

# infrastructure

KILKENNY WESTERN ENVIRONS :

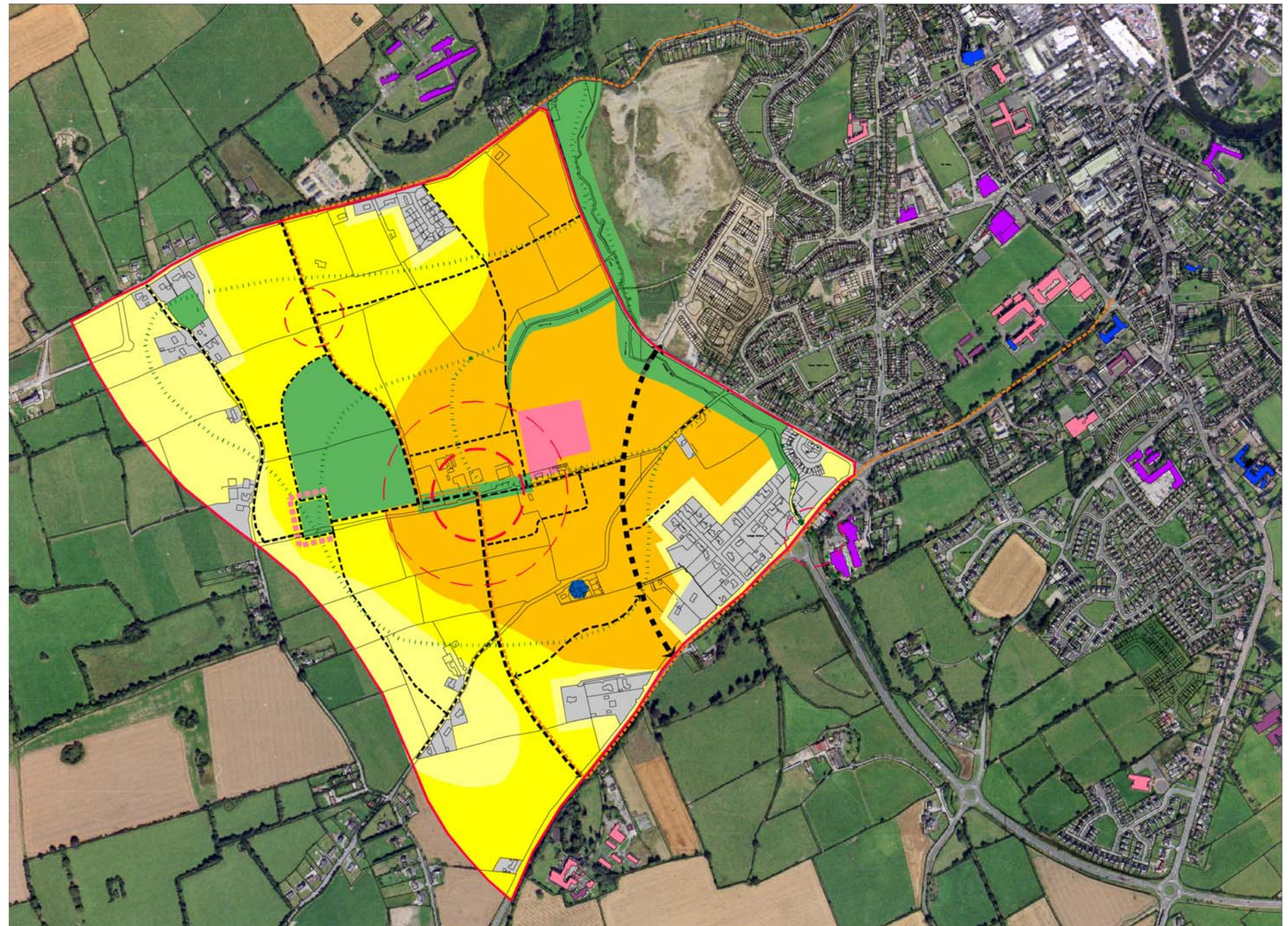
URBAN DESIGN & INFRASTRUCTURE GUIDANCE DOCUMENT

for KILKENNY COUNTY and BOROUGH COUNCILS - January 2004



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## 1.0 Introduction

A Local Area Plan has been developed for some 346 acres of zoned lands in the townlands of Drakeland Lower, Poulgour, Wetland in County Kilkenny. The area will be known as the Kilkenny Western Environs. This Infrastructural Guidance Document has been developed for use in conjunction with the Local Area Plan and the Urban Design Guidance Document. It is the intention that they will be used by Kilkenny County Council as a basis for assessing any development proposals for lands in the Western Environs.

The purpose of the Infrastructural Guidance Document is to:-

- consider not only the immediate area but also to address the wider context in terms of the provision of future infrastructure;
- promote effective integration between land-use planning and transport;
- identify the local infrastructure required to service the Western Environs;
- assess the expected impact of the development of the Western Environs on existing infrastructure and its ability to support such development;
- identify the enhancements to existing infrastructure which would be necessary to support the development of the Western Environs;
- ensure that infrastructure is provided in a timely manner which is consistent with the Local Area Plan and in so doing also addresses the capacity constraints of existing infrastructure;
- promote the creation of safe attractive places in which people are happy to live, work and take their leisure;
- ensure that strong links are provided from the Western Environs into Kilkenny City;

- set out the design standards for roads and services infrastructure;
- promote sustainability in those standards.

Kilkenny County and Borough Councils' objective is to achieve a high quality of design for the Western Environs both in terms of house types and layouts and infrastructure to ensure that the new neighbourhood has a well defined sense of space. To achieve this high quality of design it will be necessary to develop strong cooperation between the Local Authorities and the various Landowners in the area.

There are many challenges facing the Council and Landowners alike if the vision for the Western Environs is to be realised. The multiple interactions of evolving infrastructure, especially communications and transportation, with urban economic, social and environmental conditions are vital to the future of the Western Environs and guidance needs to be provided to those responsible for developing that infrastructure.

Cross relationships and good cooperation will be required between many complex components such as laws and regulations, political and special interests, economic and environmental issues, science and technology and resources. An integrated / holistic approach is required to ensure that the requisite infrastructure is delivered in an orderly fashion and to a high standard of quality. Such an approach will provide solutions for long-term economic and environmental sustainability in the Western Environs.

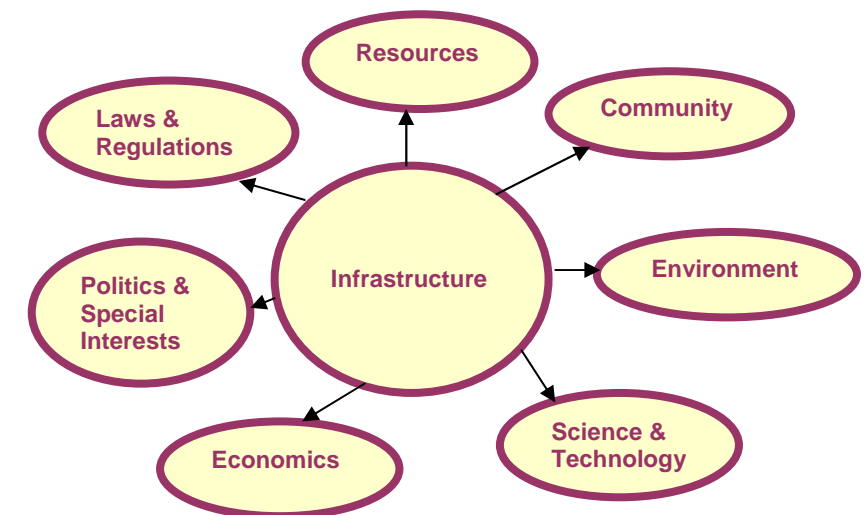
Infrastructure will be best delivered through vision driven solutions which offer greater potential of optimising resources, developing sustainable outcomes and greater community ownership.

Many practical and simple strategies can be part of a "collaborative" team approach that encompasses different kinds of interests and expertise within various public and private entities. Integrating public and private infrastructure programmes will lead to a more robust

urban system, better tailored to needs and more adaptable to change.

Strong leadership will be required. Without leadership and an integrated team approach, the delivery of infrastructure to service the Western Environs will be fragmented and possibly ill thought out.

Design criteria must include the use of new and continually changing engineering systems and methods in order to provide sustainable solutions that are needed for the future.



## 2.01 Roads & Transportation

### Traffic Generation

A population equivalent of 9,500 in the Western Environs, distributed as outlined in the Local Area Plan will generate approximately 24,000 trips (12,000 in / 12,000 out) per day. Map 13 shows how these trips might be distributed on the roads network.

### Proposed New Roads Infrastructure

Aside from the internal roads infrastructure, It will be necessary to upgrade existing roads infrastructure to accommodate this volume of traffic.

The following capital works programmes are recommended to support the development of the Western Environs:

- construction of a roundabout on the Callan Road at the proposed junction with the proposed Outer Relief Road – this roundabout to act as a Gateway to the City;
- upgrading of the Callan Road to provide right turning lanes to access the Western environs together with footpaths;
- construction of the Inner Relief Road;
- upgrading of the Kilmanagh Road to an AADT capacity of 7,000.
- traffic calming and access restrictions on the existing Circular Road

Additionally the speed limit on the Callan Road adjacent to the Western Environs will be reduced to suit the urban setting.

Albeit that it will be some time before these volumes are reached a progressive phasing of the provision of local and strategic infrastructure will be critical to the successful development of the Western Environs. Phasing is discussed in an overall context later in this Plan.

### Road Layout

The proposed road layout has been designed to redress the perceived imbalance of providing for vehicular movement at the expense of the quality of the local environment. In doing so, sustainable development and integrated transport issues, as espoused by the Kilkenny City & Environs Development Plan 2002, are addressed.

There will be a hierarchy of roads of different carriageway widths, paving materials and vehicular / pedestrian priorities. The hierarchy of importance of the roads will be:

- National Primary Routes
- Inner Relief Road
- Collector Roads
- Major Access Roads
- Minor Access Roads
- Village Main Street

The benefits of this hierarchical layout include:

- Accessible development amenable to pedestrians;
- People are able to use their cars whilst not being overly dependant on them;

- Shared surfaces are designed to allow pedestrians, cyclists and car users to mix safely;
- The majority of drivers find acceptable the distances over which they are expected to proceed at slow speeds;
- Parking spaces are provided close to the dwellings which they are intended to serve;
- Cleaner, safe environment for residents and non-vehicular road users.

The horizontal alignment of the proposed Local Collector Roads has been designed to avoid long straights and includes a number of curved features and shifts which will be effective in the control of speed.

### Inner Relief Road (IRR) and Pedestrian Accessibility to the City

It is important that the IRR does not sever the Western Environs from the remainder of the City. A number of key junctions are proposed as shown on Fig.2.01.1 below

Equally, safe pedestrian crossings of the IRR are required to access the proposed linear parks along the Breagagh River and the City. It is proposed to provide 4 No. of at grade signal controlled crossings as shown on Fig. 2.01.1 below.

Reference should be made to the Urban Design Guidance Document for further information

### Outer Relief Road

Statistically a very high proportion of drivers travelling to Kilkenny terminate their journey

in the City and return to their origin via the same radial route. Consequently the provision of an Outer Relief Road is considered premature and it is only at such time as the lands north of the study area, i.e. Loughmacask etc. are fully built out that traffic volumes would be such that an Outer relief Road would be warranted.

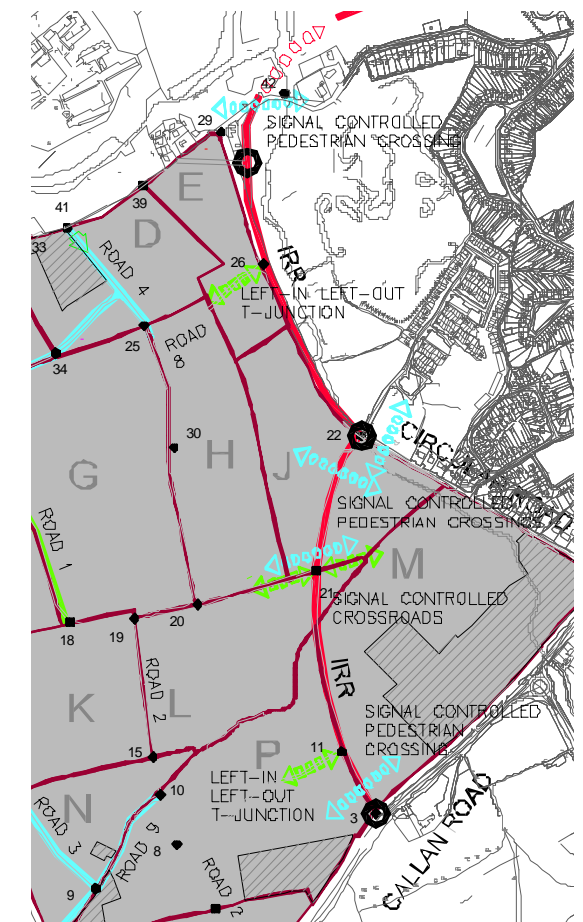


Fig 2.01.1 Site access and pedestrian crossings for IRR



## 2.01 Roads & Transportation

### Road Widths

The proposed carriageway widths ensure that there is adequate access for the emergency services and allow sufficient lane width to remain open in the event of blockages due to broken down vehicles, road works or service vehicles or parked cars. The absence of cul-de-sacs and the provision of through roads help service providers and other delivery operators to provide a more efficient service. **3**

The geometric design characteristics for the roads network are summarised in the Table on Map 4.

### Traffic Calming

The Local Area Plan for the Western Environs aspires to the development of strong connections to the historic core of the City via safe and direct routes for pedestrians, cyclists and public transport commuters. The proposed layout for the Western Environs has been developed in such a way that it is very clear to the driver that he is entering a residential area

The overall objective has been to balance the need for movement through the area and the local environment. There is a clear relationship between vehicle speeds and the length of road / street between junctions and bends. For straight lengths of between 60m and 100m findings suggest that the 85 percentile speeds are between 20 mph and 25 mph. The road layout provides for a maximum spacing of 80m between junctions.

Each individual development will have to take particular care to ensure pedestrian and cyclist safety, both actual and

perceived by using standard traffic calming features to ensure that speeds greater than 20mph are not reached.

These measures include:

- Village gateways



Fig 2.01.2 Village Gateway

- Raised junction platforms.
- Small radii corners with over-runable strips
- Surface treatments
- On-street parking
- Horizontal shifts
- Appropriate 'optical width'

The horizontal alignments of the proposed new Local Distributor Roads have been designed to avoid long straights and include a number of curved features which will be effective in the control of speed.



Fig 2.01.3 Horizontal shift

The impact of the parking is small in relation to the overall package of traffic calming measures that are envisaged. Nevertheless, the role of the parking as a traffic calming measure is important to ensure consistency of speed through the site and to reinforce the visual signals to drivers to respect the residential community that they are driving through.

Speed restraint will be further addressed by the provision of raised junctions, both at T-junctions and in particular in the area of "town centre" development.



Fig 2.01.4 Speed ramp

### Circular Road

The Circular Road will be downgraded and traffic calming introduced. A variety of methods could be employed to restrict access:

- apply weight restriction
- introduce ramps, speed cushions
- road closure, prohibit access from the Callan Road

### Parking

As the Western Environs develop it will be necessary to provide for on-street and off-street parking to cater for:

- residents' and visitors' cars;
- short-term parking of service and delivery vehicles.

