

3.0 PROJECT DESCRIPTION

This section provides an overview of the proposals for the Kinsale Sewerage Scheme. It is addressed under the headings of:

- ◆ Purpose and Necessity for the Scheme
- ◆ Scheme Proposals, Design and Layout

3.1 Purpose and Necessity for the Scheme

3.1.1 Currently, the town of Kinsale has a collection system which cannot cope with the development pressures being applied. While no formal treatment of effluent takes place, a portion of the discharge is subjected to comminution prior to discharge to the harbour.

3.1.2 Under the EPA Act, 1992 (Urban Waste Water Treatment) Regulations 1994, S.I. 419 of 1994, all waste water entering collection systems shall be subject to secondary treatment, or an equivalent treatment, before discharge. In the case of Kinsale and environs, the latest date for compliance with the Directive is 31 December 2005.

3.1.3 Under the proposals for the Scheme, the Town and environs will be served by an upgraded collection system which will combine all untreated foul discharges and pump these forward to a single treatment location to be provided. Following appropriate treatment at this location, the effluent will be discharged to the Estuary.

3.2 Scheme Proposals, Design and Layout

3.2.1 The proposed layout for the Kinsale Sewerage Scheme is shown on Figures 3.1 to 3.6, and comprises the elements below. Plate 9 shows a photo montage of the proposed waste water treatment plant.

- ◆ an upgraded foul sewer network with new pumping facilities
- ◆ an upgraded storm sewer network (1 yr return period, 5yr and 30 yr simulations)
- ◆ new treatment facilities and outfall pipe

This section summarises each of the above elements.

Main Pumping Station

3.2.2 The existing pumping station located at Denis Quay can be utilised as the main pumping station for the Scheme with the minimum of modification. The use of this existing facility also obviates the requirement of a new site. With this in mind, all gravity sewers, with the exception of those in the Commoge area, are designed to either gravitate, or to be pumped forward, to this location (see Figure 3.1).

- 3.2.3 Because of the nature of the Town and its environs, discharges from remote areas such as Summercove and Scilly need to be pumped forward to the main pumping station in Kinsale, prior to being conveyed to the treatment plant. Consequently, pumping stations for these areas are included in the Scheme (see Figure 3.1).
- 3.2.4 The main pumping station at Denis Quay will cater for all foul flows from the Town, Summercove and Scilly. The station will pump 6 DWF (Dry Weather Flow) forward to the treatment plant. Excess flow will overflow to a new storm holding tank via storm screens (see Figure 3.5).
- 3.2.5 The storm holding tank will have a capacity of 6 DWF for a period of 30 minutes. On the abatement of a storm, the volume held in the holding tank will be pumped forward to the treatment plant.
- 3.2.6 Volumes in excess of the forward pumping and holding facilities will be pumped to a nearby manhole to discharge to the harbour waters near World's End. The foul element of this flow will be considerably reduced due to screening and dilution.
- 3.2.7 Smaller pumping stations will be situated at the following locations:
- ◆ Summercove
 - ◆ Lower Scilly Walk
 - ◆ Scilly
 - ◆ World's End
 - ◆ New Road (County Council Offices)
 - ◆ Eastern Road (Storm Pumping)
- 3.2.8 Odour removal facilities will be included at each foul pumping station.

Gravity Sewers and Pumping Main Routes

- 3.2.9 The proposed foul sewer network is designed to convey the partially-combined flows from the Town, Summercove and Scilly to the main pumping station at Denis Quay. From there, the flow will be pumped forward to the Commoge area where it will discharge to the foul sewer in the Commoge area. This sewer will then gravitate to the waste water treatment plant (see Figure 3.1).
- 3.2.10 The proposals for the Town foul sewer network are designed to remove all existing overflows, and cross-connections with the storm sewers, from the system. These have allowed the discharge of untreated raw sewage to the inner harbour area. Following hydraulic and structural analysis of the existing network, it is proposed that the existing system be upgraded. This will entail the replacement of many of the existing sewers within the Town, and the provision of new sewers in the Scilly and Summercove areas.
- 3.2.11 Where existing development does not have separate storm and foul sewers, it has been found that attempting to separate these flows within individual premises is not viable. Consequently, the foul network is designed to cater for a partially-

combined flow for existing development, and a separated foul flow from all future development.

3.2.12 The proposed foul sewer network will comprise the following:

- ◆ Eastern Road Sewer: The existing 225 mm diameter sewers will be retained. The existing 150 mm diameter will be upgraded to 225 mm.
- ◆ New Road Sewer: The discharges from the Hospital and County Council offices, currently discharging to a septic tank, will be pumped forward to the head of the sewer on Catholic Walk.
- ◆ Glen-Pearse Street Sewer: A new 225 mm diameter sewer will be laid from the bottom of the New Road. A new 675 mm diameter sewer will be laid along Pearse Street. This will accept the flows from the Market Street area. The existing 225 mm diameter sewer on Pearse Street will be retained as a rider sewer.
- ◆ Barrack Street Cork Street Sewer: The existing sewer will be retained for the most part. However, sections of the sewer will require rehabilitation works.
- ◆ Catholic Walk-The Rock Sewer: The existing sewer will be retained.
- ◆ Bandon Road Sewer: The existing sewer will be retained.
- ◆ Harbour Heights-River Meadows Sewer: Part of the flow from this area will be diverted to the proposed new sewer for the Commoge area. The 225 mm diameter sewer at River Meadows will be replaced by a 300 mm diameter sewer.
- ◆ Blind Gate Sewer: The existing sewer will be retained.
- ◆ Rampart Lane-Guard Well-Market Street Sewer: The existing sewer will be replaced by new sewers ranging in diameter from 225 mm at Rampart Lane to 600 mm at the junction of Pearse Street.
- ◆ Market Square-Market Quay-Pier Road Sewer: The existing 300 mm diameter sewer on Market Quay will be retained. The new sewer from Pearse Street will continue along Pier Road as a 675 mm diameter sewer, upsizing to 750 mm diameter where the rising main from Scilly enters. It will continue to the pumping station at Denis Quay.
- ◆ Main Street Sewer: A new 225 mm diameter sewer will be laid for the western end of Main Street. The existing sewer will serve the eastern end of the street.
- ◆ O'Connell Street Sewer: The existing sewer will be retained.
- ◆ The Mall-St. John's Hill Sewer: The existing sewer will be retained and intercepted at the bottom of the hill to flow to the pumping station at Denis Quay.

- ◆ O'Connell Street-World's End Sewer: The existing sewer will be retained. At World's End, a new pumping station will convey the flow to the bottom of John's Hill where it will gravitate to the pumping station at Denis Quay.
 - ◆ Summercove Area Sewers: The existing sewers will be retained. However, the flows will be collected at the low point in the village and pumped forward to the head of Scilly Walk. From there they will be conveyed to Scilly by means of alternating gravity sewers and rising mains.
 - ◆ Ardbrack-Scilly Area Sewers: New sewers will be laid to convey foul flows from these areas to the Scilly Pumping Station. From here, the flows will be pumped across the channel to join the gravity sewer on Pier Road.
 - ◆ Commoge Area: New sewers will be laid, ranging from 225 mm to 600 mm to serve this area. The foul flows from Denis Quay will be pumped forward along the road to discharge into these foul sewers. All flows from the Town, Summercove, Scilly and Commoge will then flow by gravity to the treatment plant site.
- 3.2.13 The storm sewer proposals for the Town are for a separate system to cater for the discharge of surface water from the higher areas of the Town, excluding that portion conveyed within the foul network, to the harbour waters (see Figure 3.2). A separate system will employ flood alleviation techniques to minimise flooding within the low-lying areas of the Town. This system will incorporate a storm holding tank.
- 3.2.14 The proposed storm sewer network will comprise the following:
- ◆ Eastern Road Sewer: A new sewer, ranging in size from 375 mm to 525 mm diameter will be laid along the route, picking up flows from a new 225 mm sewer along Featherbed Lane. This pipe will discharge at the Scilly Dam near the junction of Long Quay and Eastern Road.
 - ◆ Glen-Pearse Street Sewer: A new 1600 mm pressure pipe will convey the flows from the stream at the Glen and discharge at the Scilly Dam. A new pipe, ranging in size from 225 mm to 525 mm diameter will be laid to cater for the low-lying area of Pearse Street and Market Square. This pipe will discharge to the storm holding tank at the junction of Long Quay and Eastern Road (see Figure 3.6).
 - ◆ Barrack Street-Cork Street-Market Street Sewer: A new pipe, ranging in size from 225 mm to 675 mm will be laid in this area. It will join up with the proposed 1600 mm pressure pipe to be laid along Pearse Street.
 - ◆ Catholic Walk-The Rock Sewer: A new sewer, ranging in size from 225 mm to 300 mm diameter will be laid.
 - ◆ Bandon Road Sewer: A new sewer, ranging in size from 225 mm to 375 mm diameter will be laid. This sewer will intercept other new storm sewers to be laid in Abbey Court and developments along the route.

