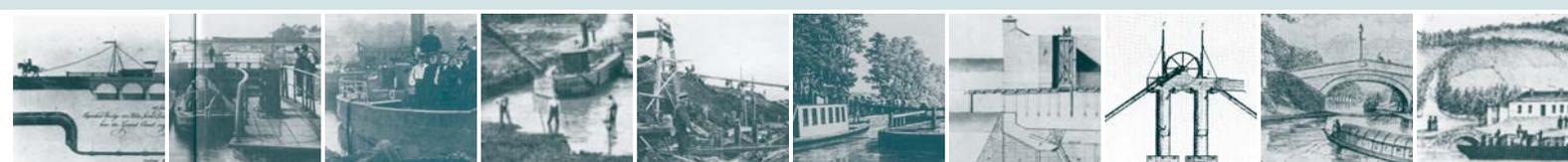


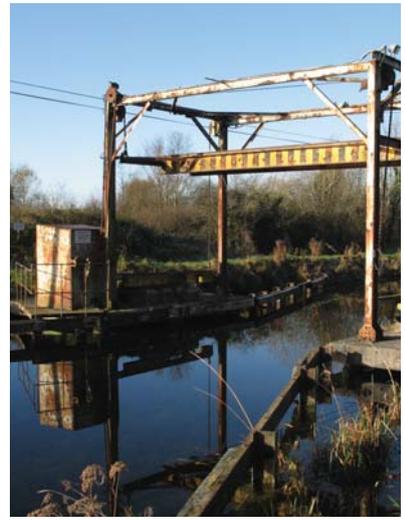


Waterways Ireland

Uiscebhealaí Éireann Watterweys Airlann



The Grand Canal, Architectural, Engineering and Industrial Heritage Assessment 2007



HEADLAND
ARCHAEOLOGY Ltd

The Grand Canal Architectural, Engineering and Industrial Heritage Assessment 2007.

Commissioned by Waterways Ireland and carried out by Headland Archaeology Ltd

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1. INTRODUCTION

This report presents a built heritage inventory and complete survey of the architectural, engineering, and industrial heritage of the Grand Canal, with an analysis of the importance of each feature identified, to help inform Waterways Ireland on the nature of the surviving cultural heritage features associated with the navigation that may be impacted upon by future development strategies. The assessment was carried out along the navigation corridor as defined by map detail, encompassing a zone extending 50m either side of a discernable centre-line, irrespective of property ownership.

The Grand Canal is located in a mixed urban and rural landscape which has been subject to much change since the entire stretch was opened to traffic in 1804, following a one year delay after staunching problems, construction works having reached Shannon Harbour in 1803. In its entirety, the canal stretches from Ringsend Docks in Dublin city to Shannon Harbour in Co. Offaly and passes through the counties of Dublin, Kildare and Offaly. The canal also comprises the Naas branch. Its surrounding environment is dominated by an industrial and urban landscape as it extends westwards from Ringsend Docks through Dublin city. This is a highly built up area containing numerous canal related features and buildings of varying architectural character. Many of these are protected structures situated amongst modern developments. The area slowly becomes more sub-urban as the canal continues westward.

Once the canal leaves behind this urban sprawl, it passes through a primarily rural setting. The navigation also passes through a number of towns including Daingean, Tullamore and Naas. These urban centres are dominated by a residential and industrial landscape, the nature and extent of which have been influenced greatly by the construction of the canal. The canal promoted the commercialisation and industrialisation of these areas during the late eighteenth/nineteenth centuries and found physical expression in the warehouses, as well as the many houses which were built by the prosperous merchant class. Though many of these features have since disappeared, a number are still visible in today's landscape and serve as a reminder of the heritage of the canal.

2. HISTORICAL BACKGROUND

For the purpose of this report, the various construction phases of the Grand Canal have been dealt with separately and accordingly, these have been assigned individual historical background (HB) numbers. In order to contextualise these construction phases, brief overviews of the years preceding this work as well as the construction techniques adopted during the execution of the navigation, are presented below.

Table 2.1: Historical Background Areas.

Historical Background Number (Figure No.)	Historical Background Area
HB01	Roberstown to James's Street Harbour
HB02	Lowtown to Tullamore
HB03	Tullamore to Shannon Harbour
HB04	Blackwood Feeder
HB05	Naas Branch
HB06	Kilbeggan Line
HB07	Circular Line

In addition, an economic overview of the Grand Canal, comprising the Grand Canal Barrow Line and Barrow Navigation, is provided following the accounts of the various construction phases (HB01-HB07). This effectively allows the subject of the canal to be examined against the backdrop of its economic success, subsequent decline and present day circumstances.

Early Years

In 1715, Act 2 Geo I, c 12 (Ir) was passed in an attempt '*to encourage the draining and improving of the bogs and unprofitable low grounds, and for easing and dispatching the inland carriage and conveyance of goods from one part to another within this kingdom*'.¹ In effect, this act authorised extensive navigation schemes throughout Ireland, at public expense. One of the main objectives was to link Dublin with the rivers Shannon and Barrow and during the 1720s an attempt was made to make the River Liffey navigable in order to achieve this. This endeavour was a complete failure however, and a costly one at that; as the scheme had been financed by private subscription, the collapse of the company served as a distinct disincentive to private investors regarding navigational projects from then on. In turn, the government was consequently forced to partake in the administration and financing of future navigation schemes for the foreseeable future.

Each navigational improvement and construction was to be in the hands of a body of commissioners. However, little work was achieved and an Act of 1721 revised the appointment of commissioners, henceforth to be Members of the Parliament and Justices of the Peace in the counties where the works were undertaken.² This was again altered under an Act in 1729 to a group of commissioners for each province and the same act empowered parliament to collect dues on certain luxury items and to disburse these monies on navigation projects. This act led to the construction of the Newry Canal and the initiation of the Coal Island Canal.

By 1751, complete centralisation had been achieved with the establishment of the 'The Corporation for Promoting and Carrying on an Inland Navigation in Ireland', a group more commonly known as the Commissioners of Inland Navigation. Recognising Ireland's need for an extensive network system to encourage trade during this ever-increasing industrial era, this group was responsible for setting the wheel in motion and thus began the real era of canal construction in Ireland.

In 1755 £20,000 was allocated to the Navigation Board towards the cost of navigation from Dublin to the River Shannon. Two routes were considered and surveys were subsequently undertaken. The more northern route of the two was to begin at the northwest end of Dublin and to pass through Castleknock to the Rye water at Kilcock and from there to join the rivers Blackwater, Boyne, Deal, Yellow and, through Lough Derravaragh, the rivers Inny and Camlin from where it would enter the River Shannon. This line was surveyed by Thomas Williams and John Cooley between 14 August 1755 and 16 January 1756³, whilst the more southerly route was surveyed by Thomas Omer at an unknown, but most likely similar date. The southern line proposed to begin at the city basin and proceed on the south side of the River Liffey to join the River Barrow and the River Brosna from where it would enter the River Shannon. Huge controversy ensued concerning which route would be the most advantageous. The northern line, which had at this point become known as the 'Royal Canal', had the disadvantage of passing through a large lake and of entering the Shannon in the middle of Lough Ree where the absence of towpaths would cause problems. On the other hand, the southern route, now referred to as the 'Grand Canal', was faced with the challenge of executing the canal through the Bog of Allen. Eventually it was agreed that the southern line should be adopted. For the time being at least all notions concerning the northern line were cast aside. These were subsequently revived and put to use by the Royal Canal Company in 1790.

¹ Quoted in Clarke 1992, 13

² Paget-Tomlinson 2006, 18

³ *Commons Journal Ireland* 17 February 1755, p. 370; quoted in Clarke 1992, 16

Omer was appointed head engineer of the Grand Canal scheme by the Commissioners of Inland Navigation and work began in 1756. The commencement of this huge project signalled the beginning of a new era in Ireland in terms of engineering, transportation and industrialisation.

Construction Techniques

For the most part private contractors were responsible for executing the construction works, although it was not until the early nineteenth century that large-scale contracting got underway. In the early years of canal construction, most of the work was carried out by small-scale local contractors, to whom the relevant overseeing company supplied all the building materials and work-men's tools, and transported these materials by boat to the works in hand. Mechanical excavators had not been invented in time to aid with the majority of canal construction, so an immense force of human labour was required. For example, during the year 1790, 3,944 men were reported as working on the Grand Canal, while some 2,000 men were reported as working on the Royal Canal, upon which work had commenced that year. This system of employing small-scale private contractors was challenged when the canal construction company 'Henry, Mullins and McMahon' was incorporated in 1808. Their success was unrivalled and they served as a real threat to smaller contractors.

A typical survey to be carried out prior to the construction of a canal is described by Charles Vallancey in his book which was first published in 1763.⁴ He states '*The ground should be frequently bored when the canal is to be dug in order to avoid if possible all bogs and rocks which exceedingly increase the expense of building the canal*'. He also recommended that cross-sections should be cut across the line of the canal at intervals so as to establish the type of soils that would be encountered during construction works. Subsequent to the proposed route having been surveyed, plans were drawn up concerning the details of features such as locks, lock-keeper's houses, bridges, aqueducts and sluices which were to be constructed along the route also. Canal construction techniques adopted in Ireland were influenced by continental, as well as British methods in many instances. We see this continental influence in features such as locks, whereby the lock chambers on early canals and river navigations of the 1750s tended to be both wide and long.⁵ Once the route had been set out, the next step involved commencing construction works. A supervising resident engineer was usually elected to oversee the running of this day-to-day work. Along with his assistants he would peg out the line of the cut, allotting sections to a number of canal contractors who would be commissioned to carry out the construction work.⁶

In order to make the canal watertight, puddle clay was used. This was a light loam or clay mixed with water, the principal of which was to impregnate the earth or clay so that it could hold no more water. Puddle was prepared by finely chopping loam, preferably mixed with coarse sand or gravel as a deterrent to rats, with a spade and mixing it with water to a semi-plastic state. It was then applied in 9" or 10" layers. This technique had been used prior to the canal age, by tanners to line their pits, and for the Dutch drainage works in the Fens.⁷ If the canal was dug out of permeable ground, both the sides and bed would have been lined with puddle, while if the canal was in a watertight bed, then only the banks thrown up above ground level necessitated sealing with what was called a puddle-ditch or puddle-gutter.⁸ In the banks, the puddle ditch was built up as the banks rose, the sides of the

⁴ Vallancey, Charles (1763) *A Treatise on Inland Navigation on the Art of Making Rivers Navigable, of Making Canals in all sorts of Soils and of Construction Locks and Sluices*. Dublin; quoted in Clarke 1992, 27

⁵ Rynne 2006, 345

⁶ Crowe, N. (1994) *English Heritage Book of Canals*. (London), pp. 25-6; quoted in Rynne 2006, 340

⁷ Paget-Tomlinson 2006, 35

⁸ Ibid.

ditch being lined with sods or spits of earth. The ditch was generally about three feet wide and went about a foot into the watertight layer to make a good seal.

As the canals often took many years to reach completion, a number of engineers and consultants were commonly involved in any one project, as will be exemplified by the following discussions on the various construction phases of the Barrow Line and Barrow Navigation/ Grand Canal/ Royal Canal.

HB01: Roberstown to James's Street Harbour

When construction work commenced on the Grand Canal in 1756, it signalled the beginning of a new era in Ireland in terms of engineering, transportation and industrialisation. Work commenced at Clondalkin and initially extended westwards under the supervision of Thomas Omer, who had been appointed head engineer of the scheme by the Commissioners of Inland Navigation.

According to Omer, the reason he had not begun work in Dublin was due to the long delays in assessing compensation for the land-owners⁹. In 1759, he reported that eight miles of canal had been completed from the Liffey near Sallins towards Dublin and that the works west of the Liffey were being carried out successfully. In 1763, he reported that three locks, six bridges and four lock-houses had been completed on the route from Clondalkin westwards. Work had still not commenced on the line towards Dublin as the land required was proving difficult to purchase. As a result, Omer reported that he was concentrating on finishing the canal from Clondalkin to the River Morrell, his first water supply.

In the meantime, Dublin Corporation had begun to express an interest in the canal as a possible source of water to supplement the Dodder supply to the city basin. Upon agreeing to provide the money necessary to purchase the land required to complete the canal from the River Morrell into the city, the commissioners authorised the corporation to take over construction of the canal.¹⁰ In 1766 the canal was reported ready to receive water from the river, although the city end of the canal was not yet finished. Optimism was short-lived however, as when the water was admitted the banks collapsed in some sections. The canal was subsequently emptied and repaired, but these efforts were unsuccessful and a second attempt to fill the canal was again met with failure. Resulting from these engineering difficulties, the corporation decided to appoint engineer John Trail to oversee the work. Omer does not seem to have played any significant part in the construction of the route from Clondalkin into Dublin.

During 1770, a group of noblemen and merchants came together to discuss the establishment of a private company which would oversee the completion of the canal. At this point the canal had not yet reached Dublin and there had been no progress of works westwards towards the River Shannon beyond the River Morrell. It had become increasingly obvious by this point that as soon as the Dublin Corporation had achieved its goal of obtaining Morrell water for the city basin, it was unlikely to actively invest in extending the canal to the west. The efforts of this group of men were successful and the Irish Parliament accepted their proposals. Consequently, on 2 June 1772, the Company of the Undertakers of the Grand Canal was incorporated.

All the '*powers, privileges, advantages and authorities*' of the Commissioners of Inland Navigation were transferred to the new company, which was authorised among other things to sell redundant water, to

⁹ Delany 1986, 76

¹⁰ *Calendar of Ancient Records of Dublin*, vol II, pp 170 & 265; Irish Commons Journal, 11 November 1763, VII, p 212; quoted in Delany 1995, 4

erect turnpikes and to charge tolls for freight not exceeding 3d (Ir) per ton per mile and fares of 2d (Ir) per mile for passengers.¹¹

Dublin Corporation were at first apprehensive in handing over the works to a private enterprise, fearing that they would lose the right to use the water. In the end however, they acknowledged the benefits to be reaped and insured their interests by agreeing to invest £10,000 which allowed them to play a role in the management of the company. The establishment of the Grand Canal Company was significant in that it was instrumental in the setting up of subsequent private companies which were responsible for taking over incomplete navigations.

The first meeting of the company took place in 105 Grafton Street on 18 July 1772 and dealt primarily with the financial situation of the company. The following meeting focused on the administrative system they would adopt and it was agreed that a secretary, pay clerk, store keeper and engineer should be appointed. John Trail subsequently agreed to enter into a contract to complete the canal from Sallins to Dublin, for which he would receive five per cent of all the money expended in carrying out the work. It was also decided that a court of forty-one directors would be elected annually; a committee of thirty-one would superintend the construction work. Two further committees were to superintend the accounts and stores.

By the time the company was incorporated, land had been purchased for the completion of the canal into the city. Finally on 15 April 1773, work began on this section of the canal signalled by the Lord Lieutenant Earl Harcourt, laying the foundation stone of the first lock at Inchicore. It wasn't long before the next controversy presented itself and much debate ensued concerning the location for the crossing of the River Liffey.

