

7.0 SITE OPERATIONS

INTRODUCTION

7.1 Meenaboll Landfill site is to be developed to meet the requirements of the Donegal County Council Waste Management Plan, which was adopted by the council in 2000. It is proposed that the site at Meenaboll will be operated by Donegal County Council and will serve the waste disposal requirements of mid and west Donegal.

7.2 It is envisaged that the site will receive a maximum of 24,000 tonnes of non hazardous waste per annum.

7.3 The waste will be delivered to the site by road in refuse freighters operated by private waste collection companies.

SITE LICENCE

7.4 All operational activities will be carried out in accordance with the Waste Disposal Licence, which would be issued by the Environmental Protection Agency in accordance with the Waste Management (Licensing) Regulation, 2000.

ENVIRONMENTAL MANAGEMENT SYSTEM

7.5 All operations on the landfill site will be carried out in accordance with the Environmental Management System, a document that defines responsibilities and site procedures, this will be required as a condition of the Site Waste Management Licence. In addition to this an Annual Environmental Report will be prepared for the site and will include an assessment of the environmental monitoring for the site as well as the waste inputs, location of cells used in the period and the phasing system.

OPENING HOURS

7.6 Proposed landfill site opening hours for waste reception will be 8.30 am to 5.00 pm Monday to Friday and 9.00 am to 1.00 pm on Saturday. Operations may be undertaken outside these hours to facilitate emergency situations and the moving of the enclosed litter netting.

PLANT

- 7.7 The following sets out a schedule of proposed plant to be used on site. If an item of plant is replaced permanently, due to circumstance, it will be by a machine of similar capability.
- 1 No. Landfill Compactor
 - 1 No. Crawler Excavator
 - 1 No. Tractor and trailer
- 7.8 In addition to this, other plant will be employed as and when required such as an extra tractor and trailer for temporary capping and road construction and a water bowser for dust suppression.

PERSONNEL

- 7.9 The site will generally be manned by a minimum of 4 personnel, consisting of a Site Manager, Weighbridge Operator and 2 Site Operatives. Further personnel will be employed on an as required basis to deal with general maintenance of the site. All personnel employed on the site will be adequately trained in their own personal discipline and will be familiar with the operating conditions relating to the site. A named engineer based at head office, at Senior Executive Engineer level or above will be appointed to have overall responsibility for the operation of the site at Meenaboll.
- 7.10 Donegal County Council Environment Section will continually assess training needs of all involved in the operation of Meenaboll Landfill and carry out such training as required by regulation. Records of staff training will be updated and stored on site.

PHASING

- 7.11 The site will be progressively infilled and restored in phases as shown in Figure 7.1. Each phase will be filled from the base to final levels sequentially. It will be necessary to commence filling in the subsequent cell before final levels may be reached in the preceding cell. However it is envisaged that no more than two cells will be open at any one time.
- 7.12 This is in accordance with the recommendations of the EPA Guidance on Landfill Operational Practices. The actual timescale for infilling will be dependent upon the rates of waste input. The detailed operation of each phase will be outlined in the site's phasing plan.

7.13 Each phase will be bounded by bund walls, lined face or previously tipped airspace. Internal bunds will be constructed to a height of 2.5 m and the depth of a working face of a cell will not exceed 2.5 m.

7.14 The site will be filled in each phase to the proposed final profile as detailed in Figures 7.1 making appropriate allowances for settlement of the waste mass to ensure that the predetermined profiles can be achieved.

SITE MANAGEMENT PROCEDURES

7.15 The site management procedures for the current landfill site will be set out in the Environmental Management System. The key sections within the Environmental Management System mirror the requirements of the site licence.

7.16 Waste Acceptance:

- All waste vehicles (suitably covered) entering the site will be booked in at the weighbridge. The site weighbridge will be fully computerised and is located close to the site control office from where it will be operated and will be regularly maintained and calibrated to ensure that reliable data is being collected. The weighbridge will record the weight and description of the waste including the European Waste Catalogue (EWC) codes.
- If the waste is scheduled for compliance testing then the vehicle will be directed to the waste inspection area.
- Once wastes have been accepted at the reception area, vehicles will be directed to their respective discharge area.
- Any loads not meeting the criteria will be held on site in the refuse freighters and the Waste Rejection procedure followed as briefly discussed in section 7.26.