The number of car parking spaces required for any particular development will depend on the number, size and type of dwellings to be provided in the development

The number of spaces will be calculated in accordance with the criteria set out in Kilkenny County Development Plan, Kilkenny City and Environs.

The following parking standards for the Village Centre will be applied; one space per residential unit (maximum standard) and as per Table 10.11 in the development plan.

A certain amount of on street parking brings activity to the street, making it more vibrant and safer.

Grouped car parking spaces, parallel to the road in the case of the Local Collector /

## 2.01 Roads & Transportation

Access Roads will help to break up the road into shorter stretches. They also have, albeit somewhat minimal, the effect of reducing vehicle speeds on this road.

Dwellings should face onto these roads so that residents may see their cars. Such parking is considerably more flexible than private parking.

Clearly demarcated parking bays will discourage the illegal parking and unauthorised parking on the pavements that might otherwise take place.

Demarcation will be achieved by the use of different paving materials. Where communal car parking spaces are being provided on shared surfaces it will be necessary to clearly distinguish the respective spaces required for pedestrians, cyclists and vehicles.

Some delays due to parking manoeuvres are expected but these are considered to be acceptable. It is not anticipated that the capacity of the Local Collector Roads / Access Roads will be adversely affected by this provision of parking. On roads such as these, the capacity is governed by the junctions.

In addition to on-street parking, it is proposed to develop two public car parks. All public car parks and Pay & Display, whether developed by the Local Authorities or by private interests, will be run by reputable management companies.

In addition to cars, developments will where appropriate include provision of parking for:

- People with disabilities
- Commercial vehicles

- Taxis
- Buses
- Cycles
- Motor cycles



Fig 2.01.5 Pedestrian Crossing

### Traffic Impact Assessments for New Developments

All planning applications for the Western Environs must incorporate a traffic impact assessment where the development leads to:

- trip generation exceeding 1,000 average daily trips or 100 peak hour trips;
- average daily movements into or out of the proposed development from any existing road exceed 10% of the projected existing traffic volume on the road;
- average daily traffic on any existing street increased by 10% or more above the projected "no-build" level, if the increase totals 200 average daily trips or more.
- Traffic impact assessments will address but not necessarily be limited to the following:

- identify source data and analytical methods used;
- the study horizon for the calculation of traffic impacts will be five years in the future, with background traffic growth of 4% per year.
- the study area will include all substantially impacted roads and intersections, generally those where project traffic adds 5% or more to projected baseline daily volumes.
- graphic presentation shall be provided showing study area average daily and peak hour traffic volume under the undeveloped and developed conditions;
- Sight distance measurements shall be provided for each point of egress from the development;
- Any mitigating measures proposed shall be described;
- impact on pedestrian safety and convenience;
- noise impacts on residential premises.



## 2.02 Water Supply

Kilkenny County Council currently abstracts approximately 8,000 m<sup>3</sup> / day from the river Nore's main channel at Troyswood. The Council has the legal right to abstract 19,085 m<sup>3</sup> / day at this location and this is the likely source to service the Western Environs. The existing plant has capacity to treat a further 2,000 m<sup>3</sup> / day without further upgrading.

Based on a projected population of 9,500 the Western Environs will require approximately 1,330 m<sup>3</sup> (300,000 gals) per day.

There are no definitive records of the age of the water mains in the Kilkenny public supplies. Much of the pipework in the water supply network is more than 50 years old and is likely to be leaking in places. Over the years new mains have been installed to extend and augment existing mains rather than to replace them. In more recent times Kilkenny County Council have put in place a conservation programme to reduce the volume of unaccounted for water. The Kilkenny Water Supplies Strategic Review identified this water conservation programme together with a number of other capital programmes as being critical to the capacity to support population growth into the future. Specifically to support population growth in the Western Environs it will be necessary to:

- further reduce the unaccounted for water in the system;
- construct a storage reservoir at Troyswood;

- install comprehensive telemetry (water metering) and management systems on supplies.

### Western Environs Water Supply Network

The existing water distribution network that services the City will be extended to supply the Western Environs. The proposed network to serve the plan area is illustrated on Map 5. Site underground infrastructure will be placed in accordance with the requirements of the Kilkenny County and Borough Councils and as illustrated by Map 12 'Typical Cross Section through Public Utilities'.

A 600mm diameter main connects the Troyswood plant to Kilkenny City. An existing ring main supplies the environs to the south and west of the City. The ring main on the western side is a 400 diameter main as it follows the Circular Road out from the City. Near White Bridge (Ref. points 29 and 42), a 200mm diameter spur supplies the Kilcreen Hospital and small estates off the Kilmanagh Road. The 400mm diameter ring main follows the Circular Road and the Breaghagh River valley to the Callan Road. At the Callan Road, (reference point 4) a 200mm diameter spur supplies the housing on the Callan Road.

Supply to the early phases of the development of the Western Environs will be provided by extending the existing nearby secondary mains on the Callan and Kilmanagh Roads.

A new 300 and 400mm diameter trunk main is proposed with capacity to supply the fully developed site and future development. The new trunk main will

extend from the existing 400mm diameter trunk main. It will form a loop across the site connecting back with existing mains on the Callan Road. Secondary mains, typically 150mm diameter and 200mm diameter, are proposed to form inner and outer loops to supply the development inside the site and future development beyond the Western Environs site.

Connections to the existing network are proposed on the Callan Road (2no. connections reference points 2 and 3), Kilmanagh Road (2no. connections, reference points 33 and 41) and the Circular Road (2no. connections, reference points 26 and 43)

### Environmental Policy

**Infrastructural Policy No. 2.02**  
It is the policy of the Councils to reduce water consumption and water loss

The following features will be encouraged to reduce water consumption:

- Water butts to collect rainwater for use as garden water.
- Low flush (6 litres) and very low (3 litres) flush WCs.
- Rainwater for flushing toilets.
- Low water use appliances (dishwashers, washing machines).
- Grey water recycling.

### Delivery

Successful delivery of services will depend on early consultation between the developers and Kilkenny County and Borough Councils. New mains will need to be put in place prior to or occur together with the development. All planning applications for the Western Environs must incorporate a water supply

strategy for the proposed development. The water supply strategy should include but not necessarily be limited to the following:

- water supply proposals;
- identify water mains to be taken in charge by the local authorities and provide details of construction for same.
- demonstration of good environmental and ecological practices;
- identify the maintenance requirements of the proposed drainage system and the proposed management regime to oversee the maintenance;
- examine the availability/capacity of public water supply to deliver water to the development including results of network modeling;
- take into account possible future development

Mains for taking in charge shall be constructed in accordance with Kilkenny County and Borough Councils' requirements.

Furthermore, successful delivery of services will be dependant in the first instance, on the successful negotiations and cooperation of the proposed site developers.

## 2.03 Foul Water Drainage

### Foul Sewers

At present, foul sewage from the western environs of the City is collected by the trunk sewer no. 2, Kilkenny Main Drainage Stage 4, which runs along the City side of the Breagagh River valley from the Callan Road into the pump house at Market Yard in the City.

Generally, the sewer has the capacity to support the projected population growth of the Western Environs. Small existing branch sewers in the western environs have little capacity or no capacity to carry additional loading.

The proposed sewer network to serve the plan area is illustrated on Map 7. The sewers will be placed in accordance with the requirements of Kilkenny County and Borough Councils and as illustrated by Map 12 'Typical Cross Section through Public Utilities'.

It is proposed that foul sewage is collected by a pipe network and is discharged into the trunk sewer no2 at a number of location points.

Parcels J, K, N, M, P and Q should discharge into the trunk sewer in the Robert's Hill area at reference point 13. At the river crossing a pump station will be required to discharge the foul water to the trunk sewer. The total peak flow from the above parcels is estimated at 47 l/s.

A limited amount of development in Parcels M, P and Q may be allowed to discharge into the trunk sewer at the Callan Road/Circular Road roundabout via a pump station and a new rising main on the Callan Road.

The existing sewer on the Kilmanagh Road should be upgraded to allow a limited amount of development in Parcels A, B, C, D and E.

Parcels A, B, C, D, E, F, G, H and L should discharge into the trunk sewer near White Bridge on the Circular Road. The peak flow from these parcels is estimated at 94 l/s.

Generally, the sewers are positioned in the new and existing streets/roads. A small number of new sewers may require way-leaves.

### Effluent Generation

The target population for the Western Environs is 9,500. Effluent requiring biological treatment only

is envisaged at this stage. Biochemical Oxygen Demand (BOD) content is estimated at 300 mg/litre. It is not envisaged that major *wet industries* would be located in the area

### Effluent Treatment

Foul sewage from Kilkenny City and its environs is treated at Kilkenny County Council's wastewater treatment plant at Purcellsinch. The wastewater treatment plant which has a population equivalent capacity of 107,000 is working at near capacity. Its ability to support future population growth in the future is largely dependent on what measures (if any) are put in place to reduce the biochemical load on the plant from Smithwick's Brewery. The brewery currently utilises 75% of the BOD treatment capacity of the plant.

It is proposed to free up capacity at Purcellsinch by reducing biochemical load from Smithwick's Brewery.

A 12% reduction in the volume of effluent received from the brewery would free up sufficient capacity to service the target population of 9,500 in the Western Environs.

This is the preferred option as it minimizes the amount of infrastructure which has to be upgraded to support development in the Western Environs. It also places more onus on the polluter to deal with pollutants at source.

### Environmental Policy

**Infrastructure Policy No.2.03**  
*It is the Councils policy to encourage the use of alternative eco-solutions to reduce the load on the Council wastewater treatment plant.*

Kilkenny County Council will actively encourage developments which employ "front of pipe" solutions to separate wastes at source to reduce

the overall load on the municipal plant. Examples include:

- use of urine separation toilets to separate urine from flush water with the urine used for as fertiliser (high nitrate content) composting purposes;
- use of faecal matter separators to separate flush water from faecal matter and toilet paper with the solids diverted to a compost system;
- the provision of grease traps for the removal of oils and fats on domestic as well as commercial kitchen outfalls.

It is possible that using the above system would produce a sufficient reduction in the load to allow a small stand alone treatment plant (such as the Living Machines type and/or reed bed systems) to service the Western Environs. The advantages of such

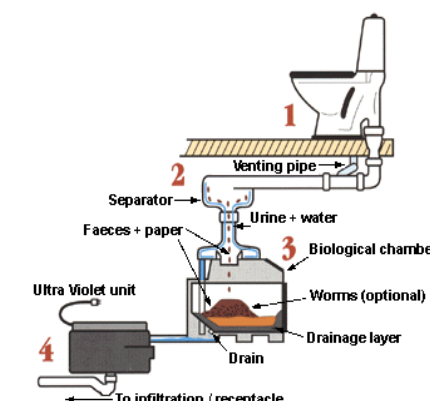


Fig. 3.01 Urine separation toilet

a system would be to permit the recycling of waste water for reuse in the development, biosolids would be digested in place, the community would benefit by the provision of a facility for first hand lessons on ecology, engineering and environmental stewardship, achieve tertiary treatment to meet future stringent discharge requirements.

### Drainage Impact Assessments

All planning applications for the Western Environs must incorporate a drainage strategy for the proposed development. The drainage strategy should include but not necessarily be limited to the following:

- waste water drainage proposals;
- identify drainage to be taken in charge by the local authority and provide details of construction for same.
- demonstration of good environmental and ecological practices;
- identify the maintenance requirements of the proposed drainage system and the proposed management regime to oversee the maintenance;
- a method statement detailing how contaminated water arising during construction will be dealt with.
- examine the availability/capacity of public sewers to carry waste water from development
- take into account possible future development

### Delivery

Successful delivery of services will depend on early consultation between the developers and Kilkenny County and Borough Councils. Public sewers will need to be put in place prior to or occur together with the development.

Drainage for taking in charge shall be constructed in accordance with Kilkenny County and Borough Councils' requirements.

Furthermore, successful delivery of services will be dependant in the first instance, on the successful negotiations and cooperation of the proposed site developers.



## 2.04 Surface Water Drainage

The Western Environs lands drain to the river Breagagh. The Kilkenny Flood Relief Scheme provides for surface water runoff from green field lands. It is therefore essential that a prescribed stormwater management policy be applied to surface water discharges to sewers and adjacent watercourses for all new urban development in the area.

The policy to be adopted for the Western Environs will be that set out in Dublin City Council's publication "Stormwater Management Policy for Developers".

### Source Control

A network of surface water sewers will be constructed to carry surface water runoff to the Breagagh. These sewers have been sized for green field lands. Therefore all developments will be required to incorporate source control techniques into their surface water drainage systems. Control of surface water runoff may be achieved in two ways:

1. reduction of flows entering surface water sewers or watercourses;
2. attenuation of flows before entry to the surface water system so that the capacity of the system is utilized and the need for further capacity is avoided.

A range of source control or sustainable urban drainage systems (SUDS), both "hard engineered" and "soft", will be permitted.

#### Hard Engineered

- individual plot storage;

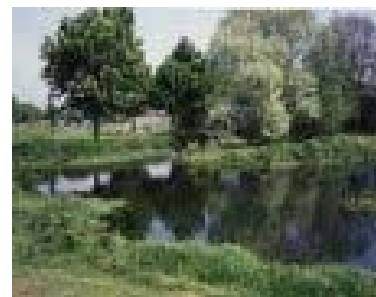


**Fig.2.04.1 Individual plot storage**

- vortex flow controls in flat roof rainwater outlets;
- underground detention basin constructed from geoplastic matrix with high structural integrity capable of withstanding vehicular loads.

#### Soft

- ponds



**Fig.2.04.2 Attenuation Pond**

- swales
- constructed wetlands

- filter drains
- green roofs



**Fig.2.04.3 Green roof, Norwegian house**

Swales, ponds and constructed wetlands will be considered in the determination of the open space provision of any particular development

Attenuation measures should be designed such that the SUDS features will not overflow during a 30-year return period rainfall event. Overflow from the attenuation measures is to be retained within the site area up to the 100 year event.

### Drainage Impact Assessments

All planning applications for the Western Environs must incorporate a drainage strategy for the proposed development. The drainage strategy should include but not necessarily be limited to the following:

- an indication of the types sustainable urban drainage techniques to be used;
- take into account possible future development;

- design calculations showing the attenuation required to ensure that post-development runoff volume does not exceed that for the critical rainfall events;
- evidence of sub-soil porosity where infiltration techniques are to be used;
- pre and post-development surface water runoff calculations;
- assessment of flood risk where this is deemed appropriate;
- proposals for integrating the drainage into the general landscape and the open space requirements for the development;
- a description of the design safety features to render the proposed attenuation systems safe;
- demonstration of good environmental and ecological practices;
- indicate proposed sediment control techniques are to be used;
- identify the maintenance requirements of the proposed drainage system and the proposed management regime to oversee the maintenance;
- indicate flow measurement and telemetric provisions to be used;
- a method statement detailing how contaminated water arising during construction will be dealt with.

## 2.04 Surface Water Drainage

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- identify drainage to be taken in charge by the local authority and provide details of construction for same
- take into account possible future development

### Surface Water Sewers

The proposed sewer network and watercourses to serve the plan area are illustrated on Map 6. The sewers will be placed in accordance with the requirements of Kilkenny County and Borough Councils and as illustrated by Map 12 'Typical Cross Section through Public Utilities'.