- ◆ Harbour Heights-River Meadows Sewer: A new sewer, ranging in size from 225 mm to 375 mm diameter will be laid in this area. This sewer will join up to the proposed new storm sewer to be laid in the Commoge area.
- ◆ Blind Gate Sewer: A new sewer, ranging in size from 225 mm to 375 mm diameter will be laid, and will discharge to the pressure pipe at Church Lane.
- ◆ Rampart Lane-Guard Well-Market Street Sewer: A new sewer, ranging in size from 225 mm to 450 mm diameter will be laid in this area, and will incorporate flows from a new sewer from the western end of Main Street. It will discharge to the 525 mm sewer at Pearse Street.
- ◆ Ramparts-Middle Hill-O'Connell Street Sewer: A new sewer, ranging in size from 225 mm to 300 mm diameter will be laid and will discharge to the harbour waters near the Town Park.
- ◆ Main Street-Emmet Place Sewer: A new sewer, ranging in size from 225 mm to 675 mm diameter will be laid and will ultimately discharge to the storm holding tank.
- ◆ Town Hall-Market Square Sewers: A new sewer, ranging in size from 225 mm to 450 mm diameter will be laid and connect to the 525 mm sewer on Pearse Street.
- ◆ Winter's Hill-The Mall-St. John's Hill-O'Connell Street Sewer: A new sewer, ranging in size from 225 mm to 700 mm diameter will be laid. The 700 mm section will be a pressure pipe which will discharge at World's End.
- ◆ Commoge Area Sewers: A new network, ranging in size from 375 to 1200 mm diameter will be laid in this area. This sewer will discharge to the Bandon Estuary.

3.2.15 The result of these proposals is that pipelaying will be necessary in virtually all areas of the Town and environs. This will lead to major temporary disruption during these periods. It is proposed that a suitable Sewer Construction Plan be agreed with the members of the Urban District Council, local tradespersons, and other interested bodies. This Plan would be incorporated within the Contract for the Scheme.

Treatment Plant and Outfall Locations

3.2.16 A hydrographic study of the harbour area was carried out in the preparation of the Preliminary Report. Several outfall locations were analysed. The conclusion of that study and engineering considerations was that the most suitable location for the outfall pipe was upstream of the new bridge, at a point in the estuary south of the Kinsale Marsh.

- 3.2.17 The proposed location for the treatment plant was then assessed to ensure that:
- ◆ It was in proximity to the outfall location
 - ◆ It was capable of being developed as a treatment plant site
 - ◆ It was compatible with the provision of the new collection system
 - ◆ It minimised pumping needs and costs
 - ◆ It was not in contravention with the draft development plan
 - ◆ It was not in close proximity to dense development
 - ◆ It had an acceptable environmental impact
- 3.2.18 Following these considerations, the original site 'E' at Commoge was recommended as being the most suitable from engineering, economic, environmental, and sustainable viewpoints.
- 3.2.19 Following the presentation and adoption of the Preliminary Report, land adjoining the proposed treatment plant site became available. The suitability of part of this land as a treatment plant was investigated and found to be compatible with the original proposed site. This alternative site was then recommended as the location for the treatment plant (See Figure 3.3). Following this recommendation, Cork County Council acquired the land in question. The findings of this study are based on the revised site location.
- 3.2.20 The engineering reasons for the recommendation are:
- ◆ The site is close to the location of the proposed outfall
 - ◆ The area of the site will contain the proposed treatment plant
 - ◆ The levels within the site ensure that a gravity discharge to the outfall point is attainable
 - ◆ Pumping requirements are minimised
- 3.2.21 The economic reasons for the recommendation are:
- ◆ The overall cost of the Scheme compares favourably with other site options
 - ◆ Pumping costs from the main pumping station are minimised
 - ◆ The land is in the ownership of Cork County Council
- 3.2.22 The environmental reasons for the recommendation are:
- ◆ Less significant impacts to the human and visual environment will occur than with other site options.
 - ◆ The impacts to flora and fauna can be ameliorated satisfactorily, coupled with additional enhancement of the Kinsale Marsh.
 - ◆ The site is remote from existing residential development and is more than 100 m from the nearest dwelling.
 - ◆ The site is currently zoned for agricultural use, with the original adjoining site zoned as a waste water treatment plant location.
 - ◆ The existing trees around the site can be retained and enhanced as screening.

3.2.23 The site is recommended in line with the requirements of sustainable development for the following reasons:

- ◆ The conflict with the County Development Plan is minor and does not adversely affect the Urban area development proposals.
- ◆ Development within the Town is facilitated. In particular, development of the Commoge area is facilitated
- ◆ Waste water treatment capacity will be provided for future development within the town of Kinsale and its environs for both domestic and industrial purposes.

Waste Water Treatment Plant and Outfall

3.2.24 This section deals with the individual components of the proposed treatment works (see Figure 3.4, and Plate 9). The effluent from the plant will meet the conventional effluent standard, as per the Client Brief, of 20 mg/l BOD and 30 mg/l Suspended Solids, which are more stringent than those required under the Urban Waste Water Directive. The design population equivalent (p.e.) for the plant is 9,800.

3.2.25 In terms of N and P removal, S.I. 419 of 1994 requires that the total phosphorus concentration be reduced to 2 mg/l or a minimum percentage reduction of 80% in sensitive areas, and that the total nitrogen concentration is to be reduced to 15 mg/l or a minimum reduction of 70 – 80%, also in sensitive areas. While the Bandon River estuary is not a sensitive area under the terms of the Statutory Instrument, the Plant is designed to remove nitrogen in the aeration basins to the levels as dictated by the Regulations. This is due to nitrogen being the limiting nutrient factor in estuaries.

3.2.26 It is proposed to treat a flow of 3 DWF through the plant; the volume retained in the storm holding tank being treated during periods of low flow.

3.2.27 The proposed units within the waste water treatment plant are as follows:

- ◆ Stormwater Holding Tank
- ◆ Screening and Degritting
- ◆ Primary Sedimentation
- ◆ Secondary Treatment
- ◆ Outfall Pipe
- ◆ Sludge Thickening and Dewatering

Stormwater Holding Tank

- 3.2.28 A basic flow of 3 DWF will be pumped forward to the Inlet Works at all times. The storm holding tank is designed to cater for a volume equivalent to a flow of 6 DWF for a one-hour period, as per the main pumping station at Denis Quay. These flows will be screened prior to inflow into the holding tank. These flows will be returned to the pump sump on the abatement of the storm flow and will be sent through the works for full treatment.
- 3.2.29 Excess storm water flows will be pumped forward to the outfall pipe.
- 3.2.30 A 'tipping bucket' arrangement will be used in the Storm Holding Tank to clean the tank on a regular basis.

Screening and Degritting

- 3.2.31 All incoming flows to the Plant will be automatically screened, washed and compacted for disposal. The bar spacing will be 5mm for the automatic screen. Following screening, grit removal will take place, capable of removing particles of 200 microns diameter. Settled grit will be removed by means of an air lift system and organics will be returned to the flow via a grit classifier.
- 3.2.32 These units will be housed, with odour removal facilities provided.

Primary Sedimentation

- 3.2.33 Twin sedimentation tanks are proposed to cater for hydraulic loading conditions, designed on the following parameters:

BOD Removal Rate:	30%
Upward flow velocity:	1.33 m/hr
Retention Time:	2 hrs

- 3.2.34 The provision of primary sedimentation facilities is in accordance with recommendations of the Department of the Environment following the *Sludge Strategy Report* regarding treatment facilities of 5,000 p.e. or greater. The purpose is to remove, as far as possible, pollutants in the form of readily settleable solids in an economic fashion. To contain any odours generated, these twin tanks will be covered.

