

FINGAL INDUSTRIAL HERITAGE SURVEY

PHASE 1: DESKTOP SURVEY



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EXECUTIVE SUMMARY

This report and database represent the first phase of the Fingal Industrial Heritage Survey (FIHS). This first phase was commissioned by Fingal County Council in August 2010 with Carrig Conservation, in association with Mary McMahon, Urban Heritage Consultancy, engaged to carry out the work. The aim of this phase was to create an inventory of industrial heritage sites within the Fingal region.

The primary aim of the project was to carry out a comprehensive assessment of historical documents and maps identifying all sites of industrial heritage interest in Fingal. The resulting mapping and database will be integrated in the Council's GIS system, providing a tool for the analysis of the county's industrial development. The project is intended to be a two year project with a field survey to be conducted in Year 2 based on the data gathered and collated in Year 1.

The primary focus of this first phase was the creation of a searchable industrial heritage database which could be added to as the project progresses. An Access Database was specifically designed in consultation with the Steering Committee to meet the needs of Phase 1.¹ The database provides essential information to the user and will allow for the extraction of reports and querying of information added to the database. A numbering system was also devised to ensure each site was given a unique number to allow its inclusion within the database.

Following development of the database, a paper survey was conducted to identify sites of industrial heritage within Fingal. The primary source for this paper survey was cartographic sources, namely the Ordnance Survey maps. The locations of identified sites have been marked on digital copies of the current maps, which also accompany the report and database.

In total **1159** sites were identified. The most numerous site classification was transport with bridges being the most prevalent site type. Extractive industries also featured quite significantly amongst the sites identified, in particular quarries.

Following on from the cartographic survey, documentary research was conducted on a number of trends which the cartographic survey highlighted. This serves as a broad overview of Fingal's industrial heritage and provides a tool to aid in identifying the significance of individual sites at field survey stage.

¹ The database also includes fields for information which will be input following Phase 2 of the project, i.e. fieldwork and additional desk-based research.

1 INTRODUCTION

This document represents a report on the findings of the First Phase of the Fingal Industrial Heritage Survey. Fingal County Council in partnership with the Heritage Council commissioned this comprehensive survey of the industrial heritage of the county. The aim is to create an inventory of industrial heritage sites within the county with GIS Co ordinates that will inform the next phase of the project including the fieldwork aspect and which will lead to the production of a published survey of industrial heritage sites in County Fingal at a later date.

The specific objectives as set out in the project brief were:

1. To record and evaluate the county's industrial heritage since 1700 using best practice methods.
2. To produce an administrative tool for Fingal County Council which enables the evaluation of industrial heritage sites in the planning process and in the performance of its other statutory functions.
3. To provide a research tool for the analysis of the county's industrial heritage.
4. To act as a resource in the development of educational materials and activities.

On appointment of Carrig Conservation in association with Mary McMahon Urban Heritage Consultancy, the first meeting with the Steering Committee was held In August 2010. It was agreed that the desk-based survey would be delivered using historic mapping available in Trinity College Map Library which, due to their restricted opening hours, would be supplemented by the use of mapping accessible on-line from the Ordnance Survey of Ireland website. In order to facilitate commencement of the historic map analysis Fingal County Council agreed to supply baseline mapping in the form of digital copies of the modern Ordnance Survey maps. Baseline mapping was received in early September and the First Phase of the project commenced focusing on identification of sites.

The report gives details of the team's approach to the survey, an overview of the database, and a summary and brief analysis of the findings and recommendations. Data collated during the survey is presented in a Microsoft Access database, complimented by GIS mapping which is linked to the database. The database contains information on site types, locations, historic cartographic details and has been designed to allow further information to be added to it as this become available.

2 INDUSTRIAL TRENDS IN FINGAL²

2.1 Introduction

Fingal is located on the east coast of Ireland to the north of Dublin city. On its eastern flank the region has a sheltered coastline which combined with its close proximity to Dublin encouraged the development of many fishing ports such as Balbriggan and Skerries. In addition the area is traversed by a transport network developed to link Dublin with the north and west of the country. The county contains a rich heritage of industrial buildings, in particular those associated with agricultural activity and the textile industry. There was also a large concentration of features and structures associated with extractive industries such as quarries and lime kilns.

2.2 Transport

Transport was the most dominant of the classification categories, with bridges being the most numerous site type. The bridges varied from road bridges straddling rivers, railway bridges crossing both the railway itself and those carrying the railway over roads and rivers, and bridges related to the Royal Canal.

2.2.1 The Royal Canal

The great canal-building schemes of the later eighteenth-century provided an infrastructural link between the industries of Dublin city and its hinterland. They proved a monumental feat of engineering having a profound impact on the landscape and leaving a wealth of related structures. Ireland developed a canal network before any other region in the British Isles and was also unique in that inland navigation was initiated and led by parliament.

In 1755 a survey was made to assess potential routes for a canal between Dublin and the River Shannon. Two possible routes were identified with the southern route chosen as the most viable and thus construction of the Grand Canal commenced in 1763. In 1789 money was sought to build a canal from Dublin to Tarmonbarry following the northern route identified in the 1750s. Construction commenced on the Royal Canal (FIHS0790) in 1790 and continued for 27 years before reaching the Shannon in 1817 at a total cost of £1,421,954. The exact route of the proposed Royal Canal had not been fully planned or surveyed in advance and this caused major problems. The decision to cut the canal through extensive rock at Clonsilla proved considerably more expensive and time-consuming than the Company had expected.

The main water supply for the Royal Canal is Lough Owel near Mullingar which feeds the highest (or summit) level. The canal levels then descend in both direction, east to Dublin and west to the River Shannon in accordance with the topography of the countryside. A total of 47 locks (including a sea lock at the Liffey were needed and four major aqueducts were built to carry the canal over rivers. In all 86 bridges were constructed. Three canal locks fall within the Fingal area - 10th Lock (FIHS 980), 11th Lock (FIHS 975) and 12th Lock (FIHS 930). There are nine canal bridges including one carrying the railway over the canal.

The quality of the workmanship was very high throughout the canal and most lock chambers and bridges are still in almost perfect condition. Virtually all materials were sourced locally - oak was the principal timber used for lock gates and limestone quarries provided stone for bridges and lock chambers. Evidence for the canal building activity was found in the FIHS - quarries were noted on the earliest OS map editions near Ranelagh Bridge, near Talbot Bridge/12th Lock, east of Kirkpatick Bridge and near Kennan Bridge. A lime kiln and forge are also shown near Kennan Bridge.

² References consulted for this overview are included in the Bibliography at the end of the Report

The onset of the railway era and the Midland Great Western Railway take-over hastened the decline of trading on the canal and rapid deterioration at the turn of the century led to its inevitable closure. In the 1830s the average annual tonnage carried by canal was 80,000 tons and 40,000 passengers, which however by 1880 had fallen to 30,000 tons.

2.2.2 Railways

The creation of the railway network radicalised transport and communications in the nineteenth-century. The railway system which developed from the 1830s left a great array of engineering heritage across Dublin and Ireland as a whole including the lines themselves, station buildings, bridges, embankments and other ancillary structures. By the close of the nineteenth-century the county of Dublin was linked to the city by an intricate network of railway lines forging links between the city, its quays and the remainder of the country.

In 1836 an act was passed enabling the building of a railway from Dublin to Drogheda. There had been successful lobbying for a coastal route for the railway which would take in towns such as Balbriggan. This would improve transport facilities for the town's textile industries which were suffering a decline in the 1820s/30s. It was hoped better transport would alleviate this decline.

