

MACHYNYS WEST LLANELLI WATCHING BRIEF 2010



Prepared by: Dyfed Archaeological Trust
For: Charles Church West Wales



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MACHYNYS WEST, LLANELLI

WATCHING BRIEF

Gan / By

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MACHYNYS WEST, LLANELLI

WATCHING BRIEF

SUMMARY

Dyfed Archaeological Trust Field Services was commissioned by Charles Church West Wales to undertake a watching brief to fulfil a condition placed on planning permission for the construction of housing on the northern fringe of Machynys, Llanelli (centred on NGR SS50739831). An archaeological desk-based assessment of the development area identified the potential for buried archaeological remains of the Tin Plate works and terraced housing to survive within the development area. The former industrial buildings and structures were demolished and comprehensively cleared during the 1960s and 1970s. Some remains do, however, survive below ground, covered by a significant depth of demolition rubble. An archaeological watching brief was therefore recommended as a condition of planning approval for the development.

In the event, the development involved the raising of ground levels using imported materials. As a result there was minimal impact upon or exposure of the buried industrial remains, and therefore limited opportunities to undertake worthwhile archaeological observation and recording.

However, during the construction of a sewer (requiring excavation to a deeper level than elsewhere across the site), part of a substantial and well-preserved tunnel system was revealed. The tunnels were investigated prior to filling them with grout to make the site safe enough for the development to continue.

The tunnel survived intact for a length of about 90m, with a cross tunnel about halfway along. The tunnels terminated with demolition debris.

Ordnance Survey mapping shows that the location of the tunnel corresponds with what appears to be a tramway built on an embankment. The tunnels were in fact part of a flue system for the open-hearth melting shop built at the South Wales Iron Steel and Tin Plate Works which post-dates the 2nd edition OS map surveyed 1905. It contained four furnaces which, with modifications, worked until the steel works ceased production in 1958.

INTRODUCTION

Dyfed Archaeological Trust Field Services was commissioned by Charles Church West Wales to undertake archaeological works to fulfil a condition placed on the development at Machynys West.

The condition was placed on planning consent for the development because the proposal was considered to have the potential to expose, damage or destroy any archaeologically significant remains that might be present within the development area.

The condition states that:

'No development shall take place until the applicant, or their agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the planning authority'.