Secondary Treatment

- 3.2.35 The activated sludge process, in the form of extended aeration, is proposed for the treatment of the waste waters. Diffused Air will be used as the aeration method, coupled with mixers for suspension purposes. This system also allows for the biological removal of nitrogen. This system has been universally used for this type of situation and is also recommended for the following reasons:

- ◆ Flexibility in design to cater for future expansion

- ◆ Facilitates biological nitrogen and phosphorus removal
- ◆ Flexibility in design to cater for retrofitting for combined biological/chemical nutrient removal
- ◆ Flexibility in control and operation of the plant
- ◆ Minimisation of odour emissions compared to attached growth/fixed film systems
- ◆ Minimisation of mist emissions compared to surface mounted aerators

3.2.36 Following Primary Treatment where BOD removal is assumed at 30%, the BOD load to be designed for would be 70%. Taking into account that the BOD removal in the Primary Sedimentation Tanks might not reach the 30% figure, the Aeration Basins are designed for removal of 75% of the BOD load.

3.2.37 Twin basins are proposed to allow for maintenance and any other works which have to be carried out.

Secondary Clarifiers

3.2.38 Clarification will be carried out using twin radial flow settlement tanks. The design of the tanks is based on a maximum upward velocity of 0.9 m/hr.

Return Activated Sludge (RAS)

3.2.39 Sludge from the secondary clarifiers will constantly be returned to the extended aeration basins until such time as the MLSS in the basins goes above a predetermined level. Excess sludge will then be wasted.

Waste Activated Sludge (WAS)

3.2.40 Waste activated sludge will be pumped forward to the splitter chamber ahead of the primary sedimentation tanks and be wasted with the primary sludge to the sludge holding tanks. This will produce a better composite sludge for final treatment.

Sludge Holding Tanks

3.2.41 Assuming a maximum of 95% BOD removal per day, Primary Sludge at 30% and WAS at 65% of total, the sludge volumes generated per day would be as follows:

Primary Sludge: 30% of Total Load:	176.4 kg/day
WAS @ 0.7 kg dry solids/kg BOD removed:	<u>267.6 kg/day</u>
Total dry solids:	443.0 kg/day

3.2.42 Assuming an average solids content of 2%, the volume of wet sludge generated is 22.15 m³/day. Assuming 3-day storage, the total volume required is 66.45 m³. Assuming twin storage tanks, the volume of each is 33.25 m³. Assuming a liquid depth of 2.5 m, the diameter of each tank will be 4.10 m internally.

Sludge Thickening and Conditioning

- 3.2.43 Sludge Thickening and Conditioning will be as set out in the original Preliminary Report, subject to the final method of sludge disposal being decided by the Local Authority. A decanter system will be included as an optional method of thickening.
- 3.2.44 The suggested method of final treatment for the sludge from the Kinsale Plant, as given in the Sludge Strategy Report is for Thickening, Anaerobic Digestion and Dewatering. It is understood that the County Council has decided that Kinsale will not be a 'hub town' for sludge treatment (Ref. Letter of 12th March 1997, Cork Co. Co. to DoE)

Outfall Pipe

- 3.2.45 The proposed final outfall pipe is designed for a flow of 3 DWF, 102 l/s, plus the overflow volume of 133 l/s from the Storm Holding Tank, giving a total flow in the outfall pipe of 235 l/sec. The design pipe is 560 DN HDPE pipe, PN6, complete with six port diffusers. The length of pipe is 800 lin m, most of which would be laid above LWM at a grade of 1/350. The line of the pipe is shown on Figure 3.3.

For inspection purposes only and not for
Consent of copyright owner required for any other use

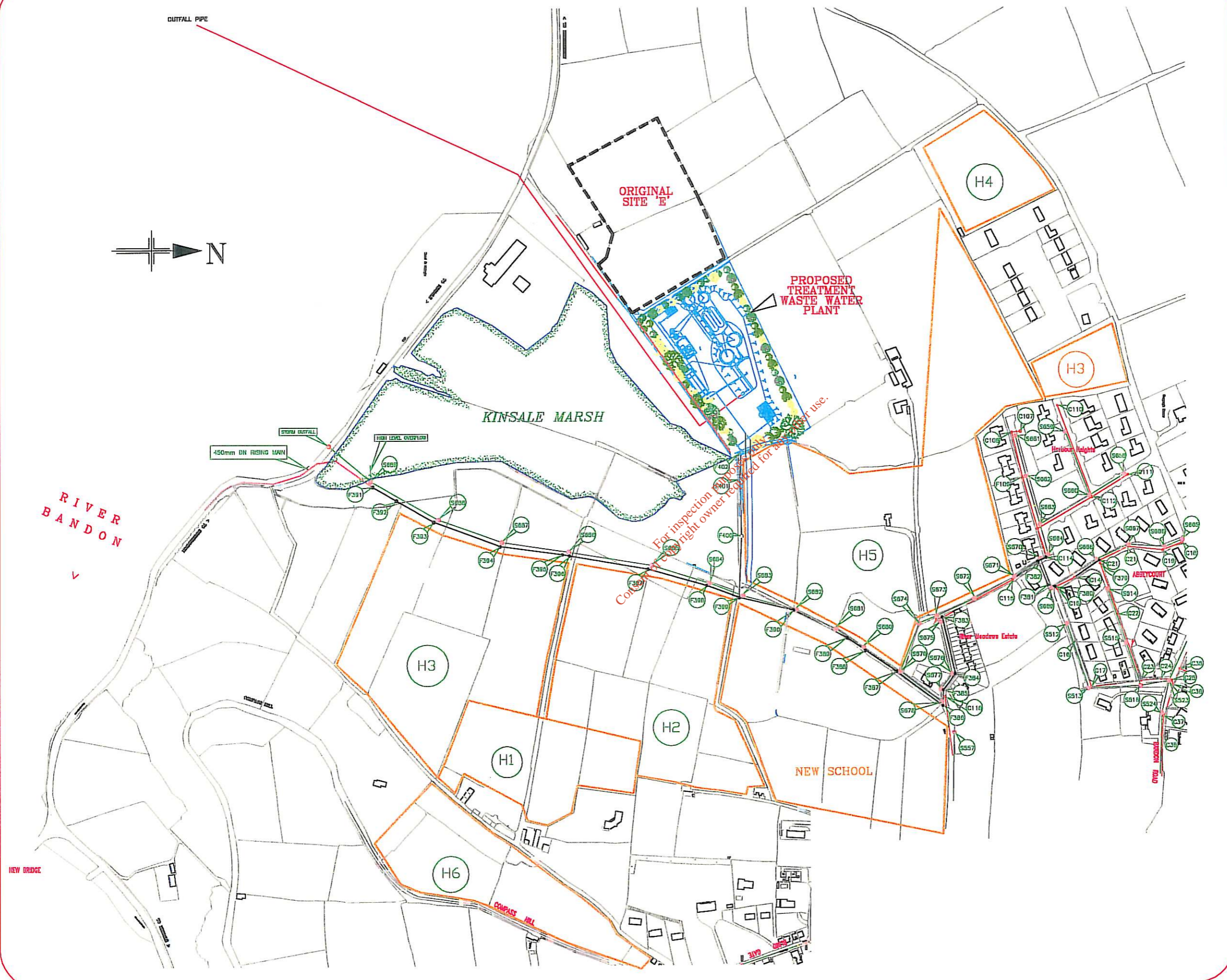


KEY PLAN CURRENT MAP SHOWN Hatched

LEGEND

- PROPOSED RISING MAIN
- PROPOSED FOUL SEWERS
- PROPOSED STORM SEWERS
- PROPOSED OUTFALL PIPE
- DEVELOPMENT AREAS

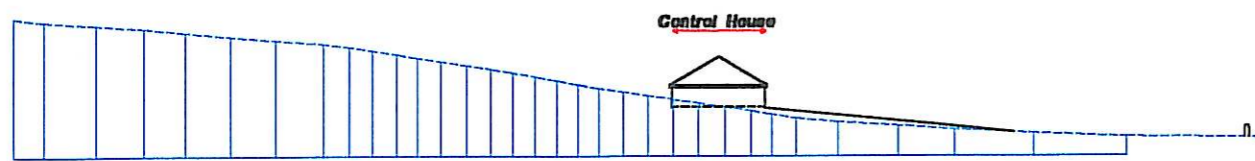
- H1 - HOUSING (TERRACED)
- H2 - HOUSING (ESTATE)
- H3 - HOUSING (INDIVIDUAL OR LOW DENSITY)
- H4 - HOUSING (INDIVIDUAL WITH WOODLAND)
- H5 - HOUSING (ESTATE OR INDIVIDUAL SITES)
- H6 - HOUSING (INDIVIDUAL SITES)



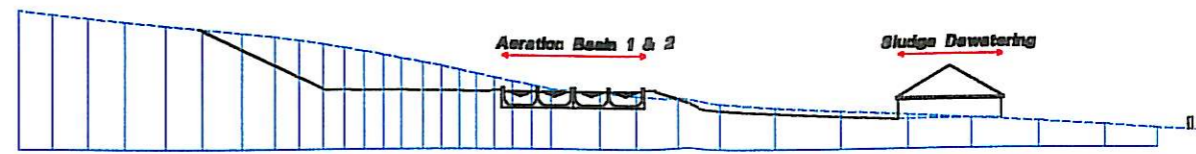
For inspection purposes only
Copyright reserved for all use.