Two reports had been compiled in 1771; one prepared by Charles Vallancy, Engineer in Ordinary in Ireland since 1762, acting for the Commissioners of Inland Navigation, and a second by John Trail, who was at that time employed by the Dublin Corporation.¹² Trail favoured constructing an aqueduct, stating that Omer's plan of locking down into the River Liffey and back up again would create problems with water supplies. Vallancy agreed with this but suggested a more suitable location for the aqueduct would be found further upstream where there was a ford. Resulting from this debate and other unresolved matters, Redmond Morres acting on behalf of the company, asked John Smeaton to come to Ireland and advise them on these issues. Smeaton, who was at that time involved on the Forth and Clyde Canal project in Scotland, came over in 1773 and was accompanied by his assistant, William Jessop. Jessop was to become a renowned figure in Irish navigation schemes and acted as consultant engineer to the Grand Canal Company until 1802.

Smeaton arrived in September 1773 and spent 14 days inspecting the line with Jessop and Trail. His recommendations included reductions in the overall proportions of the canal, evidence of which is visible in the morphology of the eleventh, twelfth and thirteenth locks today, and a deviation taking the canal along the northern limit of the Bog of Allen towards Edenderry. He had criticised Omer's proposed route and system of drainage and suggested there were much cheaper ways of reclaiming bog. However, as is exemplified by the great difficulties encountered both during and subsequent to construction works through the bog, the adoption of Smeaton's advice in this instance was to have great repercussions for the company. With regard to the controversy surrounding the most suitable location for the crossing of the River Liffey, Smeaton advised that further investigation was necessary before an informed decision could be reached.

¹¹ Delany 1995, 6

¹² Vallancey, Charles, Report on the Grand Canal (Dublin, 1771); Trail, John, Report on the Grand Canal (Dublin, 1771); both these reports help to determine the amount of work carried out before 1771; quoted in Delany 1995, 9

Eventually the Liffey debate was resolved and early 1776 the directors advertised for proposals to construct an aqueduct over the Liffey and to continue the canal west of the river with two locks and several bridges. In 1780 then, Vallancy's plan for the crossing of the River Liffey materialised and his proposed site was used for its construction.

Prior to this however, many problems were still presenting themselves. Although initially Trail had been making good progress, the company's confidence in him had begun to waiver. He complained that he was not receiving sufficient amounts of money to pay for the required labour, and also brought their attention to the difficulties he was encountering with the assemblage of the Ballyfermot lock. He reported he had been unable to supervise the work '*for my being confin'd by a very severe and painful disorder*' but that consequently he had issued instructions to be carried out.¹³ Evidently, this had not been adequate for when the lock was inspected by the company it was ordered that a whole side of the lock be taken down and rebuilt. Trail's plight was then worsened in December of the same year when he published a notice of auction of stores at the Grand Canal storeyard without the board's sanction. The company issued a notice cancelling the auction and heated exchanges prevailed. Essentially, this provided the catalyst which provoked Trail to hand in his resignation on January 9 1777, stating:

'Gentlemen,

Pursuant to articles entered into between you and me, I will on Tuesday the 21st instant January at eleven o' clock in the forenoon, attend on the Grand Canal at Sallins Bridge near the River Liffey in the County of Kildare, and from thence proceed to, and put you or such persons as you shall authorise to receiveth the same into the possession of said canal, locks, bridges, houses and storeyards, and all appurtenances thereunto belonging, and from said day I will consider myself free from any charge or risqué attending said several works, and my contracts with you, on my part fully and faithfully completed of which you as a corporation, and every person concerned are desired to take notice.

I am a gentleman your very humble servant,

John Trail' ¹⁴

On the morning of 21 January a meeting was held and attended by eight directors, Trail, Captain Tarrant, who was set to succeed Trail and other men 'of knowledge in masonry, carpentry and smithwork'. During this assembly Trail was informed by the directors that the canal from the Morrell sluice house to the city basin had not been completed to their satisfaction. To this Trail defiantly declared that he would not 'take any further charge or risqué of the said works'. The directors refused to accept that the terms of Trail's contract had been fulfilled and issued a suit against him. Contemporary records show that Trail was consequently arrested on 16 September by a Benjamin Matthews who was paid £5 5s for doing so. Surprisingly nonetheless, Trail's reputation doesn't appear to have been permanently tarnished as he was later knighted for work carried out for the Dublin Corporation.

Work progressed well under the newly-appointed Tarrant and on 2 February 1779, the canal was opened to traffic from St. James's Harbour in Dublin city to Sallins. To mark the occasion, it was decided to offer a low toll to the first seven boats to operate on the canal; 1d per ton per mile and ¼d per lock. Thereafter the charge payable was 2d per ton per mile and ½d per lock. Trade on the canal increased rapidly and goods such as stone, clay, coal and dung were transported daily. Trade was further encouraged in 1783 when the charge for lockage was abandoned and tolls for freight were

¹³ Quoted in Delany 1995, 15

¹⁴ Ibid. 17

reduced to 1½d per ton per mile with a special rate of ½d per ton per mile on lime, limestone, turf, building materials, gravel, soil and dung. By 1780 passenger boats had begun to use the canal also and commuted between Osberstown and Dublin, leaving Dublin at 6am every Monday and Thursday and returning every Tuesday and Friday. This service was obviously met some success and in 1784, upon completion of the canal to Roberstown, the service was extended to this point.

The harbour being used in Dublin city at the time was St. James' Street Harbour. This had been completed by the 1780s and was the original Dublin terminus of the Grand Canal. By the 1830s, an extensive range of buildings (now mostly demolished) had grown up around the city basin, including the city building and houses for company officials and key tradesmen, stores, stables, dry docks and fitting and harness-makers' shops. Also located here was the municipal water storage reservoir of Dublin Corporation which the canal company had agreed to supply with water in 1772, commencing service in 1777. Although successful, this harbour did not link up with the River Liffey and ambitious plans for the construction of a canal which would join the Grand to the river began to materialise in the early 1780s. The area was surveyed by Chapman, and the route of a canal which would become known as the Circular Line was chosen.

HB02: Lowtown to Tullamore

The construction of the Shannon Line was undertaken in a bid to link the River Shannon with Dublin as well as with the River Barrow. By 1789 work on the Grand Canal had reached westwards as far as Lowtown and southwards to between Monasterevin and Athy. With work on the Barrow line forging ahead, the directors decided to turn their attentions to the westward extension of the canal from Lowtown towards Shannon Harbour, where it was planned it would meet the River Shannon.

This same year plans for a 'Royal Canal', for which surveys had been carried out in the 1750s, resurfaced. Acknowledging the inevitable threat that would be posed by this rival company, the Grand Canal Company suggested that the Royal Canal should commence at Kinnegad, about ten miles north of Edenderry, and share a common trunk of canal with the company from the midlands to Dublin. In effect this would have saved a huge amount of time and money, and consequently would have served both companies beneficially. Their suggestion was rejected nonetheless, resulting in the creation of two entirely separate canal companies which were inevitably set to challenge each other's success.

On the back of this rejection, the Grand Canal Company set about commencing construction of the Shannon branch. Their determination to establish a superior line without delay had been further fuelled by this refusal. The first difficulty encountered along this line was the execution of the canal through the Bog of Allen. By this stage the Barrow Line had already met with this challenge which, coupled with additional imperfect engineering techniques, had necessitated the building of an entire new stretch of canal through the bog. Many suggestions regarding how to tackle this challenge were soon voiced. Thomas Omer's plans of drainage channels through the Bog of Allen were dismissed, resulting in the adoption of John Smeaton's suggested route along the northern edge of the bog. During the same period William Chapman was asked by the directors to carry out a survey of a line from Lowtown to Ticknevin, with an extension to Kinnegad. As is evident when one studies the route of the Grand Canal, the latter proposal was never undertaken. When considering construction methods through the bog, Chapman disagreed with Smeaton's opinion that it was unnecessary to drain the line of canal first:

'The declining surface of a bog arises not from want of cohesion but from the greater desiccation of its boundaries and from its small degree of permeability to water with which the interior part is surcharged and swoln up like a sponge, which of course

*occasions its convexity – the great point therefore undoubtedly is, to have the level of the canal sufficiently below the surface to allow for the desiccation and consequent subsidence of the bog, and what that subsidence should be in all cases, I conceive no difficult matter to be ascertained which when done would be the Acquisition of one of the greatest desiderata in the science of canals’.*¹⁵

In any case, Smeaton’s plans were put into action and the canal was constructed at the same level as the existing surface of the bog without allowing for a period of drainage. The result of which was that the land on either side drained into the canal and subsided, leaving the canal bounded on either side by great embankments; these were to prove a constant source of trouble in subsequent years. During the year 1790 William Jessop came to Ireland to inspect progress of the works. His recommendations included the following: no centre drain was to be made but two drains were to be cut on either side of the centre line about two perches from it, similar drains were to be made at 8 and 50 perches, and where the bog was very wet, transverse openings would be necessary. The drains were to be gradually deepened and widened and the outer edges of the two perch drains were to ultimately form the verge of the canal. These drains were to be deepened by degrees leaving a central pyramidal core which prevented the bottom from swelling up until the canal was ready to receive water and then the core was to be removed.

In Bernard and Mullins’, M. B. paper ‘The Origin and Reclamation of Peat Bog with some Observations on the Construction of Roads, Railways and Canals in Bog’, their criticism of the adoption of Smeaton’s advice is clearly evident. They state that the line chosen was through the centre of a deep basin

*‘the lowest tap practicable being fifteen feet above the adjacent river, the Boyne.....That which was expected to be an unusually cheap reach of canal in shallow cutting ended, after several years of unremitting labour and enormous expence, in the formation of a bank on either side, 45ft high for a distance of 80 perches, so that the canal with the carrying up of its sides and bottom to the required level, containing 6ft of water, was in the centre of a high embankment, having a base of fully 400ft.’*¹⁶

The same paper went on to explain how ramparts, about 4 perches square, were constructed from the material excavated from the drains and transverse drains. When this material had dried out wheelbarrows were used to transport the material to the embankments where it was firmly trampled and new ramparts were created as the drains were deepened. When the canal was ready to be filled with water, huge quantities of clay were subsequently transported by boats to line the bottom and sides of the canal, to sole the trackways and to cover the whole surface of the banks to give them weight and strength. It’s likely this clay was transported from the Hill of Downings.

During the summer of 1792 Jessop again visited Ireland to inspect the works. He warned against the premature removal of the core, a technique which seems to have been working satisfactorily, but reported that ‘*in general the works are doing well*’.¹⁷ At this time Captain William Evans was the engineer in charge and he was assisted by a young surveyor, John Killaly, who joined the company in 1794. It wasn’t long before Killaly proved his capabilities and in 1796 the directors of the company stated that he had become the ‘*complete superintendent of all kinds of work*’.¹⁸ Two years later he became the company’s engineer at a salary of £400 per annum. Even though operations were headed by this renowned man, efforts to successfully construct the canal through the bog continued to prove

¹⁵ Quoted in Delany 1986, 84

¹⁶ Quoted in Delany 1995, 35

¹⁷ Ibid. 36

¹⁸ Ibid.

problematic. By the winter of 1795-6 they were still struggling to complete this five mile stretch, although in the early stages of 1796 water had been admitted to the canal from Lowtown to the 20th lock at Ticknevin. The following report written by Evans conveys the hardship endured by the labourers during construction efforts here:

*'The Edenberry Bog has again got into a bad state since the rain, and that what we do have done latterly has been of little use, as the bog has sunk, cracked and given way as formerly, so much that I conceive it lost labour to persevere in wheeling bog stuff on the bad parts as when top weight is added, the bottom gives way.'*¹⁹

In response to this report Jessop advised that a wall of clay should be built some distance from the canal to prevent the embankments being pressed outwards. He stated that 3ft of water should be admitted into the canal and that clay should be boated to the site where a 'rib of clay' should be constructed on both sides about 50ft from the verge of the canal. He advised that trenches should be cut in lengths of a few yards so as to allow the wall of clay to sink down to the bottom of the bog, and that these walls should be 3yd thick at the base and gradually be reduced and allowed to lean towards the canal to counteract the bog pressing outwards. Unfortunately this was not the most helpful advice as once implemented, it caused more trouble than good. Instead of sinking the wall of clay down to firm ground, it was built resting on the crust of the bog which cracked with its weight causing the ground to split. This consequently made the embankments crack. Nonetheless, fifty Irish guineas were awarded to Jessop as recognition for his continuing contribution to the canal construction efforts. This gave Jessop a total of £346 18s 9d for that year.

The following year, 1797, the canal was opened to Philipstown (Daingean). In August however, a breach occurred where Jessop's wall of clay was under construction. Two months were spent repairing this breach. One of the director's, Richard Griffith, made his feelings over the matter known to Jessop when he wrote him the following:

*'I am therefore to acquaint you that I was convinced and am now still more so by the event, that you were entirely wrong on that occasion, and I am persuaded that if you had seen the state of the bog you would not have decided as you did.'*²⁰

Griffith surmised that the breach was the result of four causes; the lack of lining in the canal, the fluid state of the banks, the want of attention to the back drains and also the erection of a wall on the south bank which caused cracks and fissures in the banks of the canal. The latter factor was considered by Griffith to have been the primary cause of the breaching.

Even though faced with these criticisms, Jessop defended his actions and declared that he still considered the wall of clay the best means of securing the bank, although he did suggest that it should be moved to a distance of 75ft from the edge of the canal and should be constructed in such a way that the gaps between each section would be filled in gradually so as to create a complete wall. He advised that clay should be thrown into the canal wherever it had a tendency to rise as this would help the water to stop seeping into the banks, and also warned that the back drains should be kept open as effectively as possible. Griffith had made it clear that he felt the wall of clay should be abandoned and that the canal should be lined with clay and a mixture of clay and bog material added to the banks on a very broad base. Perhaps the adoption of his advice should have been given more consideration than it was as further difficulties with Jessop's wall of clay were to arise.

¹⁹ Quoted in Delany 1986, 85

²⁰ Quoted in Delany 1995, 38

Finally in 1798 the canal was opened to Tullamore and passengers as well as goods were enabled to be transported from here to James's Street Harbour in Dublin. Evans suggested that a harbour be built here until the line was extended to the Shannon, and this was subsequently undertaken. Unfortunately, the year 1800 commenced with problems relating to the original breach in Jessop's clay wall, and the controversy flared up again. John Killaly was in charge of the repairs and he reported that he was filling in deep and numerous cracks and trampling and settling the bottom of the canal. He proposed wheeling up bog material from the bottom of the canal, which he felt was too deep, and intended to place a layer of clay on top of this instead. It took many months to fix the breaching but Killaly continued to support Jessop's idea of a clay wall. Griffith, who had made it clear he felt the wall was impractical, tried to halt its construction and again implied that Jessop should admit he had made a mistake. By this time Killaly had admitted that the wall had served as the immediate cause of the breach. In response he had increased the inner slopes of the canal and raised the bottom with large quantities of clay, which subsequently led to him reporting that the embankments were in an apparently secure state. Upon receiving this report Jessop acknowledged his errors and wrote '*... I feel myself no longer inclined to advise it until further symptoms may make its security, in its present state doubtful...*'.²¹ The infamous wall of clay was abandoned and aside from some minor difficulties, the canal remained staunch for many years.

