

Attachment D: Infrastructure and Operations

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Attachment D.1: Infrastructure

Attachment D.1.a – Security

Access to the site is via a private road off the R592. The entrance gate adjacent to R592 is kept locked outside of normal office hours. The keys for the gate are held by the site caretaker and a copy is held in the Cork County Council area office in Schull. The boundary of the site consists of a 2.5m high fence around the site perimeter. The leachate lagoon is also fenced off by 2.5m high fence.

Attachment D.1.b – Roads

The circulation road within the site will have asphalt surfacing. All site roads are constructed on a layer of Clause 804 to designers specification on approved subgrade, a 100mm layer of Clause 903 Dense Bitumen Macadam, 55mm layer of Clause 906 Dense Bitumen Macadam and a final layer of 45mm Rolled Asphalt. A cross section of the road construction is shown on drawing 2528-2629A.

Attachment D.1.c - Hardstanding areas

All areas of hardstanding are shown on drawing 2528-2612A. Hardstanding areas for car parking will be available throughout the civic amenity area. All handstanding areas within the proposed development will be constructed of either concrete or asphalt. The asphalt areas will consist of Clause 804 stone, 100mm Clause 903 Dense Bitumen Macadam, 55mm Clause 903, Dense Bitumen Macadam and 45mm Clause 910 Rolled Asphalt. The concrete areas will consist of 80mm concrete blinding and 300mm thick reinforced concrete.

Storm water from all the hardstanding areas (0.68 Ha) will be drained to the surface water drainage system.

Attachment D.1.d - Weighbridge

There is an existing weighbridge serving the landfill but a new surface mounted weighbridge will be provided onsite to weigh all trucks entering and leaving the site to record the weight of waste. The weighbridge will have a platform size of 18m x 3.5m with a 3m approach and exit ramp and has a capacity of 60 tonnes. The weighbridge is shown in drawing 2528-2612A.

Attachment D.1.e - Wheel cleaner

There is an existing wheel washing area onsite as seen in Drawing 2528-2612A which consists of a power hose located in an area covered in hardstanding with dimensions of 18m x 6m. The contaminated waste water and grit from this area is drained to a settling sump (2m x 1m x 1.5m). Here following settlement of the grit, the clean water overflows into the wash water recirculation pump sump. A top up of water supply is fed into the pump sump from the mains water supply. The water level is controlled by means of a ball cock. From the sump, the water is pumped by submersible pumps via a 25mm PVC pipe to the 100 litres storage /pressure tank. Two connections for the power washer are available. The settlement tanks /sump is inspected on a daily basis and desludged as necessary. The silt shall be deposited at the working face of the landfill. The wheel wash will not be required following capping of the landfill as all operations within the Waste Transfer Station and Civic Amenity Area will take place on hardstanding.

Attachment D.1.f - Laboratory facilities

There is a proposed laboratory facility within the Control Building. This is shown on Drawing 2528-2626A.

Attachment D.1.g - Fuel storage

There is no fuel storage area on site.

Attachment D.1.h - Waste quarantine area

The existing waste quarantine area is shown in drawing 2528-2613A. Waste transported onsite is inspected and unsuitable waste is removed from the site by the carrier. If required, waste will temporarily be stored in the waste inspection area. All surface water runoff from this area is collected and drained to the leachate

collection system. A by-pass system is provided to allow the discharge of clean surface water runoff to the normal surface collection system when the area is inactive.

Attachment D.1.i - Waste inspection areas

The waste inspection area is shown in drawing 2528-2613A. All surface water runoff is collected and drained to the leachate collection system. A by-pass system is provided to allow the discharge of clean surface water runoff to the normal surface collection system when the area is inactive.

Attachment D.1.j - Traffic control

Vehicles disposing of municipal waste at the site will be weighed at the weighbridge on entry and exit and the weights of waste recorded. Loaded ejector trailers of compacted waste will be weighed when leaving the site in order to record the weight of waste leaving the site.

Movement of vehicles over the weighbridge and into the site will be controlled using electric traffic control barriers operated from the Control Building.

Bags of municipal waste from members of the public will be weighed on a scales at the Transfer Station Building and a pay by weight charge will be levied.

Recyclable materials will be accepted free of charge from the general public.

All public traffic throughout the Civic Amenity Area will move in a one-way system, which will be clearly marked as shown on drawing 2528-2612A. Site signage will direct the public to the appropriate container. Adequate parking for staff and visitors will be provided throughout the site.

