

Post medieval water
systems at
Turnastone Court,
Herefordshire

Nicky Smith



ENGLISH HERITAGE

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HEREFORDSHIRE
Post-medieval water systems**

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Surveyed by: Nicky Smith, Graham Brown and Mark Bowden
Report author: Nicky Smith
Illustrations by: Deborah Cunliffe
Photography by: Nicky Smith

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Historical Water Meadows at Turnastone Court, Herefordshire.



A survey by English Heritage.

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1. INTRODUCTION

An archaeological survey and analysis of six fields forming part of the estate of Turnastone Court Farm in Herefordshire was carried out by English Heritage (EH) in March and April 2004, by the Archaeological Investigation team based at the National Monuments Record Centre, Swindon. The survey followed a request from Green Mark International (GMI) on behalf of the owners, the Countryside Restoration Trust (CRT), and from Dr Paul Stamper (then EH Inspector of Ancient Monuments for the West Midlands). The CRT bought the Farm in 2003, when it was under imminent threat from modern residential development and changes in agricultural practice. Under the ownership of the CRT traditional farming methods are continuing at Turnastone Court and its rich variety of wildlife, as well as its historical and archaeological features, are being preserved. The CRT has commissioned complementary studies of the farm's history, flora, fauna and buildings in addition to the EH survey. Partners in the project include Green Mark International, Archenfield Archaeology and the Golden Valley Studies Group.

The farm is historically important as having been the property of Rowland Vaughan, an Elizabethan landowner, who wanted to create a utopian 'Commonwealth' on his lands in the Golden Valley. He described this in his book of 1610 entitled *Most Approved and Long Experienced Water Workes*. It is not known how much of his scheme was ever put into practice, but a number of earthwork features on the Turnastone Court estate are believed to be part of his ambitious and extensive water meadow system, laid out in the twenty years between c1585 and c1605. This was pioneering work, foreshadowing the familiar 18th and 19th-century bed-work water meadow systems of Wessex.

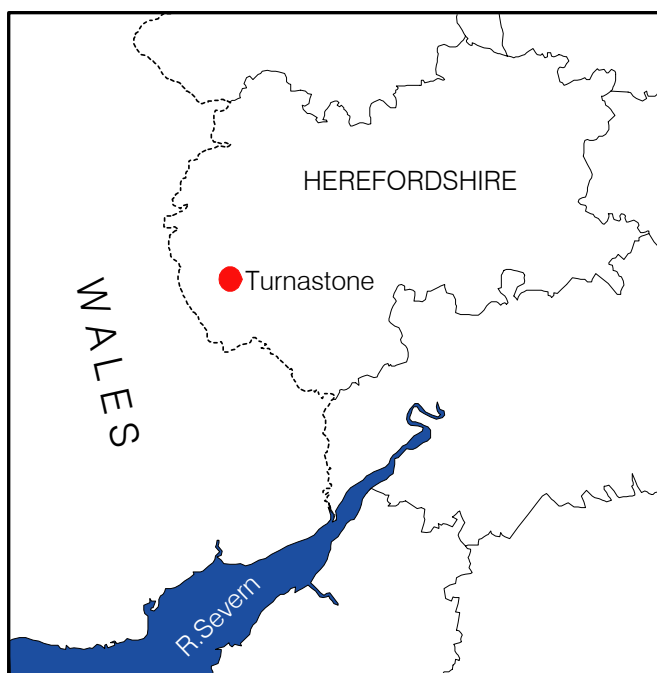


Figure 1: Location plan

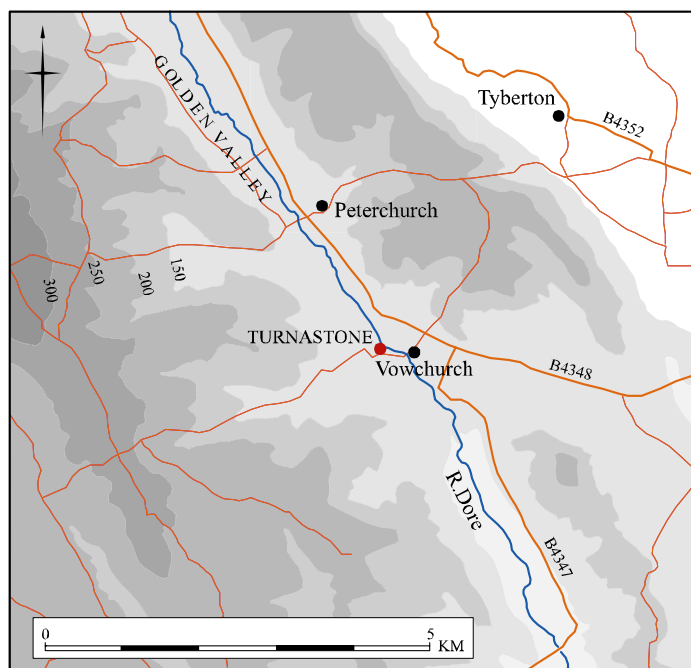
The EH survey produced the first detailed and accurate survey of the remains at Turnastone Court and analysis of the surviving earthworks has revealed that they are surprisingly complex. Many of them were clearly used for water management on a large scale, and they were probably created by Vaughan, although later minor modifications undoubtedly took place. The former field banks, closes and hollow-ways of Turnastone village were also incorporated into the layout of the water works.

2. GEOLOGY, TOPOGRAPHY AND LAND-USE

Turnastone lies approximately 12 miles west-south-west of Hereford. Today a village comprising a few houses, a church and a shop, it is situated in the Golden Valley, through which the River Dore flows, between the Black Mountains of Wales and Hereford. The fields surveyed straddle the parish boundary lying in both Turnastone and Vowchurch parishes. Turnastone parish is small, covering just 214ha, enveloped on three sides by the much larger parish of Vowchurch. Both are in Webtree Hundred.

The topography of the area consists of wooded hills, with fertile farmland in the river valley and on the lower slopes. The valley and hillsides surrounding Turnastone Court have an ample water supply from the River Dore, the Slough Brook, the Shegear Brook, the Slee Brook and numerous springs. The lower lying land is thus vulnerable to flash flooding.