The minimum pipe size for sewers will be 225mm diameter.

Generally, the pipework routes will follow the road network.

### Breagagh Valley Flood Relief

Occasional minor flooding occurs in the Breagagh River valley in the area of the site. Historically, the Circular Road and the fields to the west of the river are affected.

The flood level contours, the frequency of flooding and the extent of the flood plain are identified in a flood study dated 1982-1983 for the Kilkenny County and Borough Councils.

The main cause of the flooding appears to be the restrictions to the river flows at two bridges, the bridge on Circular Road in the Robert's Hill area and the bridge upstream that links the Circular Road with the Townland of Poulgour.

This document proposes flood relief measures for the Breagagh River valley. These works should be carried out as part of and in conjunction with the works to the proposed Linear Park, the Inner Relief Road and the development of the Western Environs lands.

This document proposes that a flood study be commissioned to develop a scheme. The study should examine but not be restricted to the following:

- Impact of proposed Inner Relief Road;
- Widening, regrading and realignment of river and valley;
- Regrading of Circular Road
- Lowering bed level of Breagagh at the bridges
- Removal/modification of bridges causing restrictions

### Delivery

Successful delivery of services will depend on early consultation between the developers and Kilkenny County and Borough Councils. Public sewers and road drainage will need to be put in place prior to or occur together with the development.

Drainage for taking in charge shall be constructed in accordance with Kilkenny County and Borough Councils' requirements.

Furthermore, successful delivery of services will be dependant in the first

instance, on the successful negotiations and cooperation of the proposed site developers.



### *Electricity/Power Supply*

All residential and commercial development in the area must be connected to the national electricity and gas networks.

Electricity will be supplied to the Western Environs via two new circuits from the ESB's Rosehill and Talbot's Inch Stations.

The ESB proposes to double the capacity of the Rosehill Station as part of its 2004 capital works programme. The existing Rosehill 38/10kV Station is located to the eastern edge of the proposed development area and initially this will be the main source of supply for the development. Rosehill is equipped with 2x 5MVA transformers and it is currently overloaded, carrying 12MVA during winter loading conditions. The refurbishment and uprating of Rosehill Station has been approved and it is part of the 2004 work program. Planning permission submission is currently being prepared. The station will be uprated to 2 x 10MVA transformers with new circuit breakers, protection systems and associated equipment. This will greatly improve the quality of supply and continuity in the area.

This upgrade will increase the capacity in Rosehill Station to 20MVA and yield an additional capacity of 8 MVA. As a rough guideline, 5MVA will cater for 3,000 houses (standard domestic customers). This would leave 3 MVA to cater for the light industrial/retail development and local load growth in the area. However the additional capacity will be partially absorbed by load growth outside of the Western Environs area.

Talbots Inch Station is situated to the north of the proposed development and this station is equipped with 2 x 5MVA transformers. The current winter peak load on this station is 5MVA so there is 5MVA available.

The new load will be supplied by new circuits developed into the Western Environs from Rosehill and Talbots Inch. The construction type for these circuits (overhead or underground) will be determined by the terrain and the proximity of existing and planned development. In order to prevent planning blight to the area future route planning will be underground.

This spare capacity will meet the requirements of the proposed development as it ramps up. As the development nears completion a new 38KV station may be required due to increased loads and local load growth outside your development. The ESB would recommend that a site be earmarked to the West or North West of the proposed development in order to feed any additional extensions to the development and industrial growth that will develop to the west. This site should be in the Drakesland/Kilcreen area in order to be in a strategic location for offloading the Rosehill and Talbots Inch Station. The Station will be connected to both Rosehill and Talbots Inch Stations.

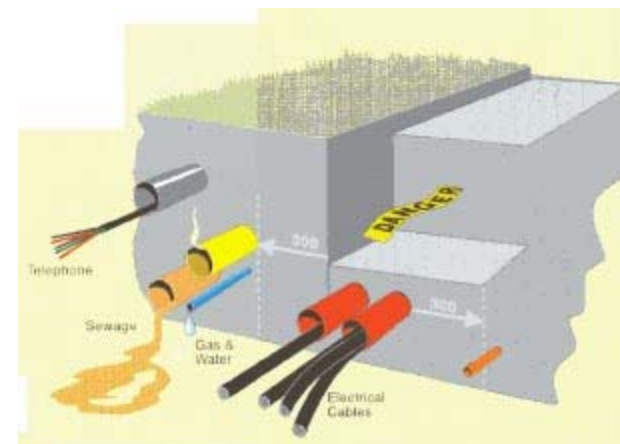
### **Undergrounding of Overhead Power Lines**

The existing 38kV and 10kV over head power lines must be placed underground as part of the development of the lands. Generally the ESB's policy is to cover the costs (excluding civil works) but in certain cases the ESB may not feel that undergrounding of a line is necessary so

further costs may be born by the developer. Developers should discuss this matter with the local ESB area staff. Early consultation with ESB is essential to agree under grounding and prevent sterilisation of land corridors along existing routes.

### **Ducting**

The proposed network to serve the plan area is illustrated on Map 9. Ducting will be placed in accordance with the requirements set out in the ESB publication 'Electrical Services Guidebook for Housing Schemes' and as illustrated by Map 12 'Typical Cross Section through Public Utilities'. For ESB requirements on national roads (Callan Road) and the Inner Relief Road contact the local ESB office for the appropriate documentation.



**Fig 2.05.1 Section thru services**

### **Delivery**

Successful delivery of services will depend on early consultation between the developers and the service providers

### *Gas Supply*

All residential and commercial development in the area must be connected to the national gas network. There is an existing natural gas supply in the city which can be readily extended to service the Western Environs.

#### **Spare Capacity/Improvements**

With an estimated 3,650 houses and a projected 9,500 population, the existing Bord Gais network (4 Bar) can cater for at least 50% of the development provided access is obtained for the larger feeder mains into the development land. This access will have to be facilitated by Kilkenny County Council. This should cater for the first 5 years of the development approximately.

For load above 50% of the maximum projected load, there may be reinforcement mains required to guarantee gas supplies to the City. Bord Gais will require the co-operation of Kilkenny County Council in completing these network reinforcements. However, this work will not affect the development of the lands on the western environs of the City.

#### **Existing Gas Infrastructure:**

The existing gas supply network in the area of the site is illustrated on map 10. Bord Gais have a 180 P/E main 4 Bar running along Maidenhill and Callan Road to the south and east of the proposed development respectively.

Also, there is a 125 mm PE 4 Bar main running along Circular Rod. Ideally, Bord

Gais would require this main to tie in through the new sites/road infrastructure with the above 180 P/E mains and create a loop in the gas network.

#### **Infrastructural / Land Requirements**

No requirement for high pressure steel transmission mains and associated above ground installations are anticipated for this development. However, individual developments with high densities may require underground pressure reduction installations. An area of approx. 2.5 m square is required in a footpath or landscaped area to cater for this. Typically, this is provided by the Builder / Developer for the specific site.

#### **Proposed Gas Network**

The proposed network to serve the plan area is illustrated on Map 10. Ducting will be placed in accordance with the requirements set out in the Bord Gais guideline publications and as illustrated by Map 12 'Typical Cross Section through Public Utilities'. For Bord Gais requirements on national roads (Callan Road) and the Inner Relief Road contact the local Bord Gais office for the appropriate documentation.

#### **Delivery**

Successful delivery of services will depend on early consultation between the developers and the service providers



### *Telecoms Network*

It is the policy of Kilkenny Borough Council and Kilkenny County Council to support the development of an up-to-date telecommunications infrastructure including the internet, e-mail and digital television in order to further enhance the attractiveness of Kilkenny City and Environs as a location for inward investment.

Kilkenny City enjoys world class telecommunications connection to the national telecommunications grid both through traditional copper and fibre optic connections.

It is intended that all development within the study area must have access to broadband technology. Cabling for broadband and television must be provided underground to serve all residential and commercial development.

At present, broadband services are available from Chorus and Eircom cabled areas of the City.

A government funded metropolitan area fibre optic network (MAN) is being built around the City (completion due in 2004) that will link up with the national backbone network thereby providing access to high speed broadband services. No plans are in place to extend this loop to the Western Environs.

Alternatively some services are equally available via Digital wireless technology

The development area is serviceable for Broadband and other telecom services.

### **Existing Eircom Infrastructure**

The existing Eircom network in the area of the site is illustrated on map 11. Eircom have an underground network on three sides of the development area, Callan Road, Circular Road and Kilmanagh Road, and any new connections will be made in these areas.

Eircom have at present capacity for 300 circuits at the northwestern corner of the development area. These lines will be used in this general location as demand comes on line.

There is a trunk fibre cable passing the area on the Callan Road, however any demand / requirement for fibre would probably be met by extension, in the existing network, of a fibre ring.

Eircom are to introduce a scheme to allow smaller Cities, towns and villages to lobby for broadband through expressions of interest. Eircom will open a Web site which will allow consumers in these areas to "vote for broadband." If interest is shown in a particular area, the company will investigate introducing a service. A trigger figure will be set for each individual exchange, which will range from 200 to 700 customers. The initiative is similar to one introduced by BT in the UK, which also allowed communities to vote for broadband

Eircom have are no plans at present to upgrade or augment their existing infrastructure, however decisions will be made on an ongoing basis in liaison with the Local Authority and Developers in the area and will be implemented on a "granted planning" basis.

To provide capacity to the completed development Eircom can either

- a) increase copper wire capacity from the main exchange , branching into phased developments with localised cabinet areas or
- b) **Locate a new exchange in a central area of the development and serve developments radially.**

Both of these options would require more detailed study and land requirements would depend on the option chosen.

Wayleaves would be required for ducting routes and cabinet locations.

### **Existing Chorus Infrastructure**

The existing Chorus infrastructure in the area of the site is illustrated on map 11. Chorus' current fibre network passes the site on the Callan Road. Any demand / requirement for fibre would probably be met by extension of the fibre loop. The local capacity of the existing fibre loop is future development proof. Regionally there is enough capacity for future development for the next 5 years.

The provision of future services to any new developments in the Western Environs would depend on the proximity of these developments to the existing Chorus network and the associated civil works development cost to interface the site to the Chorus network.

### **Ducting**

The proposed network to serve the plan area is illustrated on Map 11. Ducting and site

underground infrastructure will be placed in accordance with the requirements set out in the service providers requirements and as illustrated by Map 12 'Typical Cross Section through Public Utilities'.

It is the Councils' policy to actively encourage trench sharing between utilities/companies engaged in laying new telecoms networks or renewing existing networks

Additional spare ducts will be provided as illustrated to allow for future developments and demand.

### **Delivery**

Successful delivery of services will depend on early consultation between the developers and the service providers.

Successful delivery of telecom services and broadband in particular would be dependant in the first instance, on the successful negotiations and cooperation of the proposed site developers, the resident tenants, both commercial and residential, home developers thereafter and their cost contributions to any such broadband infrastructure. The government is putting in place a scheme to partly fund broadband in areas which express a sufficient interest.

### 3.0 Infrastructure – Costs and Phasing

#### Costs

A significant investment in roads and services infrastructure, recreational open space (Public Parks) and Community Buildings is required to support the long-term development of the Western Environs. The key elements of infrastructure have been identified in the previous sections of this document. An estimate of the construction costs is provided below.

Item	Cost (€)
Roads	36,000,000
Water Supply	5,000,000
Foul Sewerage	6,500,000
Surface Water Drainage	2,000,000
Service Ducts for Gas, Electricity, Public Lighting, Telecoms	1,500,000
Library/Community Building	2,000,000
Two Public Car Parks	500,000
Recreational Open Space (Public Parks)	7,400,000
Miscellaneous, undergrounding of powerlines	500,000
<b>TOTAL</b>	<b>€61,400,000</b>

These costs have been estimated on the basis that the works will be designed and constructed to high quality standards and will incorporate the highest standard of safety. Provision has been made for trenching and service ducts for electricity, gas and telecommunications on the assumption that there will be no charge from telephone and gas companies for new incoming

services and that a charge will be levied against each unit for electricity and water supply.

The estimated costs include for:

#### Roads

- Western Environs Local Collector / Major Access Roads
- Inner Relief Road
- Land Acquisition for Roads
- Callan Road / Outer Relief Road Roundabout
- Callan Road Improvements
- Kilmanagh Road Upgrade
- Outer Relief Road

#### Water Supply

- Water Mains
- Water Conservation
- Telemetry
- Reservoir at Troyswood

#### Surface Water Drainage

- Trunk Sewers
- Flood Relief works at Breaghagh River

#### Foul Sewerage

- Upgrading of Pump Stations
- Upgrading of Purcellsinch Waste Water Treatment Plant
- Trunk Sewers / Rising Mains

#### Service Ducts

- Gas Main
- Electricity
- Public Lighting
- Telecoms

#### Miscellaneous

- Undergrounding of 38kV Overhead Power Line

Excluded from the estimates are:

- Site Development Costs of Individual Development Parcels
- Provision of Roads and Services within Development Parcels
- Landscaping Works, Local Parks, Play Areas within Development Parcels
- Contingencies
- Construction Inflation from January 2004
- Service Supply Charges
- Professional Fees
- Management Costs
- Value Added Tax

#### Phasing

Development of the Western Environs is constrained by the capacity of - existing infrastructure. Therefore it is necessary for any particular development parcel that key elements of infrastructure have be in place prior to occupation of dwellings in the parcel. These elements of infrastructure are tabulated in the Local Area Plan and are included here again for ease of reference.

Whilst the Infrastructural Guidance Document has by nature to be prescriptive it is not intended that it should be so inflexible as to hamper development in the area. Adjustments to infrastructure layout and phasing should be considered where Developers can clearly demonstrate the benefits of such changes and as such each development will still have to be considered by the Local Authority on its own merits. The underlying requirement for quality will not be achieved without such flexibility.

The real key to opening up the Western Environs for development is the construction of the proposed Inner Relief Road (IRR). The IRR is a strategic piece of infrastructure which will ultimately link the Callan Road to the Carlow Road to the benefit of Kilkenny City and its environs. Whilst the Callan and Kilmanagh

roads will support a limited amount of new development, it is envisaged that most of the traffic generated in the Western Environs will utilise the Inner Relief Road.

Land ownership and financial constraints will dictate the deliverability of the IRR. The proposed line for the portion of the IRR within the Western Environs passes through or adjacent to the boundaries of 6 of the development parcels identified in the Local Area Plan. The construction of the road will require the cooperation of the landowners. Two options exist for the procurement of the land

- through compulsory purchase order
- allowing the Landowner / Developer construct the portion of the road through his / her land.
- a combination of i. and ii. above.

The first option requires that significant funds be available to the Councils in the short-term and the second requires that all Landowners develop their lands simultaneously.



## 4.0 Infrastructure – Recommendations for Implementation

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### 1. Steering Committee

A Western Environs Steering Committee is formed to include representation from Kilkenny County and Borough Councils, Community Interests, Planning and Technical Expertise and Developer Interests.