Attachment D.1.k - Services

Existing three-phase electricity supply at the site will be used to power the compactor equipment and other equipment and buildings on site. The main isolator and fuse box will be located in the Transfer Station Building.

A 100mm diameter water main will be connected to the existing water supply on site and brought along the site access road and distributed around the site to supply the buildings, hydrants and water points.

Three telephone lines will be connected to the site office. One line will serve a phone, another a fax and the third will serve the modem and security alarm monitoring system.

Attachment D.1.l - Sewerage and surface water drainage infrastructure

Surface water onsite is managed in two sections. Firstly, surface water is collected via drainage channels at the container collection level and basement level to the Southern and Eastern parts of the site as shown in drawing 2528-2613A. This area drains to a surface water attenuation tank. Surface water is pumped from the pump sump, which is downstream of the attenuation tank, up to manhole S1.

In section 2 of the surface water management system, surface water is collected at the public and upper truck areas via drainage channels and gulleys along the Western and Northern boundaries of the site. This surface water flow to manhole S1, through the surface water attenuation tank, through the Oil Interceptor and finally discharges to the stream at manhole S9.

Attachment D.1.m - Plant sheds and garages

The compactors for municipal waste and for recyclables will be located in the Waste Transfer Building. Bunded containers will be installed in the Domestic Hazardous Waste Building. This structure will be of steel portal-frame construction with a pitched roof.

The Reuseable Materials Building will house furniture etc for reuse. A container will be provided for storage of white goods and waste electrical and electronic equipment.

Attachment D.1.n - Site accommodation and compounds

A portacabin building is currently used as an administration building. A control room, toilets and store room are also housed in portacabins.

The proposed office and control building for the site will be a domestic type construction of cavity wall on raft foundation, with slated timber trussed roof. The building will contain a desk, shelving and reception counter, a kitchenette, storage cupboards and a WC and shower room and laboratory.

Attachment D.1.o - Fire control system

Fires are prohibited onsite. Emergency response procedures are in place in case of a fire (see Attachment J). A 100mm extension from the water mains located adjacent to the R592 allows for the provision of fire hydrants throughout the site.

Attachment D.1.p - Civic Amenity Site

The proposed Civic Amenity Area on the site will consist of an area for the deposit of recyclable waste and an area for the disposal of residual waste (see drawing 2528-2613A). The recyclable waste accepted onsite will consist of:

- Paper and cardboard
- Tetrapaks
- Textiles
- Scrap Metals
- Timber
- Furniture
- Household construction and demolition waste
- Garden waste
- Electronic and electrical waste
- White goods
- Drink and Food cans
- Glass bottles and jars
- Aluminium cans
- Plastics

Hazardous household waste will also be accepted onsite and will include the following:

- Edible oils and fats
- Hydraulic oils
- Engine, gear and lubricating oils
- Oil containers
- Oil filters
- Batteries
- Paints, inks
- Pesticides
- Solvents
- Fluorescent tubes
- Household gas cylinders

All recyclable materials transported to the site by the public will be disposed of free of charge. All the waste will be separated into the appropriate containers by the public. Paper, cardboard, cans and plastics will be deposited into hatches in the Transfer Building for compaction. These will be stored and collected by licensed carriers for recovery. A split-level concrete wall will allow for easier deposit of the bulky materials and will also allow for the collection of these materials by roll-on/roll-off containers.

The municipal waste disposed of onsite will be charged by weight. All municipal solid waste will be compacted on site and then disposed of at a licensed facility.

A reusable materials building will be provided where reusable items of furniture can be deposited for collection by other members of the public.

Attachment D.1.q - Details of composting

There are no composting facilities onsite.

Attachment D.1.r - Description of Incineration infrastructure

There is no incineration infrastructure onsite.

Attachment D.1.s - Details of any other infrastructure proposed

Not applicable

Attachment D.2: Facility Operation

Attachment D.2.a Unit Operations

D.2.a.1 Domestic Waste from Public

Activity	Location	Description of operation
Waste arrival on site from public	Transfer Building	Waste weighed on scales and charged accordingly
Waste arrival on site from waste contractors	Weighbridge	Originator and amount of waste recorded on docket and on computer database
Waste Processing	Landfill cells (until early 2008)	Waste transferred to landfill cell
	Waste Transfer Station	Waste deposited into hopper for compaction and transfer to another licensed facility