7.17 Waste Disposal:

- Wastes will be landfilled in prepared cells, which will typically be 50m in width. The waste will be compacted in layers of approximately 300mm thickness and in face depth of approximately 2.5m. The slope of the advancing face and on the edges of the cell will be maintained at a slope of less than 1:3.
- Generally waste will be disposed of inside an enclosed litter net to prevent windblown litter. However on selected calm days waste may be disposed off outside the litter net to assist will operational practices.
- In addition to the waste inspection procedures at the Weighbridge, the compactor operator, during the waste spreading and compaction process, will visually inspect all waste deliveries for compliance with acceptable Waste Management Licence categories.

- If the operator sees a suspected non-compliant waste, he shall follow procedures as set out in the site's Waste Rejection Procedure briefly discussed in paragraph 7.26.
- The waste will be covered at the end of each working day with sufficient inert material so as to ensure satisfactory control of potential problems associated with exposed wastes (e.g. litter blow, odour, vermin, insects and scavenging birds).

7.18 Traffic Control:

- The site is served by a county road and the impact of traffic movements on the road is discussed in section 18 of this document.
- To mitigate against these impacts, passing bays will be constructed along the county road and the existing surface will be improved.
- All traffic movements to the site will be along the designated route from the R250 to the site and measures to ensure the implementation of this are included in Section 18 in this document e.g. physical barrier at entrance to prevent access from the Glendowan direction, regulation through the waste permits.
- Donegal County Council will ensure that all operators using the site are aware of the designated route by the use of signage at the site and on the access route to the site.

7.19 Pest and Vermin Control:

- In order to prevent the presence of vermin, a specialist contractor will be employed to inspect the site.
- The contractor will take the necessary action to eliminate the cause of any evidence of vermin activity discovered or reported.
- If rodents or evidence of rodents is seen at any time on site, it will be immediately reported to the contractor who will visit the site as soon as is practicable and take the necessary action to eliminate the rodents.
- Insect control will be maintained by controlled spraying of the landfill areas when necessary, with an approved insecticide, in accordance with manufacturers guidelines and relevant regulations.

7.20 Bird Control:

- Rapid and effective covering of waste and the consequent decrease in potential food supply is recognised as the most effective means of bird control. In addition to this the use of an enclosed litter net for disposal activities will minimise the potential for birds to scavenge from the working face. This will be supplemented by other control measures.
- If required this will include, visual deterrents, distress calls, physical barriers, birds of prey and the flying of kites over the landfill.

- These methods will be varied to prevent birds becoming accustomed to a single method and will be reviewed to ensure that effective bird control is being achieved.

7.21 Litter Control:

- The proposed landfilling operations will minimise the possible impact of litter by tipping inside an enclosed litter net which will be located to take account of the prevailing wind direction at the site. In addition to this secondary litter netting will be located at appropriate sections of the perimeter of the site taking account of the wind strength and direction.
- Details of the litter netting will be provided and recorded in the Environmental Management System. All litter nets will be inspected daily and regularly cleared of litter.
- Any litter blown outside the boundaries of the site will be collected if possible during the same day. Any remaining litter at the end of the day will be collected as soon as possible, with notes made in site records of special actions taken to remedy the situation.
- Under normal conditions, all wind blown litter on site will be collected and deposited at the working face by the end of the day. However, if waste has blown outside the site, this will take priority over that contained within. This will not detract from the importance of standards within site and notes will be made in site records of actions taken to resolve problems.

7.22 Odour Control:

- Odours associated with ongoing operation of the site will be mitigated by effective compaction and the provision of adequate cover, rapid deposition of malodours waste, effective landfill gas management and prevention of stored leachate becoming anaerobic.

7.23 Noise Control:

- Noise impacts on the site will be minimised by ensuring that vehicles and equipment visiting the site conform to appropriate standards in relation to noise performance.
- Donegal County Council will ensure that all plant supplied to the site meets the necessary standards.

7.24 Fires:

- Site management practice do not permit material to be burnt within the boundary of the facility.
- Further to this, staff will be trained in fire prevention and control. Burning waste which is delivered to the tipping face will not be accepted.
- Any fire discovered on site will be dealt with by the fire service in accordance with the emergency response procedure for the site.

7.25 Waste Assessment:

- The Weighbridge Operator will randomly select vehicles for recorded waste assessment.
- The vehicle will be directed to the waste inspection area.
- Where there is doubt about whether the contents of a waste consignment complies with the Site Licence, the following action will be taken:
 - (i) Irrespective of whether the load has been discharged, site staff will endeavour to prevent the vehicle delivering the waste from leaving the site, they shall note details of the registration number of the vehicle, if possible, the trading name, address, name of driver, origin of waste and any other available details will also be recorded.
 - (ii) If material has been deposited at the tip face, such material will be removed and stored in the waste quarantine area.
 - (iii) If considered appropriate, a sample of waste will be sent for analysis.
 - (iv) As soon as is practicable, the Environmental Protection Agency will be notified and action taken to ensure safe disposal with the agreement of the EPA.