Rev.	Date	Description	by	ch/dep
Project Kinsale Sewerage Scheme Kinsale, County Cork				
Title PROPOSED SEWERAGE SCHEME COMMONWE AREA SCHEMATIC LAYOUT				
C.D. Devlin B.E., C.Eng., F.I.E.I., M.I.A.E. County Engineer Cork County Council				
Malachy Walsh and Partners Consulting Engineers Beresford Rd. Cork. Tel. 021 842884 Fax. 021 842829 MWPCOR0012E				
Park House, 31 Derry Street, Dublin Tel. 01 454 4100 Fax. 01 454 4101 MWLD0012E Suite 201, City Centre, 100-104, Old Street, London EC1V 0FR Tel. 020 71 337034 Fax. 020 71 337034 MWLD0012E				
Drawn Ch'g(D.O.) Ch'g(Eng.) Approved				Dwg. No. 2022/205 0 Fig 3.3 rev. A

REPRODUCED FROM THE ORDNANCE SURVEY BY PERMISSION OF THE GOVERNMENT. LICENCE No. 13270/00



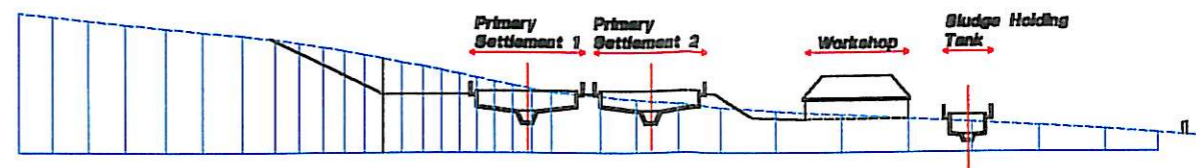
SECTION D-D



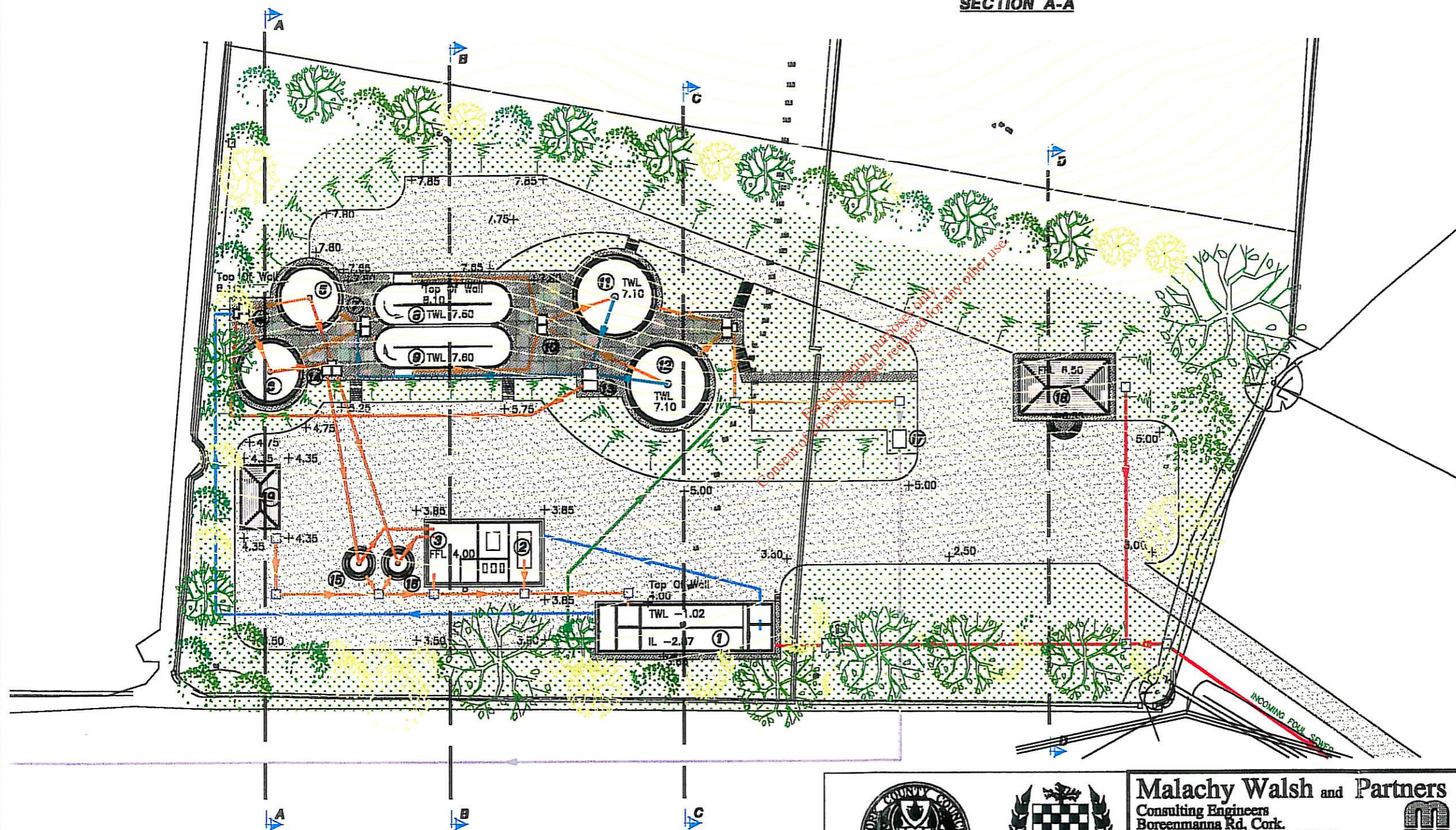
SECTION B-B



SECTION C-C



SECTION A-A



C.B. Devlin B.E., C.Eng., F.I.E.I., M.I.A.T.
County Engineer
Cork County Council



Kinsale U.D.C.

Malachy Walsh and Partners

Consulting Engineers
Boreenmanna Rd. Cork.
tel. 021 962866 fax. 021 962929
MWPCORK@IOL.IE

Park House, 21 Denny Street, Tralee
tel. 086 23404 fax. 086 28586
MWPTRA@IOL.IE

Suite C2, City Cloisters, 188-196 Old Street, London EC1V 9FR
tel. 0044 71 2530895 fax. 0044 71 3567034
MWALSH@COMPUSERVE.COM



I.A. 20 000 0001

Project
Kinsale Sewerage Scheme. E.I.S.
Kinsale, County Cork

Title
Proposed Waste Water
Treatment Plant

Scale 1:1000

Drawn

Ch'd (D.O.)