The functions of the Steering Committee will be to:

i. Establish a partnership type working environment between Kilkenny County Council, Landowners and Developers so that:

- the long-term infrastructure requirements are fully understood;
- the burden of infrastructure costs is shared equitably amongst the relevant parties;
- a workable phased sequence of development is followed;
- each identified development can operate effectively and that the requisite infrastructure is in place to service it;
- environmental goals are clearly defined.

ii. Establish a single point of overall control to ensure that:

- comprehensive and clear lines of management are in place;
- infrastructure is delivered to the appropriate standards and levels of quality;
- any proposed development is consistent with the overall vision for the Western Environs and that it delivers the requisite infrastructure

iii. Put a review process in place to ensure that:

- lessons learned from earlier individual phases are taken on board in later phases;
- potential economies of scale in the delivery of infrastructure are identified;
- the most appropriate procurement options at any particular stage of the development are identified.

### 2. Inner Relief Road

Kilkenny County Council to borrow the requisite funds to finance the construction of the Inner Relief Road. The process to effect the compulsory purchase land should be commenced without delay.

### 3. Short-term Development

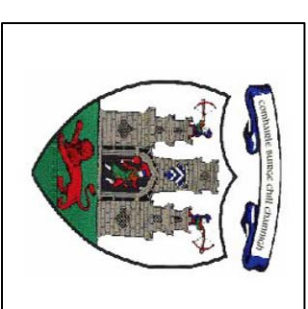
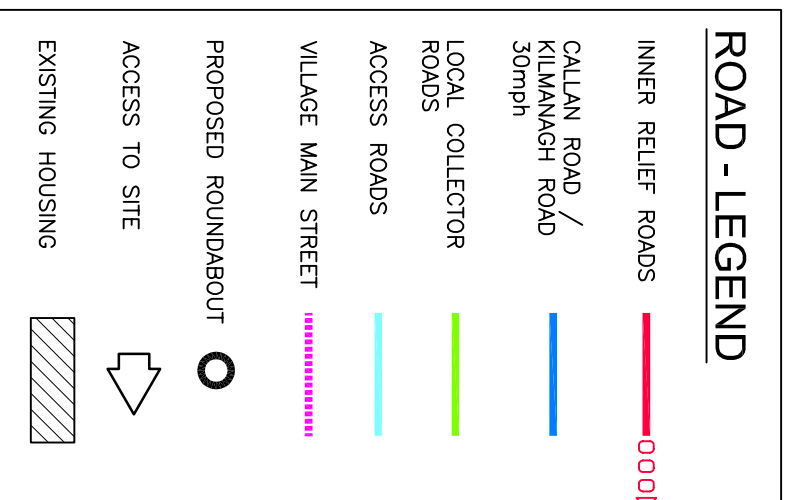
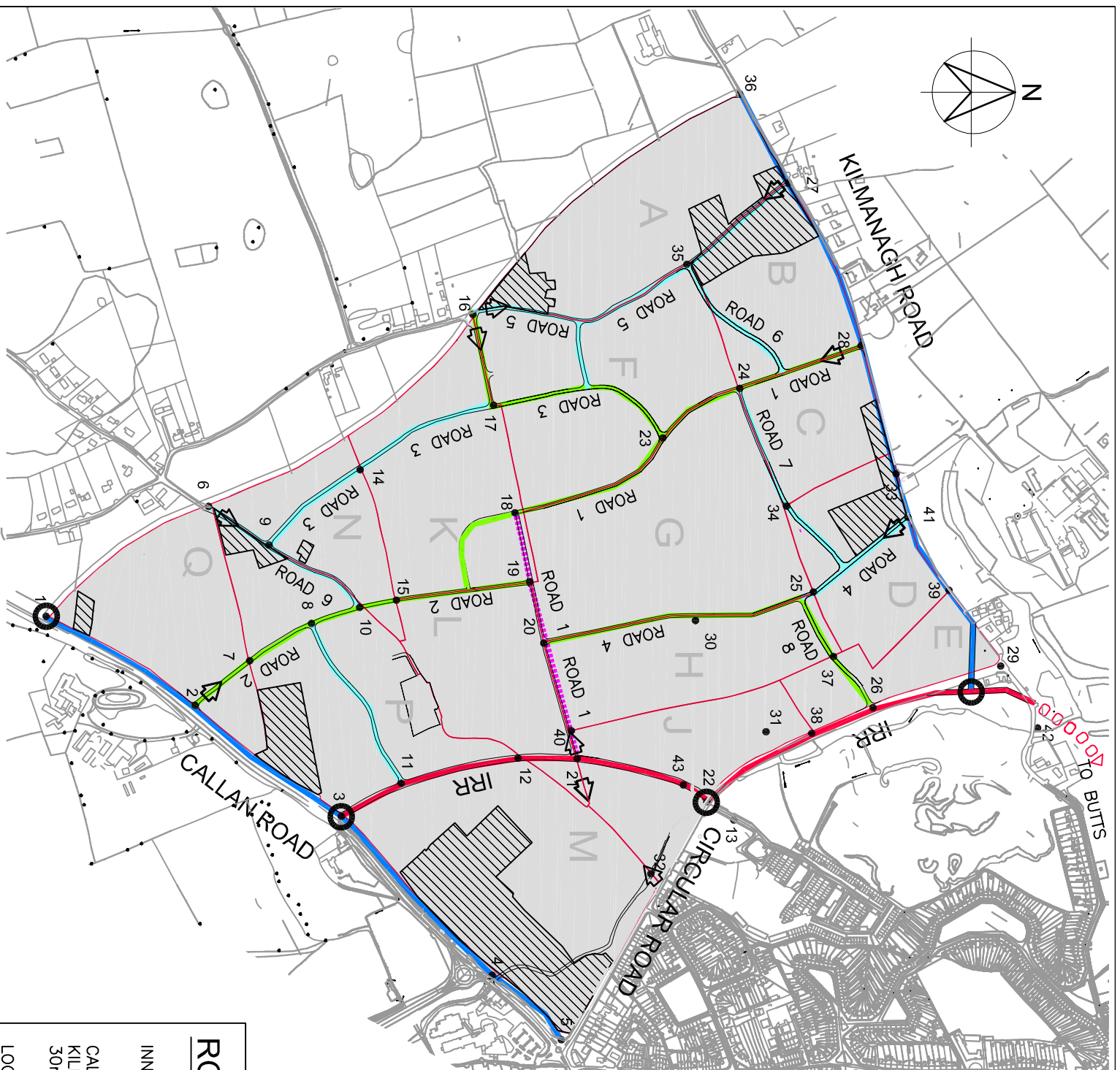
A limited amount of short-term development could be allowed where the Developer can clearly demonstrate that: the existing infrastructure can support such development; any such development is phased with the requirements of the Local Area Plan in terms of occupancy and the Developer commits to the provision of the long-term infrastructure either directly or through capital contributions.

## 5.0 Infrastructure Design Proposals – Maps and Illustrations

- Map 4 Road Layout
- Map 5 Watermains Layout
- Map 6 Surface Water Drainage
- Map 7 Foul Water Drainage
- Map 9 Electricity Supply Network
- Map 10 Gas Supply Network
- Map 11 Telecoms Network
- Map 12 Cross-section thru' Public Utilities
- Map 13 Traffic Impact on Road Network
- Map 14 Vertical Alignments for Roads
- Map 21



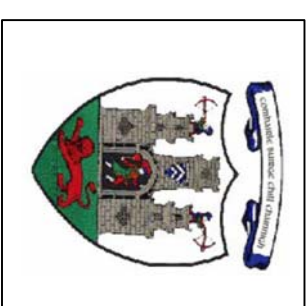
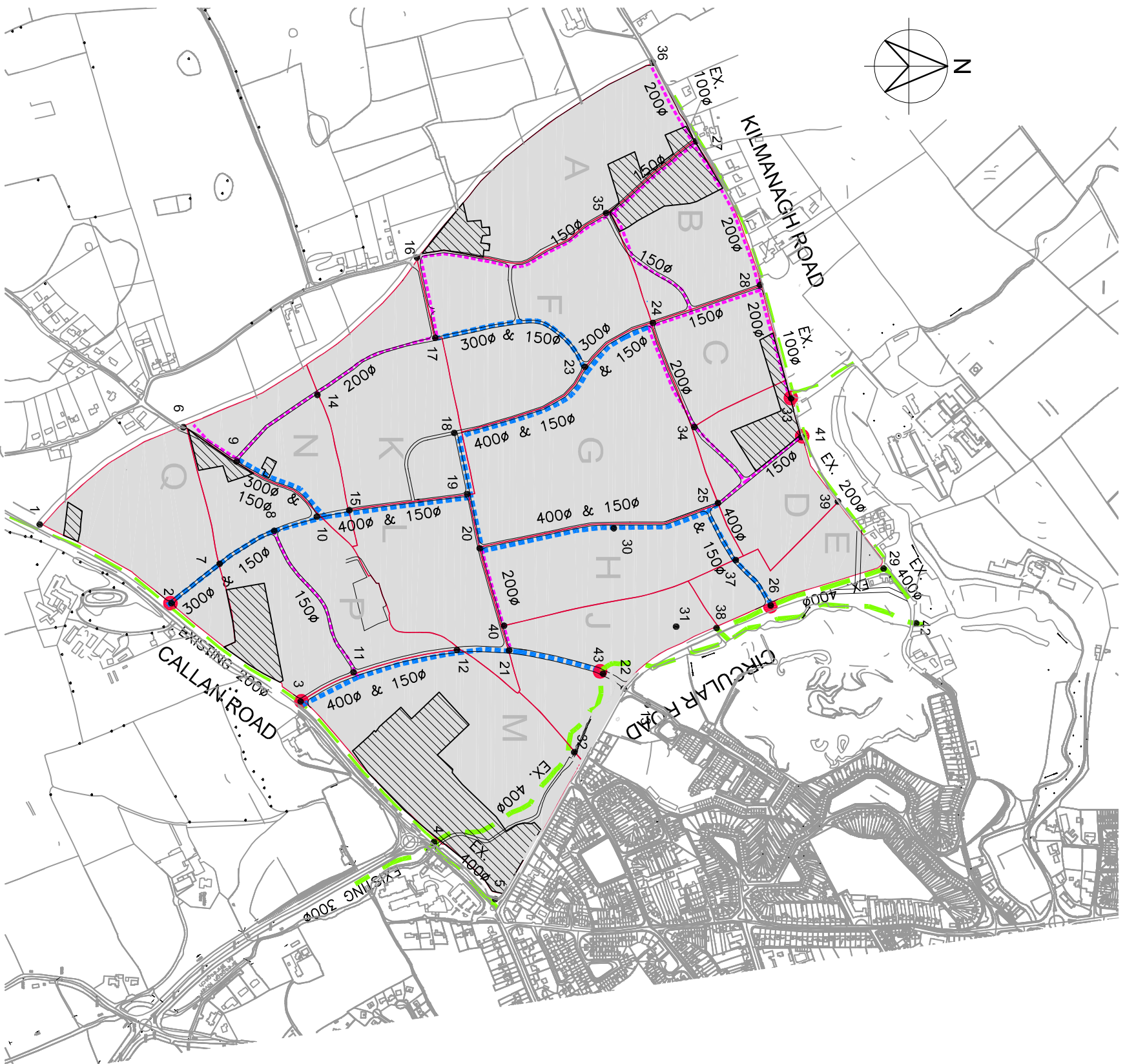









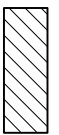

# Kilkenny Western Environs Proposed Local Area Plan January '04

Classification	Inner Relief Road	Callan Road/ Kilmanagh Road	Local Collector Road	Major Access Road	Minor Access Road	Village Main Street
<b>Design Speed</b>	50 kph (30 mph)	50 kph (30 mph)	50 kph (30 mph)	50 kph / 30kph / (30 mph / 20mph)	30 kph (20 mph)	30 kph (20 mph)
<b>Geometric Characteristics</b>						
Minimum Carriageway Width	8.0m	6.0m	6.0m	6.0m	5.0m	6.0m
Carriageway Narrowing - Minimum Width	-	-	-	5.0m	-	5.0m
Cycle Paths (each side)	-	2.0m	2.0m	-	-	-
Footpaths (each side)	2.0m	2.0m	2.0m	2.0m	2.4m	2.4m
Verges / Parking Bays	-	-	n/a	6.0m	5.4m	2.4m
Parking Perpendicular	-	-	5.4m	5.4m	5.4m	5.4m
Parking Parallel	-	-	-	-	-	-
Minimum Radius at Bends	255m (pref) 127m (min)	180m (pref) 90m (min)	180m (pref) 90m (min)	50m	20m with 33m forward visibility	20m with 33m forward visibility
Maximum Gradient	6%	6%	6%	6%	6%	6%
Minimum Length of sag Curve per 1% Change in Gradient	13m	10m	10m	10m	6.5m	10m
Maximum Super-elevation	3.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Visibility Splay						
X	3.0m (min)	2.4m (min)	2.4m (min)	2.4m (min)	2.4m (min)	2.4m (min)
Y	70m	70m	70m	70m	50m	50m

**Map 4.**  
**Road layout**  
**Scale 1:10000 @ A3**

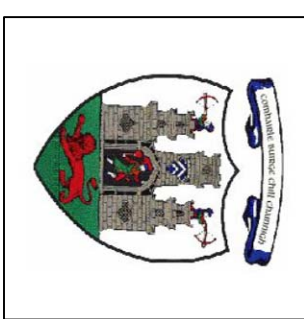
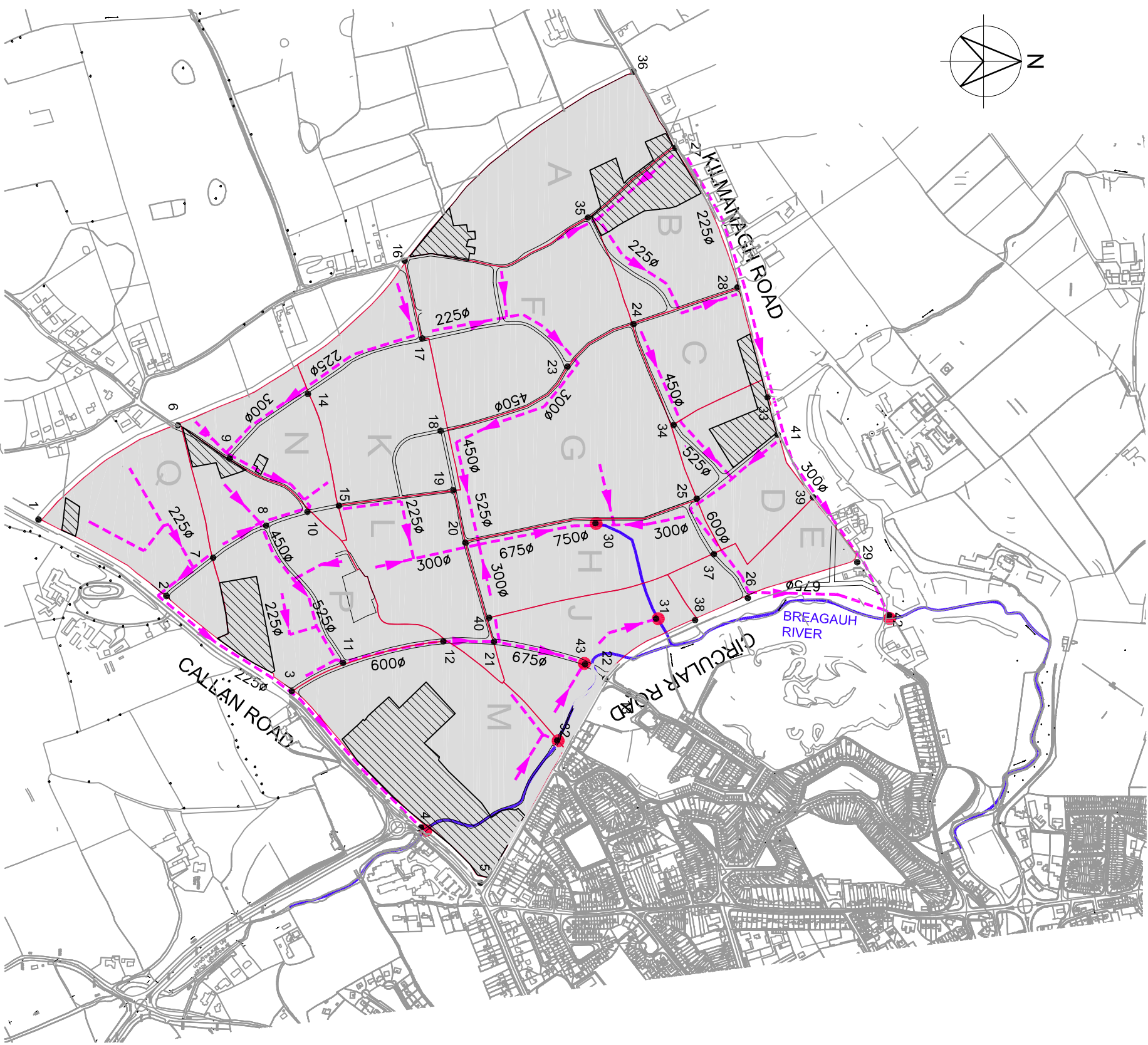