7.26 Waste Rejection:

- Any rejected waste loads will be recorded and will include details of the occurrence, type of waste and reason for rejection, name of producer and facility to which the waste was removed.

7.27 Site Traffic:

- Traffic on site will be controlled by a series of signs, marshalling by operatives and use of weighbridge traffic lights. Signs on site will indicate maximum permissible speeds, directional information and queuing positions.
- The weighbridge operator will provide the primary means of marshalling traffic. Normally he will restrict the number of vehicles on site to a level, which is easily controlled in the tipping area.
- In the event that lorries arrive at the weighbridge at a greater rate than can be allowed onto site, the weighbridge operator will allow vehicles to stack up in an orderly row until they can be allowed onto site.
- Should the number of lorries build up to an extent that the queue reaches onto the adjacent county road, enough lorries will be weighed and allowed onto site to avoid this hazard.
- Site access will be maintained by the construction of suitable roadways to ensure the safe passage of all vehicles using the site. Site roads will be swept by a tractor and brush on a regular basis. Dust control on site roads will be provided by spraying with water when necessary.

- All vehicles that have travelled off the concrete road surfaces will be required to use wheel wash facilities before leaving the site unless otherwise directed by site staff due to wheel wash failure or planned maintenance. All directions will be clearly sign posted and advised to vehicle drivers to ensure its effective use. Site personnel will supervise its use if conditions dictate.
- The wheelwash will be cleaned down by site staff when required. This will take place outside of opening hours, or when it is deemed that the wheelwash can be stood down, usually in dry weather conditions.
- If required site management will arrange to have a suction road sweeper used on the public highway.

SECURITY

- 7.28 The site will be bounded around the perimeter by a 2.4m high bent arm post with galvanised chainlink fence topped with barbed wire. The main access to the site is to the north of the site. Pedestrian access gates will be provided in the fence at points to allow access to adjacent land for maintenance. Details of site fencing are illustrated in Figure 7.2. The site gates will be locked and secured outside operating hours.

COVER MATERIALS

- 7.29 Daily covering of the waste reduces the odour from the deposited waste and also minimises any potential nuisances caused by pests and birds. Inert material or alternative cover will be placed over the working area at the end of each day. Given the significant volumes of traditional cover material which is needed and its requirement in respect of permeability and free drainage, the use of alternative cover materials (e.g. geosynthetic materials) will be considered, if a practical effectiveness can be demonstrated. This would include the ability to prevent vermin, odours and blowing litter.
- 7.30 Material which will be excavated to form the landfill will be suitable for daily cover and it is proposed that only a limited amount of material will have to be imported onto the site. Typically the quantities required for daily cover are estimated to be approximately 15-20% of the waste input by weight.

ENVIRONMENTAL MONITORING

- 7.31 All monitoring on site will be in accordance with the requirements of the site licence and the Environmental Protection Agency's manual on Landfill Monitoring. The proposed frequency and location of sampling is detailed in of Appendix D and the proposed sampling points are shown on Figure 7.3.

LEACHATE MANAGEMENT

- 7.32 Leachate management at the site will follow the procedures laid down in the Environmental Protection Agency's manual on Landfill Operational Practices. The leachate management system is shown in Figure 7.4.
- 7.33 When water enters a landfill, principally in the form of rainfall, it infiltrates the surface and percolates through the landfill and in doing so it comes into contact with the disposed material or waste. Leachate is the name given to describe any liquid percolating through or contained within a landfill and its composition and characteristics will typically depend on the type and compaction of waste, the age of waste, rainfall and surface water ingress and the extent of cover, capping and restoration.
- 7.34 The proposals for the landfill at Meenaboll allow for containment of all leachate generated at the site. This will require appropriate management throughout the life and aftercare period of the site to maintain leachate control and treatment.
- 7.35 Management of leachate will relate to generation, composition, control, treatment, disposal and monitoring. The generation of leachate will be dependant on the effective rainfall at the site and the size of landfill cells and extent of capping, coupled with the quantity of liquids deposited in the waste. The Meenaboll site is located in an area of higher than average rainfall (approximately 1600mm per year) and as such the site has been designed in small cell to minimise the leachate generation at the site. These cells, when filled, will be permanently capped within 1 year in order to ensure effective leachate management at the site.
- 7.36 It is acknowledged, given the relatively high effective rainfall typical of the central areas of Donegal that the management of leachate will be of particular importance to the successful operation of the site.