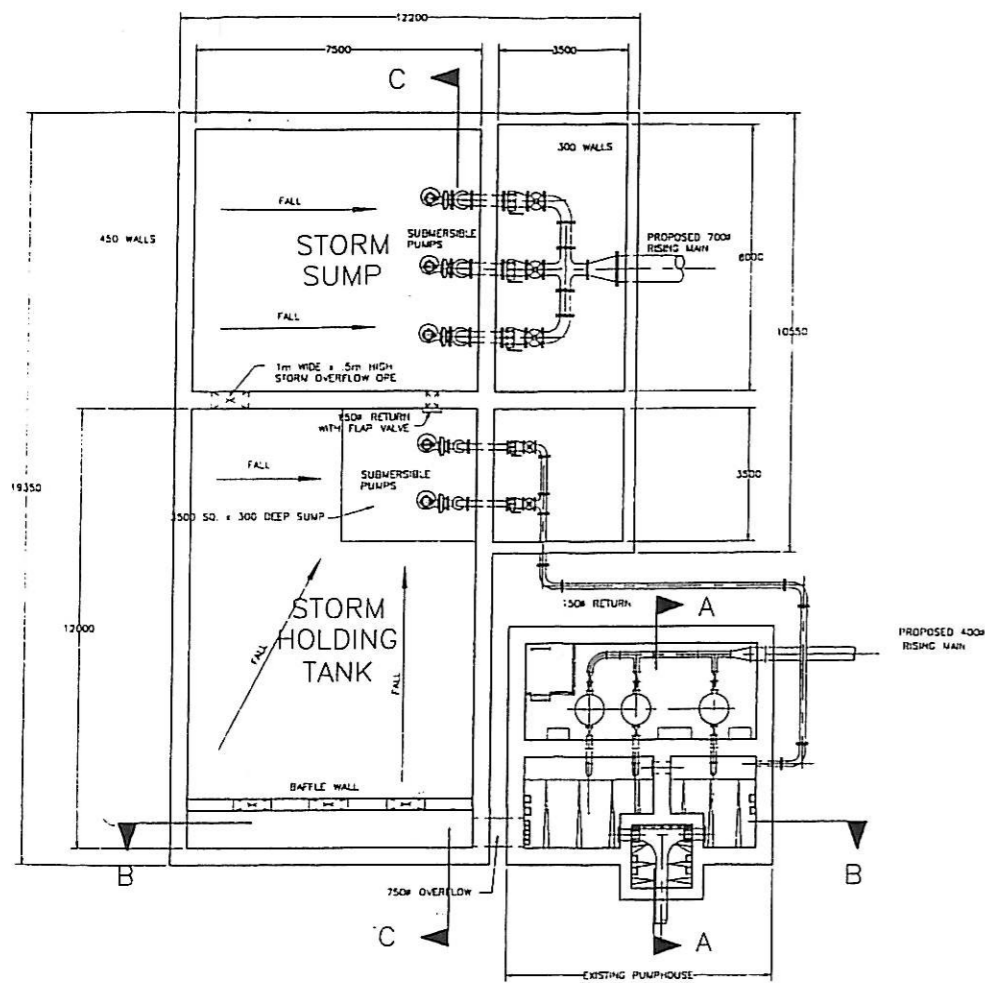
Ch'd (Eng.)

Approved

Org. No. 2328/EISB

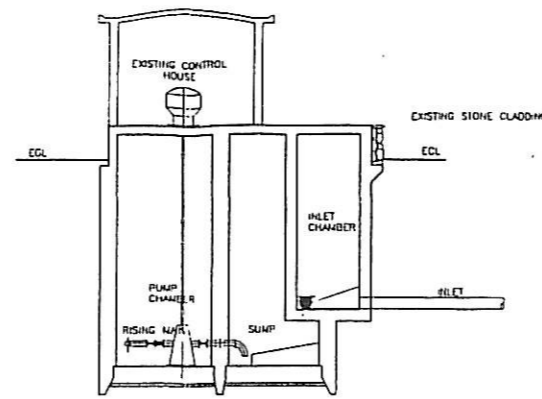
Fig. 3.4

rev. 1A



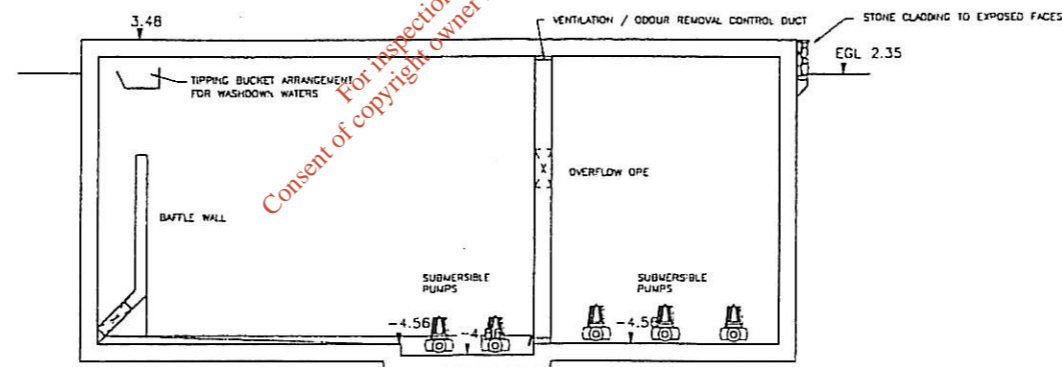
SECTIONAL PLAN.

SCALE 1:100



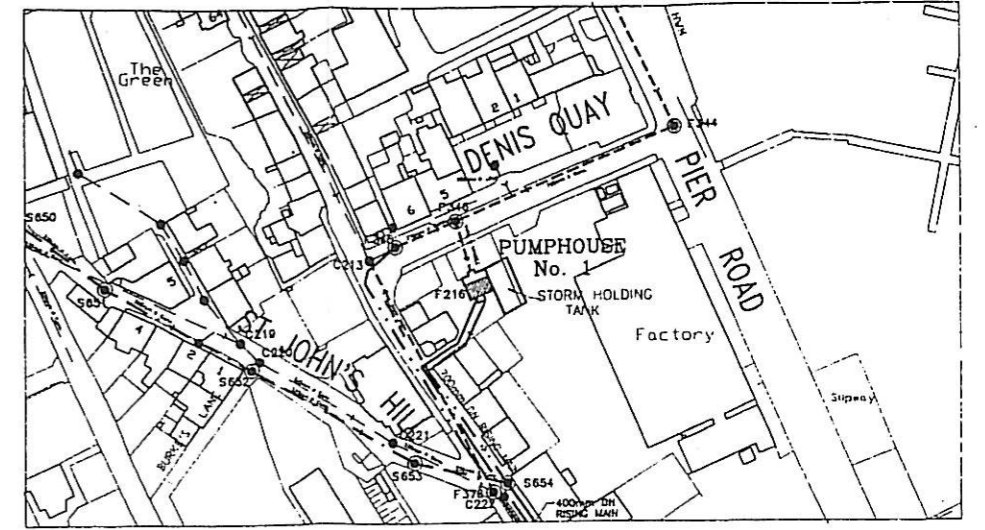
SECTION A - A

SCALE 1:100



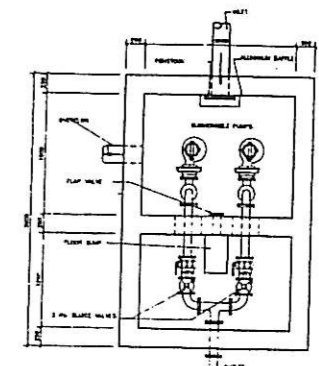
SECTION C - C

SCALE 1:50



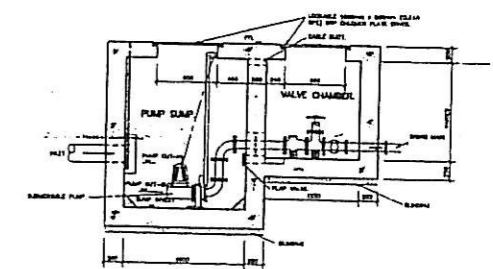
LOCATION MAP

SCALE 1:1000



SECTIONAL PLAN.

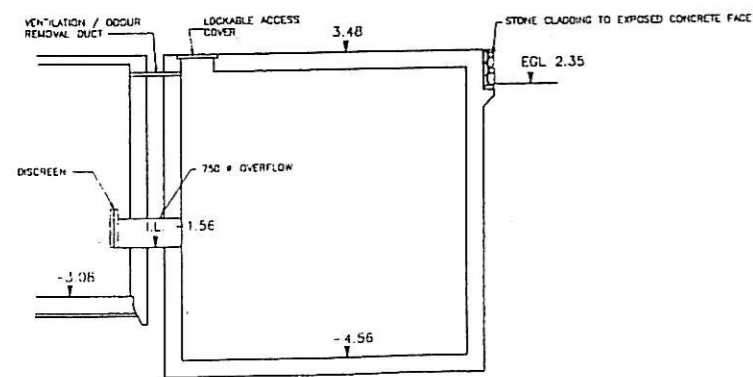
SCALE 1:50



SECTION

SCALE 1:50

TYPICAL PUMP STATION DETAILS



SECTION B - B

SCALE 1:100



C.B. Devlin B.E., C.Eng., F.I.E.I., M.I.A.T.
County Engineer
Cork County Council



Kinsale U.D.C.