**Kilkenny Western Environs  
Proposed Local Area Plan  
January '04**

WATERMAIN - LEGEND	
	PROPOSED WATERMANS TRUNK & SECONDARY NETWORK
	PROPOSED SECONDARY WATERMAIN NETWORK
	EXISTING WATERMAIN NETWORK
	CONNECTION POINT FROM PROPOSED TO EXISTING
	LAND PARCELS
	EXISTING HOUSING
	REFERENCE POINTS

**Map 5.  
Watermain Layout  
Scale 1:10000 @ A3**

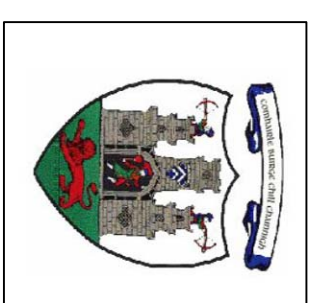




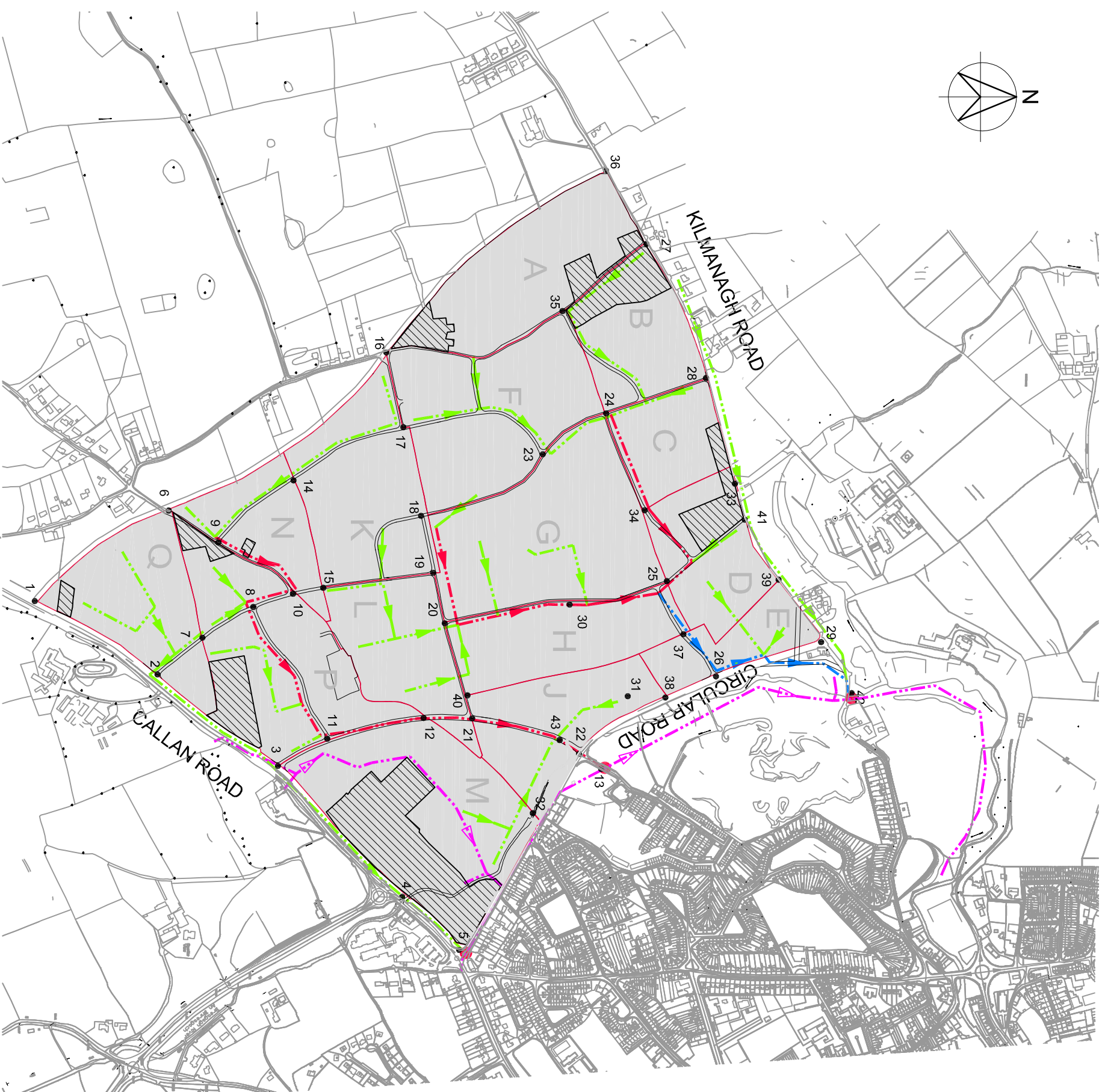
**Kilkenny Western Environs  
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January '04**

SURFACE WATER DRAINAGE - LEGEND	
PROPOSED SURFACE WATER DRAINAGE	-----
EXISTING RIVER / WATERCOURSE	—————
OUTFALL POINTS FROM PROPOSED SURFACE WATER	●
LAND PARCELS	N
EXISTING HOUSING	▨
REFERENCE POINTS	• 39

**Map 6.  
Surface Water Drainage Layout  
Scale 1:10000 @ A3**



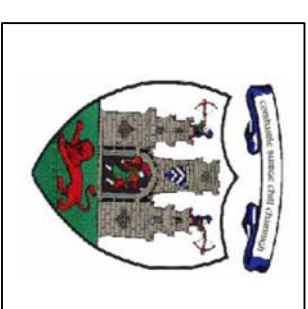
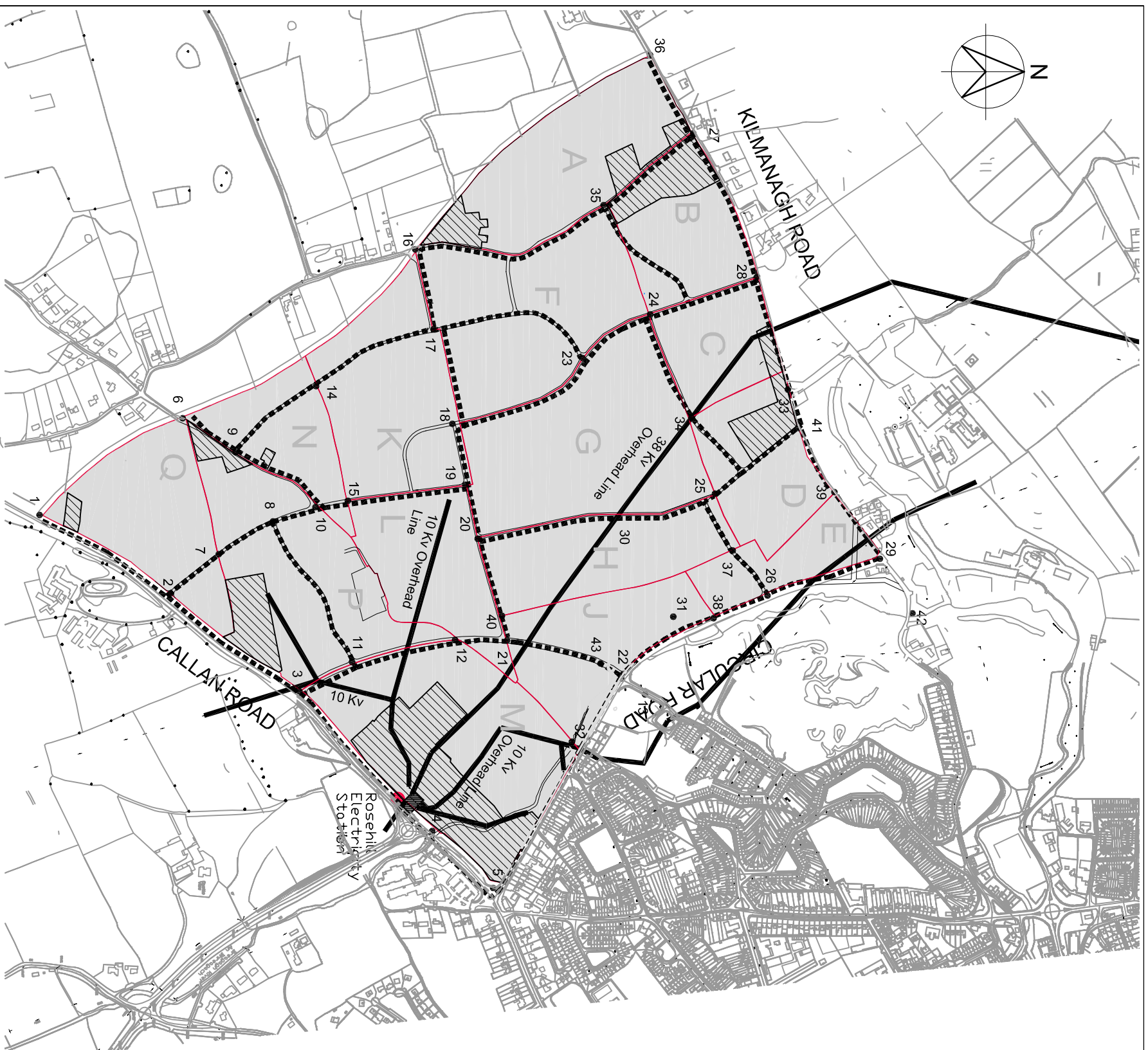
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Proposed Local Area Plan  
January '04**



FOUL WATER DRAINAGE - LEGEND	
PROPOSED FOUL WATER DRAINAGE - 225Ø	
PROPOSED FOUL WATER DRAINAGE - 300Ø	
PROPOSED FOUL WATER DRAINAGE - 450Ø	
EXISTING FOUL WATER SEWER	
CONNECTION POINT FROM PROPOSED TO EXISTING	
LAND PARCELS	
EXISTING HOUSING	
REFERENCE POINTS	

**Map 7.  
Foul Water Drainage Layout  
Scale 1:10000 @ A3**





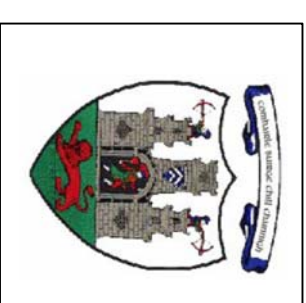
## Kilkenny Western Environs Proposed Local Area Plan January '04

ELECTRICITY - LEGEND	
PROPOSED ESB DUCTING	---
EXISTING ESB NETWORK	—
CONNECTION POINT FROM PROPOSED TO EXISTING	●
LAND PARCELS	N
EXISTING HOUSING	[Hatched Box]
REFERENCE POINTS	● 39

**Map 9.**

**Electricity Supply Network**  
**Scale 1:10000 @ A3**

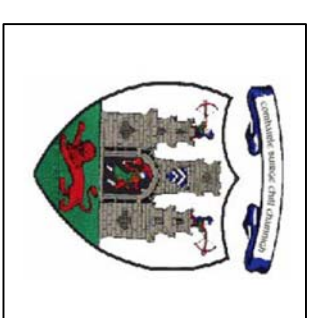
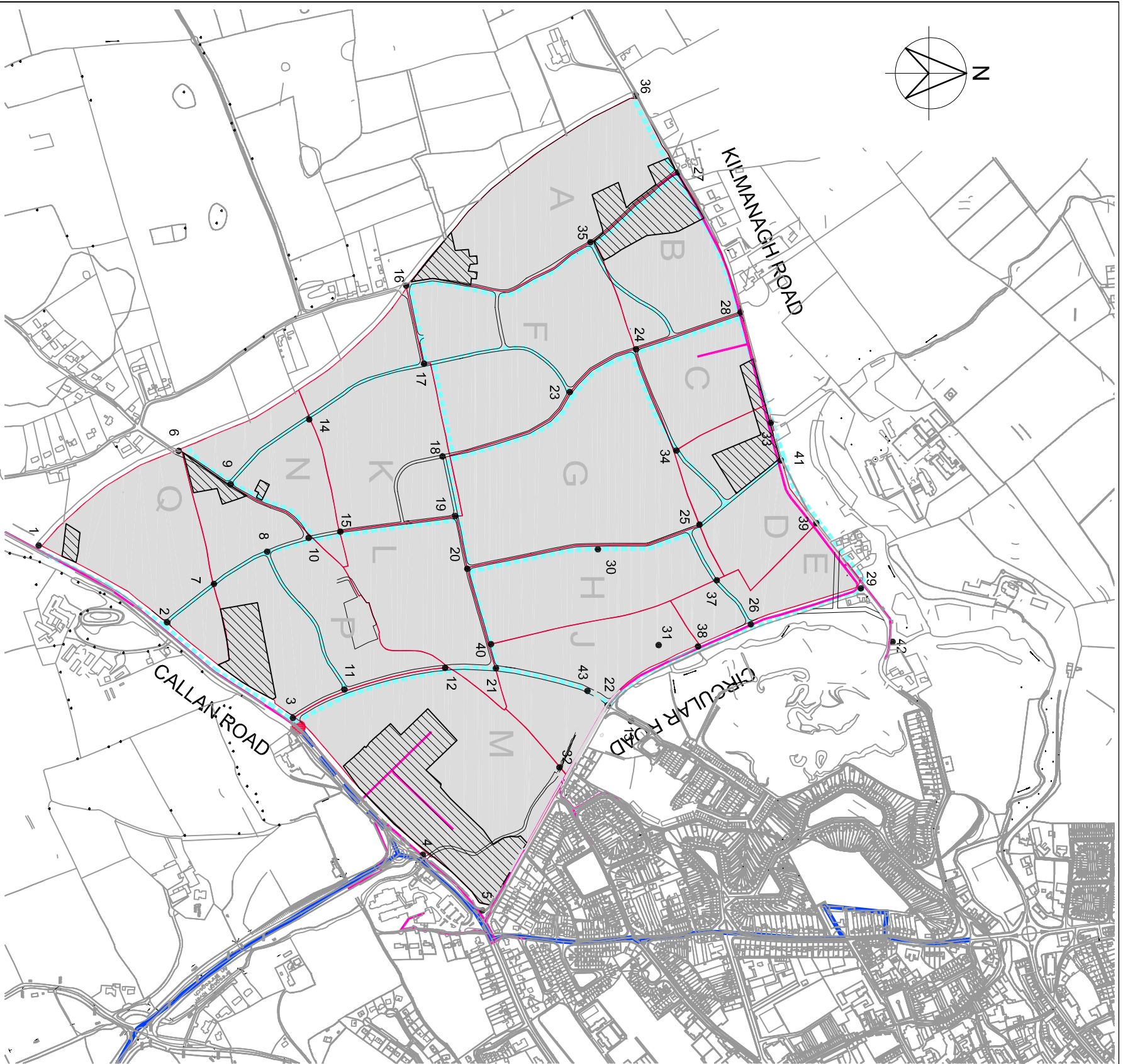




