

WIDENING OF BULHOLME LOCK,
AIRE AND CALDER NAVIGATION, CASTLEFORD,
WEST YORKSHIRE WF10 2LL

HERITAGE ASSESSMENT



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EXECUTIVE SUMMARY

This Heritage Assessment has been produced at the request of the Canal and River Trust (CRT) to assess the impact of widening proposals for Bulholme Lock, on the Aire and Calder Canal near Castleford, West Yorkshire NGR SE 43397 26746 centred), as part of a proposal to increase the freight usage of the Aire and Calder Navigation. The statement has been produced in accordance with guidance published in the National Planning Policy Framework (NPPF), and by other bodies such as Historic England, the Chartered Institute for Archaeologists, and the West Yorkshire Archaeology Advisory Service (WYAAS).

Bulholme Lock is not a Listed Building of Special Architectural or Historic Interest, is not a Scheduled Monument, is not included on Wakefield MDC's local list of Buildings of Local Interest, or otherwise subject to any other statutory protection. It is however, a non-designated heritage asset, as it is recorded on the WYAAS HER. There are no designated heritage assets within 500m of the lock.

Although the lock contains no unusual architectural features, it does nevertheless display evidence for the development of the Castleford Cut in the period from when this alignment was first constructed, between 1829-31 to the present day. The north walls of both chambers (and their inverts) preserve structural evidence for three main phases of development, dating to between 1829-31 and 1900, these changes reflecting the improvements needed to accommodate both the increasing volume of traffic on the Aire and Calder Navigation and the size of the vessels wanting to use the lock. The south walls of both chambers also preserve structural evidence for two main phases of development, 1862/1884 and 1900. The materials used in these different phases (stone, timber, brick and concrete) reflect contemporary developments in canal engineering and construction. The overall form of the lock and adjacent equipment also reflects more modern developments such as electrification and mechanisation. It is likely that many of the locks on the Aire and Calder Navigation will have undergone a similar pattern of adaptation, widening and modernisation as that seen at Bulholme Lock, with very few retaining their unaltered original form. Taken as a whole, the lock is considered to have a low to medium value of significance.

In terms of its setting, Bulholme Lock has a visual relationship with other elements of the local transport network, such as the disused 1878 Castleford railway viaduct, whilst the recent demolition of most of the chemical works complex to the south, together with trees and bushes to either side, provides a more rural feeling to the lock than might otherwise be expected. However, this is not representative of the historic setting, which as late as 1946 had a far more open aspect and therefore a stronger visual relationship to the surrounding industry. Modern works, such as the demolition of the original lock keeper's house and its replacement with the existing 1968 dwellings, and the building of the modern lock lobby, have arguably decreased the historic setting of the lock. Taken as a whole, the setting of the lock can be considered to have a medium value, and this is a contributing factor when assessing the significance of the lock.

The widening options currently under considering involve widening to the north (Option 2) or to the south (Option 5). It is considered that Option 2 will have a Moderate Adverse impact, resulting an overall Moderate/Slight Adverse significance of effect, while Option 5 has a Minor Adverse impact, which results in an overall Slight/Neutral Adverse significance of effect. This difference reflects the greater quantity of historic fabric contained in the north wall compared to the south wall. These impacts could be mitigated by a suitable programme of archaeological recording, both to record the affected walls and lock gates prior to removal and alteration, and also during the actual groundworks which are likely to reveal evidence associated with the culverts and channels through which water is moved between the chambers.

1 INTRODUCTION

- 1.1 Various options are under consideration for the widening of the Bulholme Lock, on the Aire and Calder Canal at Castleford Ings, West Yorkshire (NGR SE 43397 26746 centred), as part of a proposal to increase the use of the Aire and Calder Navigation by freight craft and to accommodate Euro II freight carrying craft. Bulholme Lock is seen as a 'pinch point' on the Aire and Calder Navigation, which will need to be substantially altered for the proposal to go ahead.
- 1.2 The Canal and River Trust (CRT) require the preparation of a Heritage Assessment to evaluate the proposed options and make recommendations on the significance of any structures of heritage value within the site, in order to fully inform the final selection of widening option and detailed design. This Heritage Assessment has been prepared by Ed Dennison Archaeological Services (EDAS) Ltd, in accordance with guidance published in the National Planning Policy Framework (NPPF) (MHCLG 2019), the Chartered Institute for Archaeologists' *Standard and Guidance for Historic Environment Desk-based Assessment* (CIfA 2017), and by the West Yorkshire Archaeology Advisory Service (WYAAS) (no date). It is envisaged that this assessment report will be submitted with a planning application for the chosen widening option.
- 1.3 In order to fully assess the heritage significance of Bulholme Lock, a study area measuring 500m in all directions from the lock was considered. It should be noted that the following statement only relates to the heritage issues of the proposed improvement works, namely the historic character and significance of the existing Bulholme Lock and its setting, and the impact of the proposed development on these issues. It does not deal with planning, design, ecological, landscape and specialist waterway issues.
- 1.4 It should be noted that the lock has historically been called and labelled as 'Bullholme', but that the modern spelling of 'Bulholme' has been used in this report.

2 SITE LOCATION AND SUMMARY DESCRIPTION

- 2.1 Bulholme Lock is located at the eastern (downstream) end of a section of the Aire and Calder Canal known as the Castleford Cut, to the immediate north of the River Aire, some 1.34km north-east of the historic centre of Castleford in West Yorkshire (NGR SE 43397 26746 centred) (see figure 1). Vehicular access can be obtained via a track running along the north side of the cut, which runs for a distance of c.830m from a gate on the east side of the A656 Barnsdale Road immediately to the north of Castleford Cut Bridge. The tarmaced track is also used as a public footpath. The lock lies at a height of between c.11m and 12m AOD.
- 2.2 The Aire and Calder Canal is now used by both commercial and leisure craft. There is a flood lock at the upstream (west) end of the cut around Castleford weir, which is usually left open to allow unrestricted navigation but it also works as a lock when required by high river levels (Fowler 2009). Bulholme Lock is located at the downstream (east) end of the cut, allowing craft to lock down and rejoin the River Aire.
- 2.3 The lock developed in a number of different stages, and now has a total length of c.140m, with an 8ft 3in (2.51m) rise (BWAHS und). The minimum width at coping level is 6.90m, and the maximum depth from lock invert (floor) to coping is 6.80m (Bradley 2019). The complex comprises two lock chambers, the bottom chamber being closest to the river (i.e. to the east) and the top chamber to the west, defined

by three sets of timber gates (see figure 2). Large commercial craft are passed through by a lock keeper who can use either or both chambers together, working the lock from the control desk in a lock tower or 'lock lobby' building located on the north side of the lock. Leisure craft crew can work the bottom chamber only, utilising consoles near the lock gates, with the top gates being left open (Fowler 2009). The bottom chamber is constructed from masonry, with the top chamber built in brick.

- 2.4 To the immediate north of the east end of the lock, there are two residential properties, built in 1968, located at the eastern termination of the aforementioned access track (Fowler 2009). To the north-east is Ledston and Fairburn Ings, two areas of low lying fields and lakes formed by mining subsidence, parts of which form a nature reserve. This area floods when the River Aire is high, but the lock is protected by a flood bund which runs east from Castleford Cut Bridge. To the south of the lock, on the isthmus of land between the cut and the River Aire, there was formerly part of the large chemical works operated by Hickson and Welch; this has recently been demolished and the area cleared, presumably for future redevelopment. At the west end of the cut there is a small marina/boat yard and industrial estate. There is a belt of screening woodland running along the south side of the cut which increases in width immediately adjacent to the south side of the lock, and there is another belt to the north side of the lock.
- 2.5 Bulholme Lock is not the subject of any statutory protection, nor are any of the structures associated with it.

3 DESIGNATED AND NON-DESIGNATED ASSETS

- 3.1 Designated Heritage Assets are defined as comprising World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields and Conservation Areas (MHCLG 2019, Annex 2: Glossary). It should be noted that there is also a lower level of heritage assets, which may or may not be of equivalent significance to a Scheduled Monument, but which are currently undesignated.

Scheduled Monuments

- 3.2 Scheduled Monuments are considered to be of national importance and are protected under the Ancient Monuments and Archaeological Areas Act 1979, and they are administered by Historic England (formerly English Heritage) on behalf of the Secretary of State. Under the terms of Part 1 Section 2 of the Act, it is an offence to damage, disturb or alter a Scheduled Monument either above or below ground without first obtaining permission (Scheduled Monument Consent) from the Secretary of State.
- 3.3 Bulholme Lock is not a Scheduled Monument, and there are no Scheduled Monuments within 500m of the lock. The nearest is the remains of the Roman bath house in Castleford town centre (National Heritage List for England 1428421), which lies 1.19km to the south-west of the lock. There is one other Scheduled Monument in the vicinity, a moated medieval site at the north-eastern extent of Fairburn Ings (NHLE 1009926), located 1.52km to the north-east of the lock.

Listed Buildings

- 3.4 Listed Buildings are afforded protection under the Planning (Listed Buildings and Conservation Areas) Act 1990. Listing is a national designation, but Listed

Buildings are divided into three grades, I, II* and II, which relate to their architectural and historical value. Section 66 of the 1990 Act states that planning authorities must have special regard for the desirability of preserving (*inter alia*) the setting of any Listed Building that may be affected by the grant of planning permission.

- 3.5 Bulholme Lock is not a Listed Building, and there are no Listed Buildings within 500m of the lock. The nearest is the Grade II listed early 19th century Castleford Bridge (NHLE 1290033), which carries the A656 Barnsdale Road over the River Aire, located some 860m to the south-west of the lock.

Other Designated Assets

- 3.6 There are no World Heritage Sites, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields, or Conservation Areas within 1km of Bulholme Lock. The nearest of any of these designated assets is the Grade II* registered historic park and garden at Ledston Hall and Park, some 2.20km to the north. Castleford does not contain a Conservation Area.

Non-designated Assets

- 3.7 There is no formal definition of what constitutes a non-designated asset, but they generally comprise archaeological sites and monuments (both above and below ground), locally listed buildings, find spots, and sites of known structures or other features of interest. In many cases, non-designated assets are usually taken to be sites or areas recorded on the local County Historic Environment Record (HER), in this case held by the West Yorkshire Archaeological Advisory Service (WYAAS), and/or sites included in a local authorities' 'local list' of historic buildings and structures.
- 3.8 In accordance with NPPF (MHCLG 2019, para 189), the WYAAS HER was consulted as part of the preparation of this heritage assessment. Bulholme Lock is recorded as a non-designated asset, forming part of the Castleford Cut (HER PRN4947). The HER notes that this section of the canal was built as part of the improvements to the Aire and Calder Navigation either in the 1780s or the 1820s, and was designed to cut off the very sharp bend in the river at Castleford Ings. The Denholme Lock and the two flash locks adjacent to the Island Cottages have been subject to 20th century alteration, but the lock by Castleford Lock Houses may retain original features; the dry dock at SE 428 264 is also of potential archaeological interest. The 17th century cut was improved in the early 19th century and is annotated 'New Cut' on the 1st edition 6" series Ordnance Survey map with Bulholme Lock at the north eastern end and Castleford Lock at the south western end with part of the older cut and flood gates becoming a dry dock. The lock is recorded as a UDP Grade 3/4 site (Grade 3 being sites of unknown significance or of local archaeological value; Grade 4 sites being destroyed archaeological sites or isolated find spots).
- 3.9 The HER also records other three non-designated assets within 500m of the lock, as follows:
- HER PRN15416: approximately 480m to the north-east of the lock, cropmarks interpreted as representing an Iron Age/Roman rectangular enclosure and associated field boundaries were identified from aerial photographs taken in June 1953.

- HER PRN13835: approximately 380m south-west of the lock, a desk-based assessment and walkover survey was undertaken in 2006 over the former site of the Hickson and Welch chemical works by Castlering Archaeology (Castlering Archaeology 2006); this report covered the area both to the north and south of the River Aire. The report showed that, with the exception of the Aire and Calder Bottle Works in the mid 19th century (see below), the area south of the Castleford Cut, to either side of the River Aire, remained largely undeveloped, being formed by low lying farmland subject to flooding. By the late 19th century, a sewage works with a pumping station had been established on the former farmland to the south of the Aire, together with terraced housing laid out to either side of Duke Street. By the early 20th century, a tar works was operating on the south bank of the Aire to the east of the Bottle Works, with the Castleford and Whitwood Gas Works on the east bank of the river bend south of the Bottle Works. A chemical works, on the site of the earlier tar works, was established in 1915, and shared a railway branch line (the Castleford East Branch) with the Bottle Works. The terraced housing around Duke Street was demolished in the c.1950s to make way for an expansion of the chemical works.
- HER PRN6816: the bottle works was established in 1836 on a piece of land formed by a bend in the River Aire, and by 1852 was known as the Aire and Calder Bottle Works. The works had substantially expanded by the late 19th century, and in their final form had four furnaces and three pot-shops. Transport infrastructure was provided by a wharf on the Aire and a railway branch line (the Castleford East Branch). The works are marked as disused in 1933, but apparently working again by 1945. The site was eventually incorporated onto the adjacent chemical works, and a site visit in 2008 discovered that all pre-1980 above ground elements had been demolished.

3.10 For completeness, Historic England's 'Heritage Gateway' database was also consulted for data relevant to this heritage assessment. This national database contains details of all known designated assets recorded on the National Heritage List for England (NHLE), and those non-designated assets recorded as Historic England Research Records (HERR) and the National Monument Record Excavation Index (NMREI). No other recorded above or below-ground assets within 500m of the lock were noted, other than those already listed on the WYAAS HER.

3.11 The local planning authority (City of Wakefield Metropolitan District Council) have published a list of locally listed or significant buildings, outside Conservation Areas (WMDC 2011). While there are 30 locally listed buildings in Castleford, none of the structures are associated with the Aire and Calder Canal in the vicinity of the lock, and Bulholme Lock is not specifically mentioned.

4 PLANNING POLICY CONTEXT

4.1 The following chapter details the core planning documents that are relevant to the proposed works, in relation to Cultural Heritage issues.

National Planning Policy Framework (February 2019)

4.2 The National Planning Policy Framework (NPPF), originally published in March 2012 and revised in both 2018 and 2019 (MHCLG 2019), sets out the Government's planning policies for England and how these are to be achieved, with the purpose of achieving sustainable development; there should be a

presumption in favour of sustainable development (paragraph 10). Three overarching objectives are put forward to achieve this, the environmental objective being that a development should “contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy” (paragraph 8).