D.2.a.2 Domestic Waste from Waste Contractors

Activity	Location	Description of operation
Waste arrival on site from waste contractors or Local Authority Vehicles	Weighbridge	Originator and amount of waste recorded on docket and on computer database
Waste Processing	Landfill cells until early 2008	Waste transferred to landfill cell
	Waste Transfer Station	Waste deposited into hopper for compaction and transfer to another licensed facility

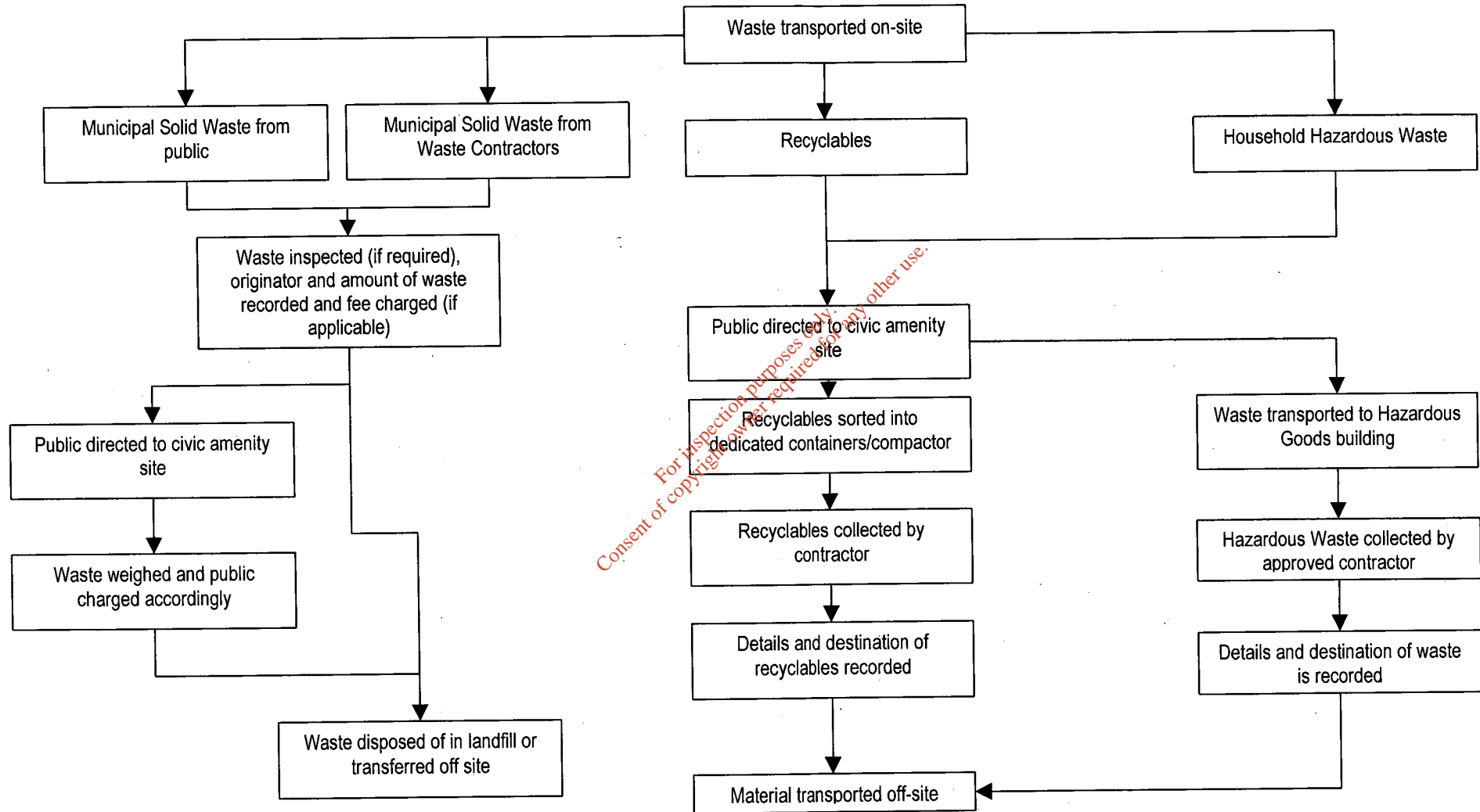
D.2.a.3 Waste Recovery

Activity	Location	Description of operation
Waste arrival on site	Recycling area	Waste delivered by public
Waste Processing	Recycling area	Waste is transferred to the appropriate container
Transfer of recyclables off site	Recycling area	Waste collected by licensed collectors for recovery

Attachment D.2.b Process Flow Diagram

The acceptance of waste and recyclables will be managed by the presence of site staff, who will be present on site at all times during normal operating hours to supervise waste disposal, deal with emergencies and prevent unauthorized entry to the site. All equipment will be serviced and maintained regularly.