**Kilkenny Western Environs  
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GAS - LEGEND	
PROPOSED GASMANS 125-180mm HDPE	
EXISTING GAS MAIN 125-180mm HDPE	
CONNECTION POINT FROM PROPOSED TO EXISTING	
LAND PARCELS	
EXISTING HOUSING	
REFERENCE POINTS	

**Map 10.  
Gas Supply Network  
Scale 1:10000 @ A3**



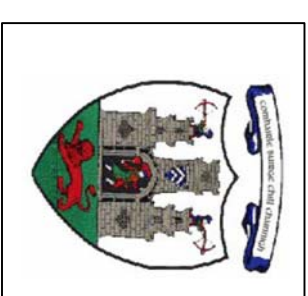
**Kilkenny Western Environs  
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January '04**

TELECOMS - LEGEND	
PROPOSED TELECOM DUCTING	
EXISTING 'CHORUS' NETWORK BROADBAND	
POSSIBLE FUTURE 'CHORUS' SPUR	
EXISTING 'EIRCOM' NETWORK BROADBAND	
CONNECTION POINT FROM PROPOSED TO EXISTING	
LAND PARCELS	
EXISTING HOUSING	
REFERENCE POINTS	

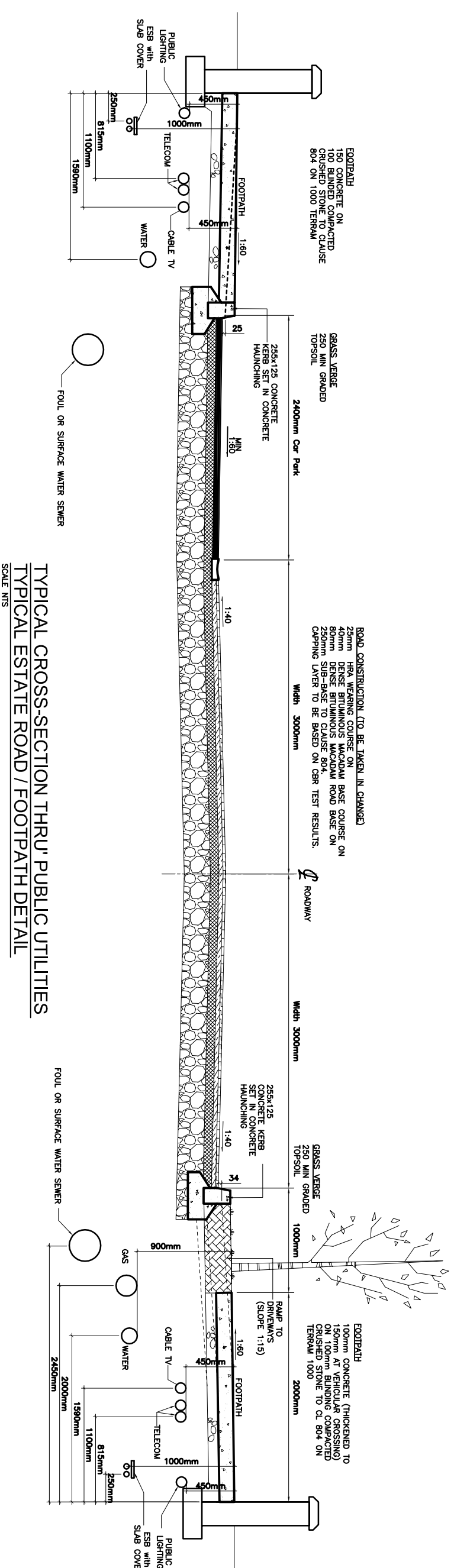
**Map 11.**

**Telecoms Network  
Scale 1:10000 @ A3**





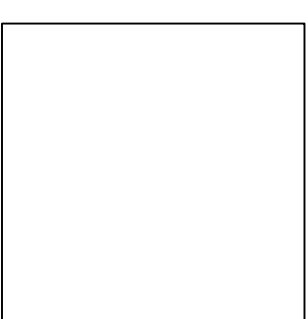
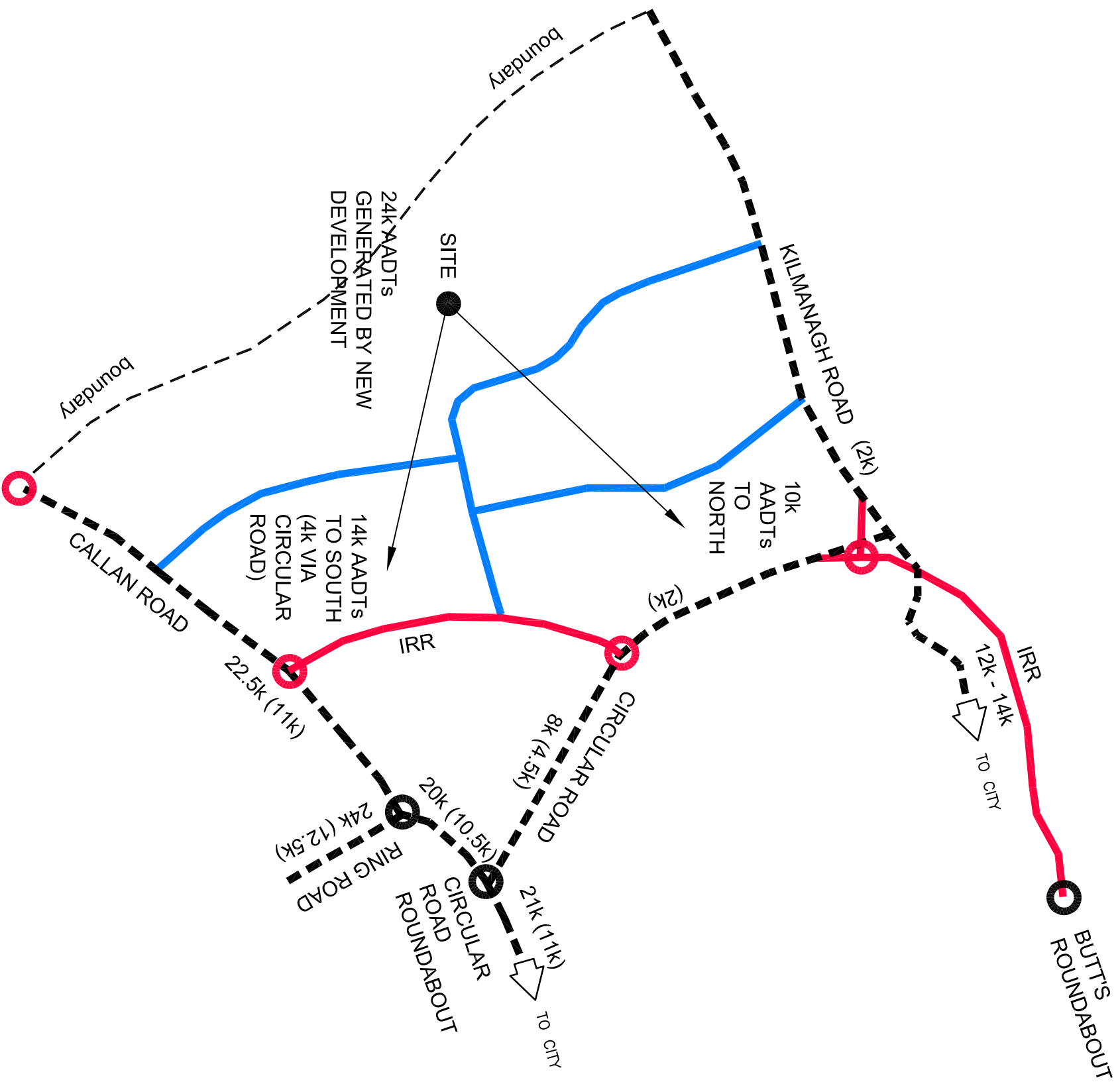
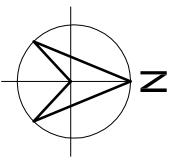
# Kilkenny Western Environs Proposed Local Area Plan January 03



TYPICAL CROSS-SECTION THRU' PUBLIC UTILITIES  
TYPICAL ESTATE ROAD / FOOTPATH DETAIL  
SCALE NTS

## Map 12. Cross-section thru' Public Utilities Scale NTS @ A3



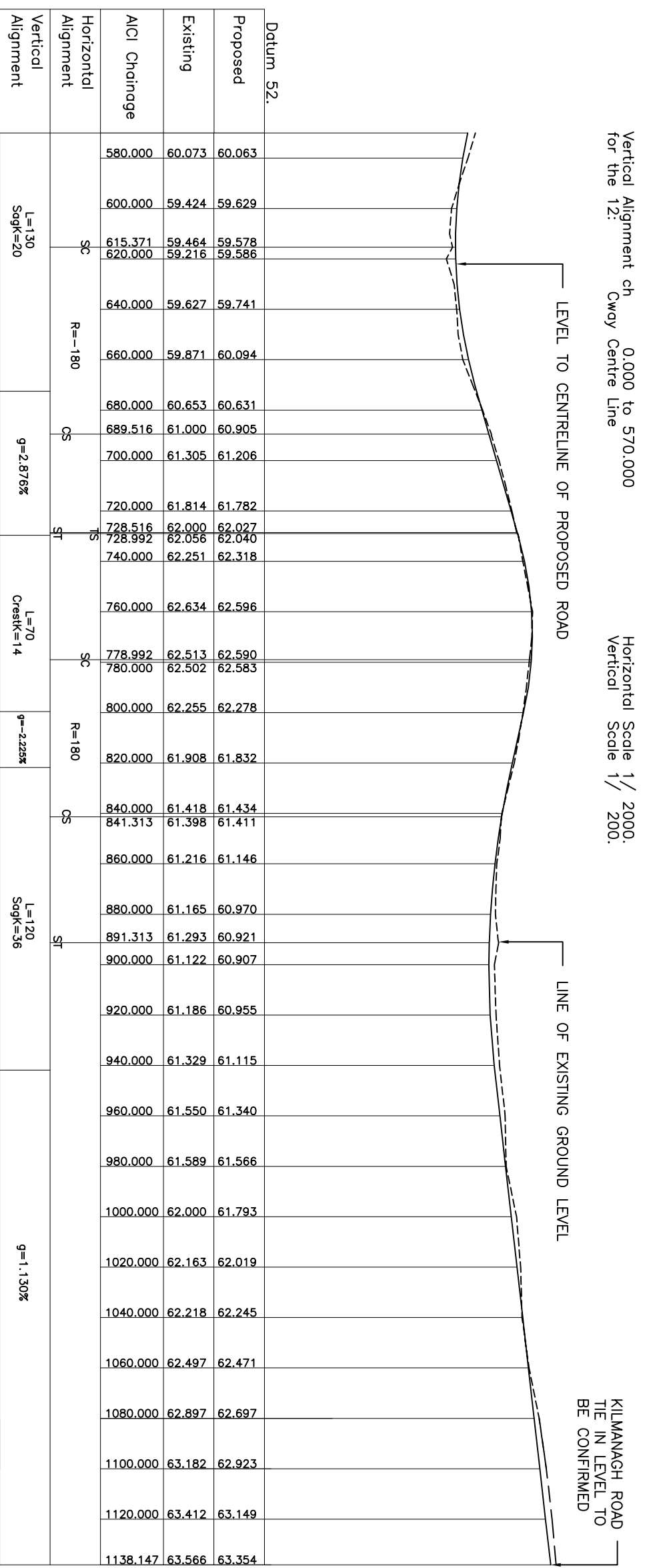
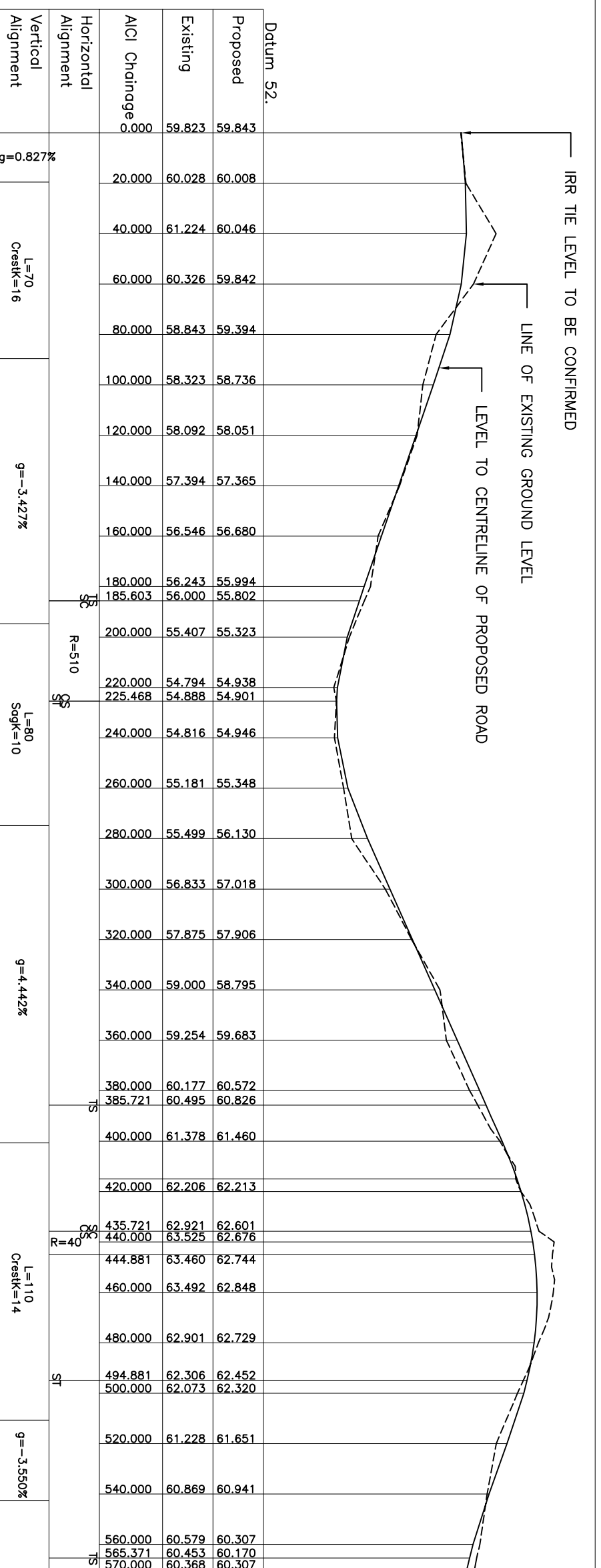