The soils of the Dore Valley bottom are deep, stoneless and fine reddish silts of the Lugwardine Association. On the hill slopes reddish silty shale, siltstone and sandstone of the Bromyard Association are to be found. These soils are generally of good permeability and are suitable for stock rearing on permanent grassland, or for growing hops or potatoes in places where the flood risk is low (Soil Survey 1983). Even without improvement this was grassland of the highest quality, capable of yielding a considerable hay crop and supporting fattening herds on the aftermath (Stamper 2002). The present land use in this part of Herefordshire is diverse, with a mixture of arable cultivation, permanent pasture and meadowland. Potato and fruit growing are also large concerns. Some fields bordering Turnastone were clearly dug for brick-making in the past, with fields named 'Upper Brick Meadow', 'Lower Brick Meadow' and 'Brick Close' appearing on the Tithe Map of 1842. The farming methods used at Turnastone Court have changed little during this century so much of its old meadowland has been preserved.



*Figure 2:
Turnastone Court
topography*

3. ARCHAEOLOGICAL CONTEXT

There is evidence for human activity from an early date in the area around Turnastone. Distribution of archaeological finds suggests that Vowchurch bordered an area of prehistoric settlement, with a major concentration of flints dating from the Mesolithic to Bronze Age periods occurring on high ground about 1½ miles north of the village (NMR SO 33 NE 1, 5, 25, 29, 30; Herefordshire SMR 1497, 1124, 1128-9, 1513), and on higher ground, in the west of Turnastone parish (NMR SO 33 NW 1; Herefordshire SMR 1110). A Bronze Age socketed axe (NMR SO 33 NE 3; Herefordshire SMR 1461) has been found at Turnastone itself, while a Bronze Age spearhead comes from Chanstone (NMR SO 33 NE 13; Herefordshire SMR 1468). The earliest monuments are Poston Iron Age hillfort, 1 mile north of Turnastone (SO 33 NE 11; Herefordshire SMR 1462) and a further hillfort in Timberline Wood, 2 miles east of Turnastone (SO 33 NE 12). These hillforts may have been used into the Romano-British period, judging by the pottery finds. Other Roman finds from the area around Turnastone Court are rare, the only one reported being a Romano-British quern stone from Vowchurch (NMR SO 33 NE 23; Herefordshire SMR 1491).

A Roman road is alleged to run along the western side of the Dore valley. A 30ft section of it was uncovered in the old station yard at Abbey Dore in the 1908 (Jack 1909). Its northward continuation was later postulated as running past Vowchurch, Turnastone and Poston Court. A large ditch, identified as the 'Trench Royal', the main water carrier of Vaughan's system, was said to have been created from deepening its roadside ditch. The Ordnance Survey (OS) Archaeology Division examined the road in 1958 and noted that a house in Turnastone, at SO 358364, was built across it, reflecting its profile in its roof line. A road paving stone of identical type (including track ruts) to those excavated at Abbey Dore was also apparently found in a field immediately north-west of Turnastone, while a deep stream on its northern boundary revealed metalling like that exposed at Abbey Dore (NMR RR 631). From the OS record it is difficult to determine the proposed course of the Roman road through Turnastone with any precision. The OS Investigator, J Rigg, describes it as passing beneath the house mentioned above, which lies about 100m north of the 'Trench Royal', but the corresponding record map shows the Roman road following the line of the 'Trench Royal'. Whatever the alignment and date of this feature, its straight course can be traced by footpaths and minor roads for a considerable distance. Field boundaries and other features also respect it, showing it to be an early feature pre-dating the layout of most of the landscape we see at Turnastone today.

During the Anglo-Saxon period, The Golden Valley was outside the probable area of initial Anglo-Saxon settlement in Herefordshire, but it had been incorporated into Herefordshire by 1086. Despite this its population appears to have remained primarily British (Perry 2002, 21).

Earthwork remains for later periods include motte and bailey castles, of which numerous examples were built in this area during the 11th century when border conflict was rife

following the Norman invasion of England, and later when feuding barons controlled the Welsh Marches. Examples can be found close to Turnastone, at Monnington and Lower Park Wood (NMR SO 33 NE 14, 28; Herefordshire SMR 890, 1516). Further possible examples exist at Chanstone, where two ditched mounds lie in the valley bottom on either side of the River Dore (NMR SO 33 NE 16, 54). The remains of a further ploughed down mound (NMR SO 33 NE 22), stand as a prominent feature 65m west of Turnastone Church. This mound has been variously interpreted as a prehistoric monument, a Roman camp, and a ring work but, judging by its shape and location the most likely explanation is that it is the site of the early manor house at Turnastone. It did not fall within the area of the current survey, but it is an interesting feature which merits further investigation.

The medieval landscape and settlement history at Turnastone is complex and needs to be better understood. Both Vowchurch and Turnastone have parish churches dating from the 12th century (NMR SO 33 NE 42 & 47; SMR 5120) lying less than 500m apart on the edges of their respective parishes, albeit separated by the River Dore. Neither place was mentioned by name in the Domesday Book (1086) but Chanstone, immediately south of Turnastone, may once have been more important than it is today, since evidence of possible settlement shrinkage or desertion has been observed there (NMR SO 33 NE 44) and it has been identified with *Elnodestune* in the Domesday Book (pers comm. David Lovelace). Poston and Monnington, farms in Vowchurch parish, are further places in close proximity to Turnastone to have been mentioned in the Domesday Book (Thorn 1983, 14:6, 19:4). Prior to the Dissolution of the monasteries in the mid 16th century Poston was amongst the lands of Aconbury Priory (pers comm D Lovelace) and until recent times the Poston estate included some of the land now attached to Turnastone Court Farm. Newcourt, to the south beyond Chanstone, was also an ancient manor house with a large deer park (Smith undated). A 'deserted medieval village' has been claimed in the vicinity of Turnastone Church (Herefordshire SMR 11143). No ground evidence for this, or for settlement shrinkage, was seen during the EH survey. The only likely building platform encountered was the mound (SO 33 NE 22) next to the church. No documentary evidence has been found to suggest that the population of Turnastone village was ever much greater than it is today, although presumably it fluctuated throughout its history. In Vaughan's time, for example, there appears to have been only one inhabitant to make a congregation for his proposed new church (Wood 1897, 64-5).

There has clearly been a large amount of topographical change at Turnastone. As elsewhere, metalled roads have replaced a multiplicity of earlier track ways which now survive as footpaths. There are two unexplained 'dog-legs' in the road as it passes through Turnastone village and the road cuts through a continuation of a green lane leading from Turnastone Hill into Long Meadow. Many of the field boundaries are relatively late creations. Some were probably laid out by Rowland Vaughan (see below p6), while later hedges were planted on top of watercourses which Vaughan may have constructed. Streams meandering through Turnastone village and its meadows were also canalised leaving dry channels and sinuous field boundaries as clues to their former existence.