John Macneill was appointed engineer in charge of the railway and William Dargan and William McGoldrick supervised the work which commenced in 1838 with between 7,000 and 8,000 workers employed on the project. On the first edition Ordnance Survey, the line is shown and annotated *Dublin and Drogheda Railway In Progress*. The construction work called for many feats of engineering, much of which can still be seen today. At Ardgillan the track was laid on the route of the old Balbriggan to Skerries road with a new road built to the east of the track. The Balbriggan Viaduct (FIHS0047 - built 1844) was described by Sir John Macneill as the single most important piece of construction on the Dublin to Drogheda project measuring 590 feet across and having 11 bridges. It could only be built with permission from the British Admiralty, given that the water in the harbour used to go back as far as the junction of High Street and Quay Street meaning the viaduct was not just about a railway crossing but also involved considerable land reclamation.

On a site to the west of the Balbriggan viaduct coke ovens were built in order to supply fuel for the train engines. Coal was sent to Balbriggan from Scotland by sea. Tramways were laid from the quayside to the coke ovens and coal was moved by means of hand propelled carts. The coke ovens fell foul of the navigation authorities who claimed that the glow from the ovens shining through the arches of the viaduct could be mistaken as navigation lights at Mornington and the company decided to brick up some of the arches to prevent this happening. The viaduct also housed a RNLI Boathouse built in 1889 following a number of ship sinkings.

The Dublin and Drogheda Railway began operating in 1844. There were stations at Balbriggan (FIHS0040), Skerries (FIHS0223), Rush and Lusk (FIHS0353), Donabate (FIHS0671), Malahide (FIHS0656) and Portmarnock (FIHS0627) within Fingal. Both Balbriggan and Malahide stations were designed by George Papworth. Shortly after the opening of the line a branch line was constructed to Howth (FIHS1019), opening in 1846. There was one other station along this branch line at Sutton and Baldoyle (FIHS0889).

The importance of the railway for local industry is best exemplified at Balbriggan. As Balbriggan was a centre of manufacture, three railway lines went into what is now the station carpark, where apparently the buffer wall of the middle line is still in place today. There was also a turntable. Goods wagons were lined up, loaded and unloaded, with produce going to and from the factories such as Smyth & Company (Smythco), as well as farmers taking delivery of machinery or selling their produce. On the seaward side of the tracks there was another siding where cattle were loaded for the markets. Balbriggan Railway Station, during the nineteenth-century and for much of the twentieth-century was primarily a goods station.

In 1875 the line was amalgamated with the newly formed Northern Railway of Ireland which also included the Dublin and Belfast Junction Railway. In 1876 the Northern Railway of Ireland merged with the Irish North Western Railway (INW) and Ulster Railway to form the Great Northern Railway (Ireland). In the first half of the twentieth-century a combination of the increasing road competition facing all railways and a change in patterns of economic activity caused by the partition of Ireland reduced the GNRI's prosperity and by the 1950's the GNRI had ceased to be profitable. In 1953 the company was jointly nationalised by the governments of the Republic of Ireland and Northern Ireland. The two governments ran the railway jointly under a Great Northern Railway Board until 1958. In May 1958, the Northern Ireland Government's desire to close many lines led to the GNRI Board being dissolved and the assets divided between the two states. All lines in Northern Ireland were transferred to the Ulster Transport Authority (UTA) and all lines in the Republic of Ireland were transferred to Córas Iompair Éireann (CIE).

The second railway line constructed within the Fingal area was the Midland and Great Western Railway (FIHS0793) which commenced construction of a railway linking Dublin and Mullingar in January 1846. The Company had purchased the Royal Canal in 1845 with a view to draining the canal and running the rail line along its bed. Instead the railway was constructed along the banks of the canal. The line opened to traffic in 1847, reaching Galway in 1851. The railway terminated at Broadstone Station, where a spur of the Royal Canal already terminated. The line had stations at Blanchardstown (FIHS0940), Clonsilla (FIHS0817) and Lucan (FIHS0944). In 1858 work commenced on the construction of the Dublin and Meath Railway (FIHS0470) which intended to connect Trim and Athboy with Dublin. In 1862 the route between Navan and Clonsilla opened. However the Dublin and Meath Railway Company went into receivership in 1868 and the following year the Midland and Great Western Railway Company, which owned the Dublin-Galway line, took out a lease on it and eventually bought it out in 1888.

2.2.3 Hill of Howth Tramway

In 1897 the Great Northern Railway were enabled by an Act of Parliament to construct a tramway connecting Sutton and Howth by a circuitous route around the Hill of Howth. The Hill of Howth Tramway (FIHS1036) was fully operating in August 1901 with the hope that it would aid both residential and tourism development in an area which was thought to have great potential. However the tramway did not prove to be as profitable as originally anticipated and the tourism potential of the Hill of Howth was never fully exploited. Even in its best years, the tramway showed a loss. In its early years it ran every 15 minutes and there was a tram to connect with every train. The tramway depot (FIHS891) was located close to Sutton & Baldoyle Railway Station. A generating station (FIHS1131) was located behind the depot. This was steam-powered having three Lancashire boilers. There was a battery house on the summit which was charged from Sutton. Around 1930 it was found that buying electricity current from the ESB was cheaper than renewing the power station plant and the power station was closed. Following the takeover of the Great Northern Railway in 1953, the tramway was threatened with closure. This was realised in 1959 with the line fully closing on 31st May. Within a few weeks of closure demolition began and one of the trams were used to bring cables, poles, overhead wires and rails back from the Hill. Demolition was finished in early 1960.

2.2.4 Roads

Little is known of the origin of most roads. The majority of trunk roads have early origins, though they have often been realigned/improved in more modern times. A major spate of road building throughout Ireland began in the 1720s when the first acts of parliament were passed to establish turnpike roads. One of these was the Dublin-Dunleer Turnpike which dates from 1731 and ran northwards from Dublin via Swords and Balbriggan. These were toll roads that were franchised out to private operators. Two other routes through Fingal to Drogheda were also made into turnpikes - one to the west of the county running via Ashbourne and another through the middle via Naul and Knocksedan. From the 1780s mail coach services

were established throughout Ireland and this led to the upgrading of many trunk roads including elimination of some of the tighter bends and sometimes the realignment of sections of road and building of new sections. In 1831 William Dargan was engaged to design alignment improvements to the road from Ballough to Balrothery and by-pass the steep hill at Man-O'-War. This work was completed in 1834. Stables associated with the Mail Coach Road from Belfast, Drogheda and Ashbourne were identified during the survey (FIHS0495). The turnpike roads of North Dublin were wound up in 1855.

The majority of the milestones on roads in Ireland were placed along the trunk routes. In some places they were placed by the turnpike trusts but many of them would have been provided by the Grand Juries, who were responsible in each county for infrastructure such as routes and bridges. Milestones served to indicate the distances travelled and usually gave the distance from Dublin - initially from Dublin Castle and later from the GPO.

The earlier milestones were made entirely of stone that was local to the area. Distances were measured in Irish miles up to the 1820s. From the 1820s the Statute or English mile became the legal measure. The usefulness of milestones diminished in the mid nineteenth-century when sign posts were erected at junctions giving the distance to destinations.