- 4.3 Chapter 16 of the NPPF deals with conserving and enhancing the historic environment. Paragraphs 184 to 188 provide an introduction to the topic, paragraphs 189 to 192 deal with proposals affecting heritage assets, and paragraphs 193 to 202 cover the potential impacts to heritage assets and their settings. The relevant paragraphs are set out in Appendix 1, while the following text provides a summary of the main points.
- 4.4 When considering the conservation and enhancement of the historic environment, the NPPF notes that the conservation of heritage assets in a manner appropriate to their significance should underpin decision-making. Heritage assets are “an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations” (paragraph 184). Significance is defined as “the value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset’s physical presence, but also from its setting” (Annex 2: Glossary). Setting is defined as “the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral” (Annex 2: Glossary).
- 4.5 The NPPF policies relating to conserving and enhancing the historic environment also state that, when determining applications, local planning authorities should require an applicant to describe the significance of any heritage asset affected, including any contribution made by its setting. This should be proportionate to the asset’s importance and, where a development site may include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, undertake a field evaluation (paragraph 189).
- 4.6 The NPPF states that local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal, including its setting (paragraph 190). The impact of development on a heritage asset should be taken into account when determining applications, and any conflict between the heritage asset’s conservation and any aspect of the proposal should be avoided or minimised (paragraph 190). A distinction is often made between designated and non-designated heritage assets; designated heritage assets are defined as being World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields and Conservation Areas (Annex 2: Glossary), whereas non-designated assets are usually considered to be those included in a local authorities ‘local list’ or the local Historic Environment Record. However, the NPPF does say that non-designated assets of archaeological interest, which are demonstrably of equivalent significance to Scheduled Monuments, should also be considered as designated assets (paragraph 194 footnote 63).

- 4.7 Paragraph 192 guides local planning authorities to take account of the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation, the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality, and the desirability of new development making a positive contribution to local character and distinctiveness. When considering the impact of a proposed development on the significance of a designated heritage asset, the NPPF notes that great weight should be given to the asset's conservation; this is irrespective of whether the potential harm is classed as being substantial, total loss or less than substantial harm to its significance (paragraph 193). Significance can be harmed or lost through alteration or destruction of the heritage asset or a development within its setting. Substantial harm to or loss of Grade II Listed Buildings or Grade II registered parks or gardens should, for example, be exceptional. Substantial harm to or loss of heritage assets of the highest significance, including Scheduled Monuments and Grade I and II* Listed Buildings, should be wholly exceptional (paragraph 194).
- 4.8 Where a proposed development would lead to substantial harm or total loss of significance to a designated heritage asset, the NPPF states that local planning authorities should refuse consent unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss (paragraph 195). If a development leads to less than substantial harm to the significance of a designated asset, this harm should be weighed against the public benefits of the proposal (paragraph 196). The NPPF goes on to state that the effect of an application on the significance of a non-designated heritage asset should also be taken into account when determining an application, and a balanced judgement is required having regard to the scale of any harm or loss and the significance of the heritage asset (paragraph 197).
- 4.9 The NPPF further states that local planning authorities should make information about the significance of the environment gathered as part of the development publicly accessible. They should also require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and the archive generated) publicly accessible (paragraph 199).
- 4.10 Finally, local planning authorities should look for opportunities for new development within Conservation Areas, and within the setting of heritage assets, to enhance or better reveal their significance (paragraph 200). Loss of a building (or other element) which makes a positive contribution to the significance of a Conservation Area should be treated either as substantial harm or less than substantial harm (see above), taking into account the relative significance of the affected element and its contribution to the significance of the Conservation Area as a whole (paragraph 201).
- 4.11 As noted above, Bulholme Lock is not a Listed Building of Special Architectural or Historic Interest, is not a Scheduled Monument, is not included on Wakefield MDC's local list of Buildings of Local Interest, or otherwise subject to any other statutory protection. It is however, a non-designated heritage asset, and so some of the NPPF paragraphs listed above will be relevant.

Wakefield Council's Local Development Framework: Core Strategy (adopted April 2009)

- 4.12 In terms of Council's Core Strategy, *Policy CS10* relates to Design, Safety and Environmental Quality (WMBC 2009a, 80-81) (see Appendix 1). Only that section which deals with environmental quality is relevant here, and this states that the district's built environment, landscape features and wildlife habitats will be protected and enhanced. Historic buildings are considered to be one of the elements which contribute to the local distinctiveness and character of the district, and new development will protect and enhance the district's historic assets particularly Scheduled Ancient Monuments, Conservation Areas, historic buildings, archaeological remains and historic landscapes.

Wakefield Council's Local Development Framework: Development Policies (adopted April 2009)

- 4.13 There are a number of policies in the Local Development Framework which deal with the historic environment. The relevant policies to this development proposal are listed in Appendix 1, with the salient points being summarised below.
- 4.14 *Policy D17* deals with developments affecting archaeological sites, and stipulates that a development which affects the site or setting of a Class I or Class II archaeological site will only be permitted if there are exceptional circumstances of overriding public interest and suitable protective and mitigation measures can be implemented to safeguard the archaeological value of the site. For Class III sites, permission will only be permitted if the archaeological remains can be preserved in situ or, if this is not possible, provided appropriate provision is made for excavation and recording before and/or during development and for appropriate post-excavation analysis, publication, and archive deposition of any findings. For developments which are likely to affect sites of known or potential archaeological interest, an appropriate pre-determination archaeological assessment and evaluation will be required to be undertaken. If development affecting an archaeological site is acceptable, appropriate archaeological recording may be secured by planning conditions and/or legal agreements (WMBC 2009b, 40-41).
- 4.15 In the policy justification, paragraph 6.91 notes that Scheduled Ancient Monuments are defined as Class I sites, Class II sites are Areas of Special Archaeological Value (i.e. sites which are registered in the WYAAS HER where evidence exists to indicate the presence or strong probability of remains of particular archaeological importance that are potentially worthy of preservation in-situ), and Class III sites are Areas of Archaeological Value (i.e. sites which are registered in the WYAAS HER where evidence exists to indicate the presence or probability of remains of archaeological or historic importance not defined above). The latter category includes unlisted buildings of archaeological or historic interest.
- 4.16 *Policy D18* covers development which affects historic locations, and states that development within or likely to affect Historic Parks and Gardens, Historic Landscapes, Conservation Areas and Sites of Historic Battles would only be permitted if there was no adverse impact on elements such as open spaces, views, landscape, the character of any buildings or structures and the preservation of features of architectural, archaeological and historic interest (WMBC 2009b, 41-42).
- 4.17 There is no specific plan policy relating to Listed Buildings, as the development framework notes that procedures for listing and the control of development

affecting Listed Buildings are established by the Listed Buildings and Conservation Areas Act 1990 (WMBC 2009b, 42). However, paragraph 6.104 states that the Council is required to have special regard to the preservation of Listed Buildings and their settings, and that development including extensions, alterations, and changes of use of a Listed Building will only be permitted if there is no adverse impact on its special features of architectural or historic interest. Paragraph 6.105 also states that the preservation of buildings and structures of special architectural or historic interest and their settings will be secured by a presumption in favour of the preservation of Listed Buildings and structures, and by ensuring that proposed alterations, extensions or changes of use to Listed Buildings, or development within their vicinity, will not have an adverse impact on the special architectural or historic interest of such buildings and their settings.

- 4.18 Finally, *Policy D19* deals with development affecting buildings of local interest, which are defined as having local significance in terms of their historical or architectural interest. These include buildings of local community interest, individual buildings or groups of buildings that contribute to the character or identity of an area, and buildings which are examples of important work by local architects or builders. Development would only be permitted if there is no adverse impact on any features of special architectural or historic interest and the character, appearance and setting of the building (WMBC 2009b, 43).
- 4.19 As noted above, Bulholme Lock is listed as a Class 3/4 non-designed heritage asset on the WYAAS HER, and so only some of the above policies will be relevant.

5 BULHOLME LOCK: ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

- 5.1 To properly understand the context and significance of Bulholme Lock, it is necessary to consider the wider development of the Aire and Calder Navigation, and in particular that section of the navigation, the Castleford Cut, on which the lock is located. Smith (1987) provides a good general account of the navigation in general, but by far the most detailed account of the navigation in relation to Castleford is given in an online article in *The Lagentian* for April 2014 (Anon 2014). The following text draws heavily on this article, with other information taken from sources listed in the bibliography (Chapter 9) below.

The Aire and Calder Navigation and the Castleford Cut

- 5.2 Castleford's location at the confluence of the Aire and Calder rivers meant that it became a place of some importance in the improvements to regional water transport that took place from the end of the 17th century onwards. The impetus for these improvements was the growth of the West Riding textile industry and the increase in trade through the port of Hull during the 17th century. In 1621, and again in 1625, commercial interests in the West Riding had submitted parliamentary bills seeking permission to build short 'cuts' which could bypass various weirs and sinuous loops along the courses of the rivers Aire and Calder, including that on the loop of the Aire at Castleford. These early attempts at improvement were opposed by York Corporation, who feared a loss of trade along the River Ouse. However, proposals made by Leeds and Wakefield based promoters in 1698 to create the Aire and Calder Navigation were successful, emphasising the poor state of the region's roads and the inconvenience of road carriage, and the resulting Act was given assent in May 1699 (Priestley 1831, 8-9; Hadfield 1972, 17-19).

- 5.3 A sketch of the various works and cuts in the Castleford area has been provided elsewhere (see figure 3). The earliest Castleford 'cut' was relatively short, measuring c.470m long and it effectively cut off the loop of the River Aire which contained the town weir. The western end of the cut left the River Aire opposite its confluence with the Calder, through a lock known as Castleford Flood Lock, and then it ran east to rejoin the Aire at Castleford Dam Lock. The cut was in operation by 1699, and Castleford became a key point for the collection of tolls from boats carrying materials such as wool, cloth, grain and coal. Although this earliest cut has since been largely infilled, the approximate line is followed by Navigation Road to the south of the present cut. The first section at the Castleford Flood Lock survives as a short stretch of water crossed by a wooden footbridge which forms a cul-de-sac off the current canal and is separated from the river by a timber barrier; the recesses for the lock gates are still visible (see figure 4 top). A further short section of the original 1699 channel remains at the Castleford Dam Lock, as a dry dock in a boatyard (see figure 4 bottom).
- 5.4 As traffic increased during the 18th century, there was a need for additional improvements to the navigation, and so in 1774, a further Parliamentary Act was obtained. The Castleford Dam Lock at the east end of the cut was awkwardly positioned, and the river channel here was also prone to silting, and so in 1775 a new channel was excavated, leaving the north side of the existing cut at a right angle, then swinging to the east and finally to the south, rejoining the river some 65m downstream of Castleford Dam Lock. These new works opened in 1775 and were known as the Castleford North Cut and Middle Lock, but again, they have been largely lost to later development. In 1791, a 'gauging station' was established at Castleford where boats could be weighed; as tolls were charged by weight, the station was used to combat fraud. In 1819, a weighting dock was excavated on the south side of the new cut, covered by an open-fronted building which was still standing in 2014 (Priestley 1831, 11-12; Hadfield 1972, 33-34).
- 5.5 Almost inevitably, the late 18th century works proved to be inadequate in the face of continued traffic growth, and in the early 19th century the Aire and Calder Navigation was the subject of three new surveys. The first was carried out by the Scottish civil engineer John Rennie who, with regard to Castleford, reported in August 1819 that "*the cut has in general good water but its entrance to the River Aire is badly laid out and should be altered whenever a new flood lock is required*", and adding that "*the old lock is in very bad repair*". The second survey, undertaken by the Aire and Calder Navigation's engineer George Leather in 1824, was highly critical of the Castleford Cut, noting that the original 1699 section was less than five feet deep in places, and that the 1775 extension was not much better. The right-angled entrance from the 1699 line to the 1775 extension was difficult to negotiate, frequently resulting in damage to the boats. Finally, Castleford Middle Lock at the east end of the cut was also poorly placed in respect of access from the river, which was shallow and prone to silting as far downstream as the point where it was joined by a beck named Bullholme (or Bullam) Clough. Leather therefore recommended that the 1699 line was bypassed altogether by means of a new cut, which basically extended the 1775 extension to the east and west, with the addition of new locks. He estimated that the cost of the eastward extension to below Bullam Clough would be £410 13s 4d, whilst the cost of building two locks, one new road bridge and a culvert would be £10,676.
- 5.6 In July 1827, a third survey of the navigation was completed by the well-known canal builder and engineer Thomas Telford. With regard to Castleford, he made the same recommendations as George Leather, proposing the excavation of a new cut to Bulholme, which he estimated would cost in the region of £12,370. Telford's

proposals were adopted by the Navigation Company, and a Parliamentary Act was passed to authorise the works in June 1828 (Hadfield 1972, 148). The contract for the works was advertised in newspapers in January 1829, and was let in February of the same year to the contractors Nowells, Hamer and Pratt. The new Castleford Cut had been completed and was open by August 1831 (Priestley 1831, 17-18). The new cut incorporated part of the line of the 1775 extension, and retained the old Castleford Middle Lock connecting it to the Aire, with new locks built at either end also giving access from the Aire; these were Castleford Junction Lock at the west end, and Bullam (later Bulholme) Lock at the east end (see figure 3). The new cut had a total length of c.1.10km, over twice the length of the original 1699 line, and it was considerably wider and deeper.

Bulholme Lock

- 5.7 As already described above, Bullam (now Bulholme) Lock was built between 1829 and 1831 as part of the construction of the new Castleford Cut. It took its name from Bullam Clough, the beck which entered the River Aire a short distance to the east. The works at Castleford, and those undertaken at the same time on the Aire and Calder Navigation towards Leeds, to straighten out the course of the River Calder, attracted much contemporary admiration. For example, in 1836, Sir George Head was compelled to praise the new works for their aesthetic, as well as commercial, values as follows:

“The principal improvements, before alluded to, on this line of water communication, which have been recently completed by the Aire and Calder Company, are between Castleford and Leeds. Although the navigation is impeded by several locks, the workmanship exhibited in these, and in the canal throughout, render this approach to Leeds worthy of a large metropolis. In some places the channel of the river Aire has been improved and rendered serviceable, in others it has been altogether abandoned, and new cuts substituted; the depth of the water being seven or eight feet throughout. The long vistas of water, wide and straight, bounded by graceful elliptical bridges in the distance, the lock houses, ornamental buildings, the solid masonry at the sides, whether by slanting planes of paving stone, or low perpendicular walls, altogether form a perfect specimen of modern art and excellent taste” (Head 1836, 230-231).

- 5.8 The lock is shown on the 1840 Ledstone tithe map, forming part of plot 108 ('Canal & Banks') owned by the Aire and Calder Navigation. The lock keeper's house on the north side formed plot 109 ('Lockhouse & Garden'), although the depiction of the building is obscured by the plot number (<https://www.thegenealogist.co.uk>) (see figure 5).
- 5.9 The Ordnance Survey 1852 6" to 1 mile map (Yorkshire sheet 234, surveyed 1846-48) names the lock as 'Bullam Lock' (see figure 6). A single chamber is shown, with two buildings, the largest of which was the lock keeper's house, on the north side. To the west, the cut is named 'New Cut', and there was a 'Towing Path' on the north side as well as two 'Rope Walks', one on the north side along the western half and the other on the south side in the eastern half. The 'Bullam Clough' is also named just to the east of the lock.
- 5.10 Significant changes had taken place by the time that the 1893 Ordnance Survey 25" to 1 mile map (Yorkshire sheet 234/7, surveyed 1888-90) was published (see figure 7 top). The lock, now named 'Bulholme Lock', had been extended to the west so that it comprised two chambers separated by three sets of gates. A British Waterways Architectural Heritage Survey (BWAHS und.) states that the lock was

enlarged in 1862 and 1884, but unfortunately no references are provided; Fowler (2009) suggests a date of c.1860 for the enlargement. By 1893, a swing bridge had been constructed over the earlier, eastern chamber, smaller additional structures had been erected to the north and south of the lock since 1852, and mooring posts are also indicated. A 'Ferry' across the river just to the east of the lock is also depicted, together with the viaduct of the North Eastern Railway's Leeds, Castleford and Pontefract line. In 1893, the cut was named as 'Aire & Calder Navigation (Castleford Cut)'.