4. HISTORICAL BACKGROUND

Early history

Although Turnastone was not mentioned in the Domesday Book, an estate named *Wluetone* has been identified as being probably centred near Lower Slough (SO 343357), where a chapel of St Leonard stood in c1132 and 1299. In c1132 Ralph de Tornai was associated with the chapel, while Robert Turuei held *Wuluetone* in 1160-70 (Coplestone-Crow 1989, 192). This identification is not supported by the most recent edition of Herefordshire Domesday, which places *Wluetone* near Lyonshall. Turnastone later became a parish in its own right, for by 1301 the parish of Turnastone, with its subordinate chapel of St Leonard, was paying Tithes to a rector named Adam of Orleton, later Bishop of Hereford. A survey of 1322-3 lists Turnastone as a manor forming part of the Herefordshire estate of Roger Mortimer of Chirk (info from D Lovelace).

It is important to distinguish between the manor of Turnastone and the 'lands of Turnastone'. During the 13th and 14th century Turnestone manor was in the possession of the Dansey family. In 1411 the manors of Poston and lands in Turnastone were granted to John ap Harry and his wife Elizabeth (info from D Lovelace).

Rowland Vaughan

Rowland Vaughan acquired an estate at Newcourt when he married Elizabeth Parry, co-heiress, in c1584. Newcourt house no longer exists but Newcourt Farm, its successor, lies further down the Dore valley, about two miles south of Turnastone. From his marriage until at least 1603 Vaughan is referred to as "of Newcourt". From 1607 onwards he is referred to as "of Whitehouse". He probably acquired lands in Turnastone with the Whitehouse estate and it was not until then that he was able to extend his lands northwards. Whitehouse was first mentioned in 1577 in the will of Griffith Jones. Prior to that the estate had been called "Moor(e)", possibly the *More* in Stradel Hundred recorded in the Domesday Book, in which the canons of Hereford had a hide worth 5/- (Wood 2000, 6). Rowland Vaughan subsequently enlarged his estate by the purchase of adjoining lands. In 1607 he purchased, from John Parry of Poston, "2 messuages, cottages, lands and tenements situated in the parishes of Vowchurch and Turnastone" (Wood 2000, 9). This included most of the lands of what is now Turnastone Court Farm (info from D Lovelace) the advowson of Turnastone rectory and the right of patronage of the parish church. Vaughan was involved in enclosure of the fields at Turnastone, for a Terrier of 1607 listing the possessions of the Rector of Turnastone states that the parson "*hath common in all the fields wherein his lands lyeth which fields were common and without in closes until they were inclosed by Rowland Vuhaen Esq*" (HRO F37/8). Ownership of the Vowchurch part of Turnastone Court Farm's land at this time is a mystery.

From about 1609 onwards Vaughan's land sales and purchases involved him in litigation which was to cause him problems in later life. In 1614 he sold the manors of Bacton and Newcourt, having previously mortgaged Newcourt and Whitehouse. He died some time before February 1629 (Wood 2000, 9-10).

The water works

Vaughan's book of 1610 (edited and reprinted by Ellen Beatrice Wood in 1897) contained one of the earliest descriptions of a floated water meadow. In it he described the works which he had carried out on his estate in the Golden Valley, which probably began at Newcourt. The book originally contained a plan of the works, but unfortunately this is now missing. Vaughan claims that his first work was his corn mill which was run by a brook fed by eight springs (Wood 1897, 33). He describes in some detail when meadows should be drowned and for what benefit. Silt-rich flood water was used in the winter to enrich the ground, but the meadows were also watered to clear snow and ice or to irrigate the grass during dry summer weather, enabling a second hay crop to be produced (Wood 1897, 96-99, 127). He also explains the types of trench he uses (Wood 1897, 86). These consist of his '*trench-royall*' (10ft wide x 4ft deep) to take water from the river to the meadows, '*counter trenches*' to take water when the river rises to flood level, '*defending trenches*', '*topping or braving trenches*' (2ft wide x 1 ft deep) beginning at the commanding weir and running within 4-5ft of the river bank (the earth taken out of them forming a bank which makes flood water from the river overflow on the opposite side). '*Winter and sommer trenches*' and '*lists*' (raised areas between them) run the length of the land to be drowned to assist the dispersal of water over it, as well as '*double and treble trenches*'. A '*traversing trench with a point*' receives water from the counter-trench and the '*stanke-royall*' (a main dam 7ft high to collect a head of water, one amongst a number of lesser '*stanks*') and disperses it over the ground on both sides, while an '*everlasting trench*' appears to serve as a main drain. Vaughan paid close attention the level of the ground in laying out these works and describes his Trench Royal as running '*plim or level forward or backward*'. He claims to have made two boats, each 20ft long and 3ft wide, to run along it for the carriage of silt which needed to be cleaned regularly (Wood 1897, 124-5). If the entire area of Vaughan's system were to be studied it might be possible to identify more of these features than has been possible during the present survey.

From the late 17th century to the late 19th century water meadows were one of the greatest achievements of English agriculture and an integral part of the sheep and corn husbandry of the down-lands of Wessex (Kerridge 1953, 105). The system involved running a thin sheet of flowing water over the meadows for short periods of time. In early spring it would be done to provide the insulation to induce early growth of grass. In summer it may be done to enable a second crop of hay to be grown, while in winter it spread beneficial deposits of sediment or manure onto the soil. Two main types were used in England: catch-work systems for land on hillsides watered by springs and small brooks, and bed-work systems for low-

lying land near rivers. The origins of the systems are obscure but recent research has indicated that irrigation of some form was practised before Vaughan's time. There are said to be traces of water meadows dating from the Roman period on the Hampshire Avon and Gloucestershire Churn, but medieval references are sparse and ambiguous (Brown forthcoming). However, the Cistercians may have developed schemes for watering their lands and there is good evidence that irrigation was already understood and used on at least a limited scale by the start of the 16th century. The key development of the post medieval period was the creation of more sophisticated bed-work systems (Cook, Stearne & Williamson 2003, 158-60).