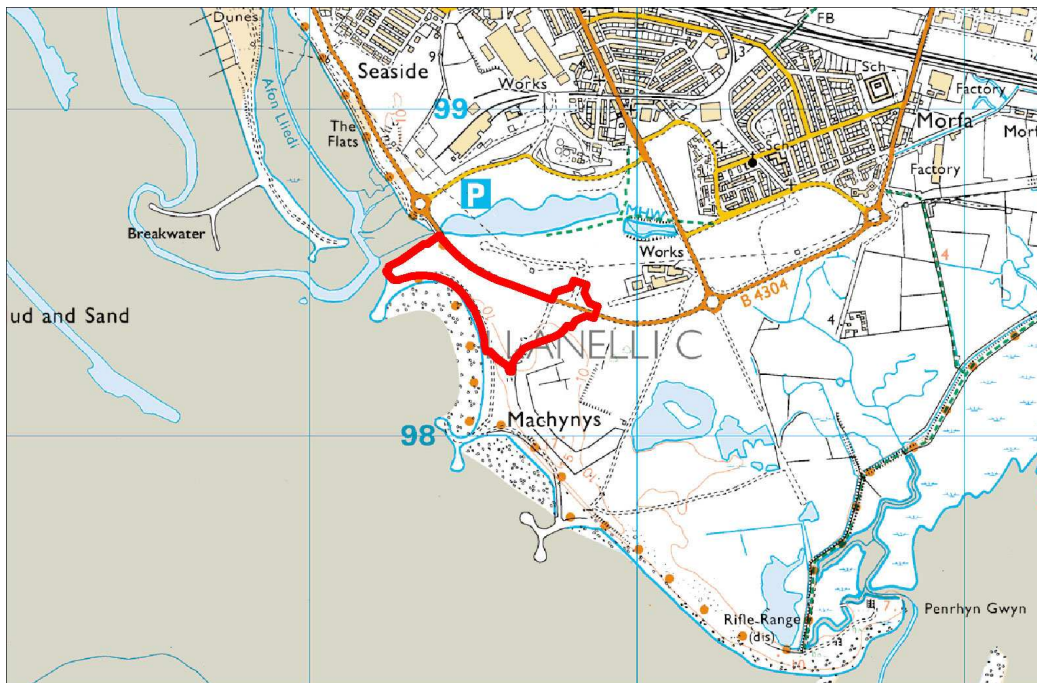


Figure 1: Location plan of development area. Reproduced with the permission of The Controller of Her Majesty's Stationery Office, © Crown Copyright. Licence No AL51842A

Physical environment

Machynys is situated on the southeast edge of Llanelli and it forms the western limit of Llanelli Marsh, an area of largely reclaimed coastal marsh that stretches to the Penclacwydd Wildfowl and Wetland Centre. Llanelli Marsh is part of an extensive system of coastal wetlands that extends 4km up the Loughor Estuary and Burry Inlet as far as Llangennech. This area is backed by a discontinuous crescent of high ground from Pembrey to Bynea that is the remnants of former sea cliffs and raised beach deposits of the last interglacial period (Page 1997, 6; Page 2000a, 4; Page 2000b, 3). The cliffs are composed of rocks of the Pennant shales, with coal and sandstones of the Upper Carboniferous Period. They are dissected by numerous small river valleys that drain the high ground to the north into the Loughor (James 1993, 8). The accumulation of sediments from these rivers, in particular the Dafen, Lleidi, Lliw and the Loughor itself has led to the

formation of the extensive saltmarshes throughout the Burry Inlet and the lower reaches of the Loughor Estuary.

The present ground surface lies between 3m and 5m above Ordnance datum (OD), with a number of small islands of higher ground at c.8mOD and a high point of 15mOD on the site of Machynys House (Page 2000b, 3). These higher points are moraines of glacial till deposited by the retreating ice sheet at the end of the last glaciation, 10,000 – 12,000 years ago. The Machynys moraine is the largest and forms a ridge that formerly extended across the estuary to Penclawdd on the north Gower coast. Traces of its former extent were shown on an 18th century (1775) navigation *Chart of Carmarthen Bay on the South Wales Coast* by Murdock Mackenzie that showed three small gravel islands running south from Machynys (Fig. 2).



Figure 2: Extract from the *Chart of Carmarthen Bay on the South Wales Coast* by Murdock Mackenzie, 1775, showing the remnants of the Machynys moraine.

Landscape history

Previous archaeological desk-based assessment and archaeological investigations on the site and the surrounding area have highlighted the long and varied history of the Machynys area. Published and unpublished sources are presented at the end of this report, but the following summary is based primarily on Page N 2006.

In the Mesolithic period, c.7000 years ago hunter-gatherers in the area would have exploited seasonally available resources such as plants, shellfish, fish and wild fowl. Later, as farming became established the coastal tidal marshes provided rich grazing lands a rich variety of wild foods. However, access to the wetlands was frequently uncontrollable. Eventually, therefore, sea walls were constructed and the enclosed land drained to provide a permanent and productive landscape (Page 1997, 1).

Reclamation of the saltmarshes in this area began in the medieval period with sea banks erected at Maes ar Dafen, a short distance to the north, to control the tidal reach of the Afon Dafen. Embankment in the Machynys region may also have medieval origins, but it was the later post-medieval and early modern periods that saw the main episodes of embankment. An estate map of Machynys produced in 1761 (CRO ref, Stepney Mapbook) shows that fields had been established by the mid-18th century. The map also showed that the Machynys peninsula had been enclosed on its south and east sides, with two separate phases of embankment. The southern sections of these banks have been incorporated into the modern sea defences. Embankment of the area was finally completed with the construction of the Great Embankment in 1808-09 (Page 1997, 11). Once enclosed, the marshes were farmed fairly intensively until the ever-expanding metal industries began to put pressure on the local agricultural economy.