- 5.11 There were further significant modifications between 1893 and 1908; again, a British Waterways Architectural Heritage Survey (BWAHS) (und.) states that these were done in 1900 but provides no reference. By 1908, the lock had been extended to the west again, with the addition of a third, wider chamber which was of approximately the same length as the two earlier chambers combined (see figure 7 bottom). Additional mooring posts had been erected along the north and south sides of the extended complex, with small rectangular buildings also added to the north and south. The site is similarly depicted in 1933, although by this date the rectangular buildings to the north and south, shown in 1908, had both been demolished.
- 5.12 An oblique black and white aerial photograph of the chemical works, taken in September 1946 (EAW002613), shows the whole of the lock in the upper left hand corner (see figure 8). When the photograph was taken, the lock was at low water, with four vessels waiting to enter the bottom chamber from the river. The original lock keeper's house to the north of the lock appears as a two storey, stone structure with a hipped, slated roof, gable end stacks and a central ridge stack. The south elevation was of symmetrical appearance, with a central ground floor doorway with porch flanked by windows, and three further windows to the first floor. There was a second building, slightly smaller but of similar appearance, to the immediate west, set at a right angle to the lock keeper's house. To the south-east of the house, the swing bridge depicted on the 1893 map is clearly visible, and there is a small shed with a tall chimney to the south of the lock, which is also marked on the Ordnance Survey maps of 1908 and 1933. The whole area of the lock had a much more open aspect than now, with very little tree growth and low fencing to both sides.
- 5.13 Another black and white photograph, this one taken during the 1960s during deepening of the lock, shows the existing bottom chamber, looking east, de-watered. The accompanying caption states that the lock bottom was being cut away to accommodate larger vessels (<http://www.twixtaireandcalder.org.uk/site/image-detail?imageid=1050>) (see figure 9). The lock is believed to have been mechanised in 1961, with the two existing residential properties to the north built in 1968, seemingly just to the east of the original lock keeper's house which was presumably demolished at the same time. It is suggested (BWAHS und.) that there were further modifications to the lock during the 1970s, but the nature of these works are unknown. The lock lobby was built in 1991, to a standard design seen elsewhere on the navigation, and the lock was converted to the current 'user operation' in 1995.

6 BULHOLME LOCK: SITE DESCRIPTION

Introduction

- 6.1 An outline description of the lock and its setting is given below. Unless otherwise stated, the technical terms used in the Principal Inspection of the lock made in

August 2009 (Fowler 2009), the more recent November 2019 inspection during de-watering (Anon 2019), and the Principal Inspection of December 2019 (Bradley 2019) have been adhered to; all three of these are illustrated by numerous photographs. The lock was visited by EDAS on the 3rd and 9th June 2021; at the time of these visits, the water level was high in both chambers, and so some features are described only from the 2019 de-watering accounts, rather than through direct observation.

- 6.2 As part of the EDAS site inspection, a general digital photographic record of the lock and its constituent parts, together with close-up photography of significant details, was undertaken. This was achieved using an SLR digital camera with 12 mega-pixel resolution. The photographs have been clearly numbered and labelled with the subject, orientation, date taken and photographer's name, and a photographic register detailing the location and direction of each photograph has been completed (see Appendix 3). Digital photographs are referenced in the descriptive text below using italics and square brackets, the number before the stroke representing the date on which the photograph was taken and the number after indicating the image number, e.g. [1/032].
- 6.3 Passing through the cut from west to east, boats and vessels approaching the lock from the west come to the *wing walls*, flanking the *top gates* which give access to the *top chamber* of the lock (see figure 2). After entering the top chamber, boats pass through the *middle gates* to enter the *bottom chamber*, which has the *lock lobby* on its north side. The *bottom gates* lead from the bottom chamber into the River Aire, again with approach walls to the river side. The floor of each chamber is formed by the *invert*. Vertical *stop plank grooves* provide recesses for temporary barriers to hold back the water in the event of repairs. During operation, the filling and emptying of the lock chambers is achieved entirely through gravity, using the culvert outlets in the chamber walls and the flanking underground culverts.

Description of Bulholme Lock

- 6.4 The Bulholme Lock is described below, starting at the top (upstream or western) end, and progressing towards the eastern or bottom end. Although the lock, and the canal, are set on a shallow north-east/south-west alignment, for the purposes of the following description it is considered to be aligned east-west.

West Approach and Top Gates

- 6.5 On the approach to the top gates, the south side of the canal is formed by a steel sheet pile wall, installed in 1993. The upstream wing walls are built of large blocks of sandstone with stone coping, and they curve or angle around from the canal walls so as to line up with the lock chamber [1/716, 1/718] (see plate 1). The north wing wall is of sandstone ashlar, with a battered profile, and it retains its original, slightly rounded coping; there is some damage caused by boats hitting or scraping the wall to the part nearest the top gates [1/720, 1/760] (see plate 2). There are two cast-iron mooring posts, painted white, along the top of the north wing wall, set into square stone blocks [1/721]. The south wing wall is in a much poorer condition, with only a short section having the same quality of stone as the north wall surviving immediately adjacent to the steel sheet piles. The remainder is weathered and eroded, with coping that may be a later replacement of the original [1/719, 1/723] (see plate 3). There are also two cast-iron white-painted mooring posts as to the north wing wall. The wing walls are tied into the top end of the recesses for the top gates, and contain vertical stop plank grooves; that to the

south wall is in poor condition. The gate recesses are built of brick, with masonry copings over.

- 6.6 The top gates are of timber, with integral wooden footbridges and steel handrails; there are no balance beams [1/722, 1/724, 1/726, 1/761] (see plate 4). The gates are suggested to date from 1983 (Fowler 2009). There is a sluice donkey to the south side of the gates, and also manual iron paddle gearing to the north side; the latter has been disused since electrification, and is now connected to an electric motor set within a cage. During de-watering in 2019, it was noted that the cill to the top gates was of concrete (Bradley 2019).

Top Chamber

- 6.7 The existing top chamber was built between 1893 and 1908, apparently in 1900 (BWAHS und.). It is wider than the bottom chamber, as shown in 1908, but it narrows towards the middle gates [1/725] (see plate 5). The south wall nearly aligns with the south wall of the bottom chamber, a slightly curving wall between the two representing the former south upstream wing wall of the lock as shown in 1893 (see figure 7 top). The more prominent curving wall to the north wall represents the former north upstream wing wall of the lock, again as shown in 1893. At the west end of the north wall, a curving section of worn and eroded sandstone ashlar wall narrows the chamber to the width of the top gates, again as shown in 1893; the uppermost course is set back slightly from the face above, and may be a later replacement [1/759]. During the 2019 de-watering, it was noted that the invert was of concrete and was set c.0.70m below the cill of the middle gates (Bradley 2019).
- 6.8 The walls of the top chamber are built of brick, with stone coping to the south wall [1/727] (see plate 6) and weathered, damaged concrete coping to the north wall [1/730]. The bricks appear to be blue engineering bricks (average dimensions 230mm by 110mm by 70mm), laid in English bond (one stretcher course to each header course) and set with a lime mortar. During the 2019 de-watering, a brick seen in the bottom of the lock, bearing the impressed mark 'P & P' was thought to have probably come from Pope and Pearson's Altofts brickworks between Wakefield and Castleford (<http://www.ipernity.com/doc/302581/21138615/in/album/400761>), but it is not known if the rest of the chamber bricks were from the same source - the bricks are apparently blue due to their being immersed in the water, and were originally red. The wall coping on both sides of the chamber is tapered downwards towards the middle gates, so as to match the coping height of the bottom chamber. There are seven cast-iron white-painted mooring posts to both the north and south of the chamber, with two metal lock ladders (set in ladder recesses) with white-painted metal climbing hoops to each side.
- 6.9 During the 2019 de-watering, it was noted that there is a slight fillet to the brickwork at the interface between the invert and the walls (see figure 10). The top chamber has three culvert outlets to the south wall, but only one corresponding culvert outlet to the north wall, opposite the westernmost example in the south wall (Bradley 2019); these connect with parallel culverts or tunnels, allowing water to pass into and out of the lock as required. The culvert/tunnel behind the south wall is oval in section and suitable for a person to enter, with the back of the culvert set c.4m from the face of the chamber wall. Above the culverts, approximately two thirds of the way up both chamber walls, there are regularly spaced lines of recesses forming prop sockets (Bradley 2019).

Approach and Middle Gates

- 6.10 As already noted, the western approach to the middle gates is flanked by what were the former upstream wing walls of the lock prior to the top chamber being constructed [1/731] (see plate 7); these were present by 1893, and may have been built as early as 1862 (BWAHS und.). There is some damage to the walls of the top chamber at this point (see figure 10 top). The north wall has concrete coping and the vertical stop plank groove is just visible above the water line [1/758] (see plate 8). The south wall retains damaged stone coping, and the stop plank groove was not clearly visible at the time of the site visit [1/732]. The gate recesses are built of masonry, with masonry copings over.
- 6.11 The middle gates are of timber, with integral wooden footbridges and steel handrails; there are no balance beams. They date from 1983 (Fowler 2009) [1/735, 1/736, 1/755; 2/769] (see plate 9). There is a sluice donkey to the south side of the gates [2/768] (see plate 10). The form of the cill to the middle gates is not known.

Bottom Chamber

- 6.12 The existing bottom chamber comprises the original lock chamber built in c.1829-31, and the former top chamber added between 1852 and 1893 (apparently in 1862 and/or 1884 (BWAHS und.), or c.1860 (Fowler 2009)) [1/733, 1/744, 1/757] (see plate 11). The former gate position between these two chambers was exposed during the de-watering in November 2019, set c.14.50m west of the existing bottom gates. The former gate position was marked by disused gate recesses, which had been filled with concrete supported on large timber lintels above the low water level. The former timber cill of the gates was also visible during the de-watering (Bradley 2019) (see figure 11 top). The blocked gate recess to the north wall is clearly visible on the September 1946 aerial photograph (EAW002613) (see figure 8).
- 6.13 Between the disused gate recesses in the bottom chamber, and the middle gates (i.e. the former top chamber), there is a timber invert, with a small area of concrete repair. There are no fillets at the interface between the invert and the walls. The walls are built of sandstone ashlar, apparently to a vertical profile. The coping of both walls comprises pre-cast concrete blocks which resemble dressed stone; in addition, there is a brick repair beneath both sets of coping. There are several culvert outlets to the south wall connecting the chamber to the parallel culvert or tunnel to the south, allowing water to pass into and out of the lock as required (see figure 11 bottom). The modern lock lobby building lies just to the east of the middle gates, on the north side of the chamber [1/728].
- 6.14 The section of the existing bottom chamber between the bottom gates and the disused gate recesses (i.e. the original c.1829-31 lock) has a curved stone invert. This invert is flat at the gate forebays and cills, but with curved fillets between. The curve to the north side is steeper than on the south side, and has been worn by boats (see figure 12 top). This is because at some point, perhaps in 1862 or 1884, the south wall of the chamber was rebuilt c.0.60m to the south of its former position. The shallower curve to the south side dates from when the south chamber wall was rebuilt, and this has also been worn and scarred by boats. The difference in curve is clearly visible on the aforementioned black and white 1960s photograph (see figure 9). At a later date, after the south chamber wall had been built, both curves were roughly squared using chisels so that the lock could accommodate square-bottomed craft (Bradley 2019).

- 6.15 The north and south walls of the bottom chamber are of sandstone ashlar, both with a slight curved batter. The original stone copings have been replaced with pre-cast concrete copings, and to the north wall this has had the effect of removing the slightly lowered section which would have allowed for the movement of the swing bridge here [1/754] (see plate 12). There is however a small patch of stone and concrete bearing the impression of former fixings to the immediate north of the north sluice donkey that might form a remnant of the swing bridge's mechanism [2/772]. There are four cast-iron mooring posts to both the north and south of the chamber, with a single metal lock ladder (set in a ladder recess) with white-painted metal climbing hoops to each side. The recesses for the bottom gates are built of masonry, with masonry copings over.

Bottom Gates

- 6.16 The bottom gates are of timber, with integral wooden footbridges and steel handrails; there are no balance beams. They date from 1996 (Fowler 2009) and were leaking at the time of the site visits [1/734, 1/739, 1/748; 2/773] (see plate 13). There are sluice donkeys to the north and south sides of the gates. The form of the cill to the bottom gates is not known.

East Approach to Bottom Gates

- 6.17 To the east of the bottom gates, during de-watering in 2019, the original vertical stop plank groove to the north wall was exposed (see figure 12 bottom). Beneath the stop plank groove, a culvert outlet had been inserted into the wall here. There is a similar culvert outlet opposite to the south wall, but no corresponding stop plank groove above. This is because, as noted above, the south wall here was moved to the south by c.0.60m and rebuilt. Photographs taken at this time (Anon 2019) show Roman numeral watermarks cut into the north wall adjacent to the former stop plank groove; 'XIX', 'XVIII', 'XVII' and 'XVI' are clearly visible, with several further, much fainter numerals below. These remained visible at the time of the site visit [1/746, 1/747; 2/775] (see plates 14 and 15).

- 6.18 Beyond the bottom gates, the downstream approach walls to the lock are of large sandstone ashlar, with large masonry copings; the north wall retains what appear to be cast-iron plates bolted to the wall, each plate containing an integral socket. They resemble prop sockets, but their exact function is not certain. To the north wall, there is a groove set beyond the former stop plank groove described above [2/774] (see figure 12 bottom and plate 14), with a corresponding groove opposite in the south wall [1/740]. Although these have latterly had vertical timbers set into them to act as rubbing strips, it is assumed that they were originally stop plank grooves, moved to this position after the south wall had been rebuilt. The south approach wall has a bullnosed end which runs into the river bank on the north side of the Aire [1/743, 1/753] (see plate 16); timbers are set vertically on the masonry to act as rubbing strips, although despite these measures much of the masonry is damaged. The bullnosed end was definitely present by 1893 and may be shown in 1852; if so, it is likely to be part of the original 1829-31 works. The surface of the bullnosed end is partly formed by stone setts [1/745], and there is a single white-painted cast-iron mooring post. The north approach wall runs straight for a short distance from the bottom gates and then angles to the north-east for a short distance, terminating in a bullnosed end [1/749, 1/752] (see plate 17). The angled section was probably in place by 1893, but may not have been present by 1852.

- 6.19 In 1893 and 1908, at the end of the angled section, the approach wall apparently angled again to continue as far as the point where the Bulholme Clough enters the

River Aire (see figure 7). However, there were no visible traces of any structures beyond the bullnosed end at the time of the site visit, there being only a steeply scarping river bank; this also appears to have been the case in 1946 (EAW002613) (see figure 8). There is a timber landing adjacent to the north wall, accessed by timber steps from the bullnosed end, suitable for leisure craft only [1/750, 1/751] (see plate 18). There are three white-painted cast-iron mooring posts along the top of the north wall, of a different, more bulbous, form to those to the rest of the lock.

