orfordness No. 5*.

For references, please click here

In 1990 or 1991, both locomotives, as well as a large number of flatbed and tipper wagons, were loaned to the Imperial War Museums' site in Duxford, Cambridgeshire. Two of the flatbed wagons were converted to passenger carriages in 1991. A 2-ft. narrow-gauge railway was specially laid from the new Land Warfare Hall, leading to a straight section following the taxiway in one direction, and to a loop near the south-western end of the runway in the other. Intended as a practical demonstration of the light railways used at the front in World War I, the 'Duxford Railway' [17] was opened to visitors together with the Land Warfare Hall in August 1992. Unfortunately, the tourist train was not a success. Both Simplex locomotives left Duxford just five years later but, oddly, around a dozen of the tipper wagons formerly used on Orford Ness, as well as the two carriages and several original flatbed wagons, remained standing on the rails at Duxford for several years after the locomotives had departed. Their fate is currently unknown.

The two Simplex locos from Duxford, Nos. 22209 and 22211, started their new careers in 1997. Now on permanent loan to the East Anglia Transport Museum, they became the nucleus of the East Suffolk Light Railway [18], taking visitors around the museum site at Carlton Colville near Lowestoft. Both were still in their element in 2021 - the only surviving active locomotives that saw use on Orford Ness.

MR Simplex No. 22209 Thorpeness No. 6 *of the East Suffolk Light Railway (ESLR), operating around the East Anglia Transport Museum at Carlton Colville near Lowestoft in 2012 (Steven's Transport Photo [19])*

MR Simplex No. 22209 Thorpeness No. 6 *(left.) of the ESLR at Carlton Colville in 2014 (Lee Nash [20])*

MR Simplex No. 22211 Orfordness No. 5 *of the East Suffolk Light Railway (ESLR), operating around the East Anglia Transport Museum at Carlton Colville near Lowestoft in 2010 (Steven's Transport Photo [21])*

MR Simplex No. 22211 Orfordness No. 5 *of the ESLR at Carlton Colville in 2014 (Lee Nash [22])*

For references, please click here

These days, narrow-gauge railways are no longer used in reconstruction work on sea defences. As we come to rely on heavy plant and construction vehicles, the era of compact, hard-working locomotives negotiating the marshes, dunes and shingle on Orford Ness for over 70 years has come to an end.

Although the rails on Orford Ness were taken up long ago and little of its infrastructure remains visible, we are at least fortunate to still enjoy examples of these historic locomotives and rolling stock preserved at many locations, for future generations to enjoy.

Acknowledgements

Putting together this document, and the associated table "History of Locomotives used on Orford Ness Railway", has only been possible because many people have helped me in my first foray into the world of railways. I would like to extend my particular thanks to Chris Fisher, whose 1993 book "Industrial Locomotives of East Anglia (Handbook)" features the tables of narrow-gauge locomotives that provided the basic data for this account. I am also indebted to Alan Keef, Alan Smith, David Warren and Philip Boydell for their information, time and patience in getting me going on this track.

Notes

[a] Rather than being entirely consistent, a mixture of Imperial and metric measurements were used in this document and the associated table "History of Locomotives used on Orford Ness". This was chosen because historical records and official dimensions likewise used different units.

The narrow-gauge railways used on Orford Ness are nominally 2 ft. = 60.96 cm. The difference between 2 ft. and a precise 60 cm gauge is small enough that rolling stocks of these two nominal dimensions can be used interchangeably.

Similarly, weights of locomotives are quoted in tons, i.e. long tons, defined as 2240 lbs. = 1.016 metric tonnes. Conveniently, "tons" and "tonnes" are therefore very close in value and the two terms can be used interchangeably, for all intents and purposes.

[b] The Baguley Model 677 is a 0-4-0PM locomotive. This code signifies four wheels on two driven axles, no leading or trailing axles, a petrol engine and a mechanical transmission.

[c] Both the Orenstein & Koppel RL1c and Motor Rail Simplex are 4wDM locomotives. This code signifies four wheels with both axles powered but no coupling rods, a diesel engine and mechanical transmission.

References

For references, please click here.