Malachy Walsh and Partners

Consulting Engineers
Boreenmanna Rd. Cork.
tel. 021 962866 fax. 021 962929
MWPCORK@IOL.IE

Park House, 21 Danny Street Tralee
tel. 066 23404 fax. 066 26586
MWPTRA@IOL.IE
Suite C2, City Cloisters, 188-196 Old Street, London EC1V 9FR
tel. 0044 71 2530893 fax. 0044 71 3367034
MWALSH@COMPUSERVE.COM



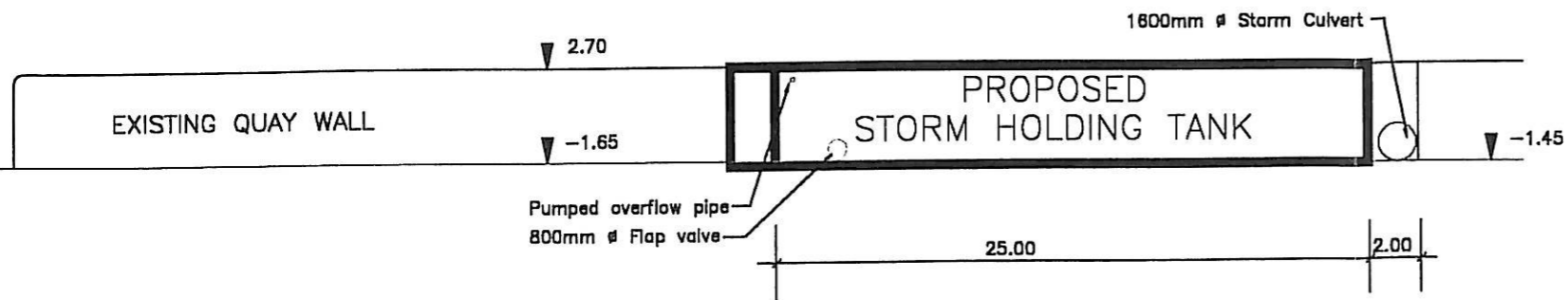
I.E. No. 200 0001

Project
Kinsale Sewerage Scheme. E.I.S.
Kinsale, County Cork

Title
Proposed Pump Sumps
At Denis' Quay And
Typical Pumping Station Layout

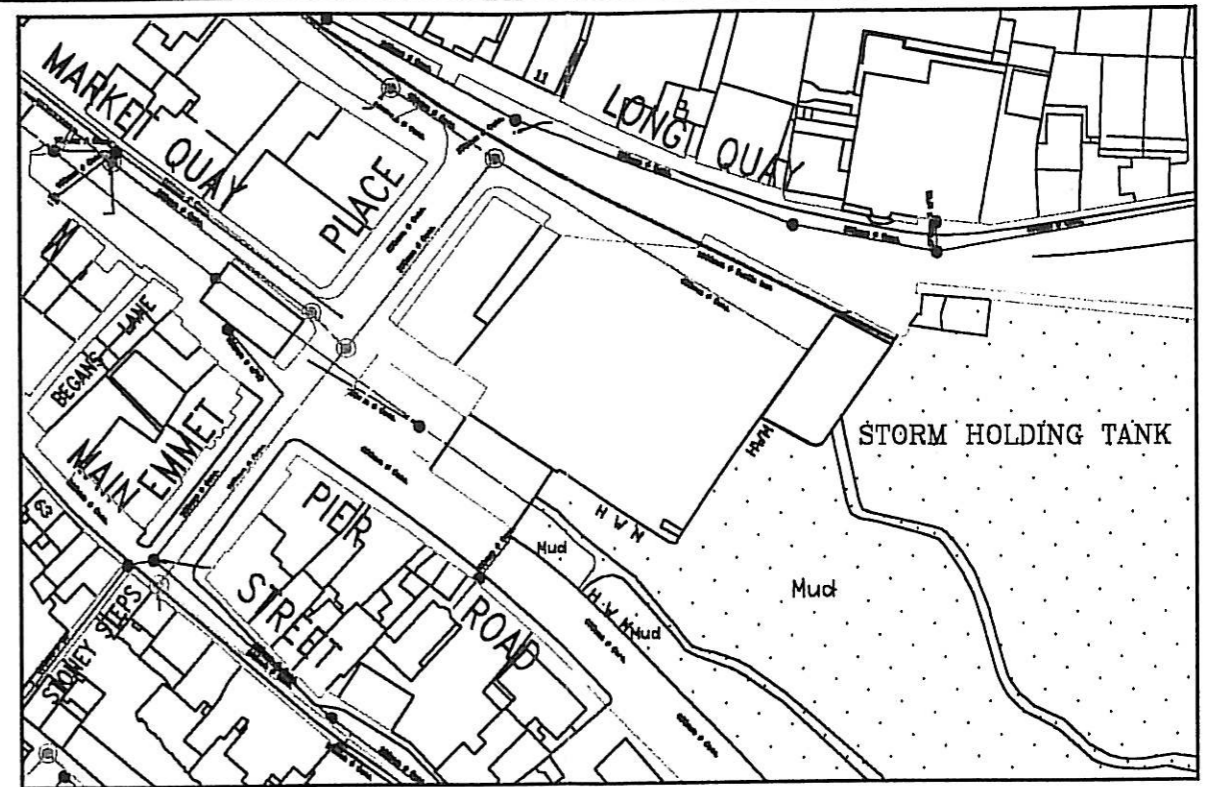
Scale	As Noted	Org. No. 2328/EIS 9
Drawn		
Ch'd (D.O.)		
Ch'd (Eng.)		
Approved		