The Grand Canal passes within a mile to the south of Edenderry Town and as early as 1768 a section of canal was being planned to link Edenberry to the canal system. Work on this section commenced in 1797 financed by Lord Downshire and in 1802 the short branch of canal to the town of Edenderry was complete.

HB03: Tullamore to Shannon Harbour

With the construction of the canal slowly extending towards Tullamore, consideration began to be given over to the stretch from Tullamore to the Shannon. During the early 1790s a number of surveys were undertaken.

These surveys created three viable options: the first included erecting a lock which would provide access down into the river Brosna, the second comprised constructing a canal alongside the Brosna, while the third option was to continue the canal on the same level to the south, with the possibility of an extension to Birr and to lock down steeply into the Shannon at Banagher.

In June 1801 the second option of constructing a canal alongside the River Brosna was agreed upon. The entire stretch comprised twenty-two miles, eight of which were through bog. Jessop was asked to visit and inspect the line as had been laid out by John Killaly, head engineer for the company at this time. He reported that the line had been very astutely planned, although he felt Killaly's estimated costs which amounted to £89,731 were rather high. As it turned out the final costs amounted to £146,276. Much of this unexpected expenditure was due to unforeseen difficulties which subsequently arose, as will be discussed further on.²²

As the Bog of Allen had been tackled by canal constructors prior to the commencement of works on the Tullamore to Shannon section, valuable experience had been gained. Extensive drainage works were carried out over a number of years on wet landscapes and the land was allowed to subside before any excavation of the canal was attempted. When these drainage works began, twenty-one contractors were engaged to carry out the remaining earthworks. The price varied from £3 to £12 per

²¹ Quoted in Delany 1995, 41; 1986 85

²² Delany 1995, 43

perch according to the difficulty of the terrain. As work forged ahead to complete the line, over 3,000 men were employed on the scheme. Problems arose however, resulting from the poor wages that were being paid to the construction workers. When Irish wages were viewed in the context of their English counterparts it was hardly surprising that Irish labourers felt hard done by; in England canal construction workers were being paid twice as much. As a result, many Irish men set off for England and contributed greatly to the construction of her navigations. These men became commonly known as 'Irish navvies'.

All of the masonry work for the Tullamore to Shannon section of canal had been taken on by a Michael Hayes who undertook to complete the work before September 1803; the period when it was envisioned the canal would be opened to Shannon Harbour.²³ This undertaking carried a penalty clause of £2,000. Resulting from the controversy surrounding the level of wages being paid to the workers, Mr Hayes was forced to raise the pay of all his workers, thus requiring him to seek an increase in his contract price from the board. The directors granted him the increase and offered him a bonus of 500 guineas if the work was completed by November 1803.

The foundation stone of the last lock was laid in the summer of 1802 at Shannon Harbour. The two locks here which give access from the harbour to the River Shannon were made 80ft by 16ft by 6ft to conform to the locks on the Shannon Navigation. During the severe winter months of 1803 very little work was able to be undertaken and hot lime was used to make the masonry set more quickly. Nonetheless, Griffith reported the same year that he anticipated all the earthworks to be finished by August and, although some of the stonework would still have to be completed, that the water could be admitted in September and the canal opened to traffic on 1 October 1803. He recommended also that work should commence on Shannon Harbour itself stating:

'You have terminated your canal in a wild and unfrequented situation to which it is useless to try to open a navigation unless you provide shelter at the same time for men and merchandise'.²⁴

Griffith was successful in his endeavour and work soon began on Shannon Harbour. In 1804 he instigated further works when he recommended the construction of additional stores at Shannon Harbour, a number of which were built.²⁵ Prior to the arrival of the canal, Shannon Harbour had comprised a relatively uninhabited, peaceful area. This soon changed however after it was chosen as the terminus for the Grand Canal, where the navigation would meet the River Shannon. It was constructed as a purpose-built village to accommodate the needs of the canal and as a result the village boasted 'a bonded warehouse, a customs and excise post, a large Royal Irish Constabulary barracks complete with holding cells, the Harbour Masters house, boat and barge repair dockyard and dry-docks, a small school, several taverns, a smithy and livery, many cottages and the standard Grand Hotel'.²⁶

Griffith was also responsible for organising the extravagant ceremony proposed for the opening of the canal from Tullamore to Shannon Harbour. He drew up a memorandum of suggestions for the occasion which were subsequently accepted by the board. Consequently, large numbers of distinguished guests were to be brought from Shannon Harbour in a fleet of passenger boats, four trade boats were to be loaded up with symbolic cargoes in Dublin, Athy and Killaloe; on the north Shannon and it was arranged that these would converge on Shannon Harbour at the appropriate time. A military band was also to play and the usual military salute was arranged by the artillery. The

²³ Ibid.

²⁴ Quoted in Delany 1995, 46

²⁵ Delany 1995, 71

²⁶ Quoted from <http://shr.iwai.ie/history.html>

passenger boats intended to leave Dublin on Sunday morning on the 9th October and travel to Tullamore that day where the guests were to spend the night in the company's hotel. From here they were to travel onto Shannon Harbour the following morning.²⁷

However, this grand exhibition never materialised, its cancellation caused by low water levels in the canal. Griffith blamed the dry summer which had just prevailed but in fact some of the levels were leaking badly and further work was required to staunch them. After a number of postponements, it was finally resolved by the board that the boats prepared for this stretch of canal '*be no longer detained but be allowed to proceed on their usual duties and business*'.²⁸ It was not until 1804 that the first trade boat arrived in Shannon Harbour from Dublin. In an effort to mark the event the crew, along with Patrick Killeen master of the boat the *Ranger*, were presented with a suit of clothes each.

Prior to this occasion, a number of problems had had to be resolved. The Rahan level had had to be drained again and new efforts made to staunch it. Killaly stated that fifty perches had to be lined with 2ft 6in of well-puddled clay laid on furze. The floor of the furze was laid 70ft wide extending 10ft under the foot of the banks on both sides of the canal. It was subsequently realised that a similar lining of puddled clay was required for the Glyn and Belmont levels. In their report to the shareholders during February 1804 the board reported that part of the canal had been found to pass through a 'rotten quarry' and that although great care had been taken in lining the canal, the water had passed through swallow holes into subterranean passages connecting the bogland. The canal continued to give trouble and Killaly had to oversee the draining and re-puddling of the Ballycowan and Rahan levels twice more. It was not therefore, until the end of May 1805 that the link with the Shannon was permanently secured. When this had been achieved the way was made clear for the company to really begin consolidating their position in the transport industry of the early nineteenth century.

HB04: Blackwood Feeder

The Blackwood feeder, also known as Ballynafagh Lake, comprises a feeder and a reservoir built near to the head waters of what was then known as the Clashaghbane River, now the Slate River, about 2.5km northwest of Prosperous, Co. Kildare. Construction of this feeder resulted from a proposal made by Chief Baron Burgh in 1783 to create a reservoir, which would provide a reserve supply of water for the Grand Canal, and open a cut from the Bog of Donore to the Grand Canal at Moods to help alleviate distress of the poor.²⁹

The canal stretched for 8 Km and accommodated the transport of water from the lake to the main line of the Grand Canal near Bonynges or Healy's Bridge. The line of the feeder from Healy's Bridge along the north edge of Moods Bog is very close to the original line of the Grand Canal which had been proposed by Thomas Omer.³⁰

Below the sluices, at the outfall of the reservoir, was a small basin of about 150m x 50m. A further 1km of canal was built out to the west which then turns south for a short distance. There is evidence in the field patterns that an alternate route for the feeder was considered. According to land plans of the feeder from 1798, it seems that some work may have actually taken place on this alternate route³¹.

Contemporary maps of the area illustrate the extent of boggy terrain within the vicinity of the feeder. Richard Griffith, engineer to the Grand Canal Company at this time, wanted to use the canal to drain

²⁷ Delany 1995, 47

²⁸ Ibid.

²⁹ Information taken from <http://www.kelt.ie/waterwaysnet/blackwood-feeder-history.asp>

³⁰ Information taken from <http://www.kelt.ie/waterwaysnet/blackwood-feeder-history.asp>

³¹ Information taken from <http://www.kelt.ie/waterwaysnet/blackwood-feeder-history.asp>

water from the bog in an attempt to create land that was more agriculturally productive³². He proposed two lines in 1810; one going from the western edge of the reservoir north towards Hodgestown for about 2km and another running from the southern corner of the reservoir south for a short distance, then east for about 2km and finally running northeast towards Kilmurry for about 3km. However, these routes were never adopted.

For many years the feeder was used to draw turf from the surrounding bogs into Dublin. A small field at the end of the western arm of the canal is believed to have been used by the local turf cutters to stack the turf prior to transportation to Dublin. Harold's Cross in Dublin, which is still operating, is one such depot that was used to receive this turf. As well as providing a transport route for goods, the Blackwood feeder was also used as an important fishing resource for the local population. Diets were supplemented by netting fish in the canal. When smaller fish were caught they were reported to have frequently been transported into the reservoir to allow them to grow before being re-caught.

For most of the operational life of the feeder the sluices, which controlled the level of water allowed into the canal, were operated by the Lynch family. They were provided with a cottage and given rights of grazing to parts of the canal banks and some adjacent fields as part of their terms of agreement. In 1952, the feeder, reservoir and associated lands were handed over to the Kildare County Council and the navigation was closed to traffic. The feeder was drained and its fate was sealed by the construction of some low level bridges. The last boat to have travelled on the feeder before it closed was the 111B, belonging to a local man Joe Kane.

HB05: Naas Branch

Construction of the Naas canal had been under consideration for many years and in 1782, Richard Evans, acting on behalf of the Grand Canal Company, carried out a survey to determine the most suitable route for its construction.

A plan was produced and comprised three locks. However, the company failed to take any action and the responsibility for overseeing the materialisation of the proposed canal was ultimately taken on by a group of local landowners. Their efforts were successful and in 1786 an Act was passed to set up the County of Kildare Canal Company. This company was empowered to construct a canal from the Grand Canal near Sallins via Naas towards Kilcullen.³³ With William Chapman employed as the engineer, work forged ahead and by 1788 works had reached Oldtown. This accomplishment was marked by celebrations and in relation to the event the *Dublin Evening Post* reported the following:

*'This day was opened the new County of Kildare Canal. His Grace the Duke of Leinster and the other gentlemen of the company were assembled this morning on board the Milecent packet, where an excellent breakfast, music etc., were provided. They proceeded with streamers flying, and the discharge of several pieces, from Sallins, up their own line through the Leinster and Wolfe locks etc. On entering the new line, they were received with loud and repeated acclamations; and as soon as they entered the Leinster Lock, the populace seized the line, and drew them in triumph to the excavation of the third lock at Old Town.'*³⁴

This celebratory climate was short-lived however as by the time the canal had reached Naas the following year, the company had ran itself into serious debt. The total cost of the works amounted to

³² Information taken from <http://www.kelt.ie/waterwaysnet/blackwood-feeder-history.asp>

³³ 26 Geo III, c 60 (Ir), 1786; Delany, p 52-3; quoted in Delany 1995, 58

³⁴ *Dublin Evening Post*, 8 March 1788; Meagher, Niall, 'The Naas Branch of the Grand Canal', *Canaliana* (1971); Costello, Con, 'The Corbally Line', *Canaliana* (1967); quoted in Delany 1995, 58

£10,477 and despite the company receiving a loan from the government the debt still stood at over £4,500 by 1792.³⁵

This debt forced the company into liquidation and in 1808 the Grand Canal Company purchased the canal through the Court of Chancery for the mere sum of £2,250.³⁶ Resulting from this changeover, repairs and improvements of the navigation were carried out and included the demolition of three early 'skew' bridges which had been designed by William Chapman. These bridges were significant as Chapman had been instructed not to alter in any way the line of the roads which meant he had to cross the canal at an angle. This naturally presented problems in terms of designing the courses of the stonework.

In addressing this problem, Chapman decided to build skew humpbacked bridges. This technique had been used by the Romans, but it was the first time it had been used in this part of the world. Chapman's technique became known as the helicoidal or 'English' method of skew arch construction, and became the standard means of building masonry skew arches.³⁷ Unfortunately, these bridges were lower than the Grand Canal ones and did not have towpaths under them which caused the Grand Canal Company to demolish them and rebuild new ones. In addition to this, the company also set about continuing the line to Corbally which required a further five and three-quarter miles of canal. It was at this time that David Henry, Bernard Mullins and John McMahon first joined together and they tendered for the job for which they were successful in obtaining. This marked the beginning of an ambitious partnership, the incorporation of which was responsible for contributing greatly to Irish navigation schemes of the nineteenth century. Work was completed on this line in 1810 and amounted to a cost of £20,291³⁸. It had been intended to continue the line through Kilcullen and Baltinglass into Co. Wicklow, for which Killaly had undertaken a survey, but no further action was ever taken to implement this proposal.

The Naas branch was never as successful as had been anticipated in terms of goods or passenger transportation. The Grand Canal had extended their passenger boat services to Naas in the 1790s but it did not prove profitable. This led the directors in 1811 to subsidise a service operated by Benjamin Lister. Again however, this endeavour failed as Lister withdrew his service after a year, citing the subsidy of £1 10s per week as insufficient to maintain such an operation.

In terms of the transportation of trade goods, canal companies were not permitted to carry on their own canals; goods were only allowed to be transported by private contractors. This changed in 1845 when legislation was passed which enabled canal companies to operate within this field. Faced with the ever-increasing threat of the railway network system, the Grand Canal Company decided in 1849 to try and establish themselves as successful traders on the canal in order to increase profitability for the company. Kilbeggan and Naas were chosen as the locations to initially assess the viability of such a scheme. Naas was chosen primarily due to the fact that John Daly of Sallins, the only trader to Naas, had announced his intention of withdrawing his service as he was operating at a loss.³⁹ The year prior to this another trader by the name of Mr Harrington, 'an extensive malster', had also ceased to trade on the canal. This served to further fuel ambitions of the company to make a success out of the goods carrying operation.

This trading experiment was not hugely successful. Following the trials undertaken at both Naas and Kilbeggan the Grand Canal Company did go on to extend the scheme to the River Shannon. However

³⁵ Delany Ibid.

³⁶ Ibid.

³⁷ Schofield 1989 *op. cit*; quoted in Rynne 2006, 353

³⁸ Delany 1995, 59

³⁹ Ibid. 171

this act was mainly carried out in response to the threat posed by the rival Royal Canal Company which challenged the amount of traffic being carried by the Grand Canal; it was not necessarily a reflection of success of the scheme.

The Naas line was closed to navigation in 1961 and although not as successful as had originally been envisioned, this section of canal was instrumental in increasing the importance of Naas as a market centre throughout the nineteenth, as well as part of the twentieth century. Under the care of *Dúchas* (The Heritage Service) the line was restored in 1987. Today the line is under the responsibility of Waterways Ireland which is now under the remit of the Department of Community Rural and Gaeltacht Affairs in the south and the Department of Culture Arts and Leisure in the North.

HB06: Kilbeggan Line

The Kilbeggan Line was constructed from 1830-35. The canal was 8 miles long and although it included no locks, it proved quite difficult to construct because of problems with the embankments. The line eventually became workable and remained in use until 1961 when the end was dammed and the canal was allowed to dry out.