Summary of Development of Bulholme Lock

- 6.20 Based on the information given above, a summary history and development of the lock is proposed.
- 6.21 The earliest part of the lock, the present bottom chamber, was built in 1829-31 and forms an original part of this alignment of the Castleford Cut. It was constructed in stone, with a curved stone invert, gates and stop plank grooves; it is depicted on the 1840 tithe map and the 1852 1st edition Ordnance Survey map (see figures 5 and 6). Roman numeral watermarks were cut into the north wall below (east of) the bottom gates. There was a lock keeper's house to the north. The downstream approach walls are also in stone, and the bullnosed south wall is likely to be part of the original 1829-31 construction.
- 6.22 In 1862, the original lock was extended to the west with the addition of a top chamber, as depicted on the 1893 Ordnance Survey map (see figure 7 top). This chamber was also built of stone, but has a timber invert. Possibly when this first top chamber was added, or perhaps in 1884, the south wall of the bottom chamber was re-built 0.60m further to the south; this also necessitated re-building the stone invert to the south wall of the original 1829-31 lock. The new south wall incorporated a culvert outlet below the bottom gates when built, but a new outlet had to be cut into the earlier north wall beneath the stop plank groove. New stop plank grooves were created a short distance to the east.
- 6.23 In 1900, the lock was again extended to the west to create the existing top chamber; it is assumed that the earlier top chamber was combined with the bottom chamber at this time (see figure 7 bottom). The existing top chamber is built from brick, with a concrete invert. The upstream wing walls of the top chamber are built of stone, with a steel sheet pile wall just beyond the wing wall to the south side.
- 6.24 All of the existing lock gates date to the 1980s or later. The lock was mechanised in 1961, with the existing houses to the north built in 1968, replacing the earlier lock keeper's house and adjacent structure, of which nothing now remains. There were further modifications to the lock during the 1960s and 1970s, with the lock lobby built towards the west end of the north side of the middle chamber in 1991.

The Setting of Bulholme Lock

- 6.25 From the west, the lock is approached on foot along the former towpath on the north side of the cut [1/715, 1/717, 1/762] (see plate 19). There is also vehicular access along the same route, which now has a tarmac surface, and there are numerous boats moored to both the north and south sides of the cut, more towards the A656 Barnsdale Road end (see plate 24). The former towpath is flanked by a flood bund to the north which, at the time of the site visits, had a rich covering of wild flowers. Closer to Bulholme Lock itself, only two large structures from the former chemical works to the south of the cut remain in place, and around the lock

itself these are screened from view by flanking trees and bushes (see plates 4, 11 and 19). The setting of the lock is surprisingly enclosed, rural and quiet, given the presence of much urban development to the south around Castleford. This does not reflect the historic setting of the lock, which the 1946 aerial photograph (see figure 8) shows to have been much more open than it is now with views to the nearby industrial complexes. Just before the vehicle gate which allows access to the lock lobby and houses (see below), there is a footpath leading onto the Fairburn lngs nature reserve which is located to the immediate north.

- 6.26 The modern lock tower or lock lobby stands on the north side of the bottom chamber, and appears to be built to a standard design for the Aire and Calder Navigation. It is broadly octagonal in plan, of two storeys, with a pyramidal, slated roof [1/729, 1/737, 1/756; 2/770] (see plate 20). The structure is built of machine-made brown to blue bricks, laid in stretcher bond and set with a cement mortar. The ground floor contains the electrical controls and a stand-by generator, and is accessed via a doorway in the building's west side. The first floor is reached by an external concrete staircase which wraps around the lobby's north-west angle. The first floor houses the control desk, a toilet and mess facilities (Fowler 2009). There are doorway openings to the south-east and south-west angles of the first floor, fitted with sliding glazed doors. These open out onto small balconies, which provide clear views east and west along the lock. The building was not manned during the site visits, and it is assumed that a lock keeper only appears on site when it is necessary, for example during periods of particularly heavy traffic.
- 6.27 The adjacent residential properties to the east, located on the north side of the lock opposite the bottom gates, were built in 1968 - they are of a single storey, and are raised on concrete stilts to protect them in the event of any flooding [1/738] (see plate 21). Comparison with historic maps and modern aerial photography suggests that the original lock keeper's house and associated structures were located to the immediate west of the 1968 houses, but there are apparently no surviving above ground remains, although part of this area was overgrown at the time of the site visit. The area immediately to the west side of the properties is now partly formed by a roughly surfaced drive [2/771].
- 6.28 The view to the east from the eastern approach walls, along the River Aire, is dominated by the disused railway bridge of the former Leeds and Castleford Branch of the London and North Eastern Railway (LNER) [1/741, 1/742] (see plate 22). This bowstring span, cast-iron bridge was opened in 1878 and formed part of the Castleford viaduct over the River Aire. It has been disused since 1998 when the line closed for freight and is now in poor structural condition (<http://www.lostrailwayswestyorkshire.co.uk/Castleford%20Garforth.htm>). Modern pylons and overhead electricity lines are also visible over the railway bridge. The chimneys of Ferrybridge power station are just visible above the tree line to the south-east, but again, the majority of the area that can be seen comprises farmland.
- 6.29 The view to the west from the top chamber, along the line of the cut, is predominantly rural in character, with boats moored to either side of the cut [2/765]. In the far distance, the bridge carrying the A656 over the cut is visible, with a metal loading chute for boats to the south side; this does not appear on any of the maps consulted for this report, and so is assumed to be associated with the post-war chemical works here [2/766]. To the north [2/767] and south of the lock, the surrounding landscape is effectively screened by tree planting which has been established since 1946 (see plates 11 and 23).

7 ASSESSMENT OF DEVELOPMENT PROPOSALS

- 7.1 A report was prepared by the Canal and River Trust by Arcadis Design and Consultancy which proposed four different options for the widening of Bulholme Lock (Peters 2019). This widening will result in the creation of either two new lock chambers or a single lock chamber, 75m long and 7.50m wide, and with a depth of 3.10m from normal water level (Peters 2019, 3).
- 7.2 *Option 1* would keep the existing two chambers to the lock, but would require the removal of the whole of the north wall of the bottom chamber, the north approach wall east of the bottom chamber, and those parts of the north wall of the top chamber adjacent to the middle gates and top gates. A new north wall would be constructed c.1m to the north of the existing wall sections, to create a continuous north chamber wall in line with the existing north wall of the top chamber. This would mean the lock lobby and associated mechanical and electrical equipment would have to be-relocated. In addition, the fillet at the base of the bottom chamber's south wall would also need to be partly removed to accommodate the larger Euro II freight vessels. All three lock gates would need to be replaced with wider lock gates, and the gate recesses would need amending. (Peters 2019, 5-8).
- 7.3 *Option 2* would reduce the number of chambers in the lock from two to one. The works required would be as set out for Option One above, with the addition of the removal of the bottom gates altogether and the re-location of a new set of middle gates a minimum of 5.50m to the east of their existing position (Peters 2019, 9).
- 7.4 *Option 3* could keep two chambers or reduce the lock to a single chamber. It would require the removal of all of the south wall of the top and bottom chambers, and the south approach wall, with a new south wall being constructed; this would presumably be sited c.1m to the south of the existing south wall, although the exact distance is not given in the widening proposals. This would mean the relocation of the mechanical and electrical equipment adjacent to the south wall, the partial removal of the fillet at the base of the bottom chamber's south wall, the replacement of all three lock gates with wider lock gates and the amendment of the gate recesses (Peters 2019, 10-12).
- 7.5 *Option 4* was to cut back both the north and south walls of the bottom chamber each by 500mm. However, it was not thought that this could be undertaken without both walls being propped and rebuilt, and it was considered less intrusive to move one wall in its entirety. This option was therefore eliminated from any further discussion (Peters 2019, 13).
- 7.6 It was considered that Option 2 best fitted the requirements issued by the Canal and River Trust for Euro II freight vessels, that it provided the best alignment, and required the least geometrical changes due to the reduced number of lock gates (Peters 2019, 14).
- 7.7 At the time of writing this heritage report, the favoured options of the Canal and River Trust are Option 2 with the reduction to a single chamber, and Option 3 - these have now been renamed as Options 2 and 5 respectively), and these are assessed for impact below.

Heritage Assessment of the Significance of Bulholme Lock

- 7.8 Advice on the criteria to be used when assessing the significance (or value) of heritage assets is contained within several Historic England documents (2015;

2019), as well as in earlier English Heritage guidance (2008). This guidance states that heritage assets are considered to have a significance based on their evidential, historical, aesthetic or communal value. The NPPF also defines 'significance (for heritage policy)' as the value of a heritage asset to this and future generations because of its heritage interest - this interest may be archaeological, architectural, artistic or historic (MHCLG 2019, Annex 2: Glossary). Significance therefore derives not only from a heritage asset's physical presence, but also from its setting.

- 7.9 Taken together, the above documents identify the need to understand the importance of the heritage values, to understand the level of significance of an asset, and to provide an assessment of the development impact on significance; the latter two also being requirements of the NPPF. However, none of the documents provide a methodology for the ranking of significance of heritage assets, and so a scale and hierarchy derived from the Cultural Heritage and Environmental assessments of the Highways Agency's *Design Manual for Roads and Bridges* (Highways Agency 2019a & b) is often used (see Appendix 2). An understanding of the relative significance of affected heritage assets is important because of the issue of proportionality expressed in NPPF paragraphs 189, 190, and 193).
- 7.10 Following the criteria given in Appendix 2, the significance of heritage assets can range from Negligible to Very High (see Appendix 2). Bulholme Lock is not listed as being of Special Architectural or Historic Interest, is not a Scheduled Monument, is not included on Wakefield MDC's local list of Buildings of Local Interest, or otherwise subject to any other statutory protection.
- 7.11 A previous Lock Inspection report states that the lock contains "*no unusual architectural features*" (Fowler 2009). While this is technically correct, the lock does nevertheless display evidence for the development of the Castleford Cut in the period from when this alignment was first constructed between 1829-31 and the present day. The north walls of both chambers (and the invert) preserve structural evidence for three main phases of development, between 1829-31 and 1900, these changes reflecting the improvements needed to accommodate both the increasing volume of traffic on the Aire and Calder Navigation and the size of the vessels wanting to use the lock. The south walls of both chambers also preserve structural evidence for two main phases of development, either 1862 or 1884, and 1900. The materials used in these different phases (stone, timber, brick and concrete) reflect contemporary developments in canal engineering and construction. The overall form of the lock and adjacent equipment also reflects more modern developments such as electrification and mechanisation. Although it would take work beyond the scope of this assessment to establish, it is considered likely that many locks on the Aire and Calder Navigation will have undergone a similar pattern of adaptation, widening and modernisation as can be seen at Bulholme Lock, with very few retaining their original form unaltered.
- 7.12 Taken as a whole, the lock can be considered to have a *low to medium* value of significance.

Assessment of the Setting of Bulholme Lock

- 7.13 An important aspect to be considered when determining the significance of an identified asset is the contribution made by its setting. The NPPF defines the 'setting of a heritage asset' as being the surroundings in which a heritage asset is experienced - its extent is not fixed and it may change as the asset and its

surroundings evolve; elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance, or may be neutral (MHCLG 2019, Annex 2: Glossary). Historic England also consider that the importance of setting depends on a wide range of physical elements within, as well as perceptual and associational attributes pertaining to, the heritage asset under consideration.

- 7.14 Guidance on the potential impacts of any development upon the setting of heritage assets, including an outline methodology for assessment and how impacts can be mitigated, is also contained within the Highways Agency's *Design Manual for Roads and Bridges* (Highways England 2019a & b). Historic England (2017) advocate a five-step approach, as follows:
- (1) Identify which heritage assets and their settings are affected;
 - (2) Assess the degree to which these settings and views make a contribution to the significance of the heritage asset(s) or allow significance to be appreciated;
 - (3) Assess the effects of the proposed development, whether beneficial or harmful, on the significance or on the ability to appreciate it;
 - (4) Explore ways to maximise enhancement and avoid or minimise harm;
 - (5) Make and document the decision and monitor outcomes.
- 7.15 A value grading system, in respect of the setting of an identified heritage asset, has been formulated, namely Very High, High, Medium, Low and Negligible; details as to how these grades can be applied are given in Appendix 2. The value given to the setting of an asset is therefore taken into account when determining the significance of the asset.
- 7.16 Bulholme Lock has a visual relationship with other elements of the local transport network, such as the disused 1878 Castleford railway viaduct to the east, whilst the demolition of the majority of the chemical works complex to the south, together with the presence of trees and bushes to either side, provides a more rural and tranquil feeling to the setting than might otherwise be expected. However, recent works, such as the demolition of the original lock keeper's house and its replacement by the existing 1968 residential properties, have arguably decreased the historic setting of the lock.
- 7.17 Taken as a whole, the setting of the lock can be considered to have a medium value of setting, and this is a contributing factor when assessing the heritage significance of the lock (see above).

Assessment of Development Impact

- 7.18 In general, the assessment of development impact on any heritage asset will depend on the value or significance of that asset combined with the degree or magnitude of potential development. It has already been noted that that value or significance can be graded from Very High to Negligible. Any magnitude of development impact can also be graded according to whether it is Major, Moderate, Minor, Negligible or No Change, and this magnitude can be positive or negative; details of how these grades can be applied in principle are again given in Appendix 2. An overall Significance of Effect (either positive or negative) can then be determined by combining the value or significance of the asset and the magnitude of development impact. The matrix by which this overall effect is calculated is also explained in Appendix 2, and in some cases there are two possible overall effects, depending on the site circumstances; in these instances, professional judgement is used.

Option 2: widen the bottom chamber by relocating the north wall and retaining only one chamber

- 7.19 This option would reduce the number of chambers in the lock from two to one, and would involve the removal of the whole of the north wall of the bottom chamber, and those parts of the north wall of the top chamber adjacent to the middle gates and top gates. The new north wall would be constructed c.1 m to the north of the existing wall sections, to create a continuous north chamber wall in line with the existing north wall of the top chamber. This would mean the modern lock lobby structure and associated mechanical and electrical equipment would have to be relocated. In addition, the fillet at the base of the bottom chamber's south wall would also need to be partly removed to accommodate Euro II freight vessels. All three lock gates would need to be replaced with wider lock gates, and the gate recesses would need amending.
- 7.20 This option would have the effect of removing much of the surviving structure of the original 1829-31 lock, and the surviving structural elements in the north wall (including the north approach wall) which demonstrate how the lock developed in several phases between 1829-31 and 1900. The south walls of the top and bottom chambers would be unaffected, but the evidence for the historical development of the lock is not as evident here. The magnitude of impact for this option is considered to be *Moderate Adverse*, resulting in an overall *Moderate/Slight Adverse* significance of effect.

Option 5: widen the bottom chamber and part of the top chamber by relocating a section of the south wall

- 7.21 This option involves the widening the bottom lock chamber and a proportion of the top chamber. This would require the removal of all of the south wall of the bottom chamber and the eastern half of the wall to the top chamber, with a new south wall sited c.1 m to the south of the existing wall. A step in the plan of the south wall part way along the top chamber would accommodate the change, and this will also remove the existing kink in the south wall of the bottom chamber. This would mean the relocation of the mechanical and electrical equipment adjacent to the south wall, and the partial removal of the fillet at the base of the bottom chamber's south wall. The middle and bottom gates would be replaced with wider ones, although the top gates could remain as existing.
- 7.22 This option would have the effect of removing much of the surviving structural elements in the south wall which demonstrate how the lock developed in several phases between 1862 and 1900. However, it would leave the surviving structure of the original 1829-31 lock in place. The magnitude of impact of this option is considered to be *Minor Adverse*, resulting in an overall *Slight/Neutral Adverse* significance of effect.