A house has stood on Machynys since at least the late 16th or early 17th century. It was not shown on Saxton's map of Carmarthenshire produced in 1578, although others in Llanelli were shown. It is possible that there was an even earlier building on the site. There are the known 14th century documentary references to a farm at 'Maghenes' (James 1993, 14) and Jones (1987, 124) relates a story of rafters in the house having AD 1450 carved into them.

Industrial development

The development of the coal industry was slow and dictated by the available technology and the contemporary knowledge about the formation of the coalfields (Page 1997, 16). Sixteenth and 17th century mining was focused on exposed seams in well-drained locations, where any drainage could be easily achieved. Export was by boat from small shipping places established along the north bank of the Loughor, with larger facilities developing at Pembrey, Burry Port and eventually Llanelli. By the 18th century the potential of the Llanelli region was attracting large-scale investment from the metal processing industries.

Rapid expansion during the late 19th and early 20th centuries turned Llanelli into one of the world's leading iron and tinplate suppliers in a few decades. The rapid expansion of the coal, metal processing and associated transport industries dramatically increased the number of people living and working in the Llanelli area during the 19th century. The flat lands of Llanelli Marsh around Machynys and the areas around Seaside – to the west of the Machynys – were seen as ideal building land for both factories and worker housing. By the time the 2nd edition Ordnance Survey map was published in the early 20th century parts of several factories, terraces of worker housing, a school, a chapel and a mission room were all present within the development boundary. But the decline of Llanelli's industry was as dramatic as its rise, and by the early to mid 20th century most of the coastal farms had been abandoned and industry was in decline.

Modern changes have removed most traces of the former reclaimed agricultural and industrial landscapes of the area, which has been replaced by a more leisure-oriented and residential areas.