Later history

The Parry family owned Poston Manor until 1635, when it was sold to Henry, the first Duke of Beaufort, who subsequently acquired several other local farms including Chanstone (info from D Lovelace). Documentary research has revealed little to suggest that the succeeding owners of White House maintained the water meadows after Vaughan's death (Smith 2000). However, in February 1796 an agreement for leasing the Whitehouse estate mentioned that the prospective tenant was to pay to William Downes, owner, "*interest at a rate of 2% for all the money he shall lay out in clearing, draining, fencing, and dividing the premises and erecting lime kilns, floodgates, banks or stanks*" (HRO F37/139). In October 1800 William Downes also asked William Davies, Manager of Poston Estates, "*to raise and extend the lowermost wear in the lane behind Poston House so as to prevent the water as much as possible from running down to Turnastone and driving the inhabitants out of their houses as well as blowing up the road and also to make the upper wear safe so that water may be turned off the Road into the new course down the meadow*" (HRO F37/114). This shows that well after Vaughan's time the water flow around Turnastone needed to be controlled and that existing dams and sluices needed to be kept in good repair to prevent flooding. Furthermore, in 1878 the sale particulars of the Poston Court estate, which included the fields surveyed at Turnastone Court (listed as "pasture"), stated that "*nearly one half of the land is pasture, a large tract consisting of well-laid water meadows resting upon a deep alluvial soil and abundantly irrigated by the River Dore and its tributaries...nearly the whole of the land has been drained where necessary*" (HRO E1/5). The Poston estate was broken up during the Victorian period and parts sold off. Turnastone Court Farm was purchased in 1912 by William Watkins (info from D Lovelace). Some of the weirs, trenches and sluices of the White House estate were also said to be in continuous use during the early 20th century (Wood 2000, 10). This shows that work on water courses at Turnastone continued well after Vaughan's time and supports the archaeological evidence of brick and concrete repairs to sluices and weirs (Green Mark International 2004).

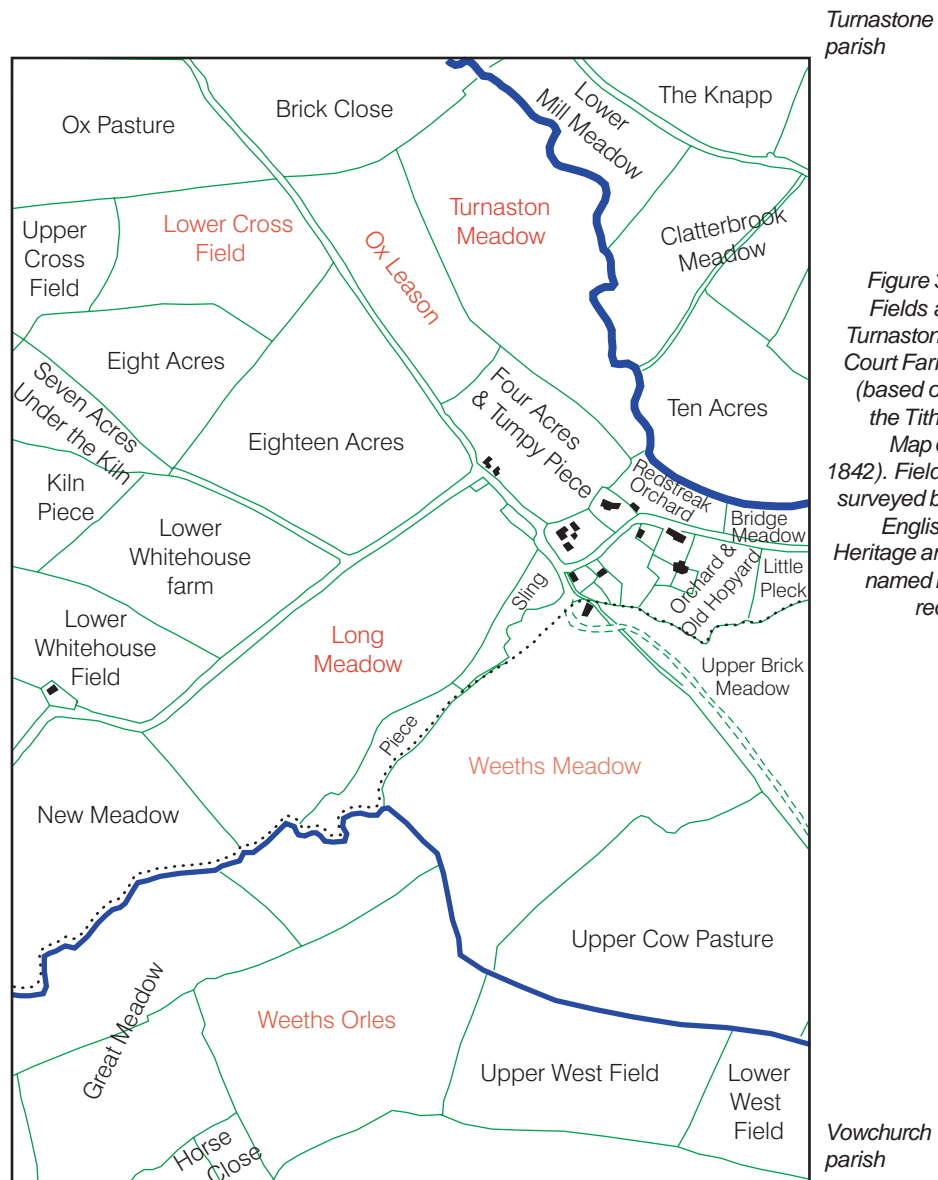
5. PREVIOUS ARCHAEOLOGICAL WORK

The archaeological remains at Turnastone Court have been the subject of field observations in the past but they have not been excavated. The Tithe Map of 1842, and early Ordnance Survey (OS) maps, show field boundaries and main watercourses but they do not show any detail of the lesser watercourses and other earthworks visible on the ground today. The present survey is the first measured and detailed survey of these to have been carried out.

The Royal Commission on Historical Monuments briefly looked at the remains for their South-West Herefordshire Inventory of 1931 but commented that it was impossible to identify with any certainty the ditches and weirs dating from Vaughan's time (RCHM 1931 xxxvii). Progress was made in 1936 when the Woolhope Club published a paper drawing attention to the fact that remains of the waterworks survived (Gavin Robinson 1936). The OS site record for the earthworks at Turnastone Court (SO 33 NE 4) is based upon secondary sources and their Investigator's field comments were confined to observations on the Roman road.