Fig. 3.5



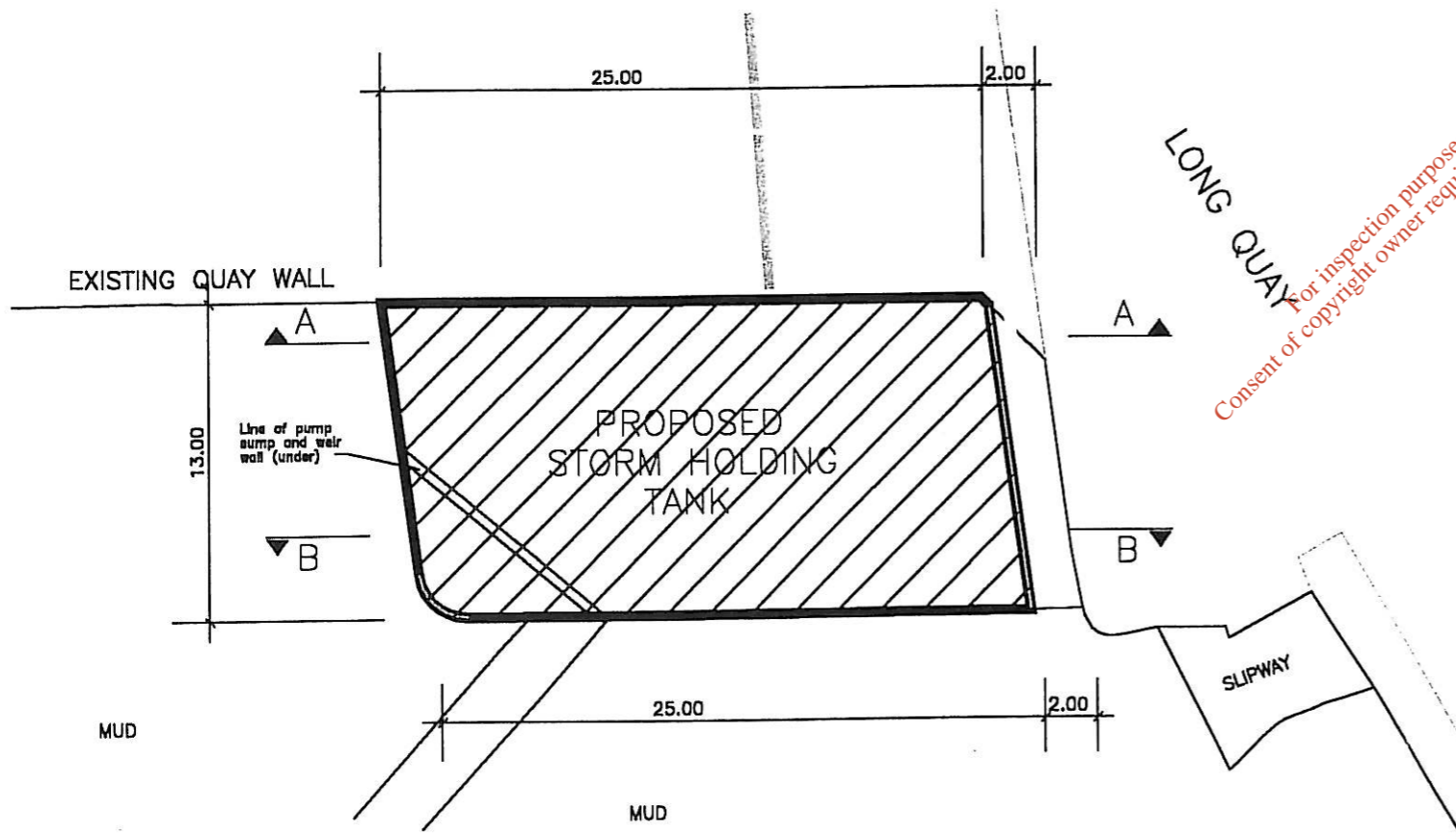
ELEVATION - SEAWARD

SCALE 1:200



LOCATION MAP

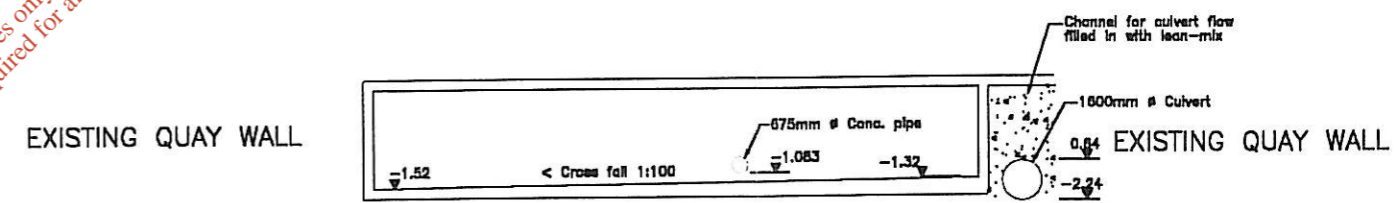
SCALE 1: 1000



LAYOUT PLAN OF PROPOSED STORM HOLDING TANK

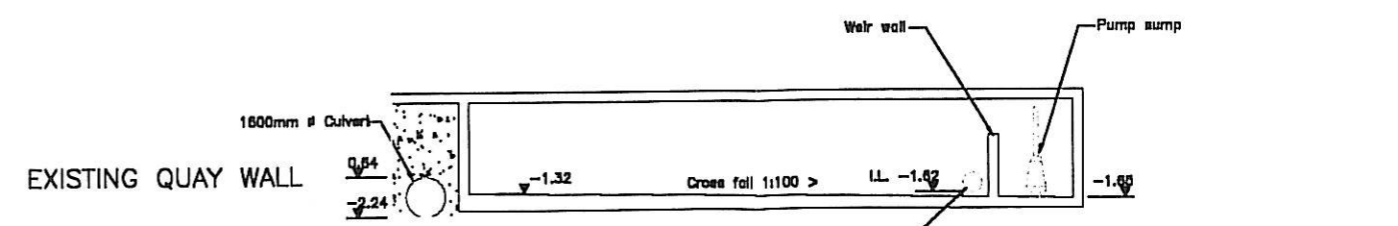
SCALE 1:200

For inspection purposes only.
 Consent of copyright owner required for any other use.



SECTION A-A

SCALE 1:200



SECTION B-B

SCALE 1:200



C.B. Devlin B.E., C.Eng., F.I.E.I., M.I.A.T.
County Engineer
Cork County Council



Kinsale U.D.C.

Malachy Walsh and Partners

Consulting Engineers
Boreenmanna Rd. Cork.
tel. 021 962866 fax. 021 962929
MWPCORK@IOL.IE

Park House, 21 Danny Street, Tralee
tel. 066 23404 fax. 066 26586
MWPTRA@IOL.IE

Suite C2, City Cloisters, 188-196 Old Street, London EC1V 9FR
tel. 0044 71 2530893 fax. 0044 71 3367034
MWALSH1@COMPUSERVE.COM



Project
Kinsale Sewerage Scheme. E.I.B.
Kinsale, County Cork

Title
Proposed Storm Holding
Tank Details

Scales	As Noted	Org. No. 2328/EIS B
Drawn		Fig. 3.6
Ch'd (D.O.)		
Ch'd (Eng.)		
Approved		rev. 1A



PLATE 9

**PHOTOMONTAGE OF PROPOSED
WASTE WATER TREATMENT WORKS**

4.0 HUMAN ENVIRONMENT

4.1 Introduction

4.1.1 This section considers both the construction and operational affects of the proposals. Temporary and locally significant disruptive impacts may occur during the construction phase of the collection system in built-up areas. These impacts may include noise, dust, restrictive access for pedestrians and traffic. To minimise the potential for these effects, a traffic and construction plan would be drawn up and agreed with local organisations and residents before works commence. This short term disruption, however, would be outweighed in the long term by the significant positive effect of the works and its collection system on the economic well being of Kinsale.

4.1.2 As the operational impacts of the treatment plant will be largely positive (see subsequent sections), the nature of construction impacts is further considered below.

4.2 Impacts Caused by Construction

4.2.1 Construction of the following elements will take place.

- ◆ Pipelines - Sewers and Rising Mains
- ◆ Pumping Stations and Holding Tanks
- ◆ Waste Water Treatment Plant
- ◆ Outfall Pipe

4.3 Pipelines - Sewers and Rising Mains

4.3.1 Construction of sewers and rising mains will generally comprise the following actions:

- ◆ Saw cutting of roads and removal of surface
- ◆ Excavation to required depths
- ◆ Laying of pipe
- ◆ Back-filling with imported material
- ◆ Resurfacing
- ◆ Removal and disposal of excavated material
- ◆ Construction of manholes
- ◆ Connecting to existing services

Impacts

4.3.2 The following temporary impacts will be felt:

- ◆ Traffic disruption
- ◆ Additional construction traffic
- ◆ Noise

- ◆ Air Quality
- ◆ Material Assets

Traffic Disruption

4.3.3 As in any urban environment, the provision of new or additional services has a serious but temporary impact. In particular, in a town like Kinsale, traffic disruption will be a major impact.

4.3.4 To ameliorate the impact, the following actions will be undertaken:

- ◆ *Traffic Management Plan:* Following consultations with the County Council, Urban District Council, Harbour Commissioners, local Tradespersons and other interested bodies, a construction traffic management plan will be incorporated into the Scheme. This will form part of subsequent Tender Documents, e.g. this plan will ensure that traffic disruption is kept to a minimum during the summer months.
- ◆ *Main Road approaches:* Temporary traffic lights and diversions will be in operation.
- ◆ *Streets:* Where streets are closed off, alternative routes will be sign-posted.
- ◆ Safety precautions regarding pedestrian access will be undertaken at all times.
- ◆ Excavated works will be closed back as soon as possible.

Additional Construction Traffic

4.3.5 Additional construction traffic during the pipeline construction will generally comprise one gang for each section of pipe being undertaken as follows:

- ◆ Tracked Hydraulic Excavator
- ◆ Wheeled Hydraulic Offset and Centre-post Excavator
- ◆ Articulated Dumper
- ◆ Small Dumper
- ◆ Compressor
- ◆ Generator
- ◆ Pump
- ◆ Rock-breaker (where necessary)
- ◆ Ready-mix Concrete Trucks
- ◆ Mobile Cranes

Noise

4.3.6 Construction of the pipelines will cause temporary and localised increases in sound levels. The actual impact will depend on the methods employed and the equipment used during construction. Generally, noise levels will be in the range 68-95 dB(A) at a range of 16 m (50 ft) (see Table 4.1 below). Noise levels of up to 105 dB(A) can be generated by impact equipment such as a rock-breaker.