2.2.5 Dublin Airport

The decision to convert a former Royal Air Force aerodrome at Collinstown into a commercial airport represented a major development in the transport infrastructure of Ireland. Dublin Airport (FIHS0551) was officially opened in January 1940 with the first flight being made by Aer Lingus to Liverpool. The terminal building was designed by Desmond Fitzgerald, who was appointed by the Board of Works. The building has been described as an 'elegant exercise in the International Modern style' and is designed on a curved plan with four storeys emphasised by repeated bands of horizontal glazing, cantilevered terraces and promenades overlooking the airfield. The design with its convex curvature towards the airport apron allowed the maximum number of airplanes to be serviced. The terminal building is regarded as one of Ireland's finest buildings of the twentieth-century. World War II seriously curtailed development at the airport until the late 1940s but by 1947 three concrete runways had been constructed. By the early 1950s the airport's passenger numbers had grown beyond its original intended capacity and the decision was taken to construct another terminal. This new terminal, completed in 1959, was constructed on the northern flank of the main terminal and was known as North Terminal. In 1972 a new passenger terminal was opened to cope with a further increase in passenger numbers and there were further expansions to the airport in the 1980s and 1990s including new runways and a state-of-the-art air traffic control centre (opened in 1989).

2.3 Balbriggan and the Textile Industry

At the turn of the twentieth-century Balbriggan was known around the world for the quality of its textile products. The hosiery and linen industries were central businesses in the Balbriggan area for about 250 years with cotton manufacture introduced to the town by Baron Hamilton in 1780. Prior to that Balbriggan was a small fishing village overshadowed by the main population centre at Balrothery which has several small manufacturing industries in the eighteenth-century producing basic furniture, tanned products, beer and biscuits. There had been some hosiery manufacturing in Balrothery prior to 1740 but this was largely a cottage industry. In 1740 the hosiery industry was established on a more solid basis but the business lapsed in the 1760s. It was revived shortly after and in 1780 the firm Smyth & Company was established before moving to Balbriggan. Smyth & Company gradually and steadily gained in reputation and Balbriggan products became known the world over. In the early nineteenth-century the company began producing openwork stockings which were to become a favourite of Queen Victoria and the Tsarina of Russia.

Smyth & Co. occupied what was known as Upper Mill by 1783. They were by no means the only textile manufacturers in Balbriggan with the Drogheda Linen Company operating out of Lower Mill on Mill Street. In the 1830s the latter company took advantage of mechanisation and began developing power from water turbines and installing weaving looms from Lancashire. The factory built up a healthy business in bed sheets, pillowcases, tablecloths and mattress coverings. In 1887 the company was bought by Charles Gallen and renamed Charles Gallen & Co and continued operating with marked success into the late twentieth-century.

By the mid nineteenth-century Balbriggan had two thriving large factories powered by a combination of steam engine and waterwheel - together providing 84 horsepower which was sufficient to drive 7500 spindles for spinning the cotton, an average production of 7400lbs per week giving employment to about 300 people. A millrace, known locally as 'The Canal' drove the waterwheel. The presence of a sufficient water supply to drive the machinery was one of the key elements in transforming what had begun as a small cottage industry into a major manufacturing concern. The reservoir (FIHS0183), located to the south of the town, together with an intricate network of natural watercourses such as Tanner's water and the River Bracken, were augmented by mill ponds and mill races to ensure a supply of water to aid the development of the industries in Balbriggan.

The Bracken River was central to providing a water supply. It was created by a confluence of streams including Tanner's Water and flowed northwards feeding the reservoir which supplied water for the upper mill, located on Dublin Street. It also supplied water to the Mill Dam (FIHS0184) situated adjacent to Vauxhall Street which fed the lower mill by means of 'The Canal'.

In 1867 Smyth & Co. built new premises next to the railway station, which had opened in 1844. This new factory contained the most up-to date machinery, but was destroyed by fire in 1882. It was subsequently rebuilt on a larger scale and fitted with the latest machinery.

The fire at Smyth & Co. presented opportunities for other firms, who utilised the skilled labour. An English firm, Deeds, Templar & Co., established a factory near the railway line to the north of the town named Balbriggan Banks Hosiery Company in 1884. The factory was destroyed by the Black and Tans in 1920.

Tambour-work (a form of embroidery) was carried out extensively in Skerries with Lewis reporting that more than 700 women were employed in this work. It was carried out extensively throughout the nineteenth-century but appears to have largely been a cottage industry carried out by women in their homes.

2.4 Industry of Agriculture

Human muscle power was a plentiful and cheap commodity in pre-Famine Ireland and its cheapness largely inhibited the introduction of labour-saving devices into Irish agriculture. Furthermore Irish farms were also quite small. It was only shortly before the Famine and in its immediate aftermath that mechanisation became a viable option. The earliest horse-powered threshing machines used in Ireland were introduced in the late eighteenth-century. These were powered by wooden horse wheels and due to their timber construction had to be enclosed within buildings. In the early 1830s a number of iron foundries were supplying horse-powered threshing machines to an expanding market. The products of these foundries were a series of compact cast-iron horse engines, where the drive was taken from the top of the wheel rather than the bottom of the drive shaft, as in the traditional wooden horse wheel. As these machines were made of cast metal, there was no need to protect them from the elements. By 1875 it was estimated that some 10,000 threshing machines were operating in Ireland. The locations of these machines are recorded on the first and second edition OS maps with 23 examples identified in the industrial heritage survey of Fingal.

Fingal's low-lying coastal lands are ideal for harnessing wind energy, while the lack of rivers large enough to power watermills also resulted in a reliance on wind power. Tower windmills

were relatively common in Ireland's main grain-producing counties on the eastern seaboard with the earliest shown on a map of 1591 from Waterford harbour. These were called *tower mills* as the mill machinery was contained within a typically cylindrical, masonry tower. In the tower mill the building is a fixed entity, and the moving portion containing the sails and the drive shaft (or windshaft) is carried in a rotating cap section set on top of the tower. A tail pole with a tiller wheel at its lower end was connected to the cap portion, a movement of the pole in any direction enabling the miller to turn the cap and thence the sails into the prevailing wind. The tower mills built before c.1770 in Ireland tend to be cylindrical, three- or four-storey rubblestone structures and they generally had opposing doors so that at least one would not be blocked off by the sails when the mill was operating. The gearing of nearly all windmills of this period were of wood while the moveable cap portion would have had a wooden roof covered with thatch.

The period after 1770 up to the end of the Napoleonic Wars witnessed a spate of windmill construction as the cultivation of cereals became a very profitable activity. The windmills of this period tended to be larger and more powerful. Smaller windmills continued to be built but these tended to be for local needs. By the early 1800s, tower mills of tapered profile with four or five floors (the upper floors for the milling plant and the lower for storage) were becoming more common. The increased height allowed larger sails to be used and the consequent increase in motive power made it possible for up to four sets of millstones to be employed. Wind speeds along the eastern coastal strip of Ireland favoured the construction of windmills and in many cases windmills were used to supplement water mills, particularly where watercourses were prone to drying up during summer months. There were 12 windmills identified in the Fingal area.

From the first editions of the OS maps, it is clear that many Irish windmills were already falling into disuse by the early 1830s. An important factor in this was the decrease in demand for milled cereals at the end of the Napoleonic wars in 1815. The growth in steam-powered mills also forced smaller water and wind-powered grain mills into decline. Wherever practical water power was preferred to wind power as it was more reliable and could be stored in millponds and regulated by means of sluices or inlet control gates.