In 1943 Miss LFP Wood of White House, Vowchurch, wrote a thesis entitled "*Water drowning in the Golden Valley, Herefordshire in the 16th century*". Much evidence on the ground disappeared between this and the next survey in 1982-3 by Rosamund Skelton. In the meantime, in 1974, the Woolhope Club had published a further paper giving a good field description, with plans, of the surviving weirs and sluices (Kay 1974). The Golden Valley Studies Group has more recently sketch plotted the earthwork features, at 1:10,000, over a wide area to include Turnastone and its surrounds (Davies undated).

6. THE REMAINS



Turnastone parish

Figure 3: Fields at Turnastone Court Farm (based on the Tithe Map of 1842). Fields surveyed by English Heritage are named in red.

Vowchurch parish

General

The back-bone of Rowland Vaughan's scheme was a canal named the Trench Royal (NMR SO 33 NE 4; SMR 365) which began in the parish of Peterchurch and was nearly 3 miles long (Wood 1897, 87, 120, 144). The substantial ditch, named 'Trench Royal' on the survey plan (Figure 4), is generally regarded as being Vaughan's Trench Royal. There seems no reason to doubt its authenticity since it begins at the parish boundary with Peterchurch, it is of the appropriate dimensions and there is no other obvious candidate. Much of its length is now filled in or dry. In addition to the Trench Royal many smaller trenches run from hillside streams across the meadows, while a number of earthwork banks exist. Narrow, parallel, linear trenches cover large areas of Turnastone Court's meadow land, while the remains of sluices and weirs also survive as settings of stone, brick and concrete in surrounding watercourses.



Figure 4: EH Survey plan at 1:2500 scale.

Weeths Meadow

The terrain of Weeths Meadow slopes gently from its highest point in the south-west to its lowest points in the north and east, where the dried up channel of the Trench Royal lies. This field contains the most complete and best preserved earthwork system at Turnastone Court. This may be because it has suffered less damage from ploughing than some of the other fields (not having been ploughed within living memory and not documented as having been ploughed).

The main earthwork features in Weeths Meadow are: (a) a dry section of the Trench Royal, 1.5m deep which cuts across the eastern side of the field; (b) a meandering channel 0.8m deep. At its western end this leads towards the probable former course of the Slough Brook, now the hedged northern boundary of Weeths Meadow, while to the east it joins a further channel (k), on top of which a hedge has been planted. Channel (b) cuts through, and thus post-dates, a substantial but spread bank (c), 0.5m high. Bank (c) has a wide canal on its north-western side and a narrow bank (d) constructed on top of it at its south-western end, while a further ditch (e) runs parallel with its south-eastern side. There are six further banks within the field of which three, (f) (g) and (z), fall on the same alignment as those already described, while (h) lies at approximately 90° to (f) and (g). Two others, (i) and (j), have a different orientation.

From both their plan and profile banks (c), (f), (g), (h) and (z) appear to be the remains of an early field system, with the most prominent bank (c) probably representing a headland track-way which continues as a long distance footpath extending beyond this field to the north and south. The fact that the parish boundary between Turnastone and Vowchurch follows the course of bank (z) shows that the field system pre-dates the layout of this boundary. A sub-square depression (D) may delimit the edge of a former close, perhaps connected with medieval settlement at Turnastone.

Further earthworks in Weeths Meadow result from water management. The Slough Brook has been canalised from sluice (m) and its original course probably marked the field's north-western boundary. The remains of another sluice lie on the Slough Brook at (l), where a later sheep wash was also apparently located (pers comm Dr K Stearne). Apart from diverting water in the Slough Brook from its natural course to the new canal these sluices were perhaps also used to raise the water level sufficiently for it to flood onto the field. The spread bank (i) running diagonally from sluice (m) may have carried water onto the meadow or separated two areas of irrigation. The earlier field banks may have been re-used as part of the water works. The canal and ditch along bank (c) connect sluice (l) with the Trench Royal lower down the field. Feature (b) also has three right angled turns in its course and links the wide canal at (c) with the Trench Royal further downstream. Re-use of existing features would have helped to make savings in capital expenditure and was common practice in water meadow construction (pers comm. Dr K Stearne).

Linear depressions, no more than 0.5m wide and 0.2m deep, are also to be found over large areas of Weeths meadow. They run parallel to each other and are spaced between about 10-15m apart. It is difficult to be certain as to what these represent. They do not have the usual undulating form of ridge and furrow cultivation, but appear as narrow cuts in the ground surface. This, combined with the absence of documentary evidence that this field has been ploughed suggests that they are not plough marks. Parallel drains, on the other hand, were widely laid out for “thorough drainage” of fields, as practised in 19th- century England. The interval between these drains depended upon their depth and the texture of the soil (Phillips 1999, 63). Such drainage was used not only to remove excess water from soils but as an economic improvement to enhance land values by its improved wheat yields. Records indicate that over 50% of soils in need of draining in Herefordshire were treated between 1847 and 1899 (*ibid*, 69-70). The soil at Turnastone Court is permeable and there is nothing to suggest that drainage was ever poor, although flooding may have been a problem. Documentary evidence (Tithe Award 1842), however, indicates that Weeths Meadow was pasture before this period and, as far as is known, it has continued to be pasture to the present day, so it is unlikely to have been the subject of relatively expensive under drainage.



Figure 5: Sluice and weir at (l) on the Slough Brook. Although dry when this photograph was taken, it still carries water for much of the year.

The overall layout of the earthworks and sluices combined with the underlying topography of Weeths Meadow suggest that water was diverted from the Slough Brook into the canal along the western boundary of the field to water lower ground and along the northern boundary of the field to water the upper ground. Additional supply came from Weeths Orles, via a channel (d) which entered the Slough Brook at (l). A lesser channel (k) appears to have

been a main drain leading back into the Trench Royal at the bottom (eastern) corner of the field. Water may have been carried across the meadow by these ditches and by channels (e) and (b), which overflowed into basins to be retained by (former field) banks on one side, while on the other side it may have flowed back into ditches or towards banks, such as (j), which diverted it back into the main watercourse. The interpretative plan, (Figure 13), attempts to show how the earthworks surviving today could have worked as an irrigation system. It is based upon the premise that the remains are either broadly contemporary with each other or that earlier remains have been re-used.