TABLE 4.1. Construction equipment noise ranges.

Equipment	Noise Ranges in dB(A)
Tracked Hydraulic Excavator	75-95
Wheeled Hydraulic Offset and Centre-post Excavator	75-85
Articulated Dumper	78-93
Small Dumper	72-80
Compressor	75-85
Generator	73-83
Pump	65-73
Rock-breaker	83-105
Ready-mix Concrete Truck	75-85
Mobile Crane	75-85

4.3.7 Ambient noise levels in an urban environment are likely to be in the range of 66-78 dB(A). However, because noise levels decrease by at least 6 dB as the distance from the source is doubled, noise levels will be felt in the locality of the construction. For example, a noise level of 90 dB(A) for an excavator at 16 m would be reduced to 66dB(A) at 250 m, and 60 dB(A) at 500 m. Because of localised ground and atmospheric absorption conditions, these figures would probably be further reduced. Therefore, a temporary and localised increase is likely over existing conditions.

4.3.8 To alleviate construction noise, operating hours of all machinery will be limited to periods between 8.00 a.m. and 6.00 p.m. Monday to Friday, and 10.00 a.m. to 4.00 p.m. on Saturdays. Sunday work will not be allowed. In the event of an emergency, these times might be changed with the agreement of the Council.

Air Quality

4.3.9 Again, impacts on air quality will be short-term and minor. Emissions of nitrous oxides (Nox) and hydrocarbons, together with limited emissions of sulphur dioxides (SO₂) will be generated by the use of diesel fuel in construction equipment. These limits will be low and will result in a negligible impact to ambient air quality.

4.3.10 Dust emissions may be a problem during excavation and back-filling in dry periods. To alleviate these emissions, water will be applied to suppress the dust.

Material Assets

4.3.11 During pipeline construction, an archaeologist will be employed at each location. The archaeologist will monitor all excavations to ensure that any findings are recorded. The archaeologist will also be empowered to suspend operations in the event of archaeological finds.

4.3.12 Vibration measurement equipment will be employed to ensure that damage to properties due to vibrations does not occur.

4.3.13 General safety and health requirements will be adhered to during the pipeline construction phase.

4.3.14 Disposal of excavated materials will be carried out in designated areas only.

4.4 Pumping Stations and Holding Tanks

4.4.1 Construction of the pumping stations and holding tanks will generally comprise the following actions:

- ◆ Excavation to required depths
- ◆ Construction of chambers
- ◆ Back-filling with imported material
- ◆ Resurfacing
- ◆ Removal and disposal of excavated material
- ◆ Connecting to proposed pipelines

Impacts

4.4.2 The following temporary impacts will be felt:

- ◆ Traffic disruption
- ◆ Additional construction traffic
- ◆ Noise
- ◆ Air Quality

4.4.3 The following permanent impacts will ensue:

- ◆ Material Assets

Traffic Disruption

4.4.4 The pumping stations and holding tanks are generally to the side of the public road and as such will not disrupt traffic. Minor disruptions may occur during concrete pours, but these will be temporary.

Additional Construction Traffic

4.4.5 As with the pipeline construction, additional construction traffic will be necessary to excavate and construct the pumping stations and holding tanks. However, this impact will be minor compared to the pipelines.

Noise

4.4.6 The night-time noise guideline for a 'green-field' site is generally taken as 40 dB(A) at local residences. Given that these proposed sites will be located in mixed land use areas, the 'green-field' guideline level is considered to be too stringent in these cases. A figure of 45 dB(A) is considered more appropriate.

- 4.4.7 Because the type of pumping station proposed is submersible, and below ground, noise levels emanating from these stations will be minimal and below the 45 dB(A) threshold.

Air Quality

- 4.4.8 Odour removal facilities will be provided at each pumping station. Sewer gas emissions from the pump sumps will be conveyed directly to these facilities where they will be scrubbed prior to discharge to the atmosphere. Proper operation and maintenance of these facilities will ensure that odour emissions are minimised.

Material Assets

- 4.4.9 The change of use of the sites where the new pumping stations and holding tanks are to be located will be permanent.

4.5 Waste Water Treatment Plant

- 4.5.1 Construction of the waste water treatment plant will generally comprise the following actions:

- ◆ Removal of topsoil
- ◆ Excavation to required depths
- ◆ Construction of proposed tanks and buildings
- ◆ Back-filling with imported material
- ◆ Return of topsoil
- ◆ Removal and disposal of excavated material
- ◆ Construction of miscellaneous pipelines and chambers

Impacts

- 4.5.2 The following impacts will be felt:

- ◆ Traffic disruption
- ◆ Additional construction traffic
- ◆ Noise
- ◆ Air Quality
- ◆ Material Assets

Traffic Disruption

- 4.5.3 Permanent local traffic disruption will be of a very minor nature and will comprise transportation for employees permanently employed at the plant (two cars per day), and intermittent haulage vehicles (two trucks per day).

Additional Construction Traffic

- 4.5.4 Temporary construction traffic impacts will be felt similar to those during the pipeline construction. However, the duration of these impacts will be of a longer duration, given the nature of the construction, and confined to the site area and approaches.
- 4.5.5 The additional traffic will include transportation for the workers on the site. It is envisaged that up to 50 personnel will be employed during the construction of the treatment plant. Cars owned by these workers will be parked in designated areas adjacent to the treatment plant. However, an increase in traffic in the early morning and late afternoon will occur. The extra traffic generated is estimated at 15-20 cars per day over a two-year period.
- 4.5.6 Disruption will also be felt due to traffic carrying materials, consisting of ready-mix concrete, timber, steel and other materials haulage vehicles. This will occur during daylight hours. The extra traffic generated will be intermittent and is estimated at a maximum of 10-15 trucks per day over approximately a two-year period.

Noise

- 4.5.7 Temporary noise emanating from the site will be similar to that generated in the pipeline construction.

Air Quality

- 4.5.8 Air quality impacts will be similar to that generated in the pipeline construction. However, during prolonged dry periods, dust emissions will occur due to excavation and grading activities and from wind erosion prior to re-vegetation of disturbed areas.
- 4.5.9 As with the pipelines, water will be used to douse these emissions.

Material Assets

- 4.5.10 The land use of the waste water treatment site and approach road will be permanently changed. However, the plant will have a beneficial effect on adjoining lands which are zoned for development.

Local Residences/School

- 4.5.11 All views of the sewage treatment works would be screened except from Compass Hill where the proposed woodland would compensate for the partial visibility of the site. The visual impact would be slight.

- 4.5.12 Noise emissions from activities related to the proposed sewage works would not have a significant effect on the existing noise environment in the surrounding area.
- 4.5.13 Overall, the design and operation of the waste water treatment plant would ensure that odorous emissions are kept to a minimum. The predicted short-term maximum ground level odour concentrations are very low at the nearest private properties. The site is relatively remote, with areas where odours might be generated being over 300 m from the nearest housing and school. The predicted odour levels at this distance downwind are well below the values likely to result in complaints. The prevailing weather conditions would also aid rapid dilution of any odour from the various components of the treatment plant. No adverse impact on the air quality of the area at the nearest residential properties is therefore predicted.
- 4.5.14 It should be noted, however, that temporary and locally significant disruptive impacts may occur during the construction phase of the collection system in built-up areas. These impacts may include noise, dust, restrictive access for pedestrians and traffic. To minimise the potential for these effects, a traffic and construction plan would be drawn up and agreed with local organisations and residents before works commence.

4.6 Outfall Pipe

- 4.6.1 Construction of the outfall in the inter-tidal area will generally comprise the following actions:
- ◆ Excavation to required depths by dredging or other means
 - ◆ Laying and weighting of pipe
 - ◆ Back-filling with imported material
 - ◆ Removal and disposal of excavated material

Temporary Impacts

- 4.6.2 Construction of the outfall pipe may have a temporary impact on leisure boating in the immediate area of the pipeline. Again, as the pipe will be laid during the winter months, this impact will be minor.

Permanent Impacts

- 4.6.3 No permanent impact will result in relation to leisure activities as the outfall pipe will be buried. No jetting impact will result due to the diffusers at the end of the pipe.