Mitigation

- 7.23 In order to mitigate the impact of the proposed widening scheme for Bulholme Lock, a number of measures could be considered, although they are essentially the same for both options.
- 7.24 Once the canal is de-watered, but prior to any structural works commencing, it is recommended that a drawn archaeological record should be made of those parts which are to be removed or otherwise affected by the works (e.g. the whole of the north wall of the bottom chamber and parts of the north wall of the top chamber for

Option 2, and the whole of the south wall of the bottom chamber and parts of the south wall to the top chamber for Option 5). This recording could be achieved either by producing new existing elevation drawings using a combination of remote survey (e.g. photogrammetry) and/or hand measurement, or enhancing the existing elevation drawings through hand measurement. Additional more detailed drawings should also be made of the culverts and other features which lie within the elevations. Given the likely health and safety issues associated with working in the de-watered lock, it may be that a combination of remote and hand measuring would be a more efficient and practical way of achieving the drawn record. The drawn record would need to be supplemented by photographs and written observations made on site.

- 7.25 It is assumed that the cutting back of either the north or south walls of the lock has the potential to expose the remains of associated structures behind the walls, such as the culverts and channels through which water is moved between the chambers. The groundworks should therefore be subject to an archaeological watching brief during key phases, in order to record any information that might be exposed. Again, given the potential health and safety considerations, it is possible that most of the watching brief would have to be achieved by remote observation and photography.
- 7.26 Both phases of site recording would need to be accompanied by an appropriate level of post-recording analysis, reporting and archive deposition.

8 CONCLUSIONS

- 8.1 Bulholme Lock is not a Listed Building of Special Architectural or Historic Interest, is not a Scheduled Monument, is not included on Wakefield MDC's local list of Buildings of Local Interest, or otherwise subject to any other statutory protection. It is however, a non-designated heritage asset, as it is recorded on the WYAAS HER. There are no designated assets (Scheduled Monuments, Listed Buildings, World Heritage Sites, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields, or Conservation Areas) within 500m of the lock. The WYAAS HER records three other non-designated heritage assets within 500m of the lock.
- 8.2 Although the lock contains no unusual architectural features, it does nevertheless display evidence for the development of the Castleford Cut in the period from when this alignment was first constructed, between 1829-1831 to the present day. The north walls of both chambers (and their invert) preserve structural evidence for three main phases of development, dating to between 1829-31 and 1900, these changes reflecting the improvements needed to accommodate both the increasing volume of traffic on the Aire and Calder Navigation and the size of the vessels wanting to use the lock. The south walls of both chambers also preserve structural evidence for two main phases of development, either 1862 or 1884, and 1900. The materials used in these different phases (stone, timber, brick and concrete) reflect contemporary developments in canal engineering and construction. The overall form of the lock and its adjacent equipment also reflects more modern developments such as electrification and mechanisation. Although it would take work beyond the scope of this assessment to establish, it is considered likely that many locks on the Aire and Calder Navigation will have undergone a similar pattern of adaptation, widening and modernisation as that seen at Bulholme Lock, with very few retaining their original unaltered form. Taken as a whole, the lock can be considered to have a *low to medium* value of significance.

- 8.3 In terms of its setting, Bulholme Lock has a visual relationship with other elements of the local transport network, such as the disused 1878 Castleford railway viaduct, whilst the demolition of the majority of the chemical works complex to the south, together with trees and bushes to either side, provide a more rural, enclosed and tranquil feeling to the setting than might otherwise be expected. However, this is not representative of its historic setting, which as late as 1946 had a far more open aspect and therefore a stronger visual relationship to the surrounding industry. Modern works, such as the demolition of the original lock keeper's house and its replacement with the existing 1968 residences, have arguably decreased the historic setting of the lock. Taken as a whole, the setting of the lock can be considered to have a *medium value*, and this has been taken into account when assessing the significance of the lock.
- 8.4 The widening options which are currently favoured are Option 2 (essentially widening to the north involving the construction of a new north wall to the bottom chamber and part of the top chamber) and Option 5 (widening to the south involving the construction of a new south wall to the bottom chamber and part of the top chamber). It is considered that Option 2 will have a *Moderate Adverse* impact, resulting an overall *Moderate/Slight Adverse* significance of effect, while Option 5 has a *Minor Adverse* impact, which results in an overall *Slight/Neutral Adverse* significance of effect. This difference reflects the greater quantity of historic fabric contained in the north wall compared to the south wall. The impacts could be mitigated by a programme of archaeological recording, both to record the existing walls of the two chambers and lock gates prior to removal and alteration, and also during the actual groundworks which are likely to reveal evidence associated with the culverts and channels through which water is moved between the chambers.

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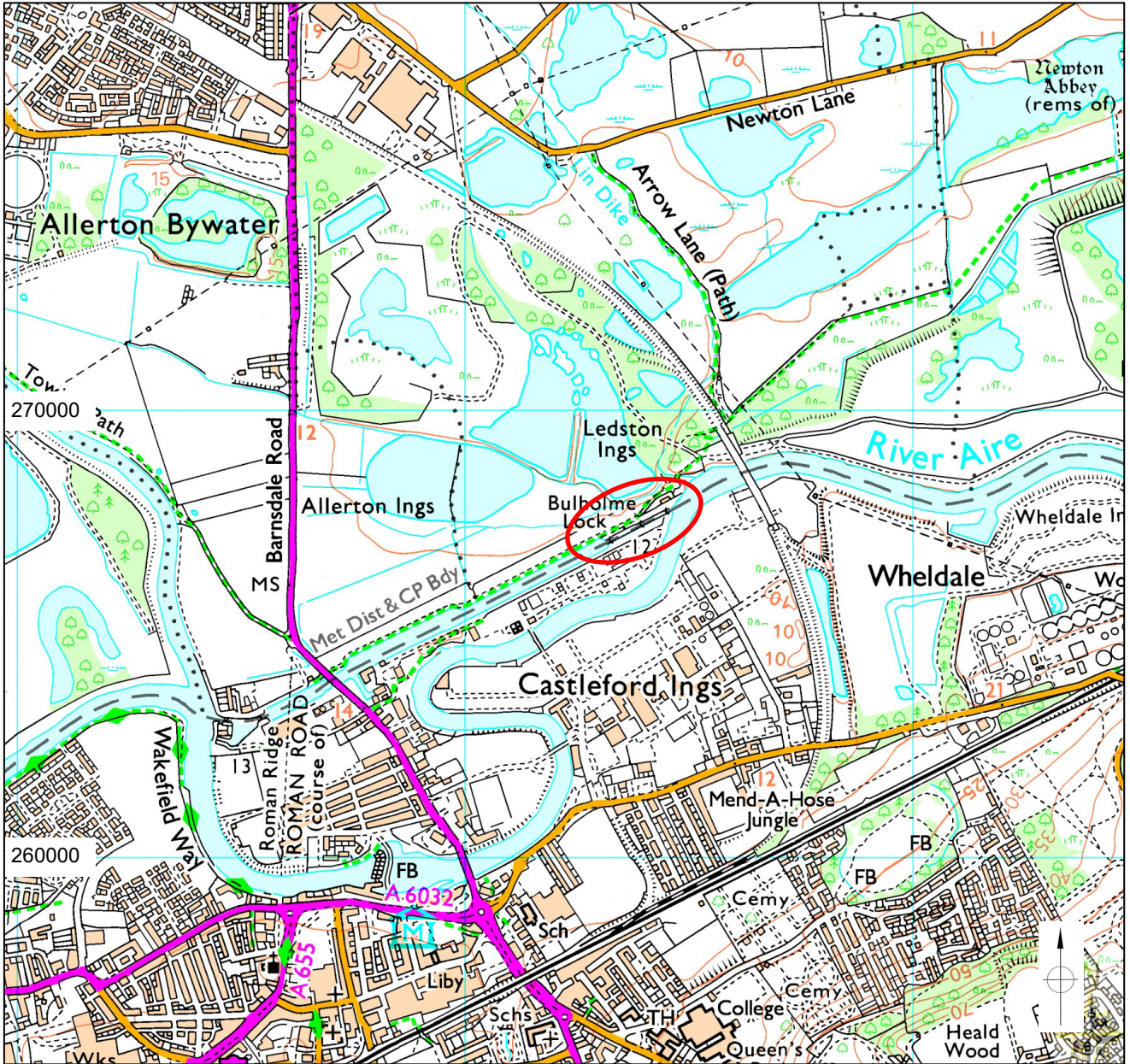
<https://www.ipernity.com> = online photo club

<http://lostrailwayswestyorkshire.co.uk> = Lost Railways of West Yorkshire

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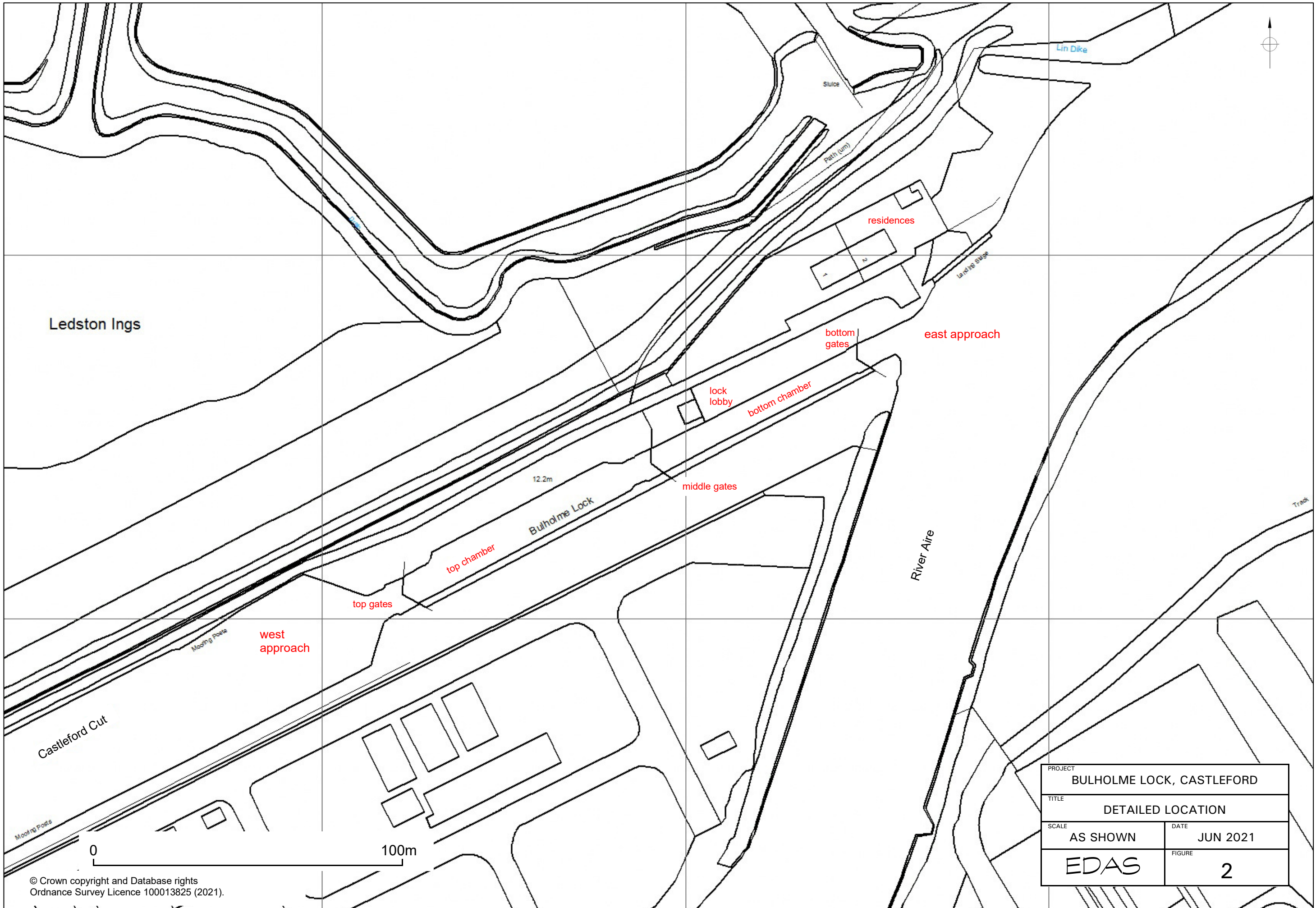
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PROJECT		BULHOLME LOCK, CASTLEFORD	
TITLE		GENERAL LOCATION	
SCALE	AS SHOWN	DATE	JUN 2021
EDAS		FIGURE	1



Ledston Ings

Lin Dike

Sluice

Path (um)

residences

landing stage

bottom gates

east approach

lock lobby

bottom chamber

12.2m

Bulholme Lock

middle gates

top chamber

top gates

west approach

Mooring Posts

Castleford Cut

Mooring Posts

0

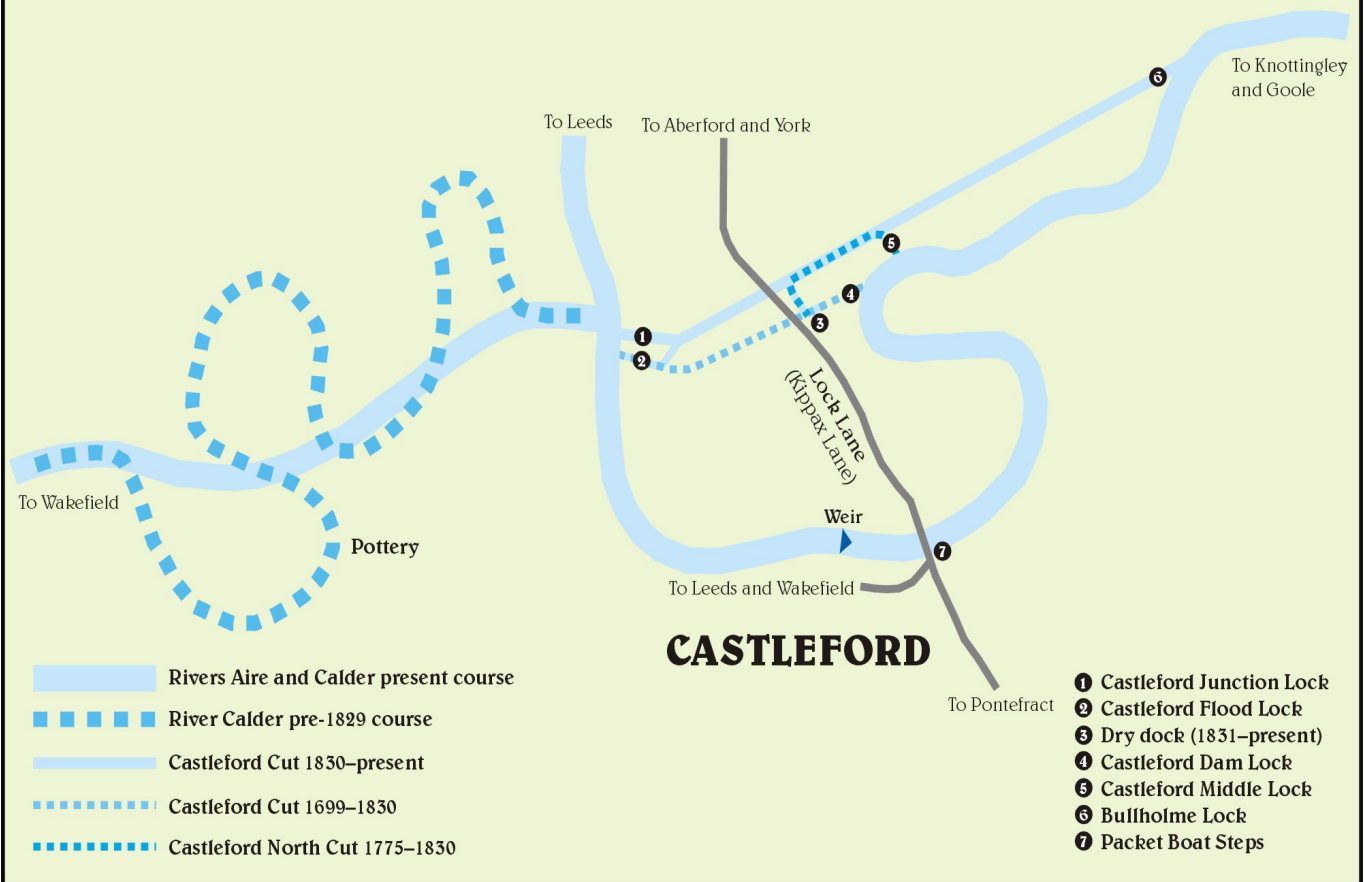
100m

River Aire

Track

PROJECT		BULHOLME LOCK, CASTLEFORD	
TITLE		DETAILED LOCATION	
SCALE	AS SHOWN	DATE	JUN 2021
EDAS		FIGURE	2

THE AIRE & CALDER NAVIGATION IN CASTLEFORD



Source: Anon 2014 'The Changing Course of Castleford's Waterways' (<https://castlefordhistory.wordpress.com/2014/04/13/the-changing-course-of-castlefords-waterways/> accessed June 2021).