**Kilkenny Western Environs  
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January '04**

LEGEND	
EXISTING ROAD WITH AADTS	8 (4.5)
FUTURE ROAD WITH AADTS	12
FUTURE SITE ROAD	
ROUNDABOUT JUNCTION	

NOTE:-  
1) EXISTING AADT IN BRACKETS  
2) FIGURES IN 1000'S AADT

**Map 13.  
Traffic Impact on  
Road Network  
Scale 1:10000 @ A3**

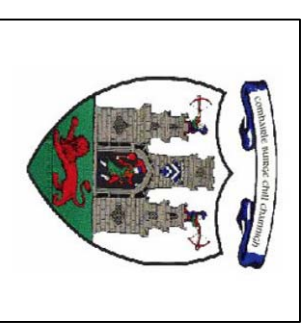


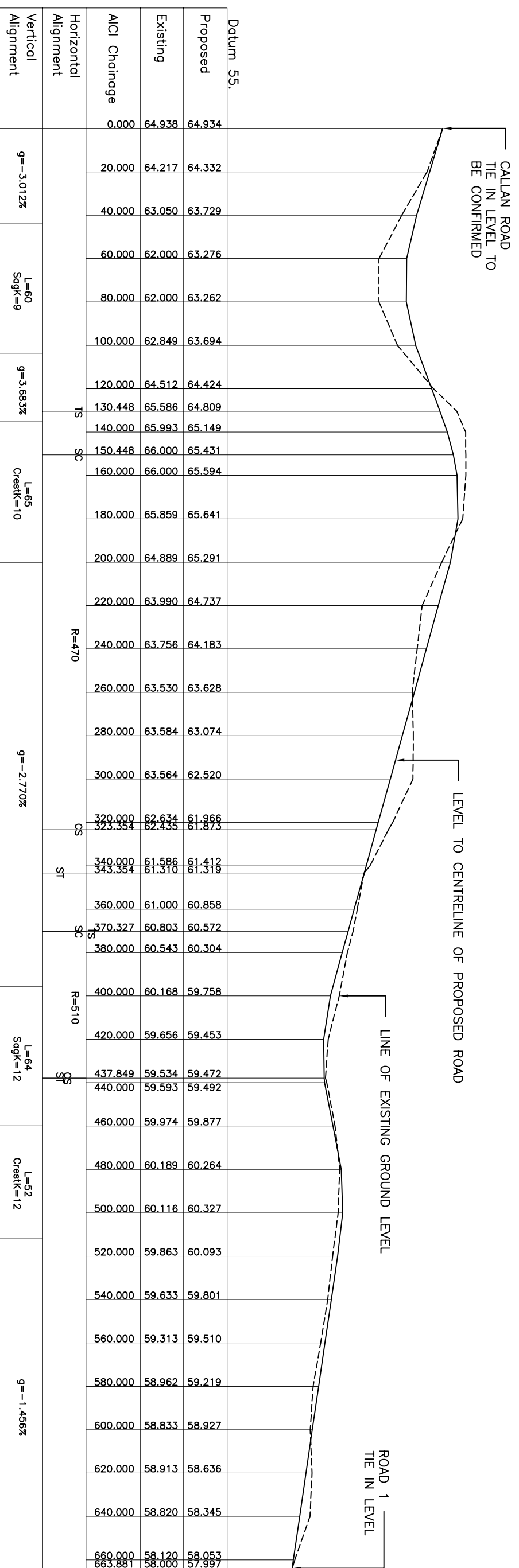
Vertical Alignment ch 570,000 to 1138,147  
for the 12: Cway Centre Line

Horizontal Scale 1/2000.  
Vertical Scale 1/200.



**Kilkenny Western Environs**  
**Map 14**  
**Proposed Road 1**  
**Vertical Alignment**  
**January '04**



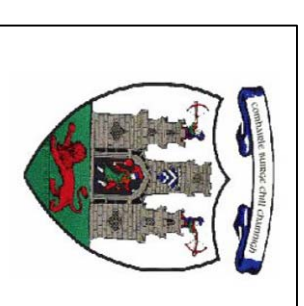


Vertical Alignment ch 0.000 to 663.881  
for the 12: Cway Centre Line

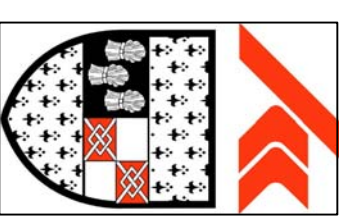
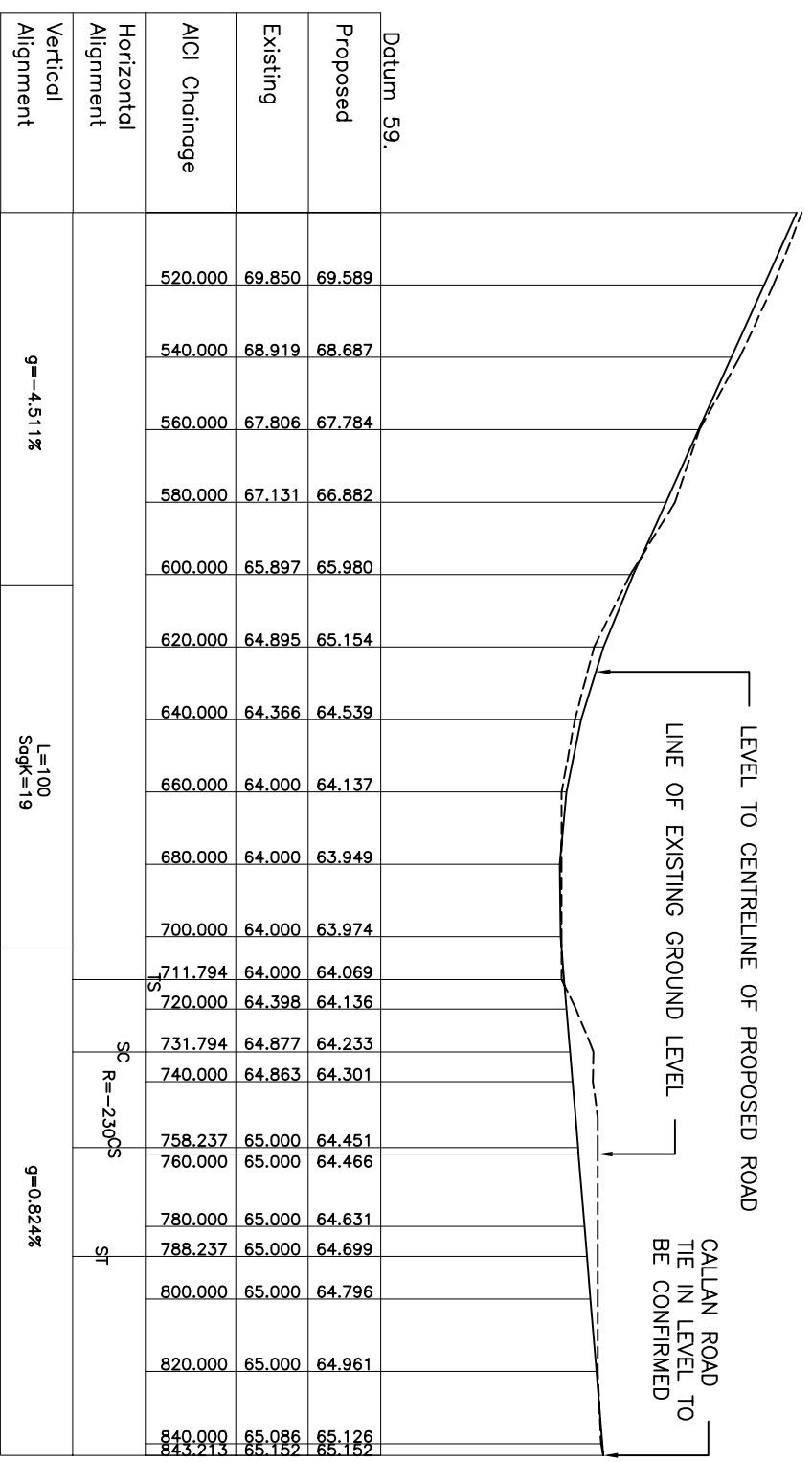
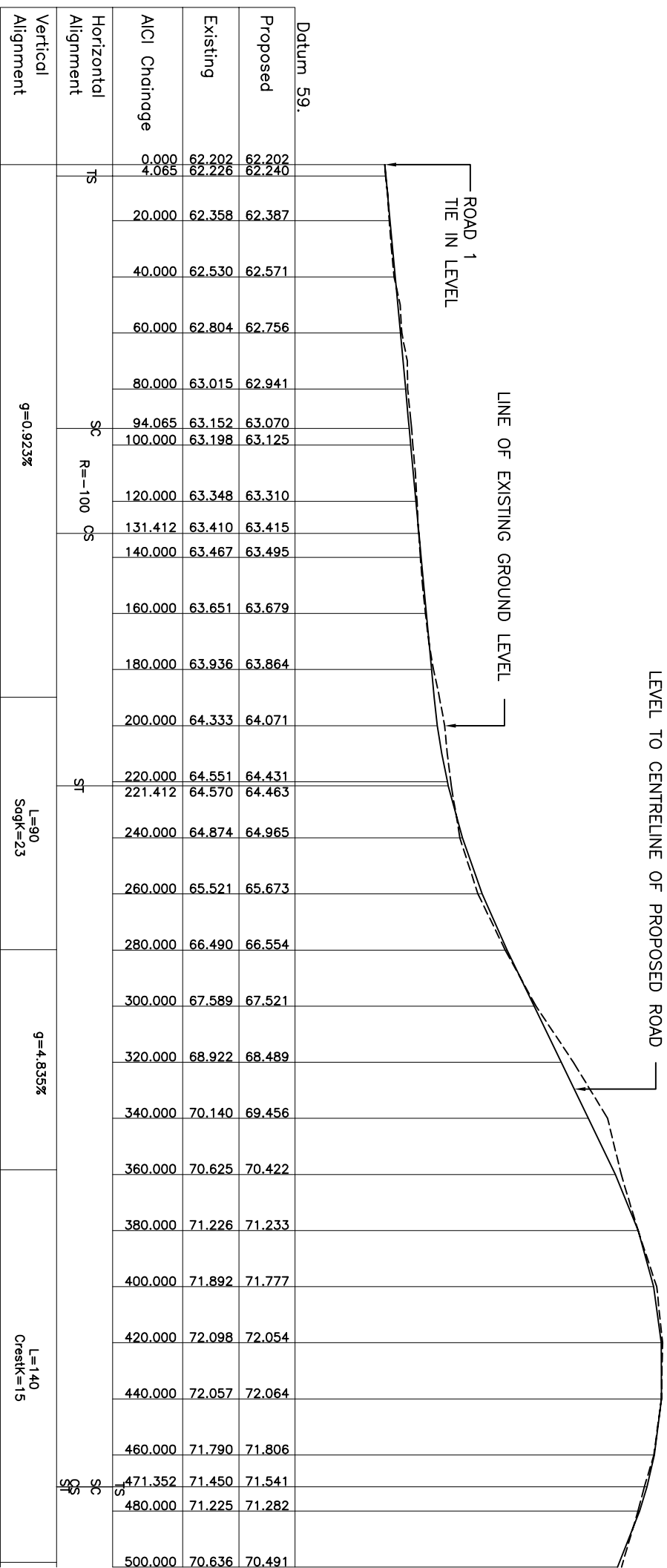
Horizontal Scale 1 / 2000.  
Vertical Scale 1 / 200.



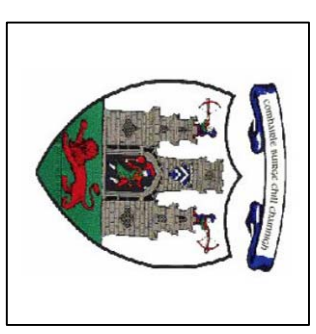
**Kilkenny Western Environs  
Map 15  
Proposed Road 2  
Vertical Alignment  
January '04**

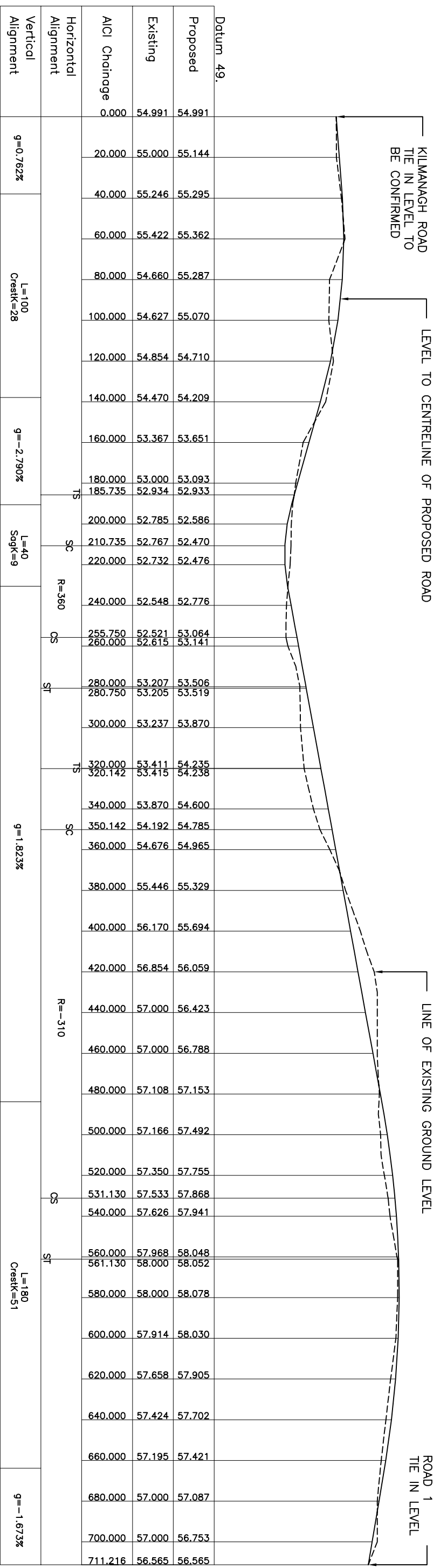






**Kilkenny Western Environs**  
**Map 16**  
**Proposed Road 3**  
**Vertical Alignment**  
**January '04**



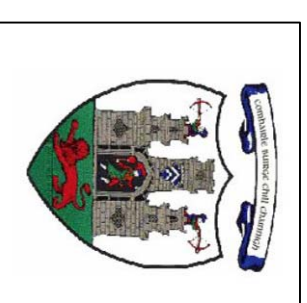


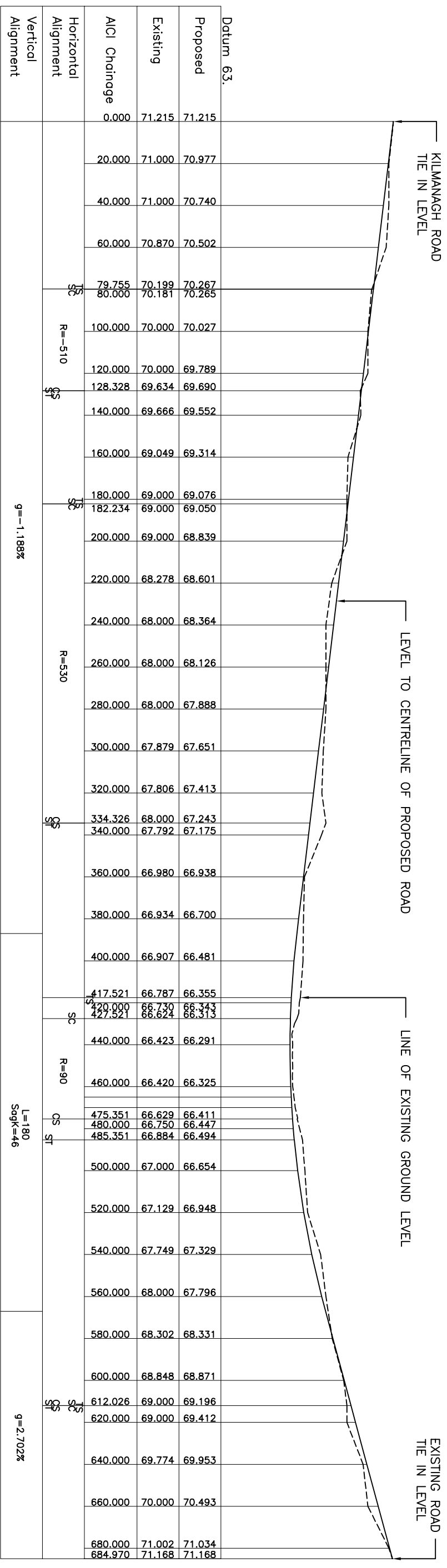
Vertical Alignment ch 0.000 to 711.216  
for the 1:2: Cway Centre Line

Horizontal Scale 1 / 2000.  
Vertical Scale 1 / 200.