Wind power was also used for pumping water. There were seven wind pumps identified during the survey. These date to the early twentieth-century and in some instances were replaced by pump houses. The identification of a number of pump houses (seven), which occur in isolation, would suggest water management of agricultural land, particularly given the proliferation of drainage ditches noted on the historic mapping during the study. These systems of ditches were not recorded, but they date to the early twentieth-century.

2.5 Extractive Industry

2.5.1 Quarrying

Fingal is largely underlain by Carboniferous limestone. Extractive industries, in particular quarrying, featured quite significantly amongst the industrial heritage of Fingal as identified during the course of this survey. From the medieval period onwards building stones were generally quarried locally due to transportation costs. This continued into the eighteenth- and early nineteenth-centuries. Structures were generally stone-built and this stone was sourced within a narrow radius of the construction site. However access to a navigable waterway also enabled stone to be transported over considerable distances. For the most part, Irish quarries were opened on an *ad hoc* basis to minimise transport costs for a special building project in an isolated area or simply because large amounts of stone were needed for a project. Quarries open on a continuous basis tended to supply the general needs of the building industry. Permanent or portable forges were used at most quarries to enable workers to re-edge tools. At the larger quarries ancillary buildings for storage as well as gunpowder magazines were also provided, as was stabling for horses used to operate whims and to pull wagons.

Lime kilns were commonly located in quarries, at the roadside or at coastal locations to facilitate transport. There were 27 lime kilns identified in Fingal. The primary use of lime was agricultural, where it was employed as an alkali to neutralise acidic soils, but it was also a key raw material for many industries such as a flux in blast furnaces, in the purification of town gas, in the production of bleaching powder and in de-hairing hides in the tanning process. It was also used for mortar. Two basic varieties of traditional lime kiln were used in Ireland over the past 250 years. The first and earliest of these was the *intermittent* kiln in which the body of the kiln was charged, fired and allowed to cool off before being emptied, after which it was re-charged for the next firing campaign. In these kilns the fuel and the limestone charge were separated within the main body of the kiln by a crude arch or dome constructed with limestone blocks. In this way the fuel and unslaked lime did not come into contact, giving an ash-free and purer product. The second kind of kiln is the *continuous* type, with a mixed feed of fuel and limestone, which were continuously fed into and burnt in the kiln bowl, with quicklime drawn off at the base.

With the spread of improved agricultural techniques in the second half of the eighteenth-century, the increased demand for quicklime as fertiliser led to the construction of larger continuous draw kilns. These tended to be rubblestone structures around 4-8m wide and about 5-8m high with a square or rectangular (and occasionally circular) ground plan. The central body of the kiln was either stone or brick-lined. The draw hole was set into an arched or lintelled recess. In small country kilns, this recess would often be supported by a simple lintel but in the larger, more developed kilns, elaborate arches with cut-stone voussoirs were common. The kiln funnel was charged with stone and fuel which was lighted from the recess at the base. In Irish coastal towns and ports it was a common practice for the heat rising out of the kiln to be used for refining salt. In what were called salt and lime works, which originated in the mid eighteenth-century, salt pans were positioned over lime kilns, whose rising heat was used to boil the water in the pans.

2.5.2 Mining

Ireland has a long and rich mining heritage, with records of mining dating back to the Bronze Age (ca 2000 B.C.) with the southwest being an important copper producer. However it was not until the Industrial Revolution in the eighteenth and nineteenth-centuries that the metal mining in Ireland really developed. While there was mining activity in almost every Irish county during the nineteenth-century, the vast majority were marginal activities, undertaken when market conditions for particular minerals were thriving. They were also, particularly in the early decades of the nineteenth-century, small-scale, sporadic, under-capitalised and financed without the relative cushion of wider public investment. Throughout the nineteenth-century mining continued to operate on the periphery of the economy with mines located in remote areas. Fingal's mining industry included copper and lead.

Copper mines were opened at Loughshinny in 1777 by Benedict Arthur who brought over experienced miners from Belgium and Germany. The mines thrived for a time as copper was in demand for use in munitions. The ore was shipped to Sunderland where it was smelted down. However, after the Napoleonic Wars ended, the demand for copper fell dramatically and the mines were no longer financially viable. They were closed in 1812. Copper mines being worked by the Irish Consuls Company between 1862 and 1865 were noted in contemporary official listings as being in Fingal.

Lead mines were identified in Howth, Castleknock and the townland of Cloghran. Cole, referring to a late eighteenth century publication, notes that a lead mine was opened by Edward Ford northeast of the old castle of Castleknock in 1744. He also notes, citing the same reference, that a 'very rich ore' was being raised c.1772 from two mines at the church of Cloghran, on the road from Dublin to Swords. Lewis mentions lead and copper being found at Cloghran and also the discovery of lead in Malahide.

2.6 Coastal Industries

Balbriggan, Skerries and Loughshinny had maritime facilities prior to the eighteenth-century and these were developed between the mid-eighteenth and early-nineteenth centuries by the Hamilton family. This encouraged the growth of the fishing industry in the towns of Balbriggan and Skerries. By the early eighteenth-century the industry had been in decline and in the 1760s the government commenced providing subsidies. The fishing industry in Fingal was at its height in the late eighteenth-century. Herring was a major industry at Balbriggan and a saltworks (FIHS0038) was established alongside the harbour which continued to operate into the twentieth-century. Skerries also had a saltworks (FIHS0209), though this was no longer in operation by the 1870s.

Work on Balbriggan pier (FIHS0037) commenced in 1762 with the belief that it would be of particular benefit to coastal and coal trade as there was no harbour between Dublin and Carlingford. A lighthouse was built at the end of the pier in the 1760s. A further pier was added in 1826-9 with some money provided by the Fishery Board. In the 1830s Balbriggan was importing coal, culm, rock salt, slates and bark and exporting corn and cattle.

A pier (FIHS0207) was constructed at Skerries about the same time as at Balbriggan. This pier was located on Red Island, which was linked to the mainland by means of a causeway. Red Island may have received its name from the drying of sails, as it was known by a different name prior in the 17th century before barking of sails began. 'Barking' or dyeing of sails would have been carried out in Skerries using a mixture of bark of certain trees and a pitch-like substance called 'cutch' and the sails then spread on the island to dry. The heat when boiling the mixture changed it to a reddish brown liquid and this may have caused the rocks and soil of the island to turn red in colour. A ropewalk (FIHS0220) was also identified in Skerries which would have been linked to the fishing industry. This appears to have been no longer in operation by 1870.

In 1831 the government suspended payment of subsidies and this had a significant impact on the fishery industry. Lewis reports a severe diminishing in fishing throughout Fingal following this, though it was still carried out.

Maritime access to many coastal villages was greatly enhanced during the nineteenth-century by the development of other harbours. Amongst those developed was Howth Harbour where the packet boat from Britain docked and had been frequently delayed waiting for tides and winds. The decision to develop the harbour was taken in the 1790s and in 1807 Captain George Taylor was appointed engineer, beginning work on the new piers to plans drawn up by Captain Bligh. The harbour, comprising two piers of rubble stone (FIHS1012 & 1014), was completed in 1813, though silting and excessive storm damage, Taylor's resignation and revised plans delayed the execution of the project. The harbour, however, was too small for the increased size of steamboats and in 1834 the mail station was transferred to Dún Laoghaire. Lewis describes the harbour as being chiefly used by fishermen with the fishery supplying the Dublin market. A lighthouse (FIHS1011), which was included in Rennie's design, was built on the East Pier in 1817-18 with a lighthouse keeper's house attached in 1821. A lighthouse (FIHS1056) was built on the summit of Howth Hill in 1790 in the place where a light had been kept burning from the early ninth-century. This was replaced by the Baily Lighthouse (FIHS1060 - c.1849-56) which was designed by George Halpin Snr.