- 7.37 Leachate management within the waste mass will be effected by a leachate drainage collection layer below the waste which is transferred by pipeline to the leachate sump at the low point of each cell. From this point the leachate will be pumped by a submersible pump and flexible rising main in a side slope riser or leachate extraction tower to the leachate main and to the treatment tanks.
- 7.38 Effective leachate management at the site will require the use of optimum cell sizes and the phasing of capping to quickly follow infilling to ensure that the areas contributing to leachate generation are restricted.
- 7.39 Cell sizes will initially be based on the water balance calculations detailed in the site development section and will be continually reviewed against site operational requirements and the results of ongoing monitoring.
- 7.40 Phases 1 and 2 will be operated as individual cells while the remaining phases will be subdivided to give a further 6 cells. This will allow efficient and effective management of leachate and will optimize the "open" area producing leachate in terms of minimizing area while allowing practical daily operations. It will further allow the segregation of rainwater falling in lined but unfilled cells which can be discharged as surface water.
- 7.41 To assist with leachate management temporary capping will be introduced to areas of filling which have reached elevated levels to allow incident surface water to be diverted away hence minimising leachate production. To allow drainage of the cap (temporary or permanent) a perimeter cut off and surface water drain will be established. This will also act as a barrier to surface water and groundwater flows at the perimeter of the landfill area thus reducing any possibility of groundwater or surface water intrusion.
- 7.42 All leachate collected by this system will receive treatment on site in leachate tanks prior to disposal to the sewage treatment works. The on site treatment will be an aeration and settlement process operated on a batch system.
- 7.43 The treatment process will allow the quality of leachate to be improved to domestic sewage standards prior to discharge to the sewage treatment works for further treatment and ultimate disposal to the stipulated acceptance criteria. There is no proposal to discharge treated leachate directly to any watercourse. The sizing of the tanks allow for the batching and storage of leachate required by the operation of the process throughout the lifetime and aftercare of the site.

7.44 Leachate recirculation will be used as part of the leachate management system at the site to take advantage of the anaerobic treatment within the landfill and to introduce flushing of the waste mass.

7.45 Recirculation of site treated leachate will be by way of pumped irrigation system located within the gas collection layer, which forms part of the final capping proposals. The details of the extent of recirculation will be site specific and will be based on ongoing monitored and assessment of the process.

LANDFILL GAS MANAGEMENT

7.46 Landfill gas will be produced by the biodegradation process in the landfill. It is primarily composed of methane, carbon dioxide and water vapour.

7.47 The rate of gas generation is typically a function of the dimensions of the site; the type, age and rate of infilling of waste; moisture content, pH, temperature and density of wastes deposited and the extent of cover and capping.

7.48 Management procedures at Meenaboll will ensure appropriate management of landfill gas during the life and aftercare of the site. This will accommodate the changes in quantity and composition of landfill gas which occur with time. The management procedures will ensure that uncontrolled off-site migration will not occur. This will be monitored at the boundary of the facility at locations illustrated in Figure 7.3.

7.49 Monitoring will form an important part of this process and will follow the guidance laid down in the Environmental Protection Agency's manual on "Landfill Monitoring".

7.50 Gas control at the site will initially be through the use of passive gas venting system in the form of vents installed retrospectively to landfilling as detailed in Figure 7.5. The lining system will form an effective gas barrier around the perimeter of the landfill area. The leachate collection layer will continue up the side slopes and will effectively act as a gas venting trench adjacent to the lining system around the perimeter of the landfill area.

7.51 The active system will abstract gas under negative pressure by a system of pipework interlinking gas vents. The negative pressure will be applied by extractor pumps and the system will include moisture traps, flame arrestor and an alarm to indicate instances when combustion is not occurring.

7.52 The system will be supported by other gases as required by the combustion process. The collected gas will be used for flaring and may ultimately be used for energy generation.

COMMUNITY LIAISON GROUP

7.53 It is proposed to establish a Community Liaison Group. Representatives of the local community will be invited to meet periodically with representatives of Donegal County Council and site management to discuss progress with the infilling, restoration and landscaping and to resolve any difficulties that may arise from time to time. Specific details of the composition of the group will be agreed following issue of the waste licence.

HEALTH AND SAFETY

7.54 Site personnel have been appropriately trained in health safety matters generally and particularly on those areas which specifically pertain to operation of a landfill facility. Training already undertaken with existing site staff includes first aid and Safe Pass as well as the site emergency procedures.