Originally, a canal to Kilbeggan was proposed in 1796 by a group of local gentlemen who approached the Grand Canal Company. At this time, however, the Canal Company did not feel it could justify undertaking the construction, and the proposal went no further. In 1806, Gustavus Lambert again suggested constructing a narrow canal. The Grand Canal directors saw the benefit of the line and stated that they would be willing to pay the difference between building a narrow canal and building one that would conform to the existing line. The project was not pursued until 1827, when the Grand Canal Company's success in securing other loans encouraged the board to apply for a new loan to finance the Kilbeggan branch of the canal.

The loan was initially approved. However, the Royal Canal Company objected on the grounds that the branch would interfere with their established trade. On these grounds, the loan was withdrawn and negotiations began. The loan was again authorised in December 1828 and the Company accepted William Dargan's tender of £12,850 to complete the canal in one year. Dargan had just taken over the contract to complete the Ulster Canal and he went on to work for the railway companies and played an active part in setting up transport companies. In the summer of 1830, work began on the Kilbeggan branch of the Grand Canal.

During the course of the first year, John Stokes reviewed the work and criticized it for its methods of construction, particularly on the embankment and the aqueduct over the Silver River. He did not feel that this particular structure would be strong enough. The directors took little heed of his statements and said that it was the responsibility of the contractor to provide a staunch navigation system.

By August of 1831, Dargan reported that the canal was nearing completion except for the harbour which had not been included in the original contract. Water was not let into the canal until the end of the following year which caused the Silver River embankment to leak so badly that Dargan had to reline it with additional clay. In December of 1832, an advertisement appeared stating that the Canal Company was requesting proposals from competent persons to complete the canal. Dargan was upset, but the directors assured him that it had not been printed by them and that it was a forgery. Dargan insisted he had built the canal to the specifications provided to him by Killaly but said that he could strengthen it for a fair price. As he had contracts in other places, he wanted the work completed quickly. This was not to be, however, as he continued to try to staunch the embankment without success throughout 1833.

A deputation of directors visited the canal and found it *“very defective in depth, trackways and staunchness, and other respects”*.⁴⁰ They informed Dargan that they would not accept the canal in such condition and in March of 1834 reminded him that the original date of completion had been May 1831 and that legal proceedings would be started against him if the canal was not completed by April. The canal continued to cause problems and Dargan was unable to successfully staunch the canal. The board finally agreed to accept the canal if Dargan would undertake to fix any defects which might arise for the next six months. Dargan agreed to this and the canal was opened to traffic on the first of January 1835. The line ran eight miles without locks from Ballycommon to Kilbeggan. Dargan requested to be paid an additional £5000 and after a long correspondence, the board agreed to £1000.

The problems with the branch were not over as trade boats were finding it very difficult to pass through the canal. In July, a boat drawing 4ft 6in was brought through to Kilbeggan with Dargan watching. The process took all day with a team of four horses and ten men, so Dargan was required to carry out further work. In August, he wrote to the company demanding the £4000 that he claimed he was owed and issued a writ for payment. The board issued a writ against him for breach of contract. A compromise was reached and Dargan accepted £2657 and was relieved of all further responsibility. The canal was removed from his charge 1 February 1836 and it proved little trouble in the subsequent years, with the exception of a tunnel collapsing in 1840 and some malicious breaches occurring in 1849.

The branch was not a particular success however, as it never carried a great deal of trade and rarely made a profit of more than £100 to put towards the repayment of the loan which totalled £14,000. Kilbeggan town increased in importance as a market centre as a result of the canal, despite the problems and minimal trade. In 1844, three canals became the subject of a complicated deal with the government: the Ballinasloe, Mountmellick and Kilbeggan branches. These canals were handed over to the canal company and the loans, which including interest amounted to £98,524, were commuted to £10,000.

Fly boat services had been introduced to Kilbeggan in 1838 with the extension of the Shannon Harbour service. This was withdrawn on 1st January 1848 however. Kilbeggan was subsequently chosen as an experimental branch in 1849, along with the Naas branch, to test the company carrying its own cargo. Although this trial only enjoyed measured success, it was followed by the extension of the service to the Shannon Line. This was primarily done in an attempt to increase the traffic being carried on the Grand line so as to meet the challenge being posed by the Royal Canal Company at the time.

The Kilbeggan line ceased to be used in approximately 1940 and it was officially closed to traffic in 1961. At this time it was sealed off and drained. In 1987, when the Naas line was restored, interest began to be taken in restoring the Kilbeggan line as well. Restoration was recommended and was carried out on the warehouses at Kilbeggan Harbour. The harbour was also cleaned out by the Office of Public Works. Today, like all sections of the Grand Canal, the Kilbeggan line is under the care of Waterways Ireland which is now under the remit of the Department of Community Rural and Gaeltacht Affairs in the south and the Department of Culture Arts and Leisure in the North.

HB07: Circular Line

Prior to the construction of the Circular Line, the Grand Canal terminated at St. James' Harbour which had been completed in the 1780s. A link with the River Liffey was necessary, and originally a plan surveyed by John Brownrigg which involved a series of locks into the Liffey from the harbour at St.

⁴⁰ Delany 1995, 97

James' Street was proposed. This was eventually abandoned and a more ambitious plan comprising the construction of 4 Miles of canal as far as Ringsend was adopted to link the canal with the river. The route was surveyed by William Chapman and consisted of seven locks.

Initially, when plans for this link were first proposed, there was some disagreement between the directors concerning the need to prioritise this section of canal. Some of the directors felt that the Barrow and Shannon Lines should be completed first. However, due to the efforts of John Macartney and Richard Griffith, work commenced on the proposed link in 1790. It is not surprising that Macartney supported the construction of this section of canal as he stood to gain by selling land along the route. Nonetheless there was logic in the decision: because the junction with the Liffey at Ringsend lay downstream of the low bridges on the river, it opened up the option to the company to develop extensive docks which in turn would enable ships to lock up into the basin and remain afloat at all tides.

Work progressed well under the appointed engineers, Rhodes and Oates. Richard Evans, who had been head engineer for the Grand Canal at the time, had recently been dismissed resulting from his continuing commitments to other navigation schemes which he refused to abandon. Consequently, his aforementioned assistants were assigned to oversee the Circular Line project. When Jessop visited Ireland during 1790, he inspected the works and recommended some small deviations in the line and in the positioning of the locks. He also drew attention to the fact that by constructing the entrance into the Liffey by the mouth of the River Dodder, problems of silting may be encountered.

Jessop was indeed right in his analysis as keeping the entrance clear proved a constant burden for the operation of the harbour. In 1839, the dockmaster reported that the bar was so bad that *'even those vessels of a moderate size cannot get into the docks'*.⁴¹ The continuing accumulation of the silt served to cause much controversy between the Grand Canal Company and the Corporation for Preserving and Improving the Port of Dublin known as Ballast Board as neither wanted to claim responsibility. The burden of carrying this maintenance work usually fell on the canal company however.

Whilst on the same visit, Jessop also recommended that the construction of floating and graving docks be undertaken by the company. Acting on this advice, the company petitioned to Parliament in 1791 for a grant to build docks which would be capable of accommodating 150 sea-going vessels. The government granted £22,000 in 4 per cent debentures and stipulated that the docks should be completed by 1 November 1795.⁴² Work subsequently commenced under William Chapman and finally, in 1796, the docks were ready to receive water. To mark the occasion, an official opening ceremony was planned for 23rd April. It was to be a lavish affair and the Lord Lieutenant, the Earl of Camden, was invited to perform the opening. It was reported that the ceremony was attended by over 1,000 guests and that an estimated 150,000 people witnessed the scene. DeLatocnaye, the well-known French traveller, was touring Ireland at the time and gave the following account of the event:

*'The viceroy's yacht was the first to pass the gates to the sound of volleys of cannon and when the centre of the dock was reached his lordship knighted, on the vessel, the contractor who had built and furnished part of the cost of this superb national work which completes on this side the junction of the canals with the sea. The viceroy was afterwards rowed from one end of the dock to the other in an elegant barge, followed and preceded by the acclamations of the people.'*⁴³

⁴¹ Delany 1995, 55

⁴² 31 Geo III, c 42 (Ir), 1791; quoted in Delany 1995, 52

⁴³ De Latocnaye 1917, pp. xxx

The completion of these docks was significant as they involved the earliest recorded use of steam engines in Ireland for draining civil engineering works. The docks were also the largest of their type anywhere in Britain or Ireland before 1800.

It is worth mentioning at this point the once-bustling Portobello complex, which comprised two harbours and two dry-docks. The level to Portobello without a lock was completed by the end of 1790. In 1805 the company decided to make this, instead of James's Street Harbour, the terminus for passage boats and to build a hotel here for the passengers. The tender for the construction of the hotel was won by Alexander Wilson and was ready to accommodate guests by July 1807. In the meantime a city basin had been built here in 1806 to supplement the water but this ceased to be used in 1870, and in 1883 the Artizan Dwelling Company built on this area. In 1912 some of the wharves and the disused harbour area were leased to the Waytes who established the firm A & B Taxis, Dublin's first ever taxi service. Armstrong Siddeley subsequently took over their premises and in 1935 they were allowed to sell their lease to Ever-Ready, a battery manufacturing company. This firm later extended its lease to occupy the remaining area, with the exception of the second harbour which was filled in by the Dublin Corporation during the 1990s to make a public car park.

Focusing back on the Ringsend Docks, in an effort to establish the harbour as a commercial centre, the company offered free use of the Collierstown quarries and toll-free travel for one year for the first twenty stores to be built. Essentially however, the docks were not a commercial success. They had cost the company £112,149, five times the parliamentary loan, and the Circular Line had cost £56,959, five times Chapman's original estimate. The graving-docks were quite successful, but trade in the basin was disappointing; a situation which wasn't helped by the problem of silting from the River Dodder which frequently restricted the size of vessels that could enter the docks. In 1812 the number of vessels reported to have used the basin was 453, but by the 1830s this number had fallen to an annual average of 200. This figure did rise again however and in the 1840s, the annual average of boats entering the basin was reported to be around 600, with a temporary increase caused by the famine relief ships in 1846-8. About 100 boats used the dry-docks each year and the total revenue from the whole concern amounted to about £1,000 per annum.⁴⁴

Efforts to persuade the government to take over the whole affair had been made as early as 1803. The company had been unsuccessful in their attempts though, and eventually the government decided to build the Custom House Docks on the north side of the River Liffey. Resulting from the limited success of the docks, the company resumed negotiations in 1850 seeking to lease them out. In November of the same year the board received an offer 'from certain parties of unquestionable respectability connected with the shipping interests of the Port of Dublin' to take a lease of Ringsend basin and graving-docks. The agreement arrived at in 1850 between the Grand Canal Company and the Dublin Dockyard Company, represented by Wight Pike and Fred Barrington, stipulated that the directors would receive an annual payment of £600 and would retain the smallest of the three sea locks and that the lessees would take over the rest of the concern with an undertaking to retain the rates and regulations in consultation with the canal company. The lease was negotiated for a thirty year period. During this time the dry-dock business was developed and many of the company's iron trade boats were built here. In the 1870s the number of boats entering the basin increased to an average of 800 boats a year, with over one hundred boats using the dry-docks. In the meantime the Ballast Board had been replaced by the Port and Docks Board and they carried out improvements to the port, including the construction of extensive new deep water quays. Evidently these efforts were not sufficient to promote the potential of the docks and the Dublin Dockyard Company found it increasingly difficult to run the concern economically. In 1870 they made an attempt to surrender the

⁴⁴ Thom's *Directory*, 1849-52. The number of boats entering the docks 1844-50; quoted in Delany 1995, 177

lease, but the Grand Canal Company refused to accept their termination and they were forced to fulfil the lease until 1881.

In 1863 the board had received a proposal from the Metropolitan Junction Railway Company to purchase the Circular Line. The directors replied that *'the question of obliterating this portion of the canal is very important indeed to the interests of this company, and has occupied the anxious attention of the directors.'*⁴⁵ They agreed to sell it for the sum of £80,000, with the canal company retaining the ownership of one line of railway to the docks with a pipe conveying water to the basin at Ringsend. However, nothing ever came of this scheme.

When the lease with the Dublin Dockyard ended, the docks were again under the care of the canal company and they reverted to the old system of charging boats for the use of the dry-docks and allowing the owners of the boats to make their own arrangements for repairs. The dry-docks were again leased out in 1913, to William McMillan, who with William Alexander, his chief draughtsman, started the Ringsend Dockyard Company. The docks remained leased out to this company until it went out of business in 1963, during which time the Board of Directors handed over the entire Grand Canal system, including the Circular Line and the Ringsend Docks, to CIE. On 1 July 1986, together with the Royal Canal and Shannon Navigation, the Grand Canal system became the responsibility of the Department of Arts, Culture and the Gaeltacht and was under the aegis of "Duchas", The Heritage Service.

Following the British Irish Agreement in 1999 Waterways Ireland was established. Waterways Ireland is the North/South Implementation Body for the inland navigable waterway systems of Ireland and was established North and South by means of the North/South (Implementation Bodies) (Northern Ireland) Order 1999 [SI No 859 Northern Ireland] and the British Irish Agreement Act, 1999, respectively. The Statutory remit of Waterways Ireland is to manage, maintain, develop and restore the inland navigable waterways, principally for recreational purposes. Waterways Ireland is now under the remit of the Department of Community Rural and Gaeltacht Affairs in the south and the Department of Culture Arts and Leisure in the North.

Economic overview of the Grand Canal

At the turn of the nineteenth century the Grand Canal Company was beginning to consolidate its position in the transport industry. Contemporary competition only involved horse drawn carriages and coach operators, neither of which provided a real threat during the company's early years in operation. By this period, construction works of the canal extended from Dublin as far south as Athy on the Barrow Line, and were four years from reaching Shannon Harbour to the west. Traffic had been travelling on the canal since 1779 when the route between Dublin in Lowtown was first opened. Initially, only cargo goods were being carried but by the following year passenger services were also operated.

The company was restricted by law from operating its own cargo carrying service and only private contractors were authorised to do so, thus the company generated its revenue from charging tolls as well as a fixed amount per ton per mile payable by the private contractors. Once the company was allowed to operate its own passenger service, this provision provided the company with a valuable source of income also.

A profitable market existed for the transport of goods at this time and once the canal was opened to traffic many commodities such as corn, meal, flour, malt, turf, building materials and dung were

⁴⁵ Quoted in Delany 1995, 189

transported in this way. An attempt to encourage traffic in livestock was undertaken in 1803 whereby the company hired a boat to the Framing Repository and offered a low toll rate to use the canal. Although a limited trade in livestock did develop, the venture was never really successful. This was most likely due to the problem of cleaning the boats when they were not used exclusively for animal transportation.

Trade developed slowly and by 1801 the tonnage carried on the canal amounted to 110,855 tons (at this time the canal had not reached Shannon Harbour). Of this figure, there were nearly three times as many goods transported into Dublin as there was shipped outwards.⁴⁶ Flour, turf and building materials were the principal commodities entering the city and manure and general merchandise comprised the general exports. Revenue for this year amounted to £54,193; almost twice the figure raised in the year prior to the 1798 Rebellion, which had caused a temporary lull in the canal's trade.