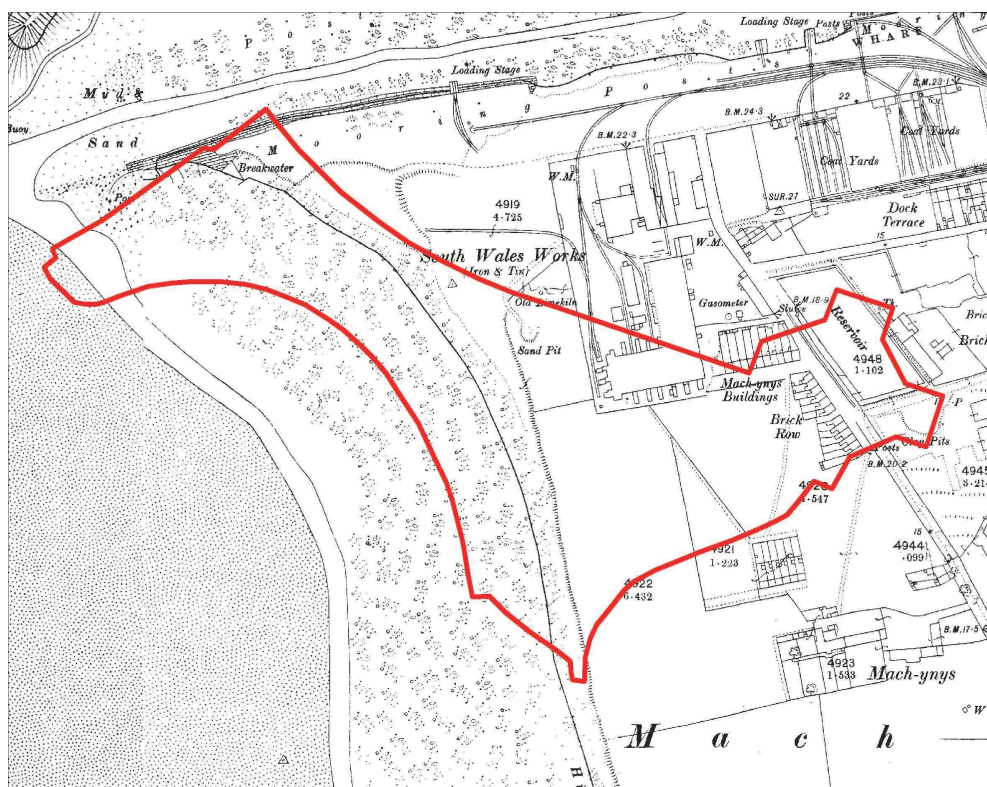


Figure 3: Extract from the Ordnance Survey 1st edition map

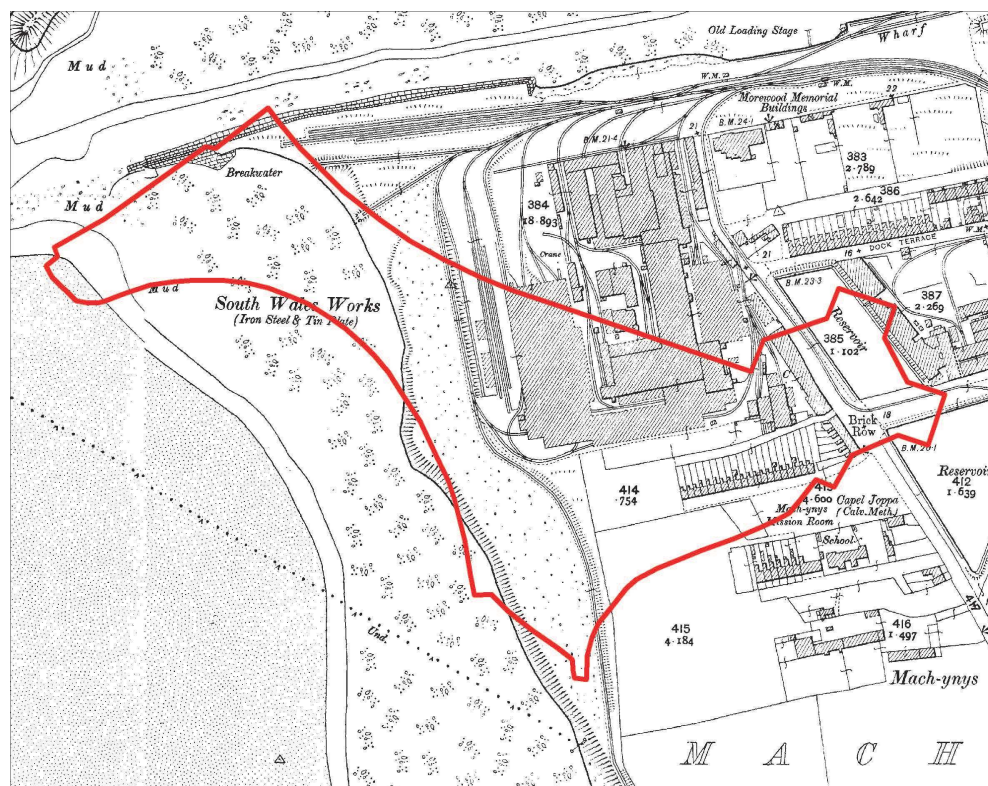


Figure 4: Extract from the Ordnance Survey 2nd edition map

ARCHAEOLOGICAL BACKGROUND

Previous archaeological work

An archaeological desk-based assessment of the development area (Page 2006) identified the potential for buried archaeological remains of the Tin Plate works and terraced housing to survive within the development area. As a result, an archaeological evaluation was recommended to ascertain the extent of survival. This investigation (Ramsey 2007) showed that little if anything survives of the terraced housing to the south of the Tin Plate works. Substantial remains of the Tin Plate works were present however, although it was unclear to what extent or how well preserved. In the light of these findings, an archaeological watching brief was recommended as a condition of planning approval for the development.

The former buildings and structures within the development areas were demolished and comprehensively cleared during the 1960s and 1970s. Recent archaeological monitoring of geotechnical test-pitting on the adjacent Delta Lakes sites, formerly the New Docks area, has shown that the industrial sites, including the Tinplate Works, were almost completely removed, although some remains do survive below ground. Where they survive they are covered by a significant depth of made ground chiefly comprising the rubble and waste from the demolition (Page 2005, 9).

The watching brief

In the event, the construction details for the development involved the raising of ground levels using imported materials. The buildings were built using raft construction. As a result there was minimal impact upon or exposure of the buried industrial remains, and therefore limited opportunities to undertake worthwhile archaeological observation and recording.