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

FIGURES

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



- KEY
- GENERATOR
 - PHASE 1
 - PHASE 2
 - PHASE 3
 - PHASE 4
 - PHASE 5

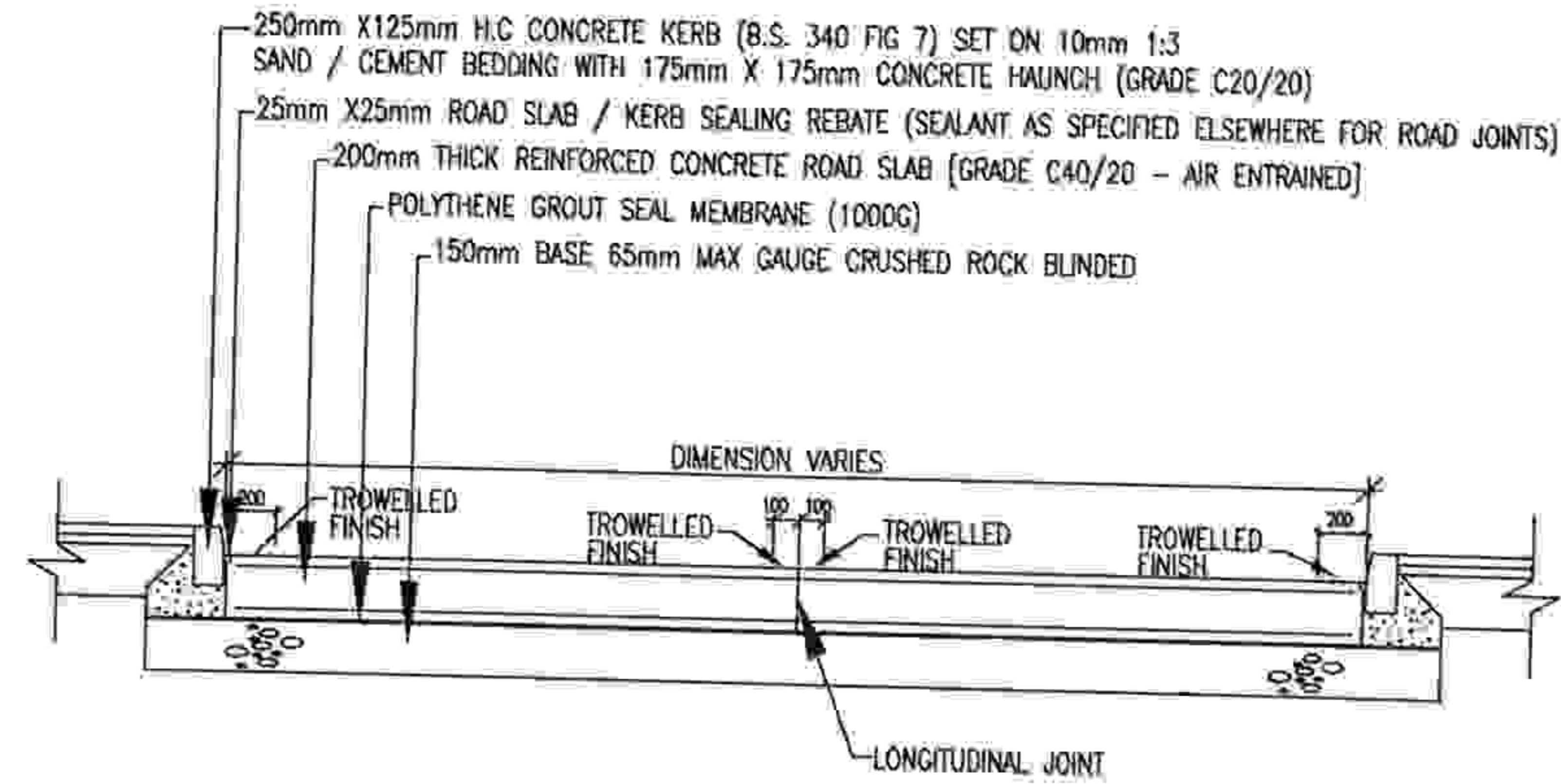