**Kilkenny Western Environs**  
**Map 17**  
**Proposed Road 4**  
**Vertical Alignment**  
**January '04**



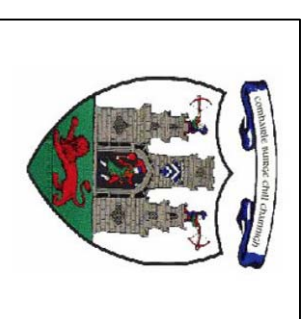


Vertical Alignment ch  
for the 12: Cway Centre Line

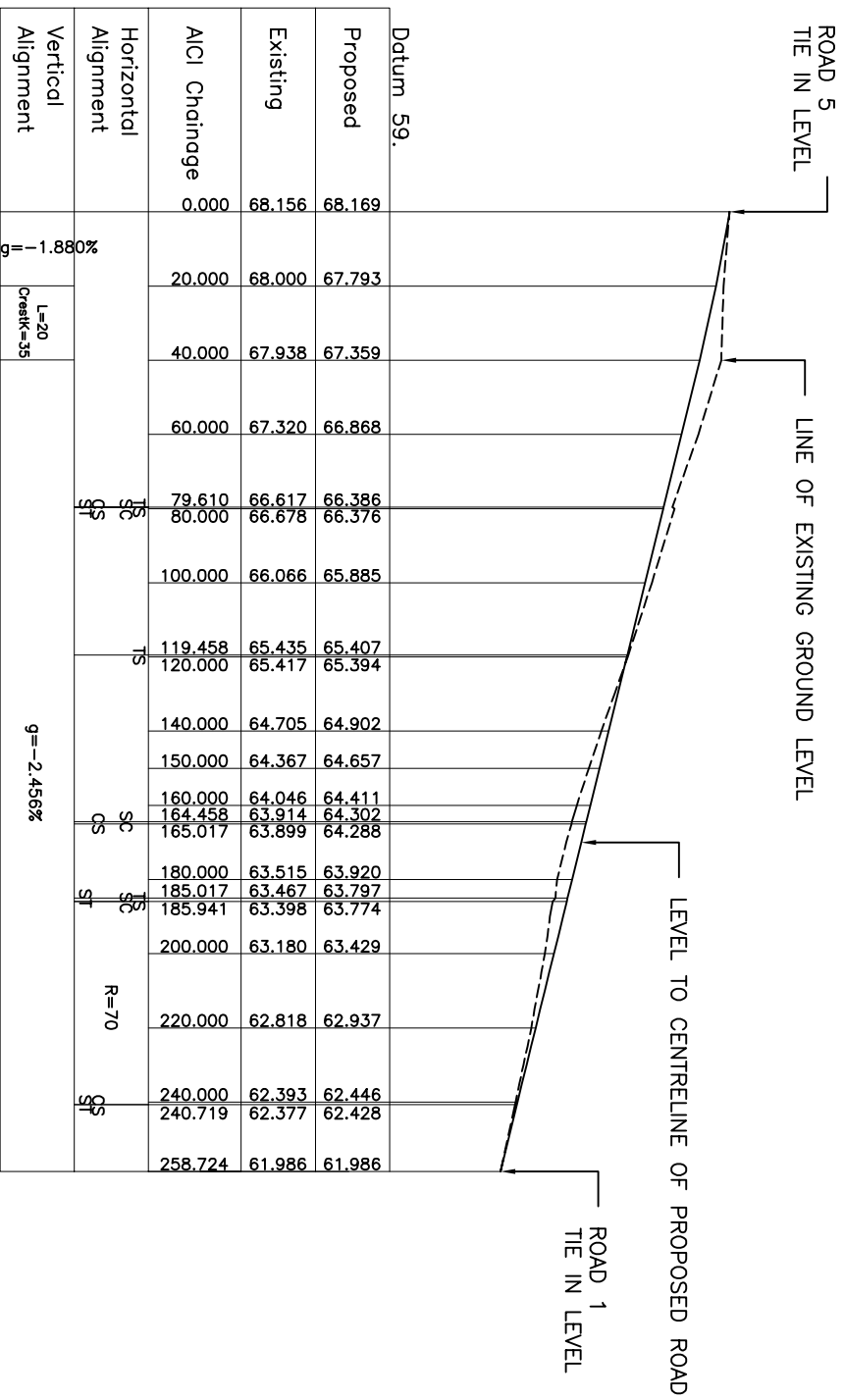
Horizontal Scale 1 / 2000.  
Vertical Scale 1 / 200.



**Kilkenny Western Environs  
Map 18  
Proposed Road 5  
Vertical Alignment  
January '04**

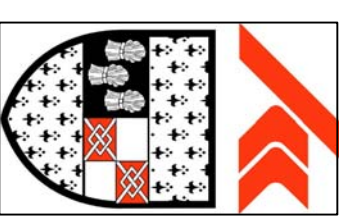




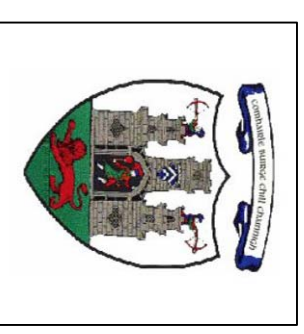


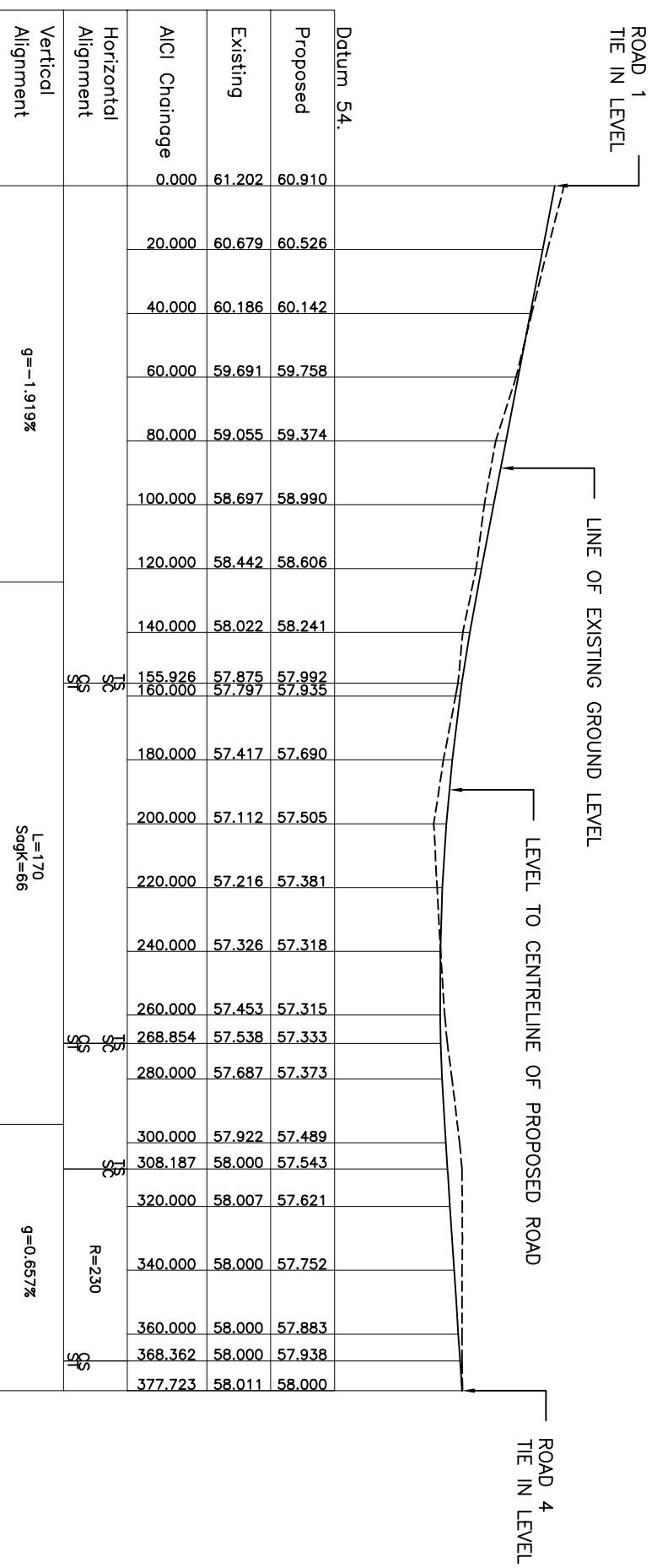
Vertical Alignment ch 0.000 to 258.724  
for the 12: Cway Centre Line

Horizontal Scale 1 / 2000.  
Vertical Scale 1 / 200.

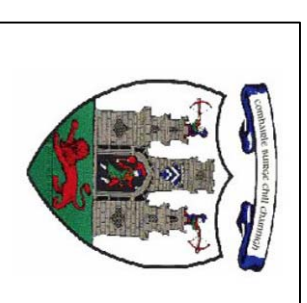


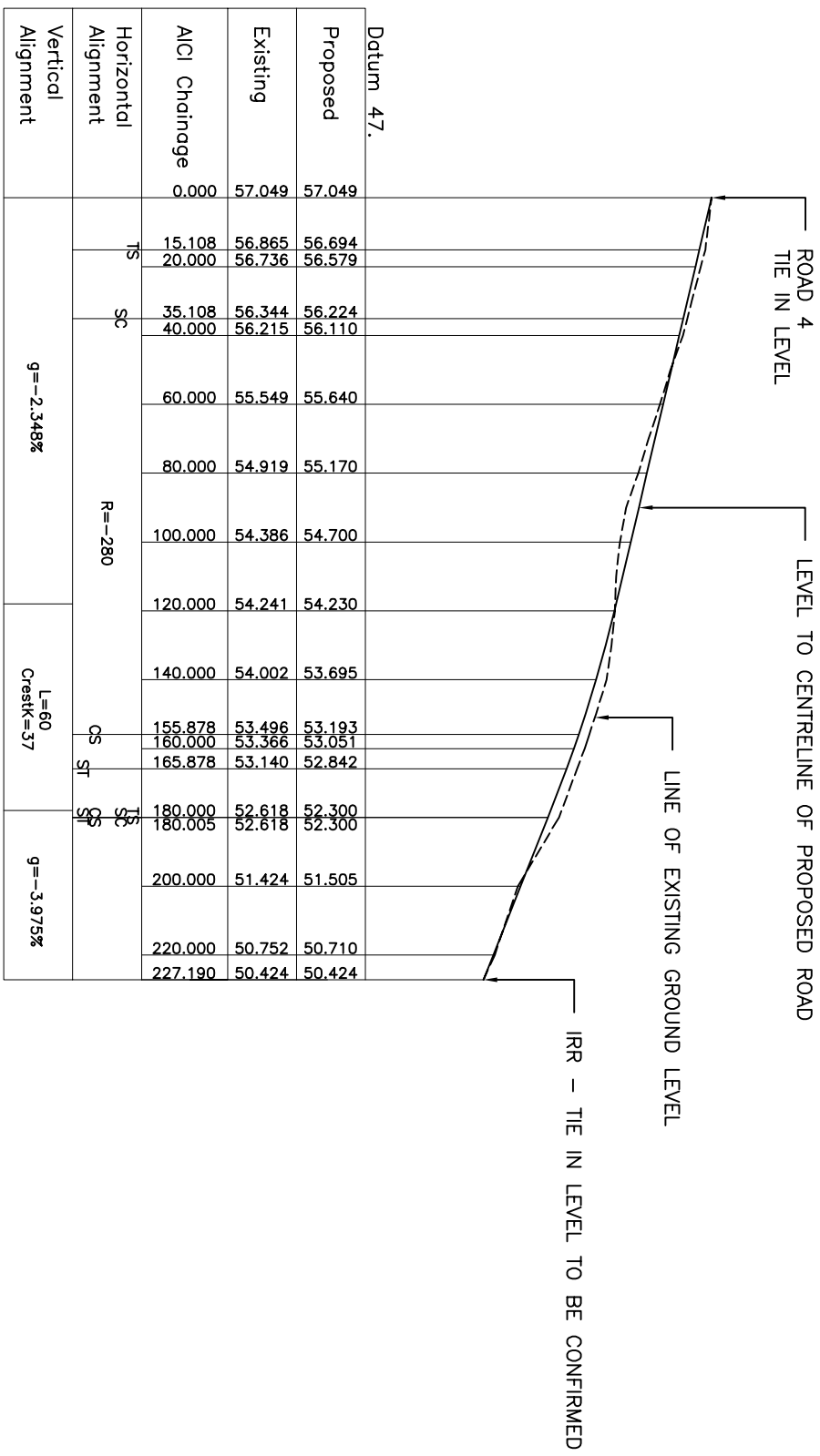
**Kilkenny Western Environs  
Map 19  
Proposed Road 6  
Vertical Alignment  
January '04**





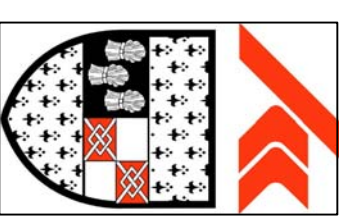
**Kilkenny Western Environs  
Map 20  
Proposed Road 7  
Vertical Alignment  
January '04**





Vertical Alignment ch 0.000 to 227.190  
 for the 12: Cway Centre Line

Horizontal Scale 1/ 2000.  
 Vertical Scale 1/ 200.



**Kilkenny Western Environs**  
**Map 21**  
**Proposed Road 8**  
**Vertical Alignment**  
**January '04**