A Coastguard Service was established in Ireland 1819 but was not fully operational in the country until 1822/23. It was originally known as the Water Guard and it was intended that the force would combat the growing smuggling trade following the imposing of excise duties on a large number of goods by the British government in 1765. It was renamed the Coast Guard following its transfer to the Board of Customs in 1822. By 1824 a line of stations had been constructed along the coast. There were 13 coastguard stations identified in Fingal, five of which were in existence in 1839. The 13 stations were not all operating at the same time.

Two waterguard stations were also identified - one at Rush (FIHS0208) and one on Red Island (FIHS0381). The example at Rush was later renamed a Coastguard Station.

3 DATA COLLECTION

3.1 Examination of Cartographic Sources

The First Phase of the Fingal Industrial Heritage Survey involved undertaking a desktop study to identify sites of industrial heritage within the county.

The starting point for conducting the desk-based site identification was the Ordnance Survey maps. These maps are the single most useful basis for site identification when conducting industrial surveys. The scale of the 6-inch maps allows for individual sites to be clearly discernible while the majority of industrial sites are generally captioned. The location, nature and change of pace of Irish industry over its most significant period of development can be gauged by examining all map editions up to the present time. Even where not captioned, the presence of associated features such as mill races may reveal sites of interest. Sites which had been captioned were recorded, as well as sites which were clearly identifiable by means of a known symbol such as bridges, lime kilns etc.

There were four map editions covering the entire study area - the first edition dating to 1837 and second edition dating to between 1869 and 1871. The third edition dates to between 1906 and 1911 while the fourth edition dates to between 1936 and 1938. In addition to the 6-inch map editions listed above, the 25-inch map edition was examined on the Ordnance Survey of Ireland website. This focused on the urban areas where the larger scale had the potential to include further sites not identifiable at the 6-inch scale. It should be noted that save for two sites in Balbriggan, no further sites were identified on the 25-inch mapping.

The locations of the identified sites have been marked on digital copies of the current OS maps for the area.

3.2 Sampling Strategy

The following table lists the types of industrial sites included in the FIHS.

Infrastructure	
Bridges	All named bridges over rivers along with unnamed bridges over rivers (indicated by symbol); also annotated footbridges and causeways.
Maritime	All named/captioned examples of piers, quays, landing places, coastguard stations, lighthouses, and slips.
Water/Sewage	All captioned examples relating to water supplies and sewage disposal.
Gas/Electricity	All captioned enterprises.
Waterways	Canals including associated structures e.g. all bridges over canals, locks, aqueducts.
Railways	Mainline railways, all bridges over/under railways, stations, terminals, level crossings and footbridges.
Miscellaneous	Fire stations, Garda stations, barracks not recorded.
Industry	
Fishing	All captioned examples relating to fishing including saltworks
Lime Kilns	All captioned examples and where indicated by lime kiln symbol were included All captioned examples and where indicated by relevant

Quarries, gravel pits, mines, sand pits	symbol were included
Factories, mills, etc.	All captioned sites included. Weirs and mill ponds also included where captioned
Brick Works	All depicted examples
Miscellaneous	All captioned examples of smithies and forges and where indicated by relevant symbol

3.3 Numbering System

Each site, when identified, was given a unique number to allow its inclusion within the database. The numbering system, agreed with the Project Steering Committee at the commencement of the project, uses a prefix **FIHS** followed by a number e.g. FIHS 0001 (Fingal Industrial Heritage Survey, Site 0001). The numbering commenced at 0001 and continued on from this. Some ‘sites’ may not represent a single building but include a complex of structures that are related to the industrial activity or activities that were carried on over time, for example a copper mine site may include a number of components. In such an instance, a decision will be taken at the field survey stage as to whether it is necessary to complete a separate recording form for each component and to allocate each structure an individual component number.

3.4 Documentary Research

Following the investigation of cartographic sources, a thorough study using secondary and some primary documentary sources at both local and national levels was commenced. The direction of this research has been informed by site types and industrial trends ascertained during the cartographic examination.

3.5 Mapping

Digital copies of the modern OS maps for the survey area were supplied by Fingal County Council. During the examination of the cartographic sources hard copies of these maps were used to mark the locations of the sites identified with the unique number for each specific FIHS site. This information was then transferred to the digital maps.

3.6 Database

Information gathered during survey, as well as any relevant material collected as part of the documentary research, has been collated and presented in a user-friendly way in the database (See Section 4).

4 DATABASE³

An Access Database created for the purpose of recording the industrial heritage of Fingal was developed as part of this First Phase of the survey. The Database has been specifically designed with assistance from Harvard Technologies Ltd, IT Consultants. A number of databases used on similar surveys by Carrig in the past were considered and used as a foundation for the new design. The database was modified and refined as recording proceeded in order to match issues and trends identified in the FIHS survey. The format for the database was agreed with the Steering Committee.

Database: example of the desk survey screen layout

The database has been compiled in a manner that provides both essential and useful information to the user. Further information can be added to the database at any time as and when this becomes available.

Each record is broken down into two main pages: 1 - *Desk Survey* and 2 - *Field Survey*.⁴ Clicking on the relevant tabs will allow the user to access the findings of each of these phases of research quickly and easily. There are a number of fields common to both pages, i.e. FIHS number, location details, links with other FIHS sites, site names and site functions. Each structure surveyed has its own individual record, identified by its unique FIHS number. The site name is derived from the latest edition of the OS maps. Any previous name(s) noted on earlier OS maps are shown in curly brackets. Site function is the specific industrial function represented. As with the site name, any previous function is shown in curly brackets.

³ As an additional assistance for the use of the database, a guideline note on its use has been included in Appendix 1 of this report.

⁴ The database includes fields for information which will be input following phase 2 of the project, i.e. fieldwork and additional desk-based research.

4.1 Desk Survey

The Desk Survey page gives a summary of the information collected during the desk-based research phases of the project. Map search results are included here, i.e. location details, links to other FIHS sites, site name(s) and any further information gleaned from historic maps, site function. A Classification category is also included (see Section 5.2 below) as well as references to bibliographic material. The information is all presented in table form and should be clearly understandable to the viewer.

Included in the Desk Survey are fields which allow for cross-referencing of the Record of Protected Structures and the Fingal Coastal Architectural Heritage Project. Both of these have been examined by the consultants and the relevant fields updated where necessary.

It is possible for the user to extract a large number of reports from the database. Clicking on the *Summary Report* tab in the top right hand corner of the screen will allow the user to access a number of these pre-designed reports (this will be of particular benefit when the Field Survey phase has been completed), while further reports can be generated individually using the interrogation features of the MS Access programme. Categories such as classification, and site function, allow for the provision of a simple search facility in order to extract reports. Like any database, it will only remain useful if updated regularly.

The collective information contained in both the Desk and Field Surveys can be viewed by clicking on the *Full Report* tab. The *Print Record* tab allows for a specific record to be to viewed/printed in isolation.