SCALE: 1:2000



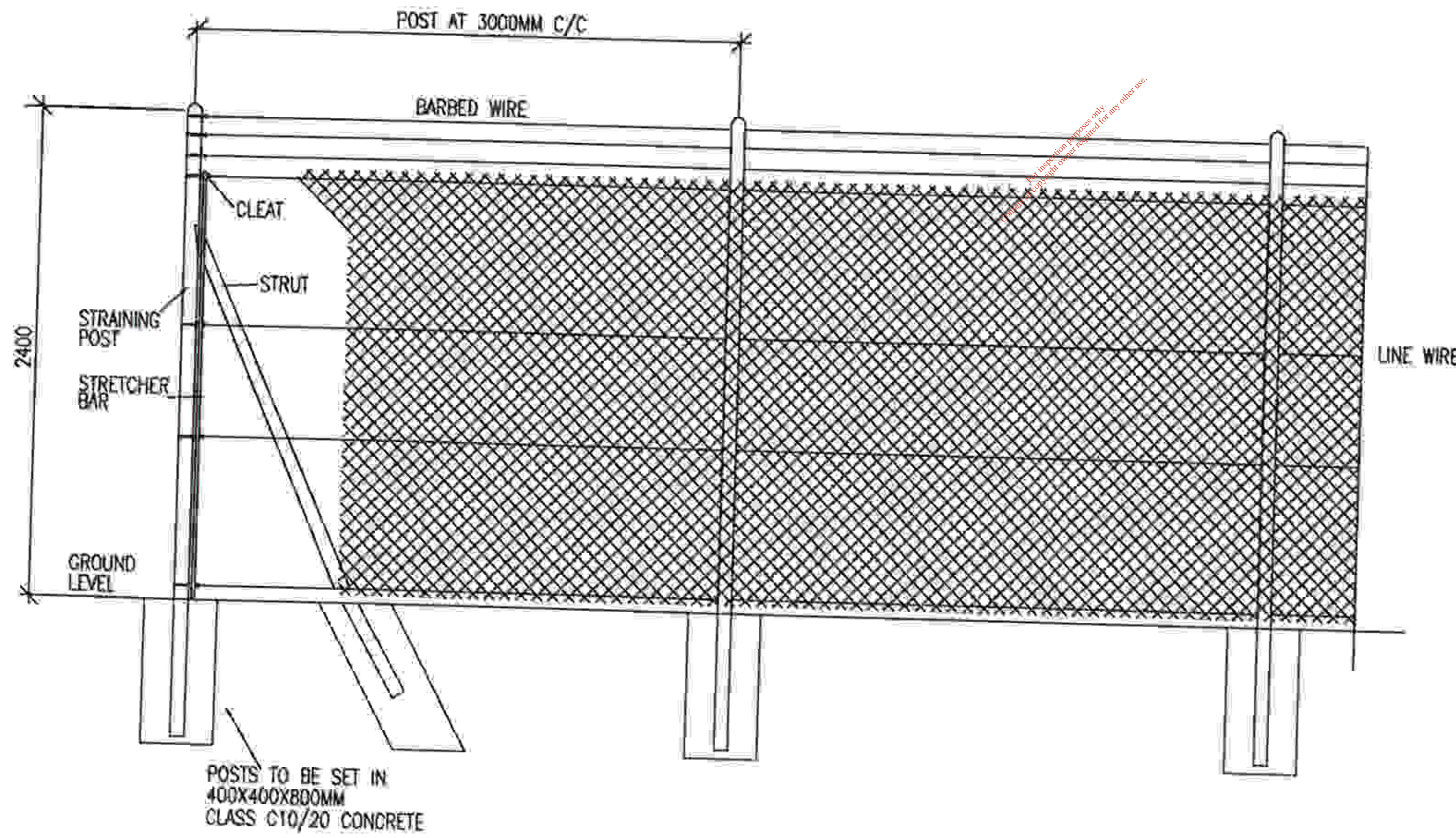
PROJECT
MEENABOLL LANDFILL PROJECT

TITLE
SITE PHASING

FIGURE
7.1



TYPICAL SECTION THROUGH CONCRETE ROAD
SCALE N.T.S.



CHAIN LINK FENCE WITH EXTENSION ARMS FOR BARBED WIRE (SECURITY FENCE)