Upon the completion of Shannon Harbour in 1804, the stage was set for the company to actively develop its industry in terms of both passenger and cargo transportation. Acknowledging the limited success of the company thus far Richard Griffith, one of the company directors, submitted a plan advising that the company should build additional stores at Shannon Harbour and that twelve new trade boats should be financed by the company which he would lease and gradually refund the cost of. The plan was approved by the board and subsequently some of the stores and boats were built.⁴⁷

The financial situation of the company did not improve greatly in the years that followed and in 1809 the company was forced to raise further loan, despite a high dividend of six per cent declared for that year. Resulting from the continued financial struggle, the shareholders formed a committee to discuss ways in which they could improve profitability. The directors refused to listen to suggestions however, and consequently a new board was set up in 1810. By this period construction of the Royal Canal was well underway and it was opened to traffic from Dublin westwards as far as and beyond Mullingar.

Tonnage carried on the Royal Canal was far less than that which was carried on the Grand Canal. In 1810 tonnage figures for the Royal Canal amounted to 52,643 tons, approximately only one third of that carried on the Grand Canal for the same year. It was important for the Grand Canal Company to maintain its superiority over its rival. Furthermore, it was vital that the company capitalised on the transportation market, which although affected by the Napoleonic Wars at this time, offered profitable opportunities. This was exactly what the new board of directors set about achieving.

The year this new board was established, the company was faced with a deficit of £38,084.⁴⁸ By this period the company had received parliamentary assistance of £93,259⁴⁹ and loans which amounted to £968,000⁵⁰ since its incorporation in 1772. Interest on these loans, as well as the payment of high dividends to shareholders, were primary factors which resulted in this deficit. The new board was successful in its endeavour, and by 1812 the financial situation of the company conveyed quite a different picture, with the board having secured a profit of £5,164.

Based on this success, the company was awarded a grant of £150,000 to help liquidate its debt, although this agreement was subject to certain conditions. The most significant of these stated that in future no dividend was to be declared except out of clear profits, that the company had to add a sum

⁴⁶ *Journal of the House of Commons*, 1805 (169), IV, 351, p. 26; quoted in Delany 1995, 70

⁴⁷ Delany 1995, 70

⁴⁸ *Ibid.* 76

⁴⁹ *Journal of the House of Commons*, 1812, (366), V, 679, pp 8, 134; 1812-13 (61), VI, 317, APP 35, P 76; quoted in Delany 1995, 76

⁵⁰ *Journal of the House of Commons*, 1812, (366), V, 679, app 16B, p 132; quoted in Delany 1995, 76

equal to one third of the grant towards the liquidation of the debt, that a sinking fund of £30,000 had to be established and that the profits from the collieries had to be used to reduce the debt.⁵¹

Although many shareholders opposed this arrangement initially, having been used to receiving high dividends of four to six per cent in previous years, they eventually agreed to accept it. The suspension naturally hit them quite hard though and one of them, William Blair, was forced to apply for position of lock-keeper on the Circular Line; a position he held until his death. As a consequence of the conditions imposed by the government, payment of dividends did not resume again until 1835, when it averaged two per cent and never succeeded in matching the large dividends of the 1790s. For the present time, however, the situation looked promising and in 1812, a tonnage of 231,112 was reported as having being carried on the canal.

Unfortunately this optimistic climate did not prevail for long. The Napoleonic War had been responsible for creating economic distress in the country and this in turn was reflected in the trading figures of the canal company. A depressed economic environment ensued in the years subsequent to the war and by 1816 we see that trade to Dublin was down by one third, traffic from the city had almost ceased. Traders appealed for reductions in their rents for stores, which were granted to them, and tolls were reduced to 2d (Ir) per ton per mile, having been charged at 3d (Ir) for a number of years. A partial failure of the potato crop in 1817 and 1822 confounded matters and many canal boats were robbed of their cargo during this time. This act of plundering canal boats is one that was frequently carried out during times of economic stress, as was as the act of causing breaches to the canal banks so as to create employment opportunities for locals.

At the same time, increased competition from coach services was also presenting itself. This forced the canal company to keep its tolls and charges at a reduced rate so as to ensure they could compete effectively with them. In 1825 the company's debt still stood at an intimidating £867,700, on which the annual interest was £30,994.⁵²

Towards the end of the 1830s, however, the outlook for the company had begun to improve. Fly-boats had been introduced in 1834 and served to provide the company with a faster, more efficient service thus allowing them opportunity to compete with the railways. By 1837 trade carried on the canal amounted to 215,911 tons. Agricultural products continued to be the principal commodities carried, with a steady trade in building materials, turf, coal, coke and culm (coal dust or anthracite) and an increasing traffic in general cargo.⁵³ This tonnage figure continued to rise, though there was a decrease during 1846 and 1847 due to the famine which consumed the country during these years.

In 1844 the tonnage carried was 239,014, while in 1847 this figure had again risen and amounted to 264, 127¼. ⁵⁴ It is not surprising to learn that during the years of the famine, the canal boats were again attempted to be plundered of their goods. Responding to this, the company increased the number of troops stationed along the canal and instructed the trade boats to move in convoy so as to deter the raiders.

The economic state of the country was not the only problem facing the company; the railways had begun to pose a very serious threat to the canals at this time. In 1844 an Act authorising the Great Southern and Western Railway (GSWR), which proposed to link Dublin to Cashel, Carlow and Kilkenny by rail, became law. Negotiations were also underway at the same time between the Midland Great Western Railway (MGWR) and the Royal Canal Company regarding the former

⁵¹ Ibid. 76

⁵² Ibid. 98

⁵³ Ibid. 99

⁵⁴ Figures taken from table illustrating breakdown of tonnage in Delany 1995, 263

purchasing the whole canal from the latter, an agreement which materialised in 1845. It was proposed that the banks of the Royal Canal would be used for a railway from Dublin to Mullingar and Longford, and that there would be an extension to Athlone and Galway via Ballinasloe. Thus it was clear that the entire system of the Grand Canal was being challenged from the cumulative exertions of both railway companies.

A number of factors afforded the canals some support during this difficult phase. Although tonnage figures during this period were comparatively high, revenue figures did not reflect this. This resulted from the company keeping their prices down so as to enable them to compete with their rivals. Consequently, the company was unable to meet even the annual payments to the loanholders. Resulting from this, permission was granted in 1848 to allow the company to consolidate its stock and loan holdings and enabled a small dividend to be declared in the years that followed. The capital was reduced to £665,938, the reserve fund was cut back to £10,000, the 6 per cent debentures were registered at £90, the 5 per cent at £75, the 4 per cent at £60 and the existing stock at £9.⁵⁵

Prior to this, legislation had been passed in 1845 also which had authorised the canal companies to be carriers of cargo goods on their own waters. The company took advantage of this and when the City of Dublin traders withdrew from the Grand Canal in 1850, the Grand Canal Company took over its interest. Subsequent to this, Messrs Berry, the only other large carrier on the canal, realised how difficult it would prove to compete with the company's expanding carrying trade and decided to sell its whole affair to the canal company. Hence by the end of 1850, the Grand Canal Company had taken over the trade of the two principal carriers on the canal. Agreements had also been reached between the canal company and the Great Southern and Western Railway regarding the latter planning a connection from Portarlinton to Tullamore and Athlone which the Grand Canal Company had rigorously opposed. Lengthy discussions ensued between the two companies and eventually in 1847, it had been agreed that the canal company would terminate certain passenger services and abandon parliamentary opposition to the Portarlinton-Athlone extension in return for a rates agreement giving the canal company preference in agricultural and heavy goods.

The railway company frequently violated their side of the agreement however, and in 1850, using a small violation by the canal company as a pretext, declared that they no longer felt themselves bound by the 1847 agreement.

Then, in 1852, both the GSWR and the MGWR companies expressed an interest in buying the Grand Canal. Aware of the opportunity that was presenting itself, the directors accepted an offer from the MGWR, but the required legislation was opposed by its rivals, the GSWR. Consequently, the former agreed to lease the tolls and duties of the canal for seven years from 1853-60 while the legislation was being enacted; a rent of £19,564 per annum was agreed upon which represented the annual net profit of the company at that time.⁵⁶

Fierce rivalry continued between the two railway bodies and as a consequence of the heated climate between the two, it was announced in 1854 that the matter would have to be settled by arbitration as the situation could no longer be allowed to prevail. The future of the Grand Canal was deeply interwoven in the discussions which followed and in February 1855, it was decided that the two railway companies would divide the canal, with the MGWR taking the main line to Ballinasloe and the Kilbeggan Line, and the GSWR acquiring the Barrow and Mountmellick Lines. The lease with the Grand Canal Company was due to expire in June 1860 and a Bill for the purchase of the canal was presented to Parliament early that year. The purchase of the canal never materialised however, with

⁵⁵ Delany 1995, 174

⁵⁶ Delany 1986, 139

the railway companies citing the schedule of tolls proposed by Sir Richard Griffith as too low to afford an adequate return on the capital.

In effect, the rail companies had probably realised that taking on the canal would only serve as a burden to them which would generate very little profit. The Board of the Grand Canal was dismayed when they learnt of this; they had hoped their responsibility to produce dividends from the canal system for their shareholders had come to an end. Alas it was not to be, and once again the directors were faced with the demanding task of generating a profit from the struggling enterprise.

Surprisingly, they forged ahead with great success despite the ever-increasing threat that the railways posed. By this stage the canal company was only carrying cargo goods, the passenger boats had been withdrawn in 1852 when they could no longer compete with the railways. In 1861 and 1863 the canal company negotiated trade agreements with the MGRW and GSWR respectively, which allowed the company the opportunity to steadily increase its growth throughout the 1860s and 1870s. At this time an average net surplus of about £20,000 (and an average dividend of about 3%) was returned. In 1875 a peak figure of 379,047 tons were carried on the canal. Thereafter however, this figure began to decline as the following table illustrates:⁵⁷

<i>Year</i>	<i>Company's Boats Tons</i>	<i>Bye-Traders Tons</i>	<i>Total Tons</i>
1875	88,836	290,211	379,047
1878	98,983	227,454	326,437
1885	129,246	113,095	242,341

<i>Year</i>	<i>Tolls £</i>	<i>Profit per ton £ s d</i>	<i>Net Revenue £</i>	<i>Dividend per cent</i>
1875	18,242	2 3¼	20,450	3
1878	16,857	2 1½	18,984	2 5/8
1885	8,069	1 10	12,856	1 11/16

Aside from the railways there were many factors which attributed to this decline; the late 1870s and early 1880s had witnessed severe winters that had interfered with harvests, Guinness' Brewery were now using their own boats on the River Liffey, the transportation of building materials for construction of the railways had declined and the trade in bricks from Pollagh and Tullamore, amounting to 40,000 tons in the 1840s, also suffered a decline due to the production of a larger brick which was manufactured in Dublin.

The declining profits were naturally a source of concern for the shareholders and in 1886 statistics were produced which showed that the value of canal stock had halved from £66 in 1878 to £33 in 1884.⁵⁸ The company's affairs were further challenged that same year when their agreement concerning rates with the GSWR was terminated. This caused all sides to lower their rates to almost non-profit generating levels in order to compete with each other. This deteriorating situation was tackled admirably by James McCann who became chairman of the canal company in 1891. McCann was responsible for the company's acquisition of the Barrow Navigation Company in 1894, whose trade the Grand Canal Company had taken over in 1878, thus extending the company's network and

⁵⁷ These figures appear in the minute books and were produced by the board in 1886 in answer to accusations of the shareholders' committee; quoted in Delany 1995, 196

⁵⁸ *Ireland's Gazette*, 24 February 1886; quoted in Delany 1995, 197

influence. This takeover brought about a new phase in the war of rates with the GSWR which resulted in ridiculous rates that generated no profit.

In 1900 and subsequent to lengthy discussions, it was agreed that the canal company would give up trading in places not directly served by water (principally trade in coal), which they had begun to undertake in order to help secure their survival in the transport industry. In return for this the canal company was to receive an annual payment of about £4,000. This was based on a fixed percentage of the profit sacrificed by the company surrendering this trade. A schedule of rates which could not be altered without consultation was agreed upon also. In addition to this, McCann was also responsible for having forged agreements regarding rates with the GMWR in 1894. As a result, before McCann died in 1904, he had succeeded in placing the company in a much stronger financial position as is exemplified by the following table:⁵⁹

<i>Year</i>	<i>Revenue</i> £	<i>Expenditure</i> £	<i>Net Surplus</i> £	<i>Ordinary Dividend</i> Per cent
1888	62,495	49,442	13,053	1 13/16
1898	89,037	65,424	23,613	4
1905	90,782	67,201	23,581	4

<i>Year</i>	<i>Company's Boats</i> Tons	<i>Bye-traders</i> Tons	<i>Total</i> Tons
1888			228,545
1898	221,985	87,303	309,288
1905	192,551	99,373	291,924

The company succeeded in maintaining these high trading figures and in 1912, a total of 308,850 tons were carried on the canal. This figure is reflective of the prosperity afforded to the company when in 1911 they began to fit many of their horse-drawn boats with a Bolinder diesel engine. This technological advancement allowed them to operate with much greater efficiency. With the onset of World War I, however, this prosperity was checked and industrial unrest ensued. Tonnage carried during 1915 fell by almost 50,000 tons when compared to 1912 figures and by 1920 tonnage carried had been reduced by a further 35,000 tons bringing the figure for that year to 226,648.⁶⁰

Throughout the period 1917-1920, the Board of Trade assumed financial responsibility for maintaining the canal and supplementing the wages of the labourers. A bonus of 6s was granted to all the boatmen and labourers, bringing the average weekly wage to £1 5s. The subsidy granted by the government amounted to about £40,000 each year.⁶¹ Throughout this period, demands were frequently made by the labourers for better working conditions in terms of pay and hours. These issues had been addressed before but had not been accompanied by the same zeal. Trade unions had become quite active by this point and were instrumental in helping the canal workers to achieve their demands after many strikes and negotiations had been undertaken.

When the wages supplement as provided by the Board of Trade during the war years was finally withdrawn in August 1920, the company was authorised to increase its freight and tolls up to a

⁵⁹ *Journal of the House of Commons* (Cd 3719), 1907, XXXIII, (Cd 5626) 1911, XIII; quoted in Delany 1995, 201

⁶⁰ Delany 1995, 208

⁶¹ *Ibid.* 207

maximum of 150 per cent to help it to meet the increased running costs it was now faced with. The company was unable to sustain itself however; a situation which is hardly surprising when a number of factors such as the decrease in trade instigated by shorter working hours of the labourers, the increased wages costs the company was forced to meet and the withdrawal of government aid which had helped sustain the operation of the canal in recent years, are considered. Consequently, the company felt it had no choice but to lay off a number of men.

This matter caused outcry and resulted in the setting up of a commission of inquiry, which under the new Free State government began to hear evidence in January 1923. After it had completed an examination of the affairs of the Grand Canal Company, the commission summed up its analysis stating;⁶²

'It appears to be clear from the evidence that the Grand Canal has been allowed to fall into a bad state over a long period of years.....We consider it is not expedient that the ownership and maintenance of a public highway should be in private hands. While the Grand Canal Company has useful functions to perform as a carrier, the navigation highway should be transferred to the public authority which we recommend it should be'.