4.2 Field Survey

This page is designed to contain information mainly gathered during the field-recording phase of the project. In addition to noting standard information such as the present function of the site and the level of access available, it is divided into a number of main headings for maximum clarity and usability.

4.2.1 Built Forms

This section notes whether any built forms survive on the site, the degree of survival of any forms found and the condition in which these now appear. It is presented in the form of standard tick boxes which present the information clearly for potential users and facilitate the creation of simple queries.

4.2.2 Special Interest Categories

This section is presented in the form of standard tick boxes for clarity and to facilitate queries. In order to identify the areas of heritage for which each site is important, this section uses the standard National Inventory of Architectural Heritage (NIAH) 'Special Interest Categories' i.e. Archaeological, Architectural, Artistic, Cultural, Historic, Scientific, Social and Technical. It has been recognised that evaluation of industrial heritage sites can present very special problems, and therefore a further 'Industrial Heritage' category has been included and the evaluation criteria included in the Hamond & McMahon publication will be used.

4.2.3 Rating

This section is presented in the form of standard tick boxes for clarity and to facilitate queries. Each site is given a preliminary rating using the standard NIAH system which identifies sites of International, National, Regional, Local and Record Only importance.

The assigning of a particular 'Rating' to a site is only provisional as a comprehensive evaluation and assessment of the county's industrial heritage cannot be ascertained until the survey has been completed.

4.2.4 Description

Both 'Exterior Description' and 'Interior Description' fields are included, with the Interior Description being completed only where full interior access is available. Both are free text boxes and comprise a detailed summary description of the structure and its surrounding site. If entry is gained a description of the internal structure and materials and a brief description of the layout and any original/early fixtures and fittings is given.

4.2.5 Appraisal

The appraisal comprises a brief summary of any features that award the structure or site with significance, and acts as an expansion of the summary information given under 'Special Interest'. The appraisal may also contain a brief description of the structure's importance in relation to the surrounding area and/or community, and within the survey area, as appropriate.

4.2.6 Threats/Further Actions

This section identifies any immediate threats to the structure as noted on site and makes suggestions for further actions that may help to address the threats noted.

4.2.7 Comments

The Comments box is provided for any extra information not included in the other fields. Additional relevant information culled from other written sources, information given by the owners, etc. can be included in this section. This section also contains information culled from the desk-based survey.

4.2.8 Photographs

Each photograph will be labelled with a unique number that corresponds to the FIHS number of the site. A brief description of each photograph will also be given.

5 SUMMARY OF FINDINGS

5.1 Site Types

Overall **1159** sites were identified during the First Phase of the Fingal Industrial Heritage Survey, comprising a range of industrial sites. The list below is an indicative list of the types of sites identified and it provides an effective indication of the scope and variety of historical industrial development within Fingal.

Airport	Hosiery Factory	Ribband Factory
Aqueduct	Hydraulic Pump	Rope Walk
Boat House	Hydraulic Ram	Salt Works
Breakwater	Iron & Starch Works	Sand Pit
Brewery	Jetty	Saw Mill
Brick Field	Landing Stage	Sewage Farm
Brick Works	Landing Place	Sewage Tank
Brick Yard	Laundry	Sewage Works
Bridge	Lead Mine	Shirt Factory
Canal	Level Crossing	Signal Box
Carpet Factory	Life Boat House	Signal House
Clay Pit	Light House	Slip
Coach Stables	Lime Kiln	Sluice
Coal Yard	Linen Factory	Smithy
Coastguard Station	Lock	Starch Works
Copper Mine	Mail & Stage Coach Stables	Station House
Corn Mill	Manganese & Lime Works	Thrashing Machine
Cotton Factory	Mile Post	Tin Box Manufactory
Custom House	Mile Stone	Towing Path
Dairy	Mill	Tramway
Dairy House	Mill Dam	Tramway Depot
Drying Kiln	Mill Pond	Turnpike
Electricity Generating Station	Mill Race	Turntable
Electricity Power House	Mooring Posts	Viaduct
Engine House	Oil Mill	Watch House
Fair Green	Pier	Water Works
Fish Ponds	Pump House	Waterguard Station
Flood Gate	Pumping House	Watering Slip
Flour Mill	Pumping Station	Wax Factory
Foot Bridge	Quarry	Weighing Machine
Forge	Quay	Weir
Gas Works	Railway	Wind Mill
Gasometer	Railway Cottages	Wind Pump
Goods Shed	Railway House	Windmill Pump
Goods Yard	Railway Junction	Woollen Mills
Gravel Pit	Railway Station	Worsted Factory
Harbour	Reservoir	

5.2 Site Classification

In order to break this diverse range of sites down into a more manageable format, and to give an indication of the proportions of different industrial activities that have historically occupied the survey area, nine broad site classification categories have been identified. The nine categories were adapted from those that have been used on similar surveys both in Ireland and England.⁵

Classification	Total No. of Sites
Transport	550
Extraction	323
Miscellaneous	135
Food Processing & Products	68
Miscellaneous Production	62
Power	13
Textile Manufacturing & Products	10
Chemical Processing & Products	1
Drink Processing & Products	1

5.3 Site Numbers

A breakdown of site numbers identified during the survey is contained in the table below. This list is indicative of the trends regarding site numbers identified. The table is presented in numerical descending order. This list is not comprehensive but is indicative of the numbers of certain sites identified during the survey.

Site Type	Total No. of Sites
Bridge	379
Quarry	208
Gravel Pit	95
Weir	49
Lime Kiln	27
Smithy	24
Thrashing Machine	23

Site Type	Total No. of Sites
Sluice	22
Mile Stone	20
Corn Mill	17
Level Crossing	16
Sand Pit	14
Coastguard Station	13
Railway Station	12

⁵ A comprehensive classification listing for industrial sites can be found in *Index Record for Industrial Sites: Recording the Industrial heritage* (Association for Industrial Archaeology)

Site Type	Total No. of Sites
Windmill	10
Brick Field	8
Flour Mill	8
Mill Race	7
Pier	7
Pump House	7
Brick Works	2
Forge	2
Hosiery Factory	2
Salt Works	2
Windmill Stump	2

Site Type	Total No. of Sites
Brewery	1
Cotton Factory	1
Iron & Starch Works	1
Linen Factory	1
Mill	1
Ribband Factory	1
Shirt Factory	1
Starch Works	1
Tin Box Manufactory	1
Woollen Mills	1
Worsted Factory	1

5.4 Analysis

Analysis of the findings of the survey of the industrial heritage of Fingal shows transport to be the most dominant of the classification categories, with bridges being the most numerous site type. Construction commenced on the Royal Canal, which flows east to west in the southwest of the Fingal, in 1790 and was completed in 1817. The craftsmanship utilised during the construction of the canal was of the highest quality and it has bequeathed a variety of bridges, locks and other structures to the landscape. Within Fingal there are three canal locks and nine canal bridges. The development of railways across Ireland during the nineteenth-century profoundly altered transport in the country and was of particular benefit to the development of industry. There were three railway lines constructed across the Fingal landscape - the Dublin and Drogheda Railway (FIHS0009; opened 1844), Midland and Great Western Railway (FIHS0793; opened 1847) and the Dublin and Meath Railway (FIHS0470; opened 1862). Associated with the railways were bridges, railway stations, viaducts embankments and other ancillary structures. As the original line of the Dublin and Drogheda Railway is still in use, as is the route of the Midland and Great Western Railway, it is possible to note that many of the structures constructed to serve these two railways are shown on the most recent map edition, for example bridges FIHS0010 and 0352, level crossings FIHS0792 and 0820, viaduct FIHS0047 and railway stations FIHS0223 and 0889.