SCALE: NTS

**KIRK McCLURE
MORTON**
CONSULTING ENGINEERS



PROJECT

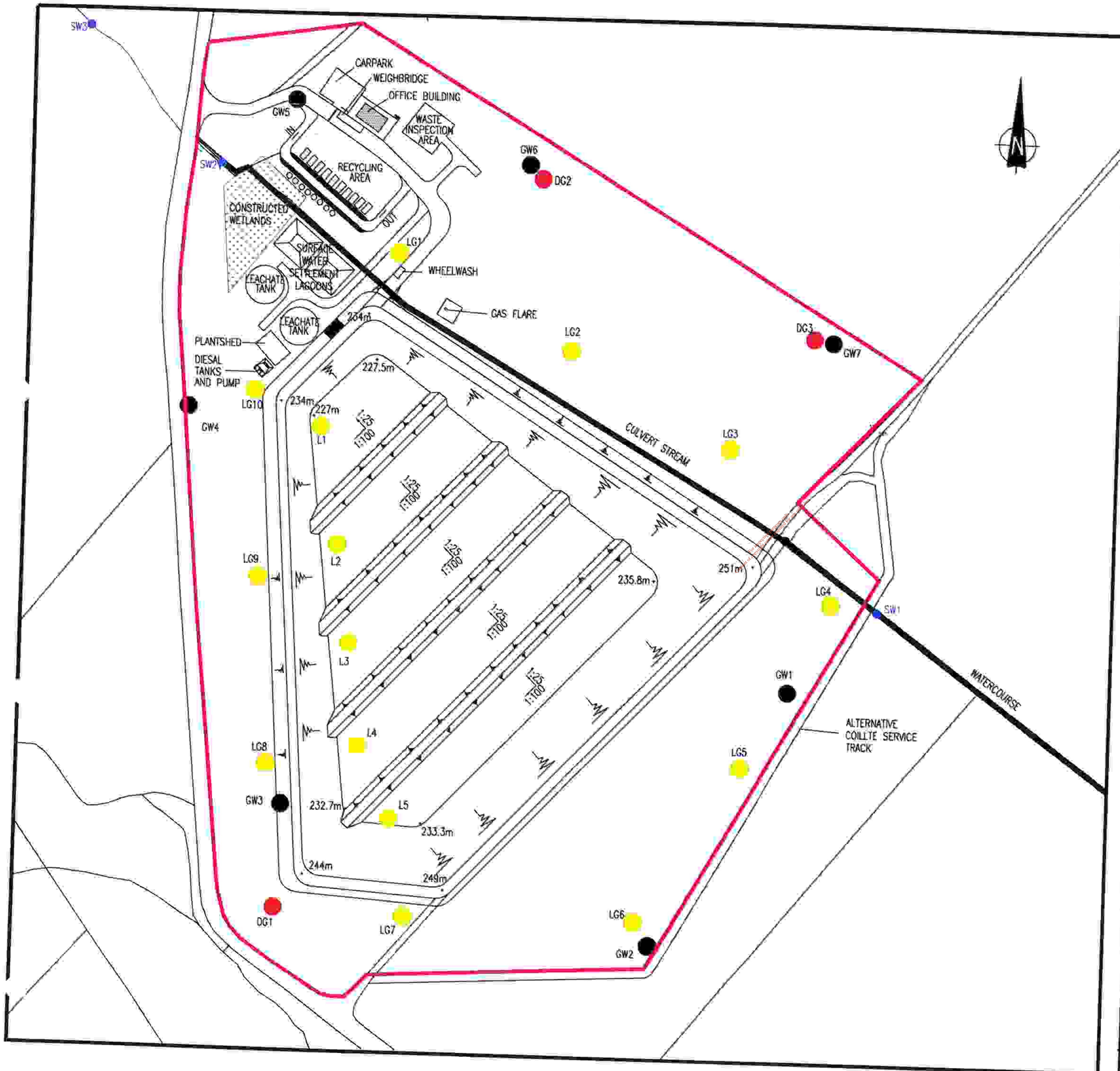
MEENABOLL LANDFILL PROJECT

TITLE

ENGINEERING DETAILS

FIGURE

7.2



- KEY
- GROUNDWATER MONITORING POINT
 - GAS MONITORING POINT
 - LEACHATE MONITORING POINT
 - DUST MONITORING POINT
 - SURFACE WATER MONITORING POINTS

SCALE: 1:2000

<p>KIRK McCLURE MORTON CONSULTING ENGINEERS</p>	<p>Comhairle Chontae Dhún na nGall Dumagal County Council</p>
--	---