Weeths Orles

Weeths Orles lies on a steep hillside with its ground level rising to 126m at its highest point and dropping by 20m at its lowest corner. This field also has a number of earthwork features, albeit very denuded. The most prominent are spread, contour-following banks (n) and (o), both a maximum of 0.6m high. At its western end (o) carries on from an existing watercourse and so almost certainly once carried water, although it is now dry. By stopping its end water may have been made to overflow from it, so watering the hill slope and level ground below and eventually returning to the channel along the field's northern boundary. A sluice located where earthwork (o) enters the western side of the field could have controlled the flow of water between this and the alternative course downhill (see Figure 13). If (o) was not stopped water may have been diverted, via bank (n), into the canalised section of the Slough Brook. Numerous parallel linear furrows cross this field. They are regularly spaced, at intervals of 6m. They do not follow a particular direction, some running at right angles to the contour, while others follow the contour. Their purpose is uncertain but they may be fragments of ridge and furrow.



Figure 6: Sluice and weir (1) on the Slough Brook. Rear view.



Figure 7: Stonework with concrete repairs at sluice (l).

Long Meadow

Long Meadow slopes very gently from its highest point at the western corner to its lowest levels at the north-eastern corner. It contains an extensive complex of earthworks, but they are poorly preserved. In the northern end of the field, close to Turnastone village, lies a small embanked area (A) which may delimit a former settlement close. Adjacent to this is a series of hollowed track ways (B). One leads from the present field gate and splits, one part joining the green lane to Turnastone Hill (now overlain by the modern road), the other continuing as a long distance footpath along bank (r). These hollow-ways also lead northwards towards Turnastone church and probable manor site. Further earthwork remains in Long Meadow include an embanked canal or carrier (p), 0.5m deep, which leaves the Slough Brook at the site of a sluice (q) in the southern corner of the field and curves along the contour of the ground before fading out at the field's north-western boundary. Feature (r), a straight, low bank with a narrow ditch cut along its southern side is parallel with the banks in Weeths Meadow and could be another former field boundary which has been used as a route-way. On the same alignment is channel (E), a drain or a former stream course, while along the field's south-eastern boundary is a further linear depression (s). Over a large area of the field there are narrow indentations identical to those already described in Weeth's Meadow. They run roughly parallel to each other and on the same north-west to south-east alignment as those recorded previously. As discussed (above p11) these features may have been plough marks or later drainage works, but there is a good possibility that they were part of the water meadow system, perhaps functioning as minor carriers and drains helping to distribute water evenly across the ground.



Figure 8: Upright stone, part of sluice (q) in the Slough Brook



Figure 9: Sluice (q). Remains damaged by tree roots and general decay.



Figure 10: Remains of the weir at sluice (q).



Figure 11: Earthworks in Turnaston Meadow, foreground. © English Heritage. NMR (23360/29)

Turnaston Meadow

Turnaston Meadow is a low-lying field, bounded on its eastern side by the River Dore. Earthworks here are well-preserved. The most obvious feature is a substantial lynchet (t) running along the length of the field from north to south, marking a drop in ground level to its east. This is on the same alignment as the field banks in Weeths Meadow. At right angles to (t) is a further bank (u) 0.5m high. The low-lying area adjacent to the River has clearly been prone to water-logging and flooding. Earthworks here comprise a large drain (v), 0.6m deep, fed by a network of lesser ditches which join it in herringbone fashion. The drain (v) leads into the River Dore. These drains probably post-date Rowland Vaughan's water works and could be of a relatively recent date. The northern boundary of Turnaston Meadow is delimited by a stream and its western, hedged, boundary appears to have been planted along a filled in channel leading from a probable sluice at (w), to the River Dore. A circular feature (x), of unknown date or purpose, lies at the southern end of the field. It stands no more than 0.2m high and is surrounded by a shallow ditch with causeways. The significance of this is yet to be determined, but it is very different in size and profile to the sub-square mound adjacent to the church.

Ox Leason

This field is on almost level ground, but slopes very gently down from the Trench Royal, which forms its western boundary, towards the filled in watercourse along its eastern boundary. Its northern boundary is delimited by the western continuation of the stream forming the northern boundary of Turnaston Meadow. The field contains few earthwork features and those that can be seen are slight. The only prominent earthwork is the dry section of the Trench Royal. The sites of sluices (y) are to be found in the stream at the north-western angle of this field. These must have controlled the flow of water into the Trench Royal. Several low and spread banks can also be seen projecting at right angles from the Trench Royal into the field, but they fade out after only a short distance. Linear cuts are discernable, but they are very fragmentary.

Lower Cross Field

Lower Cross Field, immediately west of Ox Leason, slopes gently downwards from its western boundary towards its eastern side, where it is delimited by the Trench Royal. An artificial watercourse with a hedge planted along its edge forms the northern boundary of the field, joining the Trench Royal at (y) and continuing onwards to join the River Dore. A very low and spread field bank (z), no more than 0.2m high, crosses the field while lesser linear features run parallel to it. A water channel leads into the field from its north-western angle. Between this channel and the northern boundary of the field is a curved bank enclosing

boggy ground. Lower Cross Field has been the subject of intensive agricultural activity during the past 150 years. Its western boundary was altered in the 19th century and it was under arable cultivation during World War II (Fig 12). If it ever did contain earthworks of archaeological interest they have been effectively levelled.



Figure 12: Fields to the west of the Trench Royal were under arable cultivation in 1946. English Heritage (NMR) RAF Photography (106G/UK 1652 11 July 1946 5289)

7. INTERPRETATION

The earthwork remains surveyed at Turnastone Court Farm are complex and undoubtedly reflect several periods of activity. The earliest features are field banks, hollow-ways and two small enclosures which probably delimit former settlement crofts. In addition to sharing a common alignment, former field banks are spaced at regular intervals of 90-100m, suggesting that they were perhaps part of a planned lay-out. The parish boundary diverges from the present field edge to follow one of these banks in Weeths Meadow, demonstrating the antiquity of the system.

Many of these early earthworks were later re-used as part of a water management scheme which extended beyond Turnastone Court and was probably begun at Newcourt two miles to the south. The question of whether the channels and drains we see today were Rowland Vaughan's water meadows is a difficult one. In the few years before his time the aftermath grazing on meadows along the Dore was a valuable commodity (info from D Lovelace) and perhaps needed little improvement, nevertheless Vaughan's account of his works is clearly written from his experience of having created his water system, upon which he had expended a good deal of time, effort and money. It is quite possible that some of the earthworks and other remains we see today were constructed to carry flood water away from the village or the fields after Vaughan's time. Documentary sources show that such work was carried out on the watercourses at Turnastone, but this seems to have been piecemeal modification to an existing system and no record of any major capital works has yet been found. It thus seems reasonable to conclude that at least some of the earthworks surveyed formed part of Vaughan's system.