However, the commission's recommendation that a 'Waterway Board' be set up to oversee all the waterways was never implemented and the company was left to struggle on. Competition from improved road transportation ensued and a depressed economic climate, which was further hindered by the civil war of 1922, prevailed. This war caused enormous chaos throughout the country and resulted in canal boats being plundered and stores being burnt. Throughout this period traffic continued to decrease and from 1921 to 1926 the dividend on ordinary shares fell to 2 per cent. Matters were not helped in 1924 when the railway companies, the MGSR and the GSWR, amalgamated as the Great Southern Railway and thus presented themselves as an even superior force to compete with.

All agreements between the railways and the Grand Canal Company regarding rates had terminated by this point; competition between the two was again stepped up. Prior to an Act of 1927, both the railway and canal companies had been prevented from operating road services. This Act lifted the restriction however, and acknowledging the potential offered by providing such a service, the railway company commenced a system of free delivery of goods by road from its stations; an arrangement the canal company was in turn compelled to provide. A fierce rates war with the railway company followed once again and in response, the canal company built up a fleet of lorries which was used to provide a similar service of road delivery.

The net revenue of the Grand Canal continued to fall nevertheless. It fell from over £22,000 in 1930 to £14,401 in 1933 and the dividend on the ordinary shares fell to 1 per cent.⁶³ During the 1930s also, drainage works were carried out in the upper catchment area of the River Barrow which caused damage to the navigation and resulted in the eventual withdrawal of canal services below Carlow. The years of World War II witnessed an increase in trade however. This was due to restrictions imposed on road transportation during this period. Horse-drawn haulage and canal services reaped the benefits of this restriction and as is illustrated by the following table, the Grand Canal Company entered a period of temporary prosperity:⁶⁴

<i>Year</i>	<i>Company's Boats</i>	<i>Bye-traders</i>	<i>Total</i>
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⁶² Quoted in Delany 1995, 214

⁶³ Delany 1995, 215

⁶⁴ Tonnage from 1957 *Report of the Committee of Inquiry into Internal Transport*, p 66; other statistics in Grand Canal Company balance sheets; quoted in Delany 1995, 218

	<i>Tons</i>		<i>Tons</i>		<i>Tons</i>
1938	107,441		62,291		169,732
1944	120,649		106,023		226,672
1947	112,002		48,171		160,173

<i>Year</i>	<i>Revenue</i> £	<i>Expenditure</i> £	<i>Net Surplus</i> £	<i>Ordinary Dividend</i> per cent
1938	126,716	112,542	14,174	1
1944	174,365	147,850	26,515	4½
1947	174,712	168,820	5,892	0

It will be noted from the table that after the war, even though revenue remained the same, net surplus fell. This was because wages had been stagnated during the war years, but once this restriction was removed the company was forced to meet up to fifty per cent pay rises. The government authorised an increase of twenty per cent in tolls and freight, which explains how the revenue remained the same even though the amount of tonnage carried actually fell.

Road traffic recovered quickly after the war years but because of the Grand Canal Company's entrance into this market, it still managed to maintain itself. By 1948, the company's road services were accounting for twenty-seven per cent of its total income.⁶⁵ Tonnage carried by water had steadily fallen. For instance it only amounted to 143,000 tons in 1948 but as mentioned above, the company's road service afforded them a valuable source of revenue and as a result, an ordinary dividend of 3 per cent was declared for that year.

In order to secure its survival in the transport industry at a time when competition from other road operators had reached a new height, the company carried goods by road at canal rates, thus undercutting its competitors. It is likely that this served as a catalyst in influencing the members of a transport inquiry, set up in 1948, to recommend the amalgamation of the canal company with the new transport authority, Coras Iompair Eireann (CIE) with which the Royal Canal had been amalgamated with in 1944. The directors of the Grand Canal Company resisted this takeover and instead suggested that the company give up its carrying trade but still maintain the canal as an enterprise operated upon by other traders.

The merger forged ahead nevertheless, and on 1 June 1950 a total of £702,500 in government guaranteed transport stock was issued to the shareholders on a pound for pound basis.⁶⁶ When the final meeting of the company was held, John McCann, the chairman, took the opportunity to clarify the company's position as he perceived it to have been immediately prior to the amalgamation. He stressed that the board had not sought the takeover, nor had it sought government assistance and he made it clear that he felt the company would have been well able to maintain itself had it been afforded the choice to continue. McCann maintained that although they may have been forced out of the carrying business, '*other and additional interests*' would have earned for the shareholders as good a return on their capital as that which was now being guaranteed by the government. After the merger, the financial position of the Grand Canal suffered a sharp decline as can be seen from the following table:⁶⁷

⁶⁵ Delany 1995, 218; Delany 1986, 141

⁶⁶ Tonnage from 1957 *Report of the Committee of Inquiry into Internal Transport*, p 122; other statistics in Grand Canal Company balance sheets; quoted in Delany 1995, 220

⁶⁷ *Ibid*, paras 123, 126; quoted in Delany 1995, 222

Grand Canal Traffic

<i>Year</i>	<i>CIE Boats Tons</i>	<i>Bye-traders Tons</i>	<i>Total Tons</i>
1952	89,130	26,561	115,691
1956	89,640	8,775	98,415

Grand and Royal Canals

<i>Year</i>	<i>Revenue £</i>	<i>Expenditure £</i>	<i>Deficit £</i>
1952	149,170	201,902	52,732
1956	163,114	228,236	65,112

Resulting from several increases in tolls which had been authorised since the war, the bye-traders were finding it increasingly difficult to operate economically and consequently, almost all had ceased trading. A committee of inquiry into internal transport was set up in 1957 and after acknowledging that bye-traders had all but stopped operating on the canal, it advised that CIE should be allowed to withdraw its water transport service.

It was felt that by doing this, the traffic could in turn be diverted to the railways, who at this time were struggling also due to increased competition from road services. It was estimated that if this was done, an annual saving of £108,000 would be achieved by CIE. In December of 1959, the canal boats were withdrawn, although a number remained in service to facilitate the Guinness Brewery until the following year. At the time of the withdrawal, the brewery accounted for nearly forty per cent of the canal's traffic and the Carlow Sugar Factory for another twenty per cent.

The withdrawal of the commercial boats marked the end for most canals as there was little pleasure traffic using the canals. A clause had been inserted in the 1958 Transport Act which restricted the closure of waterways to those which had not been used for three years. While this legislation secured the main line to the Shannon, the Barrow Line and the Barrow Navigation, the branch lines were all closed to traffic. Overtime even the main lines were allowed to fall into disrepair when no longer operational.

In conclusion, although the Grand Canal did certainly enjoy periods of prosperity, it struggled financially for most of its operational existence. It is difficult to assess the exact amount spent on constructing the canal but it's thought to have been in the region of £877,000. Unlike other navigations, only about a quarter of total costs had come from public funds in grants or debentures. The rest had all been acquired by private subscription. The capital required to complete, as well as maintain the works, had been a constant burden to the company and in order to meet these costs while simultaneously paying out dividends to shareholders, the company was constantly under the shadow of enormous loans which they were forced to seek. Had the canal been constructed and subsequently managed with greater expertise and caution, it is likely that it may have enjoyed a degree of further economic success. However, given that the canal operated for most of its life in a fiercely competitive market which witnessed battles between the Royal and Grand canals, the railways and various road transportation bodies, it is hardly surprising that its success was measured.

It must also be pointed out that in the face of such domineering threats, especially that as provided by the railway companies, the Grand Canal in fact met these challenges admirably well for a number of

years. Had the canals been executed and operated in an era prior to the emergence of the great railways and the motor car, as was the case when plans for its initial construction surfaced back in the early eighteenth century, the Grand Canal would have enjoyed the success initially envisioned for it. It was impossible for the early proprietors of this scheme to have been aware of the advanced technical climate that was to develop, which in turn would challenge, and eventually destroy, the foundations of their once awe-inspiring project.

On 1 July 1986, together with the Royal Canal and Shannon Navigation, the Grand Canal system became the responsibility of the Department of Arts, Culture and the Gaeltacht and was under the aegis of "Duchas", The Heritage Service. Following the British Irish Agreement in 1999 Waterways Ireland was established. Waterways Ireland is the North/South Implementation Body for the inland navigable waterway systems of Ireland and was established North and South by means of the North/South (Implementation Bodies) (Northern Ireland) Order 1999 [SI No 859 Northern Ireland] and the British Irish Agreement Act, 1999, respectively. The Statutory remit of Waterways Ireland is to manage, maintain, develop and restore the inland navigable waterways, principally for recreational purposes. Waterways Ireland is now under the remit of the Department of Community Rural and Gaeltacht Affairs in the south and the Department of Culture Arts and Leisure in the North.

Today the cultural heritage of the canal, as well as the potential it offers for tourism has recently began to be acknowledged. Consequently, restoration works have been taking place in parts, under the supervision of Waterways Ireland, to re-establish this extensive canal system to its former glory. This in turn will inevitably serve to re-awaken a fascinating period of Irish history; a glimpse into which has been offered in the above discussion.

3. ASSESSMENT METHODOLOGY

The assessment comprised a baseline survey (documentary research and field survey) followed by an assessment of the significance of identified areas, groups of features and individual structures and artefacts associated with the canal.

The focus of the assessment concentrated on sites of architectural, engineering and industrial heritage interest pre-dating the 2nd Edition Ordnance Survey and those sites of more recent date that have a direct relationship with the canal.

Survey Area and Sub-Divisions

All identified sites have been allocated a unique number with a WIAH prefix (Waterways Ireland Inventory of Architectural Heritage) and are included in Appendix 3, Plates and Figures 3-10.

The assessment has been divided into 4 areas:

Area 1 - Shannon Harbour - Tullamore

Area 2 - Tullamore - Robertstown

Area 3 - Robertstown – Circular Line; Dublin

Area 4 - Circular Line – Ringsend Basin

Within each area, all sites of architectural, engineering and industrial heritage interest have been assessed, both within the limits of the canal corridor (defined within the current Waterways Ireland land boundaries), encompassing a zone extending 50m either side of a discernable centre-line,

irrespective of property ownership. In order to ensure that any features associated with the canal out-with the 50m buffer zone were included within the assessment; the initial desk based assessment introduced a temporary 100m buffer to ensure exclusivity. This was particularly the case in built-up areas and those that contained concentrations of structures and features of interest. Once peripheral sites had been identified, these were added to those within the canal corridor and the 50m buffer zone.

Desk-Based Assessment

A complete and exhaustive desktop study was undertaken to include a summary of key issues relating to relevant architectural heritage features in Ireland in a waterways/canals context which are relevant to this study. The study included a comprehensive historical, cartographic and archaeological search of all published and publicly available material. This included as a minimum (where relevant):

- Record of Monuments and Places (RMP)
- Sites and Monuments Record (SMR)
- Register of Historic Monuments
- National Inventory of Architectural Heritage (NIAH)
- County Development Plans
- Urban Archaeological Surveys
- Town Development Plans
- Irish Antiquities Division, National Museum of Ireland Topographical Files
- Ordnance Survey first and subsequent editions
- Published County Archaeological Inventories and Surveys
- Excavations Bulletin (www.excavations.ie)
- Relevant published archaeological corpora
- Local archaeological societies
- All relevant published sources

A full list of sources consulted is listed in the Reference.

Field Survey

A walkover survey of the assessment area was undertaken by K. Murphy and D. Yates of Headland Archaeology Ltd between the 31/10/2007 & 22/11/2007. The walkover visited those sites identified during the desk-based assessment (154 sites) and those unrecorded features not previously identified (218 sites). The walkover survey was assisted by jeep where appropriate. Where necessary, a guide with local knowledge was appointed by Waterways Ireland to assist and / or advise the survey team.

4. SIGNIFICANCE RATING

For the purposes of this assessment, a significance rating is given to all the sites within the assessment. This significance is measured in terms of the contribution of a site or group of sites to the architectural, engineering and industrial heritage of the canal, canal corridor and immediate hinterland. These criteria are summarised in **Table 4.1** below and presented for all sites in Appendix 3.

Table 4.1: Criteria for assessing the significance of sites of architectural, engineering or industrial heritage interest.

SIGNIFICANCE	DEFINITION
High	Any sites that make a large contribution to the architectural, engineering or industrial heritage of the canal. This includes sites of a date that are contemporary with its construction, operation, administration and / or applications in trade and transport, but also sites that are not related to the canal but still of architectural interest.
Medium	Any sites that make a moderate contribution to the architectural, engineering or industrial heritage of the canal by being contemporary with its construction, operation, administration and / or applications in trade and transport but having being altered to an extent in modern times that its heritage value is reduced.
Low	Any sites that make a low contribution to the architectural, engineering or industrial heritage of the canal by appearing to be of relatively modern construction with the possibility of an earlier site or feature having being incorporated into its layout or fabric.
Negligible	Any sites that make very little or no contribution to the architectural, engineering or industrial heritage of the canal by being of modern construction.

5. CONDITION RATING

For the purposes of this assessment, a condition rating is given to all the sites within the assessment. This rating is not intended to be an authoritative or technical comment on the structural condition of a structure / feature. It is an observation made in the field of the overall state of repair of the structure / feature at the time of inspection. The condition associated with each condition rating is given in **Table 5.1** below and presented for all sites in Appendix 3.

Table 5.1: Condition ratings for sites of architectural, engineering or industrial heritage interest.

CONDITION RATING	CONDITION
0	Ruin or Absent
1	Derelict
2	Poor
3	Fair
4	Good
5	Excellent

6. ACTION RATING

For the purposes of this assessment, an action rating is given to all the sites within the assessment. This rating is not intended to be an authoritative or technical comment on the need for structural repair or other maintenance. It is an observation made in the field based on the overall state of repair

of the structure / feature at the time of inspection (see condition rating above), intended to indicate either the need or potential for repair or maintenance. Details of the nature of the condition and subsequent action can be gleaned from the description. The action associated with each action rating is given in **Table 6.1** below and presented for all sites in Appendix 3.

Table 6.1: Action ratings for sites of architectural, engineering or industrial heritage interest.

ACTION RATING	ACTION
1	Needs immediate intervention
2	Significant repairs
3	Minor repairs
4	Minimal aesthetic work
5	Stable

7. PLANNING POLICY CONTEXT

Archaeological conservation operates under the National Monuments Acts, 1930 – 1994 which provides formal and legal protection of monuments and places of particular heritage interest. This includes the Register of Sites and Places / Sites and Monuments Record comprising some one hundred and twenty thousand protected archaeological sites throughout Ireland affording them a level of statutory protection. The Department of the Environment, Heritage and Local Government manages over eight hundred major archaeological monuments in state ownership or state guardianship under the National Monument Acts. Many important or threatened archaeological sites which are not in the ownership of the state are also protected under legislation from being damaged or interfered with.