PROJECT BULHOLME LOCK, CASTLEFORD	
TITLE DEVELOPMENT OF NAVIGATION	
SCALE NTS	DATE JUN 2021
EDAS	FIGURE 3



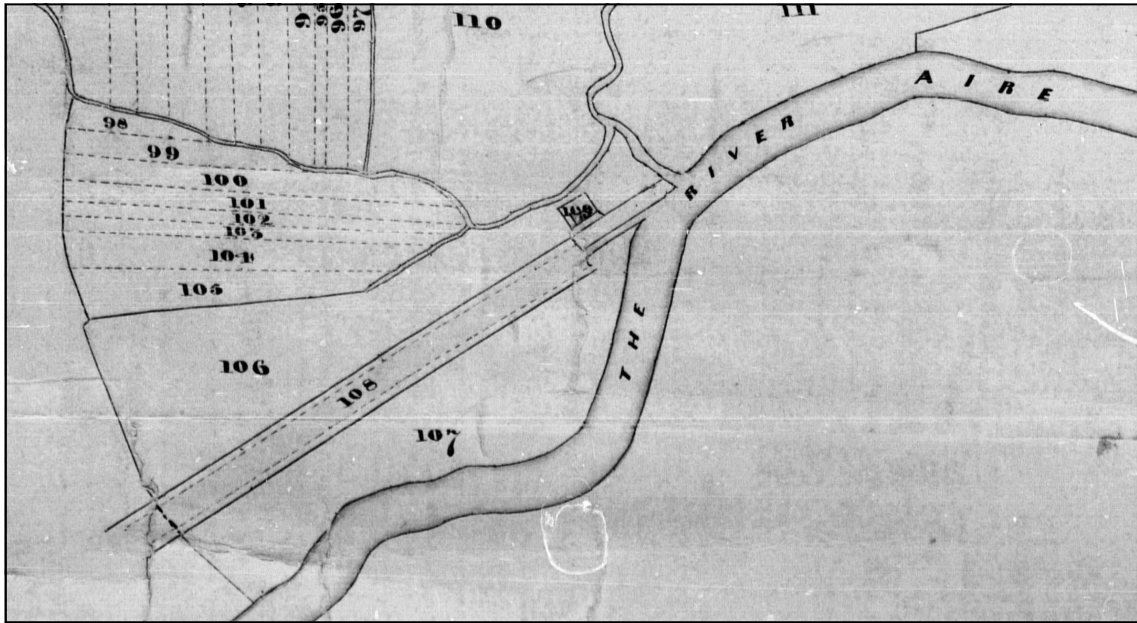
Castleford Flood Lock looking east, showing line of original 1699 cut which continued through the line of trees in the background.



Course of 1699 Castleford Cut towards its east end preserved by a dry dock and the stretch of water leading into it.

Source: Anon 2014 'The Changing Course of Castleford's Waterways' (<https://castleford-history.wordpress.com/2014/04/13/the-changing-course-of-castlefords-waterways/> accessed June 2021).

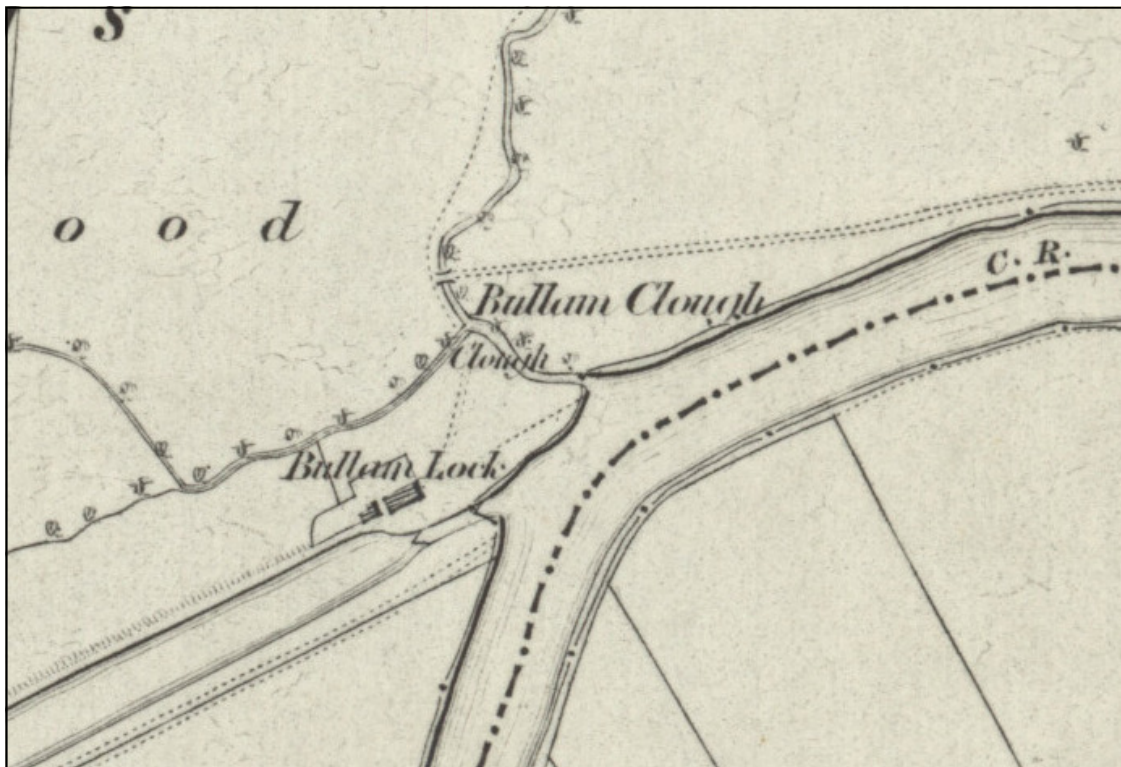
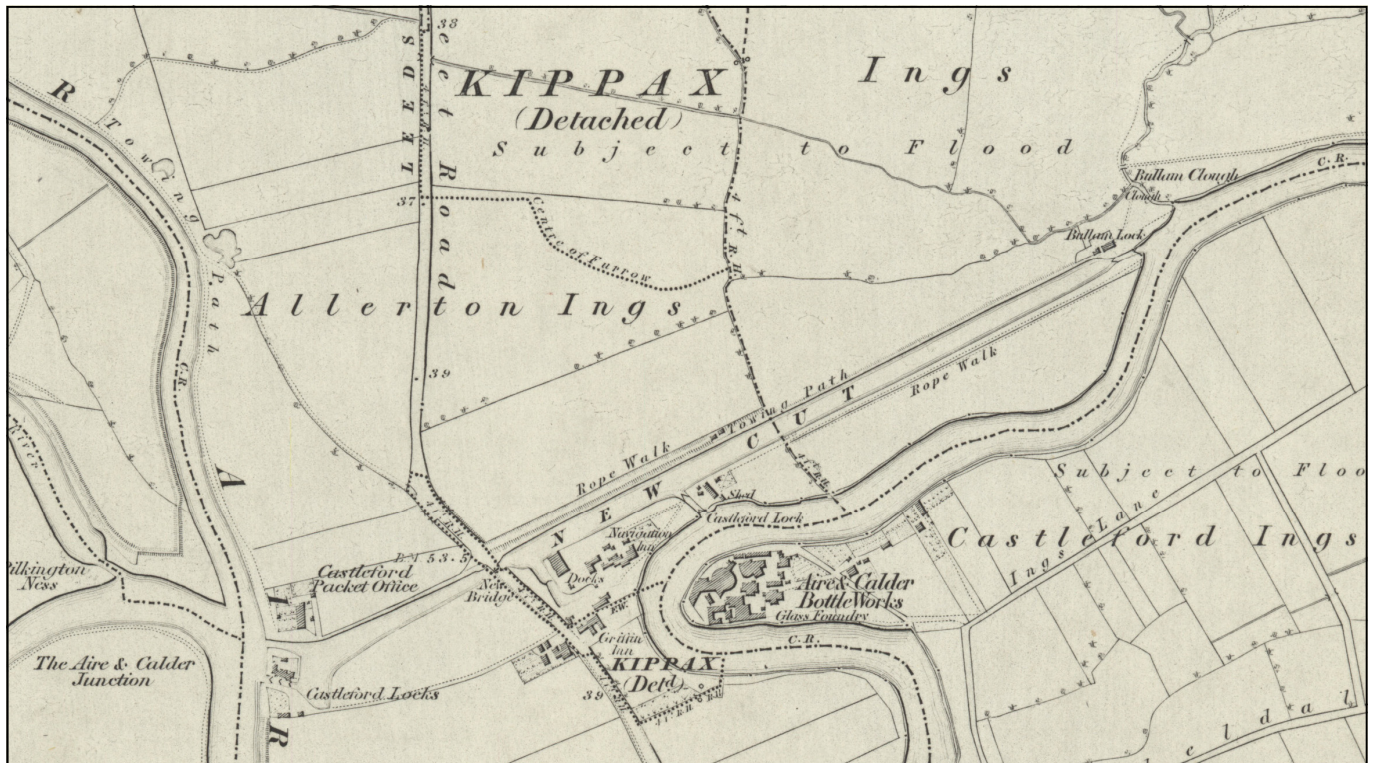
PROJECT BULHOLME LOCK, CASTLEFORD	
TITLE REMNANTS OF 1699 CASTLEFORD CUT	
SCALE NTS	DATE JUN 2021
EDAS	FIGURE 4



Source: 1840 Ledstone tithe map (<https://www.thegenealogist.co.uk>) accessed June 2021).



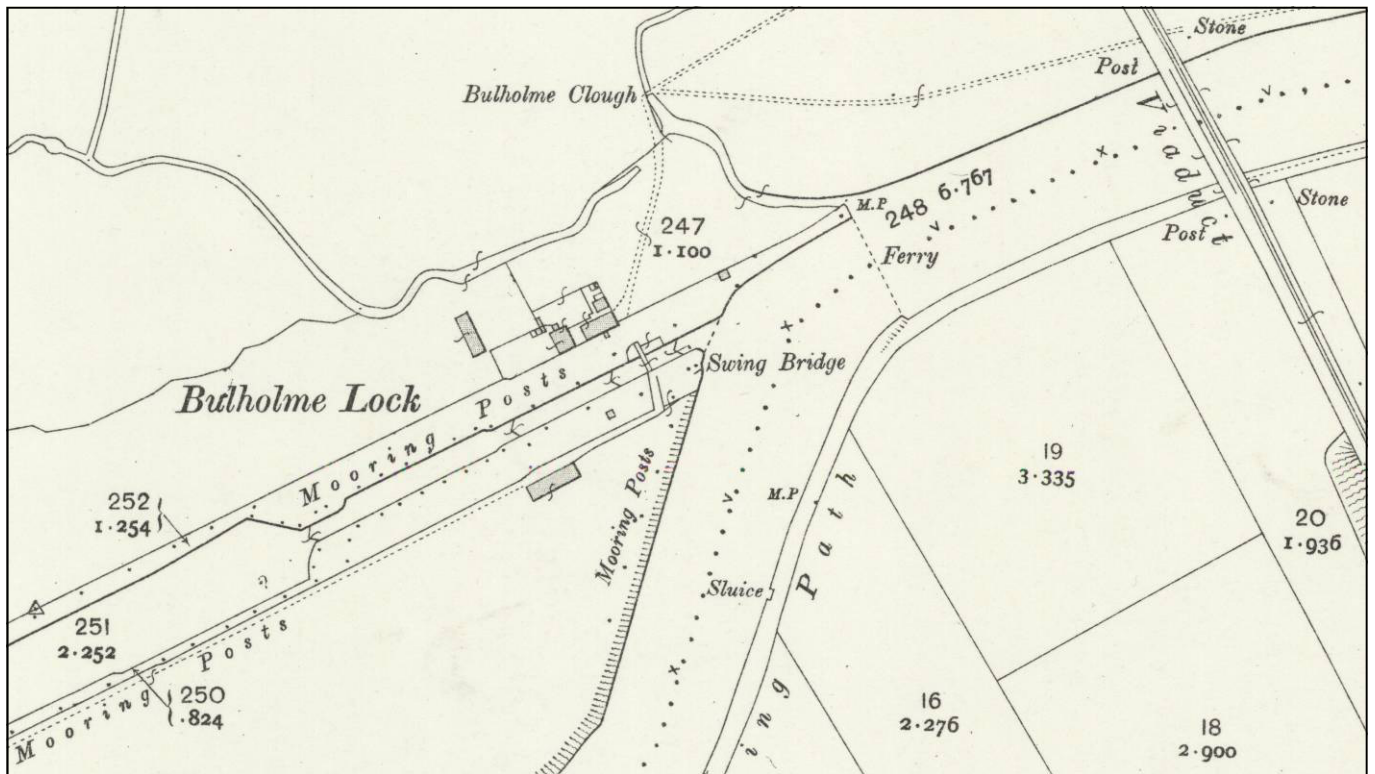
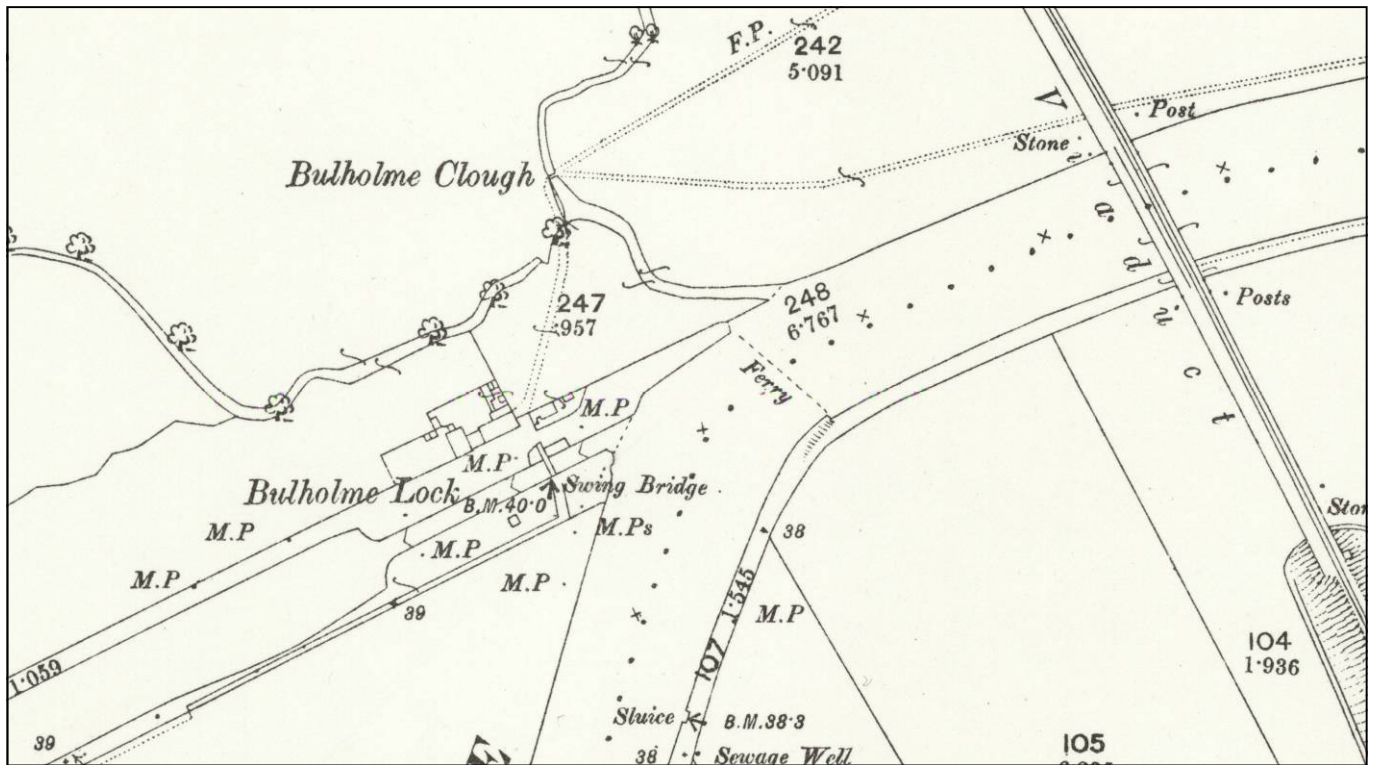
PROJECT	
BULHOLME LOCK, CASTLEFORD	
TITLE	
1840 TITHE MAP	
SCALE	DATE
NTS	JUN 2021
EDAS	FIGURE
	5