PROJECT
MEENABOLL LANDFILL PROJECT

<p>TITLE PROPOSED ENVIRONMENTAL MONITORING POINTS</p>	<p>FIGURE 7.3</p>
---	-----------------------



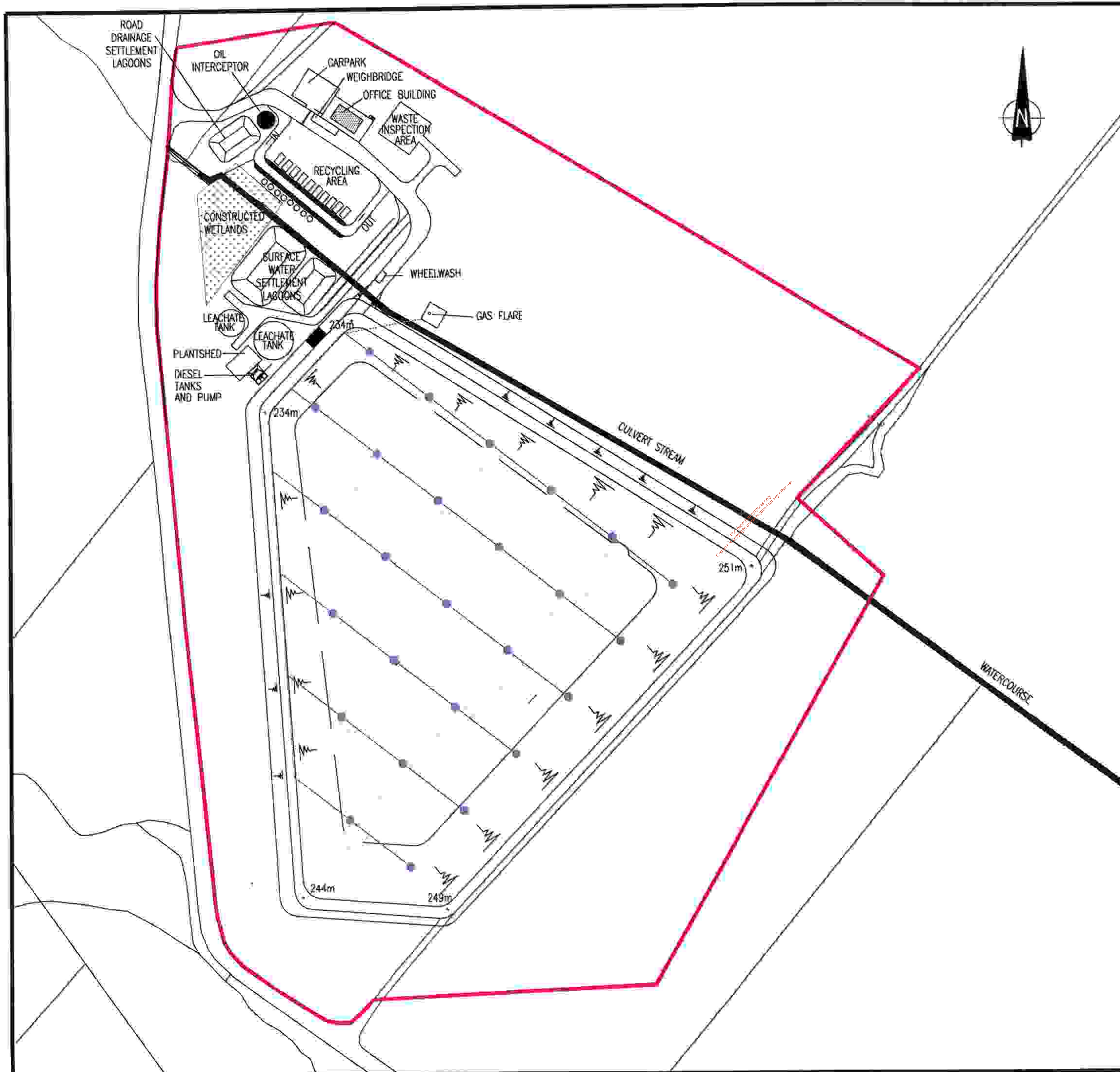
- KEY**
- GENERATOR
 - LEACHATE COLLECTION PIPE
 - LEACHATE SUMP
 - RE --- RODDING EYE
 - SSR --- SIDE SLOPE RISER
 - LEACHATE PUMPING MAIN

SCALE: 1:2000

<p>KIRK McCLURE MORTON CONSULTING ENGINEERS</p>	<p>Comhairle Chontae Dún na nGall Dún Dealgán County Council</p>
--	--

PROJECT
MEENABOLL LANDFILL PROJECT

TITLE LEACHATE MANAGEMENT SYSTEM	FIGURE 7.4
-------------------------------------	---------------



- KEY
- GENERATOR
 - GAS COLLECTION PIPELINE
 - GAS BOREHOLE

SCALE: 1:2000

 <p>KIRK McCLURE MORTON CONSULTING ENGINEERS</p>	 <p>Comhairle Chontae Dúnálaigh Dunally County Council</p>
--	---

PROJECT
MEENABOLL LANDFILL PROJECT

TITLE
LANDFILL GAS MANAGEMENT SYSTEM

FIGURE
7.5