**The Sites & Monuments Record (SMR) consists of Ordnance Survey 6-inch maps with annotated known and suspected archaeological sites that generally pre-date AD 1700. The SMR was collated from documentary sources; various editions of Ordnance Survey maps, aerial photography, historical and archaeological literature, seventeenth century Down Survey and Civil Survey maps, eighteenth century estate maps and folklore/oral traditions. The National Monuments Act (1994) made provision for a Record of Monuments & Places (RMP). The RMP is a revised set of SMR maps, on which newly-discovered sites have been added and locations which proved not to be of antiquity have been de-listed by the National Monuments Service.*

Of the 372 sites and features recorded in this assessment none were listed on the Record of Monuments and Places.

It is important to note however that many towns in Ireland are assigned an RMP number as the town itself is of historical value. The extent of the zone of protection often extends to the limits of the original settlement: Mullingar Town (WM019-089)

The National Inventory of Architectural Heritage (NIAH) is a state initiative under the administration of the Department of the Environment, Heritage and Local Government. The aim of the NIAH is to complete the preliminary surveys of the post-1700 built heritage of all counties in the Republic of Ireland in order to provide sufficient information to allow the Minister to make informed recommendations to local authorities for inclusion of sites/structures/groups of structures in the Record of Protected Structures as per Section 53 of the Local Government (Planning and Developments) Act 2000.

A Record of Protected Structures list is compiled and maintained by each local authority and available online or on request. Many of the structures with an NIAH number in Appendix 3 may be included in these lists and identifiable by that number or by name.

8. BASELINE DESCRIPTION

The study has identified a total of 372 recorded and unrecorded sites/features within the area of assessment. Of these 218 had not been identified during the desk based study. The 152 sites identified during the desk based assessment became apparent through a variety of means such as the NIAH, The Waterways Ireland Bridge Survey, RMPs, cartographic sources, and literary sources.

Area One - Shannon Harbour – Tullamore

Shannon Harbour, to the east of, and linked to the river Shannon, was once a bustling centre of activity as the junction between the Grand Canal and the Ballinasloe branch. Sitting with soggy drained pasture to the south and scrubland to the north the canal begins its long journey east within an embankment. There are several interesting features in the area, these include two locks (WIAH 400, 401), one bridge (WIAH 408) and a collection of interesting buildings and features centred around the long quayside (WIAH 402) such as, an old loading crane (WIAH 403), a former store house and loading sheds (WIAH 409). There is also a ruinous dwelling, thought to be a former canal agent's house (WIAH 405), two dry docks (WIAH 406), a former Police Barracks (WIAH 404) and a now ruinous hotel (WIAH 407).

Beyond Griffith Bridge (WIAH 408) the canal winds and meanders regularly on its route to Pollagh the next main area of habitation after passing through Belmont Bridge, through what is for the most part poor pasture land that slowly gives way to scrubland further east. It is a fairly busy stretch of canal, passing under ten interesting and well engineered bridges (WIAH 411, 414, 416, 421, 423, 426, 427, 429, 432) including a Bord Na Mona swing bridge (WIAH 433), across three aqueducts (WIAH 410, 415, 422) and through three locks (WIAH 412, 417, 424). Further to these there are several smaller scale features alongside the canal channel including three lock keepers cottages (WIAH 413,420,425), a converted warehouse (WIAH 418) now in use as a domestic dwelling, a quayside (WIAH 419), two milestones (WIAH 430,434) and an interesting little stone bollard (WIAH 428) complete with deep rope marks.

Pollagh itself is quiet in terms of current activity and features within the survey corridor. It is situated within open pasture and scrubland giving way to raised bog. Features here include one bridge (WIAH 436) two aqueducts (WIAH 437, 439), the latter of which is now disused and dry and finally an abandoned house, formerly a Police Barracks (WIAH 438). The Canal continues to the east with the embankment varying in its height along the route towards Tullamore.

This length of the canal is reasonably busy, passing Rahan to its north and Killina to the south. The land through which the embanked canal passes is fairly open and boggy in nature, with pasture and agricultural land interspersed with scrubland becoming less frequent towards Tullamore. The most frequent features along this stretch are bridges (WIAH 441, 446, 450, 451, 453, 455, 466, 467), and aqueducts (WIAH 444, 454, 457, 458, 461). Further to these there are also three locks (WIAH 442, 447, 464) and their associated lock keepers cottages (WIAH 443,449,465) as well as a canal agent's house (WIAH 448). Other smaller features include three feeders (WIAH 440,452,463), two overflows (WIAH 445, 462), a quayside (WIAH 459), a dilapidated storehouse (WIAH 456) and a public house (WIAH 460).

After passing under Shra Bridge (WIAH 467) there is a short and quiet length of canal which passes beneath a road (WIAH 469) and a rail bridge (WIAH 468) before entering Tullamore town. Here the surrounding area changes gradually from pasture and agricultural land becoming suburban in nature with housing becoming more common before finally entering the town centre. Features within this area include a total of seven bridges of various types (WIAH 468, 469, 473, 478, 482, 485, 490), two

locks (WIAH 470, 474), two lock keeper's cottages (WIAH 471, 475) and a former canal master's office (WIAH 494). Further to these there are two old canal-side public houses (WIAH476, 483), a bonded warehouse (WIAH 480), storehouse (WIAH 484) and a loading crane (WIAH 480). Finally located at the southern end of a short branch within the town is the Tullamore Harbour complex (WIAH 487). This is a self contained walled area comprising several features of interest including a lift bridge (WIAH 490), loading crane (WIAH489), dry dock, work shop (WIAH 491, 492) and small battery store (WIAH 493), as well as several sunken barges within the harbour itself.

Area Two – Tullamore - Robertstown

Beyond Tullamore the canals route becomes more linear with long shallow curves replacing the sharp twists and turns to the west. The surrounding land is of a more agricultural nature and although it is not of the best quality, it slowly appears to improve further east towards Ballycommon, the next major village. The most common features along this stretch of the canal are locks (WIAH 496, 499, 501, 505, 507), aqueducts (WIAH 495, 503) and bridges (WIAH 498, 506). Further to these, there are also several other features including a lock keepers cottage (WIAH 502), house (WIAH 497) and milestone (WIAH 504), as well as some more recent buildings (WIAH 508, 500).

To the east of Cappyroe bridge (WIAH 506) and the 22nd Lock (WIAH 507), within wide and open pasture land, the canal briefly enters a short stretch of cutting before returning to an embankment with a particularly sharp drop in the land to the South. The canal then enters Ballycommon where there are several interesting features. These include two bridges (WIAH 511, 513), two modified storehouses (WIAH 512, 514) and a lock (WIAH 509) with its associated, though unfortunately ruinous, cottage (WIAH 510). Other features include a quayside (WIAH 515), overflow (WIAH 516) and small culvert (WIAH 517). The Killbeggan branch of the canal previously located to the north of the village, has been closed and subsequently dried up and sealed off for some time.

Upon exiting Ballycommon the canal continues for a short distance as a cutting before the ground to the north and south gradually drops, as the embankment returns becoming especially steep in places. This is particularly obvious beyond Kileen Bridge (WIAH 522), after which it returns to a more modest height, gradually decreasing further and returning to a cutting before entering Edenderry. The land through which the canal passes is as varied in nature as the features which lie along its path, firstly passing through stretches of pasture and scrubland, then expanses of rather striking bog land, before slowly phasing back into scrub and pasture again.

A wide range of features lie along this section of the canal, the most common of which are bridges, of which there are nine. These include Bord Na Mona rail (WIAH 518) and swing bridges (WIAH 524), as well as various masonry bridges (WIAH 519, 522, 527, 530, 534, 538, 541). There are also three substantial aqueducts (WIAH 523, 525, 529), over flows (WIAH 528, 535, 539), quaysides (WIAH 531, 536) and ware/store houses (WIAH520, 521). Other features include a disused feeder (WIAH526), a domestic dwelling (WIAH 532) and a milestone (WIAH 533). Finally and possibly most importantly, there is the lock gate stop chamber (WIAH 540). This is present due to the fact that there are no locks for some distance and in the event of a failure in the embankment the stop chamber would be closed. This would prevent the entire stretch of canal between the 21st and 20th locks (WIAH 509, 549) from completely draining.

Passing beneath Georges Bridge (WIAH 542), the now embanked canal passes just south of Edenderry and the only other features in this poor pasture area are two bridges (WIAH 543, 544), the easternmost of which, Downshire Bridge, is located in a well drained area. This bridge straddles the entrance to the short Edenderry branch of the canal. The last feature is an impressive aqueduct known as the tunnel or Blundell aqueduct (WIAH 545). As the canal heads further east the embankment

slowly reduces and upon reaching Hartley bridge (WIAH 552) the canal is within a cutting once more as the boggy scrub land slowly dries and becomes more agricultural in its nature.

This section of the canal is littered with interesting features, the most common of which are bridges (WIAH 552, 558, 563, 564), including two Bord Na Mona constructed bridges (WIAH 556, 560). There are also three milestones along this stretch (WIAH 546, 553, 559) denoting the remaining miles to Dublin. Other noteworthy features include the first lock for quite some time (WIAH 549) and its associated cottage (WIAH 550), as well as a siphon (WIAH 547), overflow (WIAH 548), quayside (WIAH 561), two culverts (WIAH 554, 557), domestic buildings (WIAH 551, 562) and an old briquette factory (WIAH 555).

With Allenwood to the north, the canal bends and curves its way towards Robertstown with this length of the navigation containing a wide range of features. The most striking of these is the junction with the Barrow Navigation at Lowtown Harbour. There are also three bridges (WIAH 572, 576, 585) and three aqueducts (WIAH 565, 568, 569) with a wide range of features spread between and alongside them. These include an overflow (WIAH 566), milestone (WIAH 567), lock (WIAH 573), cottage (WIAH 574), former canal agent's house (WIAH 575), harbour (WIAH 570) and associated buildings complex (WIAH 571).

Robertstown itself contains numerous interesting features and buildings, some of which are domestic in nature, such as two public houses (WIAH 577, 581), a thatched cottage (WIAH 579), a now disused public water pump (WIAH 578) and a Garda Station (WIAH 581). Other features such as the culvert (WIAH 584) and storehouse (WIAH 580) relate more closely to the canal, as does the hotel (WIAH 582).

Area Three – Robertstown – Suir Road Bridge: Circular Line

Beyond Robertstown the canal continues eastwards, passing the now blocked Blackwood Feeder passing beneath Bonyng Bridge (WIAH 585). Although this is a relatively short distance the stretch is none the less busy in terms of features. Most common are bridges (WIAH 585, 586, 588, 593), locks (WIAH 589, 592, 594), affiliated cottages (WIAH 590, 591) and three aqueducts (WIAH 597, 598, 598), including the impressive Leinster Aqueduct (WIAH 598) which spans the River Liffey. Other features include an overflow (WIAH 595), milestone (WIAH 596) and domestic dwelling (WIAH 587).

The canal along this stretch takes the form of a cutting, with the surrounding area between Robertstown and Sallins retaining a wild character for the most part, with a wood-lined border along long lengths of the canal banks. These gradually give way to more open pasture land in places, especially on the approach to Sallins town. To the west of this town the cutting follows a large bend in the navigation channel which bypasses the original cutting.

Sallins is a small town located just to the east of the Naas line spur. Features in Sallins include two bridges (WIAH 600, 640), two water pumps/hydrants (WIAH 603), a long stretch of quayside (WIAH 601), a feeder (WIAH 639), a collection of old dwellings (WIAH 602) and a now in filled dry dock (WIAH 605). Finally and most interestingly is a feature that is not yet fully understood, possibly a reservoir or water holding chamber (WIAH 637).

The Naas line branch runs south towards Naas town where it then turns southwest and continues on to the now disused Corbally harbour (WIAH 634). The first section of this branch, between Sallins and Naas, is very striking, with beech tree lined banks broken only occasionally by pasture land and

former sites of industry. The canal takes the form of a cutting throughout this stretch which runs more or less straight south into Naas Harbour (WIAAH 622), passing no less than seven bridges (WIAAH 606, 608, 609, 611, 615, 621, 625), five lock chambers (WIAAH 607, 612, 614, 616, 617) and other features including an aqueduct (WIAAH 613), overflow (WIAAH 619), former gas works and quayside (WIAAH 620). Other features concentrated around Naas harbour include a renovated mill complex (WIAAH 610) and storehouse (WIAAH 623) and an old warehouse yard and site (WIAAH 624).

Leaving Naas and passing under Ploopluck Bridge (WIAAH 625), this branch of the canal continues to wind its way south towards Corbally Harbour (WIAAH 634). Again this section contains a high density of features, though not as many as the previous stretches. The main difference is seen in the state of the surrounding area and the canal cut itself. The surrounding area is relatively unkept, with rough pasture being the dominant land use. There are areas particularly near Corbally harbour which resemble the wood lined sections to the north of Naas but these have not been as well maintained.

In terms of features, the most common are bridges (WIAAH 626, 627, 628, 630, 631, 633, 636). The canal channel is now only navigable up to where the Limerick road bridge (WIAAH 628) spans the canal. It then continues to the south with the water flow being carried under the road by concrete pipes. Other features here include two overflows (WIAAH 629, 632) and a former quarry (WIAAH 672). The cutting terminates at the abandoned Corbally harbour (WIAAH 634) containing an enclosed area and buildings (WIAAH 635).

Beyond Sallins, the Grand Canal Line curves for the most part to the northeast on its route within an embankment that varies in height until Hazel Hatch Bridge (WIAAH 658), at which point the canal gradually enters a cutting. The land around the canal varies from but generally the long stretch between Sallins and Clondalkin is tree-lined with agricultural land beyond this. Reaching Clondalkin, the nature of the surrounding area becomes urbanised. Between the two towns, there are numerous features. As a result, the area shall be discussed in two sections, firstly Sallins to Milltown and finally Milltown to Clondalkin.

As has been the case along most of the navigation, the most common structures from Sallins to Milltown are bridges (WIAAH 650, 652, 653, 657, 658, 663, 673) of various age and type, with overflows (WIAAH 643, 646, 654, 670, 674, 675) being the second most common feature. This might indicate an increase in the need for close regulation of the water flow and levels on the approach to more built up areas. The other main features include four locks (WIAAH 644, 647, 655, 664), their associated lock keepers cottages (WIAAH 645, 648, 665), three aqueducts (WIAAH 641, 651, 676), four ware and storehouses (WIAAH 661, 667, 662, 666), along with other industrial features including a possible canal office building (WIAAH 669) and quayside (WIAAH 668).

Further to these, there are also two canal-side public houses (WIAAH 650, 660), an elaborate sluice system, the remains of what was presumably the equivalent of a lock keepers cottage (WIAAH 642) associated with this mechanism and finally an intriguing building known locally as 'The Hulk' (WIAAH 671). This was originally intended to be a lock keepers house but the associated the lock was never constructed.

With Milltown to the south, the canal continues its course east through Clondalkin and under Suir Road Bridge (WIAAH 711) which spans the entry into the Grand Canal Circular Line. The area around this stretch of the canal is not well kept, with increasing urbanisation and vandalism becoming more apparent as the canal runs eastwards. This is especially the case in and around Clondalkin and Ballyfermot. There is, however, a wide range of interesting features, including eleven locks (WIAAH 677, 685, 687, 689, 694, 696, 699, 701, 703, 709, 710), which are indicative of how steeply the gradient of the canal drops as it enters the city.