Source: 1852 Ordnance Survey 6" to 1 mile map
Yorkshire sheet 234 (surveyed 1846 to 1848).



PROJECT	
BULHOLME LOCK, CASTLEFORD	
TITLE	
1852 ORDNANCE SURVEY MAP	
SCALE	DATE
NTS	JUN 2021
EDAS	FIGURE
	6



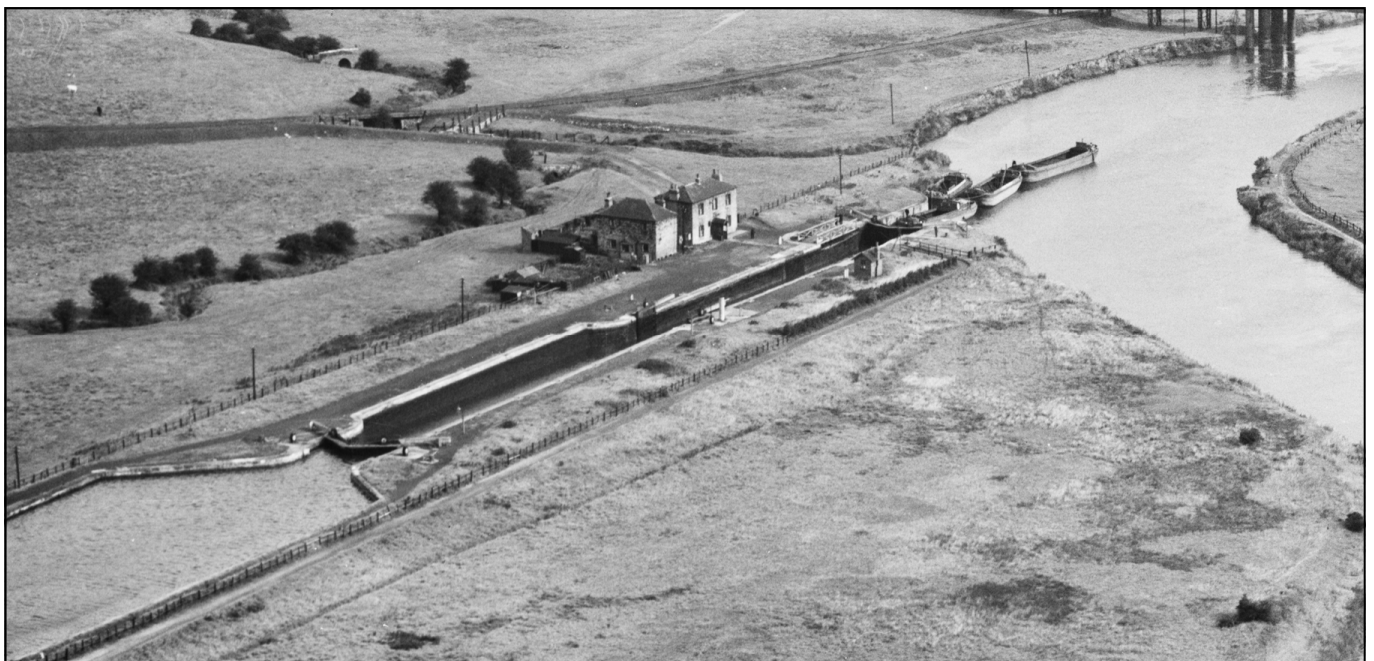
Sources:

Top: 1893 Ordnance Survey 25" to 1 mile map
Yorkshire sheet 234/7 (surveyed 1888-90).

Bottom: 1908 Ordnance Survey 25" to 1 mile map
Yorkshire sheet 234/7 (revised 1905).



PROJECT	
BULHOLME LOCK, CASTLEFORD	
TITLE	
1893-1908 ORDNANCE SURVEY MAPS	
SCALE	DATE
NTS	JUN 2021
EDAS	FIGURE
	7



Oblique black and white aerial photograph showing the Hickson and Welch Chemical Works, Bulholme Lock and the River Aire at Castleford, taken 19th September 1946.

Source: Historic Environment Scotland, EAW002613, © Historic England.

PROJECT	
BULHOLME LOCK, CASTLEFORD	
TITLE	
1946 AERIAL PHOTOGRAPH	
SCALE	DATE
NTS	JUN 2021
EDAS	FIGURE
	8



Bulholme Lock, Castleford, during enlargement in the 1960s.

Source: Image in Castleford Libraries (<http://www.twixtaireandcalder.org.uk/site/image-detail?imageid=1050>).

PROJECT		BULHOLME LOCK, CASTLEFORD	
TITLE			
		1960 ENLARGEMENT WORKS	
SCALE	DATE		
NTS	JUN 2021		
EDAS		FIGURE	9



Top chamber, south wall, showing boat impact at middle gates narrows.



Top chamber, north wall.

Source: Anon 2019 AL-018-007 *Bulholme Lock: Notes and Photos from De-watered Site Visit 25 November 2019* (unpublished Canal & River Trust document).

PROJECT		BULHOLME LOCK, CASTLEFORD	
TITLE		DE-WATERED TOP CHAMBER	
SCALE	NTS	DATE	JUN 2021
EDAS		FIGURE	10



Bottom chamber, upper part, showing original timber cill from disused gates.



Bottom chamber, south wall showing culverts.

Source: Anon 2019 AL-018-007 *Bulholme Lock: Notes and Photos from De-watered Site Visit 25 November 2019* (unpublished Canal & River Trust document).

PROJECT		BULHOLME LOCK, CASTLEFORD	
TITLE		DE-WATERED BOTTOM CHAMBER	
SCALE	NTS	DATE	JUN 2021
EDAS		FIGURE	11



Bottom chamber, lower part, from disused gate recess showing masonry fillets.



East approach to bottom gates, north wall showing vertical stop plank groove with later groove to the right holding temporary dam in place.

Sources:

Top: Anon 2019 AL-018-007 *Bulholme Lock: Notes and Photos from De-watered Site Visit 25 November 2019* (unpublished Canal & River Trust document).

Bottom: Bradley, L 2019 *Lock Principal Inspection Report Lock 10 - Bulholme Lock AL-018-007 Assessment Date: Dec 2, 2019* (unpublished Canal & River Trust document).

PROJECT	
BULHOLME LOCK, CASTLEFORD	
TITLE	
DE-WATERED BOTTOM CHAMBER	
SCALE	DATE
NTS	JUN 2021
EDAS	FIGURE
	12



Plate 1: West approach, wing walls to top gates, looking SE (photo 1/718).



Plate 2: West approach, north wing wall to top gates, looking N (photo 1/760).



Plate 3: West approach, south wing wall to top gates, looking S (photo 1/723).



Plate 4: Top gates (open), looking W (photo 1/726).



Plate 5: Top chamber, looking E (photo 1/725).



Plate 6: South wall to top chamber, looking S (photo 1/727).



Plate 7: Approach to middle gates, looking SE (photo 1/731).



Plate 8: North wall of approach to middle gates, looking N (photo 1/758).



Plate 9: Middle gates (closed), looking W (photo 1/735).



Plate 10: Sluice donkey, south side of middle gates, looking S (photo 2/768).



Plate 11: Bottom chamber, looking W (photo 1/744).



Plate 12: East end of bottom chamber, looking NE (photo 1/754).



Plate 13: Bottom gates (closed), looking W (photo 1/739).



Plate 14: East approach, north wall showing stop plank grooves etc, looking N (photo 2/774).



Plate 15: Incised numerals to north wall of east approach, looking N (photo 2/775).



Plate 16: Bullnose end to south wall of east approach, looking SW (photo 1/753).



Plate 17: North wall of east approach, looking N (photo 1/749).



Plate 18: East approach from River Aire, showing landing to north side, looking W (photo 1/751).



Plate 19: View down Castleford Cut from near lock, looking W (photo 1/717).



Plate 20: Lock lobby, north side of bottom chamber, looking N (photo 1/756).



Plate 21: 1968 residential properties, north side of bottom gates, looking NE (photo 1/738).



Plate 22: East approach from River Aire, showing 1878 railway bridge, looking E (photo 1/741).



Plate 23: Tree planting to north side of lock, looking NE (photo 2/767).



Plate 24: View down Castleford Cut towards lock from A656 Castleford Cut Bridge, looking E (photo 1/717).

APPENDIX 1
RELEVANT PLANNING POLICIES

APPENDIX 1: RELEVANT PLANNING POLICIES

National Planning Policy Framework 2019

Paragraph 189:

In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

Paragraph 190:

Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.

Paragraph 191:

Where there is evidence of deliberate neglect of, or damage to, a heritage asset, the deteriorated state of the heritage asset should not be taken into account in any decision.

Paragraph 192:

In determining applications, local planning authorities should take account of:

- a) the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;*
- b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and*
- c) the desirability of new development making a positive contribution to local character and distinctiveness.*

Paragraph 193:

When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.

Paragraph 194:

Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting) should require clear and convincing justification. Substantial harm to or loss of:

- (a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional.*
- (b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.*

Paragraph 195:

Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply;

- (a) The nature of the heritage asset prevents all reasonable uses of the site; and*
- (b) No viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and*
- (c) Conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and*
- (d) The harm or loss is outweighed by the benefit of bringing the site back into use.*

Paragraph 196:

Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.

Paragraph 197:

The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.

Paragraph 198:

Local planning authorities should not permit the loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred.

Paragraph 199:

Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.

Paragraph 200:

Local Planning Authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites and within the setting of heritage assets to enhance or better reveal their significance. Proposals that preserve those elements of the settings that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.

Government guidance on conserving and enhancing the historic environment in support of the NPPF (<https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment>)

“Whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the policy in the National Planning Policy Framework. In general terms, substantial harm is a high test, so it may not arise in many cases. For example, in determining whether works to a listed building constitute substantial harm, an important consideration would be whether the adverse impact seriously affects a key element of its special architectural or historic interest. It is the degree of harm to the

asset's significance rather than the scale of the development that is to be assessed. The harm may arise from works to the asset or from development within its setting.

While the impact of total destruction is obvious, partial destruction is likely to have a considerable impact but, depending on the circumstances, it may still be less than substantial harm or conceivably not harmful at all, for example, when removing later inappropriate additions to historic buildings which harm their significance. Similarly, works that are moderate or minor in scale are likely to cause less than substantial harm or no harm at all. However, even minor works have the potential to cause substantial harm”.

Wakefield Council's Local Development Framework: Core Strategy (adopted April 2009)

Policy CS10: Design, Safety and Environmental Quality

Good design is a key element in sustainable development. Improving our places through raising the quality of the built environment is one of the Community Strategy's underpinning challenges and also a key part of urban renaissance. The design of buildings and spaces will be improved and opportunities for crime reduced. The district's built environment, landscape features and wildlife habitats will be protected and enhanced. Protected ecological and geological sites cover just 2% of the district's land area and tree cover is only 3.8%, one of the lowest percentages in the country. A number of Scheduled Ancient Monuments, Conservation Areas, historic buildings, archaeological remains and historic landscapes contribute to the local distinctiveness and character of the district. In all parts of the district, new development will:

- a. incorporate sustainable buildings, spaces and landscaping of high quality design which:
 - i. are appropriate to their location in terms of scale and density;*
 - ii. protects and enhances local character and distinctiveness taking local building traditions into account;*
 - iii. takes into account the different landscape character across the district, including the Calder Valley, the Northern Coalfield areas, the Went River basin, the Limestone Escarpment and the south-east and south-west coalfield areas.**
- b. create safe and secure environments that reduce the opportunities for crime in all parts of the district;*
- c. protect and enhance the district's historic assets particularly Scheduled Ancient Monuments, Conservation Areas, historic buildings, archaeological remains and historic landscapes;*
- d. protect and enhance the district's biological and geological diversity and green infrastructure including the need to increase tree cover across the district, safeguard designated sites of international, national, regional and local importance, ancient woodland and other ecological assets, including priority habitats and species;*
- e. minimise the risk from all forms of pollution and contamination for existing and future occupants, the wider community and the environment, particularly within the defined Air Quality Management Areas along the M1, M62 and A1 corridors and in the urban areas in the western and northern parts of the district.*
- f. bring about improvements to the local environment including the reclamation of derelict or degraded land, where appropriate, particularly in former mining communities such as Castleford, Pontefract, South Elmsall, Sharlston, and South Hiendley.*
- g. helping reduce fossil fuel dependency, by promoting designs which incorporate energy efficiency and renewable energy generation technology.*

Wakefield Council's Local Development Framework: Development Policies (adopted April 2009)

Policy D17: Development Affecting Archaeological Sites

Within the District are a number of Scheduled Ancient Monuments, and other unique archaeological assets. New development has also led to the discovery and excavation of remains of national, regional and local importance such as Roman and Iron age Settlements and a chariot burial.