Extractive industries are also particularly prominent with quarry and lead and copper mining sites identified. Quarrying, though featuring quite frequently in the record, appears to have been carried out on a small-scale local level. The majority of quarries are not sited in areas where material extracted could be easily transported implying they served local projects, and may have only been open for a short time although they continue to appear as features in the landscape on later map editions. There were some instances of quarries located along the canal (FIHS0935, 0938, 0958, 0959, 0962, & 0963) which would seem to indicate that stone used in the construction of bridges and locks was quarried alongside the canal.

Some of the larger houses also had quarries located within their demesnes or in the immediate locality such as Malahide Castle (FIHS0674), Newbridge House (FIHS0676) and Brackenstown House (FIHS0736). Of particular note in relation to Howth Castle and Howth Harbour is the location of a townland called *Quarry* to the north of the castle and west of the harbour. This townland showed substantial quarrying activity (FIHS0893) on the first edition OS map and there was also quarrying activity being carried out within the demesne of Howth Castle (FIHS0894). Further quarries were identified to the east of Howth Harbour (FIHS1039). A quarry was located on the one of the roads leading into Skerries town (FIHS0216), while the townland of Milverton to the southeast of the town showed significant quarrying activity (FIHS0205) across all map editions. Quarries were identified within the town of Swords

(FIHS0758 & 0760) while both Naul (FIHS0132 & 0133) and Cloghran also had a number of quarries (FIHS0512, 0513, 0553, 0558, 0559 & 1082).

Agriculture was a significant aspect of Fingal, and has left its mark in the county's industrial heritage record. Thrashing machines⁶, corn mills⁷ and windmills⁸ accounted for a total of 50 sites between them and one drying kiln (FIHS0125) was identified. There were also eight flour mills (FIHS0134, 0415, 0454, 0589, 0751, 0954, 0999 & 1061). The spread of sites was across the county, though there was an accumulation to the centre. Two of the mills identified were potentially tidal mills (FIHS 0634 & 0678), though as no trace of either was noted after c.1870 it is unlikely that these survive. Both mills were titled as *Corn Mills*. These site types are all synonymous with a tillage farming economy rather than pasture farming. This is further borne out by the lack of sites such as creameries, which would be expected particularly following the establishment of the Co-Operative movement in Ireland in the 1880s. In addition to these cereal-producing related sites, a number of the quarries in the county would have been supplying limestone for the production of lime for agricultural purposes. There were 27 lime kilns (FIHS 0180, 0195, 0228, 0229, 0242, 0247, 0289, 0331, 0406, 0407, 0463, 0561, 0732, 0750, 0841, 0957, 0983, 0985, 1007, 1028, 1041, 1077, 1078, 1128, 1129, 1133 & 1152) identified, predominantly on the first two map editions. Smithies and forges would also have serviced agricultural activities. In total there were 24 smithies (FIHS0171, 0236, 0263, 0269, 0478, 0490, 0546, 0687, 0909, 0914, 0921, 1017, 1032, 1065, 1068, 1090, 1093, 1100, 1103, 1108, 1118, 1120, 1122 & 1130) and two forges (FIHS0489 & 1148) identified. Many of the smithies were identified in rural locations rather than in towns indicating that they were servicing local needs.

The significance of agriculture within Fingal is further highlighted by the multitudinous drainage ditches excavated across much of the county in the early twentieth-century, and shown on the Ordnance Survey mapping of the time.⁹ These ditches, together with a number of pump houses (FIHS0333, 0387, 0661, 0682, 0772, 0969, 1050 & 1055) and wind pumps (FIHS0022, 0643, 0651, 0769, 0821, 0950, 1074 & 1110), indicate significant water management of the land for farming purposes. Given the number and variety of sites related to agricultural activity, this evidence substantiates the common view that Fingal was effectively Dublin's bread-basket, providing for the needs of a growing urban population.

One aspect of Fingal's industrial heritage which the area had been renowned for was textile manufacturing. Out of 1159 sites identified, 10 sites were classified as textile manufacturing and products (FIHS0039, 0050, 0096, 0220, 0224, 0666, 0857, 0931, 1002 & 1095). Although the number is relatively small, historically there existed a thriving export industry in particular around the high-end textile market e.g. the openwork stockings produced in Balbriggan and much-sought after by the English and Russian royalty. Also Skerries had a significant tambour and embroidered muslin industry in the nineteenth-century which is not borne out in the historical mapping. This would indicate that the industry was a cottage industry, carried out by women in their homes working for agencies and which would not be annotated by the Ordnance Survey.

The *Miscellaneous* classification (135 sites) was largely comprised of sites related to utilities, water management and also included smithies/forges. Sluices¹⁰ and weirs¹¹ (totalling 71

⁶ FIHS091, 0109, 0122, 0164, 0262, 0264, 0268, 0274, 0275, 0276, 0348, 0421, 0460, 0571, 0778, 780, 0781, 0782, 0802, 1066, 1083, 1092 & 1159

⁷ FIHS0054, 0177, 0215, 0315, 0335, 0398, 0412, 0428, 0588, 0634, 0678, 0733, 0755, 0762, 0827 & 1149

⁸ FIHS0086, 0126, 0175, 0188, 0214, 0222, 0328, 0488, 0544, 0583, 0696 & 0753

⁹ The ditches were not included in the survey.

¹⁰ FIHS0021, 0106, 0193, 0271, 0372, 0400, 0444, 0446, 0452, 0461, 0467, 0468, 0576, 0638, 0639, 0863, 1062, 1064, 1098, 1125, 1127 & 1142

between them) are also included in this category as these could be related to a myriad of uses including manufacturing, water management and fishing. These are site types which did not fall within other classification categories (see Section 6.1 below).

¹¹ FIHS0002, 0014, 0029, 0048, 0052, 0066, 0092, 0102, 0104, 0105, 0194, 0204, 0279, 0366, 0368, 0370, 0373, 0374, 0375, 0376, 0377, 0481, 0602, 0603, 0604, 0605, 0608, 0615, 0616, 0617, 0619, 0621, 0622, 0854, 0901, 0907, 0915, 0927, 0946, 0976, 0977, 0982, 1027, 1063, 1135, 1136, 1138, 1139 & 1147

6 SIGNIFICANCE OF THE SURVEY AND RECOMMENDATIONS

The completion of this industrial inventory is timely as it demonstrates the extent of Fingal's history of manufacturing and commerce, and for the first time the planning authority now possesses an overview of the range of structures to be planned for.

Arising from this inventory and dynamic database, information gathered during fieldwork and further research - whether this is a rapid survey of all sites, thematic-based surveys or area-based surveys - can be added to the database, which will facilitate the future co-ordination and review of the survey material, allowing sites to be added, updated or removed from the process as necessary.

Some of the county's past industrial efforts appear to have been initiated by powerful landlords and then driven by c.19th century industrialists focusing mainly on the textile industry and exporting high-end products to Europe. Their industry was centred in the coastal villages initially around Balrothery and later Balbriggan and Skerries.

6.1 Extending the Scope of the Survey

In common with the rest of the country, the county has witnessed major developments over the past ten year which will have impacted on the area's industrial heritage. Also by their nature, and in addition to redundancy, many industrial sites will be undergoing a process of deterioration. Fieldwork is therefore essential to determine the survival status of the sites identified in this overview, and at the same time identifying those surviving unique sites for which specific preservation/conservation policies will be required.