There are also eleven bridges (WIAH 678, 679, 682, 686, 690, 692, 695, 697, 704, 708, 711), many of which have been modernised and altered to accommodate the increased pressure of traffic in the area. Overflows, out flows and feeders (WIAH 680, 683, 688, 691, 706, 700, 705, 681) are also common, again indicating the need for greater control of water levels. Other features include two lock keepers cottages (WIAH 684, 702), an aqueduct (WIAH 707) and the Guinness filter beds (WIAH 693, 699).

Area Four – Suir Road Bridge: Circular Line – Ringsend Basin

Having passed through the first lock (WIAH 710) and under Suir Road Bridge (WIAH 711), the Grand Canal ends and the Circular Line begins. The predominant type of feature here is again the bridge, in various forms and sizes (WIAH 712, 713, 714, 715, 717, 718, 723, 727), owing to the high levels of traffic. Many have either been modernised or repaired, while some are relatively recent additions to the canal. The level of the canal in this section descends on a shallower gradient than the lead in from the west, with only two locks (WIAH 722, 726) and two overflows (WIAH 724, 725) needed to regulate the flow.

Other features include the now in-filled Portobello Harbour (WIAH 720) and the Lower Deck Pub (WIAH 719) as well as a renovated hotel (WIAH 721) which, in stark contrast to other examples (WIAH 407, 582), is in excellent condition.

The final section of the circular line runs from Portobello, curving slowly northeast towards the Ringsend Basin. The canal once again begins to slope steeply towards the east passing through five locks (WIAH 728, 730, 736, 739, 743) and beneath five bridges (WIAH 729, 733, 737, 740, 744), again carrying heavy traffic. Other features include a feeder (WIAH 738), overflow (WIAH 731), memorial (WIAH 741), octagonal stone bollards (WIAH 734) and the only remaining lock keepers cottage on the circular line (WIAH 742). Until recently, this cottage had water chambers to its rear but these have now been backfilled.

After passing through the first lock (WIAH 744) on the Circular Line and beyond the modernised road bridge (WIAH 745), is the Ringsend basin. This large area is undergoing heavy redevelopment at the moment with numerous modern office blocks and apartment buildings surrounding the basin. As such it is a very active area with a great deal of activity, thus providing an insight into the original construction phase activities of the canal. The most common features here are stores and warehouses (WIAH 756, 757, 764, 765, 766, 767, 771, 753, 759,) of various shapes, sizes and materials, with other buildings (WIAH 755, 769, 770) also present, including some possible storage buildings or workshops, one of which has been converted into a recording studio (WIAH 758).

Other buildings of interest here include the mills (WIAH 761, 762, 763), such as Bolland's Flour mills, two lock keepers cottages (WIAH 747, 752), three sea locks (WIAH 749, 750, 751), an old work yard (WIAH 746), two bridges (WIAH 760, 768) and the very impressive dry docks (WIAH 745, 772). Finally, beyond the locks at the mouth of the basin, where the Grand Canal joins the River Liffey, is a large sign reading "Grand Canal Docks" (WIAH 748).

7. SUMMARY

The nature of the Grand Canal and its hinterland, as defined within this assessment, has changed considerably since the canal was completed in the late eighteenth/early nineteenth century. Despite this, the majority of the waterway is still navigable and managed and maintained by Waterways

Ireland, principally for recreation purposes. As a result, much of the waterway's associated heritage has been afforded some protection. A great number of sites and features found along the canal and featured in this assessment highlight the many characteristics inherent in its architectural, industrial and engineering heritage and as such define particular facets of this important heritage asset. It is recommended that the heritage value of the canal is developed alongside its role as a recreational asset.

Recommendations

Due to fact that the Grand Canal is maintained as a navigable waterway, there is a certain amount of maintenance afforded to the **canal basin** itself and its **locks**. As a result, both are in relatively good and serviceable condition.

Although functionality and safety must be of primary importance when adapting **bridges** for road and pedestrian usage, it is recommended that the original character of the bridge be maintained if possible. This is especially true when repairs are being made (e.g. WIAH 558). Although some bridges may have been adapted with modern materials to facilitate heavier loads (e.g. WIAH 652, 663), others are still of the original construction, and clearly at risk from the effect of heavy traffic (e.g. WIAH 453, 564). As with buildings, the growth, spread and effects of ivy needs to be monitored and managed in order to prevent structural damage (e.g. WIAH 511, 569).

Lock-keepers cottages are of heritage and aesthetic value to the canal and its environs. Their occupancy and upkeep should be encouraged. Similarly, other buildings such as **houses** and **farm buildings** not directly linked to the canal can be of architectural interest and contribute to the aesthetic character of the canal (e.g. WIAH 579, 587). Derelict or ruinous lock-keepers cottages (e.g. WIAH 510, 671) and other former dwellings, still add to the character of the canal but need to be maintained in their present state if they are not to be renovated. At a minimum this could involve the clearance of vegetation and the stabilisation of the remaining structure to prevent further deterioration or collapse. Re-roofing, where possible, is recommended as an immediate preservation action. Lock-keepers cottages that are semi-derelict still have the potential for development through renovation (e.g. WIAH 645, 662, 669). Where the original character of the building is still evident, it is recommended that such a renovation is in keeping with the original materials.

Public houses (e.g. WIAH 460, 577) sited next to the canal are indirectly linked to the heritage of the canal and are therefore of socio-historical interest. In addition to this they are often of architectural interest. Publicans, without encouragement, often display old photographs of the area as a means of decoration and source of interest for customers. This form of public information should be supported and, where appropriate and welcomed, supplemented with by Waterways Ireland e.g. archive photos and accompanying text.

Warehouses, stores, mills (e.g. WIAH 481, 514, 761) and other such complexes provide excellent opportunity for preservation through renovation (WIAH 512). In the absence of such a scenario these buildings should be maintained, stabilised and preserved as a visual reminder of the canal's rich industrial heritage. Derelict buildings (e.g. WIAH 484, 662, 763) that are strategically located in a populated town and available for development provide an excellent opportunity to revamp such locations for modern usage. The positioning of a new development on such a site could be equally beneficial to both the aspect of the new buildings and that of the canal. Existing buildings of heritage interest derelict or otherwise can be incorporated to good effect (e.g. WIAH 623, 766, 767).

Canal-side locations centrally located in a town or city provide an ideal opportunity to enhance the lives of inhabitants and visitors by bringing recreation activities to the canal bank either by means of a

public space or a new development that makes the most of the aspect. Excellent examples of this can be seen in Naas, Robertstown, Tullamore and Dublin.

Lift-bridges (e.g. WIIAH 490, 560, 760) and other mechanical devices should be maintained where possible. **Aqueducts** (e.g. WIIAH 410, 599, 707) when of aesthetically pleasing construction and visible from the road, canal or walkways should be maintained to add visual interest and to illustrate the technology and engineering associated with the canal. There are scant remains of canal furniture such as **milestones** (e.g. WIIAH 430, 472, 567). The few remaining examples should be preserved *in situ*, or, where salvaged, incorporated into new developments or relocated to a similar setting.

Shannon Harbour is still an active location, as is the harbour at Tullamore although to a lesser extent. Both areas share an atmosphere that is reminiscent of the former activities of the canal in its heyday. On the days of inspection there were several occupied boats and people coming and going. The presence of many boats and more than a few structures built around the same time as the canal lends to the characters of the harbours but both areas require management.

Key Recommendations

- Management of the canal as a living heritage resource for this generation and future generations.
- Development of a strategic approach to the management of the architectural, industrial and engineering heritage of the canal.
- Use the waterway and its surviving architectural heritage as a catalyst for local development, whilst maintaining control over the blending of the new structures with the receiving environment and existing structures.
- A long term conservation plan for the entire length of the waterway, including maintenance of the canal basin, associated infrastructure, canal contemporary structures and other older or more recent structures or features that add to the aesthetic and heritage value of the canal environs.
- Inclusion of these recommendations in the relevant County Development Plans.
- Restoration, where feasible, of buildings including lock keeper's cottages, houses, mills, stores, warehouses etc.
- Regular monitoring and reviews of the condition and action required for structures and canal banks, recording any deterioration, alteration, damage or improvements.
- Regular maintenance and upkeep of all canal associated structures and features.
- Minimise the impact of modern additions to the waterway and its environs:
 - o Ensure modern features have as little negative structural and visual impact as possible to the original masonry structures.
 - o Ensure new development is appropriately sited, complimenting and adding to the value of the canal, whilst continuing public access.

- Repair work is recommended for many features which were built as part of the initial construction phase of the canal. These works should include re-pointing in lime render and they should interfere as little as possible with the original character of the structure.
- Re-roofing is recommended as an immediate preservation action for as many ruined structures as possible, particularly those that are at the early stages of collapse.
- Use the waterway and its associated structures as a recreational and commercial amenity:
 - o Repair and use original structures to enhance the waterway and house services such as toilets, showers etc. needed for canal users.
 - o The repair and subsequent use of derelict buildings could be made available to local enterprise e.g. artists residences / studios / workshops, cafes, shops, accommodation, clubhouses, storage, offices, information centres etc.
 - o Placing of benches, archaeological and geographical information boards etc. along various lengths of the canal.
- Removal of graffiti on many structures, evident particularly in towns and villages.
- Repair and upkeep of the entire length of the towpath for recreational purposes, thereby allowing access for all canal users and ensuring a greater interest in the canal as well as making it safer for all users.
- Repair and upkeep of numerous quay sides and harbours for boaters, tourists and locals, with the possibility of developing parks, recreational areas or greenways close to the canal banks.
- Restrict access for large vehicles across masonry canal bridges in order to prevent accidental damage to the bridge faces and its overall structural stability.

The Grand Canal and its associated architectural, industrial and engineering heritage are to a limited extent offered some level of protection by ongoing maintenance in the interest of recreation. However, if the full potential of the canal is to be realised in terms of its heritage value and subsequent benefits to local communities and tourism, the multitude of sites and features worthy of preservation presented in this assessment must be afforded further protection, maintenance and restoration when needed. It is recommended that this is achieved by the consolidation and monitoring of all available data, most importantly the results of this assessment, the current details of site ownership, the Sites and Monument Record and the Record of Protected Structures. It is in the interests of Waterways Ireland to both pursue and promote the protection, maintenance and restoration of its waterways and associated heritage in order to maximise their appeal for both recreation and sympathetic redevelopment.

8. REFERENCES

Literary Sources

Bernard and M.B Mullins (1846) 'The Origin and Reclamation of Peat Bogs with some Observations on the Constructions of Roads, Railways and Canals in Bog'. *Trans ICE Ir*, vol 2

Clarke, Retee (1992) *The Royal Canal: the complete story*. Elo Publishing, Dublin

- Cox, Ronald (2006) *Engineering Ireland*. The Collins Press, Cork
- Cox, Ronald (2003) *Ireland's bridges*. Wolfhound Press, Dublin
- D'Arcy, Gerald (1969) *Portrait of the Grand Canal*. Transport Research Associates, Dublin
- Delany, Ruth (1995) *The Grand Canal of Ireland*. The Office of Public Works, Dublin
- Delany, Ruth (1986) *A Celebration of 250 years of Ireland's Inland waterways*. Appletree Press, Belfast
- Delany, V.T.H, (1966) *The canals of the south of Ireland*. Dave & Charles, Newtown Abbot
- DeLatocnaye, C. (1984) *A Frenchman's Walk Through Ireland*. Blackstaff Press, Belfast
- Edwards, Nancy (2004) *The Archaeology of Early Medieval Ireland*. Routledge, New York
- Hammond, Fred and Mary Mc Mahon (2002) *Recording and Conserving Ireland's Industrial Heritage; An Introductory Guide*. The Heritage Council, Dublin
- Hayward, R, (1940) *Where the River Shannon Flows*. Dundalgan Press, London
- MacNeill, John (1844) *Report on the Grand Canal*. Dublin
- O' Farrell, Padraic (1983) *Shannon through her Literature*. Mercier, London
- O' Keefe, Peter & Simington, Tom (1991) *Irish stone bridges; history and heritage*. Irish Academic Press, Dublin
- O' Regan, Edward (2005) *In Irish waterways*. Curragh Press, Dublin
- Paget-Tomlinson, Edward (2006) *The Illustrated History of Canal and River Navigation*. Landmark Publishing, Derbyshire
- Paget-Tomlinson, Edward (2005) *Britain's Canal and River Craft*. Landmark Publishing, Wiltshire
- Rynne, Colin (2006) *Industrial Ireland 1750 – 1930; An Archaeology*. Collins Press, Cork
- Salter, Mike (2004) *The Castles of Leinster*. Folly Publications, Malvern, Worcs
- Sweetnam, David (2005) *The Medieval Castles of Ireland*. The Collins Press, Cork
- Thomas, Avril (2006) *The Walled Towns of Ireland, Vol. II*. Irish Academic Press, Dublin
- Waddell, John (2000) *The Prehistoric Archaeology of Ireland*. Wordwell Ltd., Co. Wicklow
- Williams, Charles Wye (1883) *Observations on the Inland Navigation of Ireland; and of employment for its population, with a description of the Shannon. Suggested by the report of the select committee of the House of Commons in 1830, on the state of Ireland, and remedial measures proposed by them*. London, Vacher & Son, 29 Parliament Street; and R. Fenn cross. W. Curry, Dublin; T. Kaye, Liverpool

Cartographic Sources

First Edition Ordnance Survey 1829-1841, 6 inches: 1 mile, Dublin Sheet no. 3264, 3263, 3261, 3260, 3325, 3324

First Edition Ordnance Survey 1829-1841, 6 inches: 1 mile, Kildare Sheet no. 015, 014, 019, 013, 012, 008

First Edition Ordnance Survey 1829-1841, 6 inches: 1 mile, Offaly Sheet no. 012, 011, 010, 018, 017, 016, 015, 014, 022

Second Edition Ordnance Survey 1897-1913, 6 inches: 1 mile, Dublin Sheet no. 3264, 3263, 3261, 3260, 3325, 3324

Second Edition Ordnance Survey 1897-1913, 6 inches: 1 mile, Kildare Sheet no. 015, 014, 019, 013, 012, 008

Second Edition Ordnance Survey 1897-1913, 6 inches: 1 mile, Offaly Sheet no. 012, 011, 010, 018, 017, 016, 015, 014, 022

Record of Monuments and Places map, Dublin Sheet no. 3264, 3263, 3261, 3260, 3325, 3324

Record of Monuments and Places map, Kildare Sheet no. 015, 014, 019, 013, 012, 008

Record of Monuments and Places map, Offaly Sheet no. 012, 011, 010, 018, 017, 016, 015, 014, 022

Electronic Sources

www.buildingsofireland.ie – accessed 10/12/07 – 05/01/08

<http://www.kelt.ie/waterwaysnet/blackwood-feeder-history.asp> - accessed 09/01/08

<http://shr.iwai.ie/history.html> - accessed 10/01/08

http://www.askaboutireland.ie/show_narrative_page.do?page_id=3193 – accessed 11/12/07

http://www.askaboutireland.ie/show_narrative_page.do?page_id=3196 – accessed 11/12/07

See also List of desk-based assessment, pp. 32-33