1. Development that affects the site or setting of a Class I or Class II archaeological site will only be permitted if there are exceptional circumstances of overriding public interest and suitable protective and mitigation measures can be implemented to safeguard the archaeological value of the site.

2. In the case of Class III sites permission will only be permitted where:

a. The archaeological remains will be preserved in situ through careful design, layout and siting of the proposed development; or

b. When in-situ preservation is not justified or feasible, appropriate provision is made by the developer for excavation and recording before and/or during development and for the post-excavation analysis, publication, and archive deposition of any findings.

3. Where development proposals affect sites of known or potential archaeological interest, an appropriate archaeological assessment and evaluation will be required to be submitted as part of the planning application. Planning permission will not be granted without adequate assessment of the nature, extent and significance of the remains present and the degree to which the proposed development is likely to affect them.

Policy D18: Development Affecting Historic Locations

Development within or likely to affect the district's Historic Parks & Gardens, Historic Landscapes, Conservation Areas and Sites of Historic Battles will only be permitted where there is no adverse impact on:

(a) open spaces, views, landmarks and landscape that contribute to their character, appearance or setting;

(b) the character of any buildings or structures having regard to local scale, proportion, details and materials;

(c) the preservation of features of architectural, archaeological and historic interest.

The Council will require that plans for development clearly illustrate the impact of the proposal on any features of architectural, archaeological and historic interest of the area.

Such applications must also be supported with full details of the proposal.

Paragraph 6.104:

It is a criminal offence to alter a Listed Building in any way which affects its character except in accordance with Listed Building Consent. The Council is required to have special regard to the preservation of Listed Buildings and their settings. Development including extensions, alterations, and changes of use of a Listed Building will only be permitted where there is no adverse impact on its special features of architectural or historic interest, such as original external and internal details. There is a presumption against demolition unless exceptional circumstances of overriding public interest can be demonstrated. Planning Policy Guidance 15: Planning and the Historic Environment (amended by Circulars 01/2001 & 09/2005) sets out the government's national policy for protecting historic buildings, conservation areas and other elements of the historic environment. It is not considered necessary to repeat this as a detailed policy in the LDF.

Paragraph 6.105:

The preservation of buildings and structures of special architectural or historic interest and their settings will be secured by:

- a presumption in favour of the preservation of Listed Buildings and structures;*
- ensuring that proposed alterations, extensions or changes of use to Listed Buildings, or development within their vicinity, will not have an adverse impact on the special architectural or historic interest of such buildings and their settings;*

- *taking measures to ensure that neglected Listed Buildings are appropriately repaired and re-used.*

Policy D19: Development affecting Buildings of Local Interest

Within the district are a number of buildings which are identified for protection because of their local significance in terms of their historical or architectural interest. These include buildings of local community interest, individual buildings or groups of buildings that contribute to the character or identity of an area, and buildings which are examples of important work by local architects or builders. Development including extensions, alterations, and changes of use to Buildings of Local Interest will only be permitted where there is no adverse impact on:

- a. any features of special architectural or historic interest; and*
- b. the character, appearance and setting of the building.*

APPENDIX 2
METHODOLOGY FOR IMPACT ASSESSMENTS ON HERITAGE ASSETS

APPENDIX 2: METHODOLOGY FOR IMPACT ASSESSMENTS ON HERITAGE ASSETS

Based on Highways England 2019 Design Manual for Roads and Bridges LA106 'Cultural Heritage Assessment' and LA104 'Environmental Assessment and Monitoring', and in accordance with advice contained in the 2019 National Planning Policy Framework (NPPF).

Assessing the Significance of Heritage Assets

<i>Value (Significance)</i>	<i>Criteria</i>
Very High (International)	<p>World Heritage Sites, Scheduled Monuments of exceptional quality, or assets of acknowledged international importance or can contribute to international research objectives.</p> <p>Other buildings and built heritage of exceptional quality and recognised international importance.</p> <p>Historic landscapes and townscapes of international value or sensitivity, whether designated or not, or extremely well preserved historic landscapes and townscapes with exceptional coherence, integrity, time-depth, or other critical factor(s).</p>
High (National)	<p>Scheduled Monuments, or undesignated archaeological assets of national quality and importance, or than can contribute significantly to national research objectives.</p> <p>Grade I and II* Listed Buildings, other built heritage assets that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in their listing grade.</p> <p>Conservation Areas containing very important buildings or with very strong character and integrity, undesignated structures of clear national importance.</p> <p>Grade I and II* Registered Parks and Gardens, Registered Battlefields and designated or non-designated historic landscapes and townscapes of outstanding interest, quality and importance, or well preserved historic landscapes which exhibit considerable coherence, integrity time-depth or other critical factor(s).</p>
Medium (Regional)	<p>Undesignated archaeological assets of regional quality and importance that contribute to regional research objectives.</p> <p>Grade II Listed Buildings, historic unlisted buildings that can be shown to have exceptional qualities in their fabric or historical associations.</p> <p>Conservation Areas containing buildings that contribute significantly to its historic character.</p> <p>Historic townscapes or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).</p> <p>Designated special landscapes, undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value, and averagely well preserved historic landscapes with reasonable coherence, integrity, time-depth or other critical factor(s).</p> <p>Assets that form an important resource within the community, for educational or recreational purposes.</p>
Low (Local)	<p>Undesignated archaeological assets of local importance, assets compromised by poor preservation and/or poor survival of contextual associations, or assets of limited value but with potential to contribute to local research objectives.</p> <p>Locally listed buildings, historic (unlisted) buildings of modest quality in their fabric or historical association.</p> <p>Historic landscapes or built-up areas of limited historic integrity in their buildings or built settings (including street furniture and other structures).</p> <p>Robust undesignated historic landscapes, historic landscapes with importance to local interest groups, historical landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.</p> <p>Assets that form a resource within the community with occasional utilisation for educational or recreational purposes.</p>
Negligible	<p>Archaeological assets with very little or no surviving interest.</p> <p>Buildings of no architectural or historical note.</p> <p>Landscapes and townscapes that are badly fragmented and the contextual associations are severely compromised or have little or no historical interest.</p>
Unknown	<p>The importance of the asset has not been determined.</p> <p>Buildings with some hidden (i.e. inaccessible) potential for historic significance.</p>

Assessing the Value of the Setting of Heritage Assets

<i>Value (Setting)</i>	<i>Criteria</i>
Very High	A defined setting that is contemporary with, and historically and functionally linked with, the heritage asset, may contain other heritage assets of international or national importance, has a very high degree of intervisibility with the asset, and makes a very substantial contribution to both the significance of the heritage asset and to the understanding and appreciation of the significance of the asset.
High	A setting which is broadly contemporary with, and historically and functionally linked with, the heritage asset, with minor alterations (in extent and/or character), which exhibits a high degree of intervisibility with the asset, and/or which makes a substantial contribution to both the significance of the heritage asset and to the understanding and appreciation of the significance of the asset.
Medium	A setting which is basically contemporary with, and historically and/or functionally linked with, the heritage asset but with alterations which may detract from the understanding of the heritage asset, which exhibits a moderate degree of intervisibility with the asset, and/or which makes a moderate contribution to the significance of the heritage asset, and/or a moderate contribution to the understanding and appreciation of the significance of the asset.
Low	A setting which is largely altered so that there is very little evidence of contemporaneous and/or historic and/or functional links with the heritage asset, which exhibits a low degree of intervisibility with the asset, and/or which makes a minor contribution to both the significance of the heritage asset and to the understanding and appreciation of the significance of the asset.
Negligible	A setting which is significantly altered or destroyed so that there is no remaining evidence of contemporaneous and/or historic and functional links with the heritage asset, which exhibits no intervisibility with the asset, and/or which makes no contribution to both the significance of the heritage asset and to the understanding and appreciation of the significance of the asset.

Assessing Magnitude of Impact (Adverse or Beneficial)

<i>Magnitude of Impact</i>	<i>Typical Criteria Descriptors</i>
Major	<p><i>Adverse:</i> Impacts will damage or destroy cultural heritage assets; result in the loss of the asset and/or its quality and integrity; causes severe damage to key characteristic features or elements; almost complete loss of setting and/or context of the asset. The asset's integrity or setting is almost wholly destroyed or is severely compromised, such that the resource can no longer be appreciated or understood.</p> <p><i>Beneficial:</i> The proposals would remove or successfully mitigate existing damaging and discordant impacts on assets; allow for the restoration or enhancement of characteristic features; allow the substantial re-establishment of the integrity, understanding and setting for an area or group of features; halt rapid degradation and/or erosion of the heritage resource, safeguarding substantial elements of the heritage resource.</p>
Moderate	<p><i>Adverse:</i> Substantial impact on the asset, but only partially affecting the integrity; partial loss of, or damage to, key characteristics, features or elements; substantially intrusive into the setting and/or would adversely impact on the context of the asset; loss of the asset for community appreciation. The assets integrity or setting is damaged but not destroyed so understanding and appreciation is compromised.</p> <p><i>Beneficial:</i> Benefit to, or restoration of, key characteristics, features or elements; improvement of asset quality; degradation of the asset would be halted; the setting and/or context of the asset would be enhanced and understanding and appreciation is substantially improved; the asset would be brought into community use.</p>
Minor	<p><i>Adverse:</i> Some measurable change in assets quality or vulnerability minor loss of or alteration to, one (or maybe more) key characteristics, features or elements; change to the setting would not be overly intrusive or overly diminish the context; community use or understanding would be reduced. The assets integrity or setting is damaged but understanding and appreciation would only be diminished not compromised.</p>

	<i>Beneficial:</i> Minor benefit to, or partial restoration of, one (maybe more) key characteristics, features or elements; some beneficial impact on asset or a stabilisation of negative impacts; slight improvements to the context or setting of the site; community use or understanding and appreciation would be enhanced.
Negligible	<i>Adverse:</i> Very minor loss or detrimental alteration to one or more characteristics, features or elements; minor changes to the setting or context of the site. <i>Beneficial:</i> Very minor benefit to or positive addition of one or more characteristics, features or elements; minor changes to the setting or context of the site.
No change	No discernible change in baseline conditions.

Identifying Significance of Effect (Adverse or Beneficial)

<i>Value of Asset</i>	<i>Magnitude of Impact</i>				
	<i>Major</i>	<i>Moderate</i>	<i>Minor</i>	<i>Negligible</i>	<i>No change</i>
<i>Very High</i>	Very Large	Large/ Very Large	Moderate/Large	Slight	Neutral
<i>High</i>	Large/ Very Large	Moderate/Large	Moderate/Slight	Slight	Neutral
<i>Medium</i>	Moderate/Large	Moderate	Slight	Slight/Neutral	Neutral
<i>Low</i>	Moderate/Slight	Slight	Neutral/Slight	Slight/Neutral	Neutral
<i>Negligible</i>	Slight	Neutral/Slight	Neutral/Slight	Neutral	Neutral

APPENDIX 3
EDAS PHOTOGRAPHIC CATALOGUE

APPENDIX 3: EDAS PHOTOGRAPHIC CATALOGUE

Film 1: Colour digital photographs taken June 3rd 2021

Film 2: Colour digital photographs taken June 9th 2021

<i>Film</i>	<i>Frame</i>	<i>Subject</i>	<i>Scale</i>
1	715	View down Castleford Cut from A656 Castleford Cut Bridge, looking E	-
1	716	West approach, wing walls to top gates, looking E	-
1	717	View down Castleford Cut from near lock, looking W	-
1	718	West approach, wing walls to top gates, looking SE	-
1	719	West approach, south wing wall to top gates, looking S	-
1	720	West approach, north wing wall to top gates, looking SE	-
1	721	West approach, typical mooring post to north wing wall to top gates, looking SE	-
1	722	Top gates (open), looking E	-
1	723	West approach, south wing wall to top gates, looking S	-
1	724	Top gates, gate in gate recess, looking S	-
1	725	Top chamber, looking E	-
1	726	Top gates (open), looking W	-
1	727	South wall to top chamber, looking S	-
1	728	Bottom chamber, lock lobby and 1878 railway bridge, looking E	-
1	729	Lock lobby, north side of bottom chamber, looking E	-
1	730	Top chamber, looking W	-
1	731	Approach to middle gates, looking SE	-
1	732	Approach to middle gates, S wall and sluice donkey, looking S	-
1	733	Bottom chamber, looking E	-
1	734	Bottom gates (closed), looking E	-
1	735	Middle gates (closed), looking W	-
1	736	Middle gates (closed), looking W	-
1	737	Lock lobby, north side of bottom chamber, looking W	-
1	738	1968 residential properties, north side of bottom gates, looking NE	-
1	739	Bottom gates (closed), looking W	-
1	740	East approach, bullnose end of south wall, looking S	-
1	741	East approach from River Aire, showing 1878 railway bridge, looking E	-
1	742	1878 railway bridge, looking E	-
1	743	East approach, bullnose end of south wall, looking S	-
1	744	Bottom chamber, looking W	-
1	745	East approach, surface of bullnose end of south wall, looking SE	-
1	746	East approach, north wall showing stop plank grooves etc, looking N	-
1	747	East approach, incised numerals to north wall, looking N	-
1	748	Bottom gates (closed), looking NW	-
1	749	East approach, north wall, looking N	-
1	750	East approach, landing to east of north wall, looking E	-
1	751	East approach from River Aire, showing landing to north side, looking W	-
1	752	East approach, River Aire entry into lock, looking W	-
1	753	East approach, bullnose end to south wall, looking SW	-
1	754	East end of bottom chamber, looking NE	-
1	755	Middle gates (closed), looking W	-
1	756	Lock lobby, north side of bottom chamber, looking N	-
1	757	Bottom chamber, looking E	-
1	758	North wall of approach to middle gates, looking N	-
1	759	Top chamber, north wall to either side of top gates, looking N	-
1	760	West approach, north wing wall to top gates, looking N	-
1	761	Top chamber, looking E	-
1	762	View down Castleford Cut from near lock, looking W	-
2	765	View down Castleford Cut from near lock, looking W	-
2	766	A656 Castleford Cut Bridge, looking W	-
2	767	Tree planting to north side of lock, looking NE	-
2	768	Sluice donkey, south side of middle gates, looking S	-
2	769	Middle gates (closed), looking W	-
2	770	Lock lobby, north side of bottom chamber, looking W	-
2	771	Site of original lock keeper's house?, west side of residential properties, looking N	-

2	772	Remnant of swing bridge?, north side of bottom chamber, looking SW	-
2	773	Bottom gates (closed), looking W	-
2	774	East approach, north wall showing stop plank grooves etc, looking N	-
2	775	East approach, incised numerals to north wall, looking N	-