From his own account, and from the field remains, Vaughan's system seems to have been very different to the later Wessex bed-works and appears to have functioned rather as a catch-work system. Water movement across the meadows may have been assisted by the network of minor channels visible as slight earthworks today. These would also have helped to distribute water evenly and prevent puddles from forming. An alternative possibility is that rather than the water moving continuously over the meadows for short periods of time, the land may have been flooded for as long as was needed to deposit its silts, water the ground or stop it freezing, and then it would be drained, as in the "warping" method used in tidal situations. At Turnastone the flooding could have been induced by seasonally high overflow behind closed sluice gates. In this system the earthen banks may have retained water in a series of basins, while the small parallel channels could have helped the water to run off the meadows quickly. Sluice gates would have controlled the flow of water on the major water courses such as the Trench Royal and the Slough Brook, while on the lesser channels temporary turf stops are likely to have been used.

In order to understand Vaughan's system more fully, a survey of its continuation to Newcourt and Peterchurch would be invaluable in conjunction with further work on the history of Turnastone parish. Archaeological excavation of the Trench Royal and its immediate area

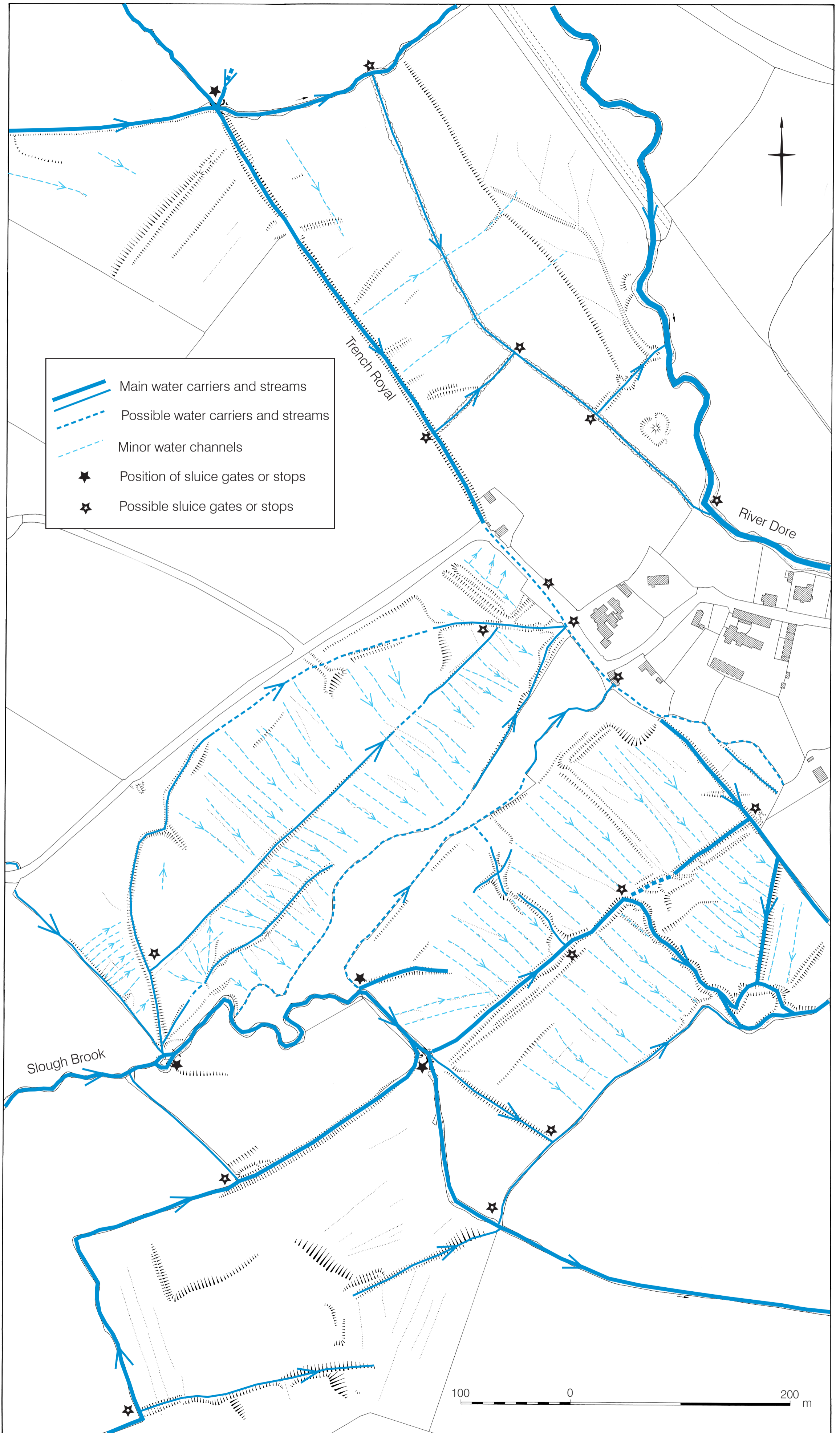


Figure 13: Interpretative plan.

to examine its method of construction and to investigate the possibility that it was laid out along a pre-existing linear feature would also be of great help in understanding the site. Limited archaeological excavation or geophysical survey may also yield useful information about the early settlement pattern at Turnastone as well as perhaps locating the positions of further water meadow sluices.

8. METHOD OF SURVEY

The survey was carried out by Nicky Smith, Graham Brown and Mark Bowden, using a Trimble 5600 Total Station Theodolite and a Trimble 5700 Global Positioning System. Survey data was processed with Geosite Office, Trimble Geomatics and Key Terra Firma software. English Heritage reserves the copyright for all plan and elevation data produced for the site. The report was written by Nicky Smith & edited by Mark Bowden. The illustrations were produced by Deborah Cunliffe.