- A total of 1159 sites have been identified in the industrial heritage survey of which the transport industry is the most heavily represented in particular by bridges. Sites which are broadly assigned to agricultural-based industry make up a significant element of the survey, e.g. land drainage features and structures, quarries, lime kilns, mills, thrashing machines, smithies and forges.
- Extensive redevelopment has taken place over the past ten years which has been mainly focused on the urban centres along the eastern seaboard and which will have impacted on industrial sites. We therefore recommend that rapid area-based surveys be carried out of all the coastal towns. However, should resources not permit this, we would recommend that these surveys focus initially on Balbriggan and Skerries, where we believe there is an urgent need for fieldwork to identify what survives and which sites require particular protection. This could be followed by similar fieldwork in Swords and Howth.
- The FIHS has identified the following potential thematic surveys:
 - Agriculture and Industry (mills, thrashing machines, smithies, forges)
 - Manufacturing Industries (lime kilns, mills, textiles, salt works,
 - Transport infrastructure (road, rail, water, trams, milestones, harbours, airport)
 - Power Sources and industry (rivers, sea, wind)
 - Extractive industry (mines, quarries, gravel pits, sand pits)
- Local knowledge can play an important role in Phase 2 of the survey. Through consultation with the Steering Committee and public consultation with interested local groups specific areas or site types may be identified as being under particular threat or in

danger of immediate loss. These areas/site types could then be targeted for rapid field survey.

- As a result of the findings of the inventory, a review of the Classification categories is recommended to take into account the dominant typologies which have been identified in the course of the survey, some of which have been included under the Miscellaneous Classification. It is also recommended that a utilities classification could be used as a replacement for power. This classification could encompass utilities including power both public and private (e.g. electricity generating stations, powerhouses, gasworks, gasometers, water supply, and sewage disposal).

6.2 General Recommendations

- The most effective method of ensuring the survival of historic building stock of all types is by affording it some degree of statutory protection. The principal legislative measures that exert some form of control and protection for industrial heritage sites are the National Monuments Acts and the Planning Acts. Both these measures, particularly in recent years, have allowed an improved degree of protection for industrial heritage buildings. Although there are no specific national or internationally-agreed guidelines for conservation of industrial heritage sites, in a proactive move to protect the industrial heritage structures in the county, Fingal County Council in its current draft development Plan Date has included specific objectives relating to industrial heritage as follows:
 - Protect buildings and features of industrial heritage (AH31)
 - Conduct a survey of industrial heritage of Fingal and to identify structures, features and their related artefacts and plant, and to add appropriate industrial heritage structures or elements of significance to the Record of Protected Structures (AH32)
 - Protect and enhance the built and natural heritage of the Royal Canal..... (AH33)

The following alterations/additions could increase the scope of protection and are suggested for inclusion if possible:

- AH 31 '..... and related artefacts and plant, where appropriate'.
 - AH32 "... and to add industrial heritage structures or complexes, or elements of significance, to the Record of Protected Structures.'
- It has been widely-recognised that the most effective long-term method of ensuring the preservation of a site is through its continued use. Most successful industries have experienced change and development overtime and, unless in exceptional circumstances, the encouragement of innovative plans for the adaptation and re-use of industrial sites is recommended.
 - Best practice requires that all works to an industrial heritage site should be properly documented before, during and after intervention.
 - In the case of on-going industries, encourage the taking of oral and visual record of the industrial processes. This could also apply to industries which have recently closed and where that knowledge is still available locally.
 - Encourage liaison between industries and the Fingal County Archive as a potential repository for the paper archives of industries facing closure or modernisation. This could be undertaken in partnership with the National Archives who in the 1970s initiated a survey of Business Records with the objective of ensuring the preservation of material of historical interest.

- Raising awareness about industrial heritage and the value and interest of such sites is vital for their long-term protection. The material contained in the survey, particularly following fieldwork, will also undoubtedly afford a major tourist opportunity to be developed in the county, for example:
 - Interactive web-based maps and database to be used both by the general public and the tourist.
 - Key information on the industrial heritage of the county could be extrapolated into a small guide or publication.
 - Themed industrial trails could be developed, for example using the existing Skerries Mills Centre as a focus for a trail focused on mills and milling.
 - Develop self-guided trails with information plaques at key sites and which would be suitable as walking and/or cycling routes.

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APPENDIX 1: INSTRUCTIONS FOR USING FIHS DATABASE

This document represents an explanatory document to accompany the Fingal Industrial Heritage Survey database. The Access Database was created for the purpose of recording the county's industrial heritage. A number of databases used on similar surveys were considered and served as a foundation for the new design. It has been compiled in a manner that provides both essential and useful information for the user. Further information can be added to the database at any time.

Each site/structure surveyed has been given its own individual record, identified by its unique FIHS number, which is located in the top-left hand corner of the screen. Location and function information are located along the top of the screen i.e. townland/location details, links with other FIHS sites, site names and site functions. The site name is derived from the latest edition of the OS maps. Any previous name(s) noted on earlier OS maps are shown in curly brackets. Site function is the specific industrial function represented. As with the site name, any previous function is shown in curly brackets.

Each record is broken down into two main pages: *Desk Survey* and *Field Survey*. Clicking on the relevant tabs will allow the user to access the findings of each of these phases of research quickly and easily.

Desk Survey gives a summary of the information collected during desk-based research phases of the project – National Grid Reference, Planning References, Record of Protected Structures and/or Record of Monument and Places numbers, classification of sites by function, map search results, and references to bibliographic material. This information is all presented in table form and should be clearly understandable to the viewer.

Some of this information is given through use of tick boxes, while free text is used for other information.

Field Survey will contain information collected during the field-recording phase of the project. In addition to noting standard information such as the present function of the site and the level of access available, it is divided into a number of main headings for maximum clarity and ease of use – Built Forms, Special Interest Categories, Rating, Description (Exterior and Interior), Appraisals, Threats/Further Actions and Comments.

A drop-down menu is used in the Threats field providing a list of a variety of potential threats which have been decided. There is scope for adding further threats to this list as it is not a definitive list.

Reports

Clicking on the *Summary Report* tab in the top right hand corner of the screen will allow the user to access a number of reports. The following pre-designed reports can be extracted from the database:

- Merit Rating Report: sites listed according to the particular merit ratings they have been given, e.g. lists of structures considered of regional or local significance.
- Remains: lists of sites with remains, none, unknown or original replaced.
- Survival: sites listed according to their survival status, i.e. substantial remains, partial remains or traces.
- Condition: lists of sites where the remains are in good, fair or poor condition.
- Threat: where threats have been identified at particular sites, lists of sites can also be drawn up in the summary reports under for example, dereliction, future development, vandalism, etc.

Further reports can be generated individually using the interrogation features of the MS Access programme. Categories such as classification, site function, survival and condition allow for the provision of a simple search facility in order to extract reports. Like any database, it will only remain useful if updated regularly.

The collective information contained in both the Desk and Field Surveys can be viewed by clicking on the *Full Report* tab.

Clicking on the *Print Record* tab allows for a specific record to be viewed in isolation and printed should this be required.

Photographs

Each photograph taken is labelled with a unique number that corresponds to the FIHS number of the relevant site. This information is contained in the *Field Survey* page and includes a brief description of each photograph.