At the initial stages of the development, however, during the construction of a sewer (requiring excavation to a deeper level than elsewhere across the site), part of a substantial and well-preserved tunnel system was revealed. The tunnels were part of a flue system associated with the tinplate works.

The tunnels were surveyed by Intégral Géotechnique (including a mechanised video survey), to inform possible mitigation strategies for making the tunnels safe and allowing the development to continue. Additional archaeological investigation and recording of the tunnels was considered unnecessary and too dangerous.

Tunnel survey results

The survey results showed that the tunnels were constructed from brick and were approximately 0.90m wide and 1.55m high, with an arched ceiling and survived in good condition, essentially free of rubble backfill. There were several square brick openings in the ceiling along its length. The tunnel ran for a distance of approximately 90m, at its northern limit the tunnel was terminated by collapsed masonry and made ground, but would presumably originally have continued further. In the survey, the southern end of the tunnel is described as 'bricked up'. How much further the tunnel would have run in either direction is uncertain, but can perhaps be inferred from the historic mapping evidence. At approximately half way along the tunnel were two branches at rightangles to the main tunnel. Each was approximately 15m length (apparently terminating in collapsed brickwork). There were several capped openings in the roof of the tunnels. The

base of the tunnels was from 4.0m to 7.0m below the present ground surface. Only made ground was visible in the excavations. The tunnels have now been grouted and filled with 273 tonnes of cement and gravel.

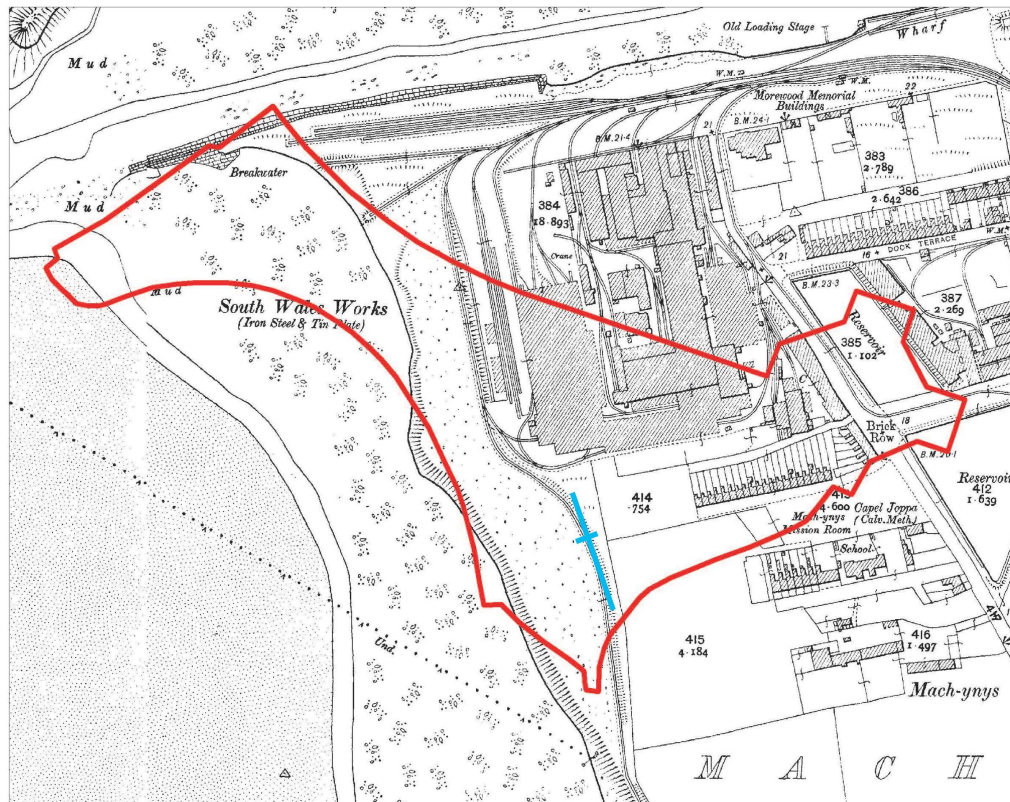


Figure 5: Approximate location of tunnel shown in blue

DISCUSSION

It was initially assumed that the tunnels were part of a flue system for the South Wales Iron Steel and Tin Plate Works. It is clear that the tunnel corresponds with what appears to be a tramway built on an embankment. Robert Protheroe Jones, curator of the heavy industries collection of the National Museum of Wales, was invited to comment on the likely function and significance of the tunnels, and has provided the following interpretation and background information about the site:

The masonry tunnel pertains to the third open-hearth melting shop built at South Wales Steel Works. This melting shop post-dates the 2nd edition OS 1:2,500 map surveyed 1905. It contained four basic open-hearth furnaces (the two earlier melting shops had contained acid open-hearth furnaces) lettered 'H' to 'K' that were originally built as around 50 tons capacity, based on 1920 data detailing 550 to 600 tons per week output per furnace, comprising 11 to 12 casts per furnace per week. Each of the furnaces commenced production on four different dates between 5.5.1917 and 12.7.1918. The furnaces were subsequently rebuilt to larger capacities and worked until the steel works ceased production in 1958.

The flue underlay approximately the area occupied the gas producers located along the western edge of the basic melting shop. These producers utilised gas coal and steam to manufacture producer gas (key constituent carbon monoxide) which, along with oxygen from the air, comprised the fuel burnt in the open-hearth furnaces. Some of the producer gas was combusted in refractory-lined

chambers beneath the furnaces to pre-heat the producer gas and air actually used in the furnaces. There were two sets of combustion chambers to each furnace - one set being pre-heated by combusting the producer gas, whilst the other set was having producer gas and air passed through them to preheat these before they were used to heat the furnace. The flows through each chamber were alternated to ensure maximum pre-heating of the fuel and air used in the furnaces.

Producer gas was usually piped above ground in refractory-lined steel pipes to the combustion chambers but it is quite likely that subsurface masonry flues were used in some works. The products of combustion from the pre-heating chambers and from the furnaces were directed to tall chimney stacks to ensure a vigorous through-draught in the pre-heating chambers and in the furnaces; the connections between the pre-heating chambers and the furnaces to the chimney stacks were usually via sub-surface masonry lined flues.

Without detailed design drawings of the layout of this plant (which definitely do not survive), it is not possible to state definitively whether the tunnel is part of the chimney flue system or part of the gas flue system. The periodic shafts in the roof suggest connections upwards to the gas producers and hence that this tunnel was a gas flue. If the tunnel was a gas flue one would anticipate four lateral tunnels to the east - one to each open-hearth furnace. The single lateral tunnel to the west is enigmatic - possibly it emerged in the slope down to the foreshore and was used to wheelbarrow flue dust out of the flue during periodic clean-outs.

Another examination of the tunnel reports that in addition to the east-west transverse tunnels (off the main north-south tunnel to the north of the entry point) that were identified in the Draintech Survey, a second transverse tunnel was identified to the south of the opening. This suggests that there may have originally been four, one to each furnace. Generally, each open-hearth furnace had its own chimney-stack and it does not seem to have been usual practice to provide cross-connections between the flues leading to each chimney. Thus a long tunnel of this nature, running parallel to the furnaces, is unlikely to have been a chimney flue. If the eastwards-leading lateral tunnel is not one of four lateral connections to the four furnaces (and in the absence of three other eastward-leading laterals it doesn't seem likely to be a connection to a furnace) then it is possible that amongst the shafts in the roof of the main tunnel were four shafts that connected to above-ground refractory-lined steel pipes that conveyed gas to each of the four furnaces.

Thus the tunnel can confidently be connected to the third open-hearth melting shop and a definite date of mid 1910s ascribed to it. It is probably a gas flue but the detail of its connections to the gas producers and furnaces cannot be deduced due to lack of records.

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Photo 1: Excavation for sewer, in which tunnel was discovered



Photo 2: View into tunnel through access shaft



Photo 3: Made ground overlying the buried structures

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WATCHING BRIEF

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This report has been checked and approved by

James Meek

ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.
on behalf of Dyfed Archaeological Trust Ltd.

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Llofnod / Signature Dyddiad / Date

Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau
sydd gennych ar gynnwys neu strwythur yr adroddiad hwn

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