9. ACKNOWLEDGEMENTS

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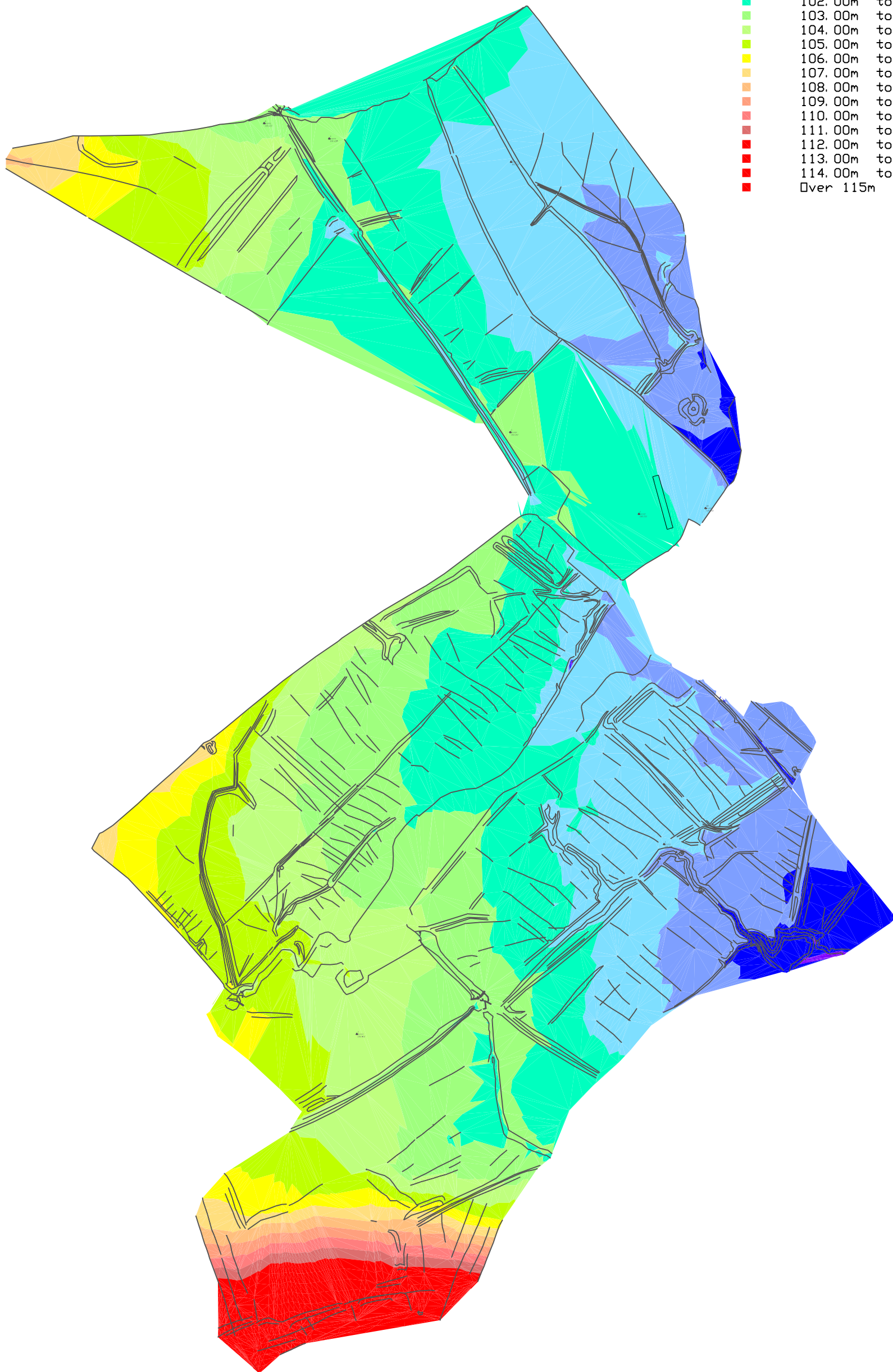
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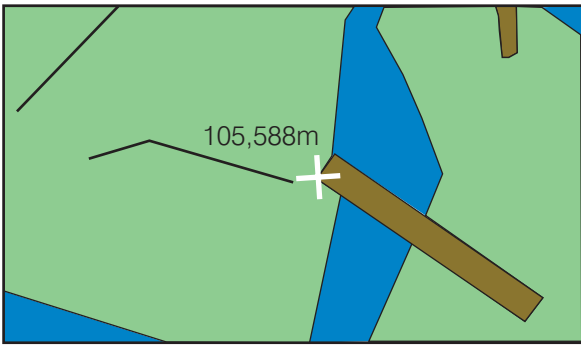
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Key to Colour Bands:

■	98.00m	to	99.00m
■	99.00m	to	100.00m
■	100.00m	to	101.00m
■	101.00m	to	102.00m
■	102.00m	to	103.00m
■	103.00m	to	104.00m
■	104.00m	to	105.00m
■	105.00m	to	106.00m
■	106.00m	to	107.00m
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■	111.00m	to	112.00m
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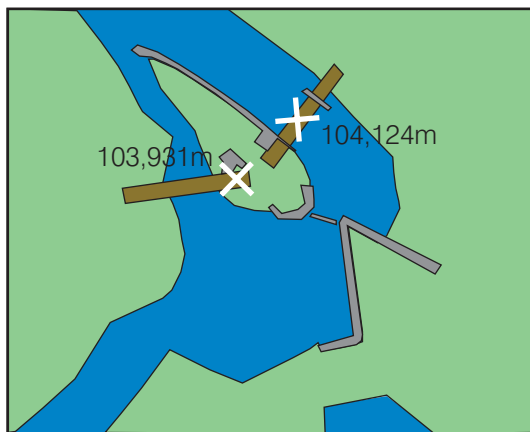
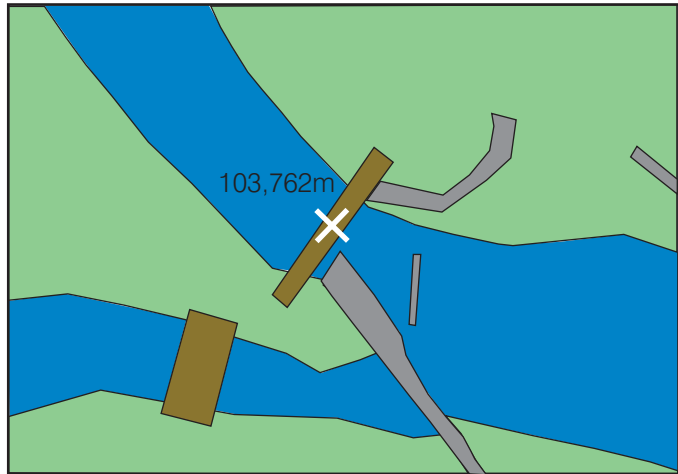


Appendix I: Turnastone Court elevation data



Top corner of footbridge at (q).

Nail in footbridge at (y).



Nails in footbridges at (l).

Stonework in the bottom of the Trench Royal discovered by GMI.