Figure D-1: Process Flow Diagram



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Attachment D.2.c Emissions

Noise emissions will arise from operational plant as well as traffic to and from the site. Compaction operations and traffic movements to and from the site will be limited to normal opening hours and so operations at the facility will not be expected to have a significant impact on existing background noise levels. The standards applicable for noise emissions at the site are as follows: BS5228 (1984 and 1987) 'Noise Control on Construction and Open Sites' Part 1. A noise emission limit of 55 dB(A)L (daytime) and 45 dB(A)L (night time) at locations on the boundary will be used. Monitoring results will be compared against these standards. Noise monitoring is carried out at the existing landfill in accordance with the licence and background noise monitoring was carried out on 18th April 2007 in the proposed development area as detailed in Attachment E5.

An odour assessment was conducted in 1999. The model determined that the worst case condition would arise in 2003 at a point 165 metres from the landfill. The predicted odour levels were all below the odour detection limits under this worst case scenario with a minimum safety factor of 2. It identified that the most significant odour problems were likely to arise from three landfill gas pollutants; ethyl mercaptan, hydrogen sulphide and methyl mercaptan which are likely to be emitted from the leachate lagoon. Following this report, a gas flare was installed which reduced the odours emitted from the site. It is unlikely that there will be any additional generation of odours as a result of the proposed Waste Transfer Station and Civic Amenity Facility. Recyclable waste received at the facility is unlikely to cause odours. All municipal waste delivered to the site will be deposited into the hopper and compacted with sealed containers. All tipping and compaction operations will take place within the Transfer Building.

Ambient dust monitoring is carried out annually under the current Waste Licence. Further monitoring points were added to measure the effect of the Transfer Station and Civic Amenity Site. A 30-day average dust deposition rate of 350 mg/m²/day is set in the existing Waste Licence for the site. All the results from the latest period of monitoring were found to be below the recommended deposition rate except for D9 which was found to be 585 mg/m²/day (possibly due to site investigation drilling onsite). Further dust monitoring will be carried out as per the agency's recommendations.

Surface water run-off from areas of the facility will be collected in the surface water drainage system and diverted via a Class 1 full retention separator before discharging to the adjacent stream. Constant monitoring will ensure that no emission limits will be breached. If this occurs, the flow will be diverted to the leachate lagoon.

There are no emissions to groundwater from the 3 no. lined cells. Reports indicate that the unlined portion of the landfill is not affecting the groundwater quality. There will be no emissions to groundwater from the proposed development at the site.

Attachment D.2.d Laboratory Facilities

It is proposed to develop a laboratory within the Control Building as part of this development.

Attachment D.2.e Incineration Facilities

There are no incineration facilities on this site.

Attachment D.3: Liner System

Attachment D.3.a and D.3.b

Derryconnell Landfill has been operating since 1985 years but due to lack of available space, it is likely to close in early 2008. For this reason and the fact that no changes to the landfill itself are being made at this time, items D.3.c to D.3.g of Section D.3 were not completed as indicated in the EPA Waste Licence Application Form.

The 3 lined cells have been lined according to best practice and in accordance with the requirements of Waste License No. W0089-1 and meet BAT as laid down in Annex 1 of the Landfill Directive.

Attachment D.4: Leachate Management

Attachment D.4.a - Leachate Management Plan

Leachate generated onsite is collected via perforated HDPE pipes in a bed of pea gravel on the lined base of the landfill. The leachate collection pipework in each cell drains into a leachate collection manhole or sump. Leachate build up in the manhole and pump sumps is piped to the leachate storage lagoon in the leachate rising main.

Contaminated storm water runoff is also diverted to the lagoon. The storage lagoon has a storage capacity of 3208m³ and a minimum freeboard of 0.5m is maintained at all times as per condition 4.14.5 of licence W0089-01. The leachate is transferred to Bandon WWTP using a fully enclosed road tanker and discharged directly to the treatment works. The frequency of removal varies but ensures that a 0.5m freeboard is maintained at all times. All leachate transfers offsite are recorded.

Attachment D.4.b - Leachate Quantities

Leachate is produced by rainfall percolating through the waste. As recommended by the EPA Guidance, it is current standard practice to minimise the quantities generated by operating to "water-balance" principles. This can be achieved by limiting cell sizes, by phased disposal, by progressive restoration, by using low permeability cap and by shaping the final landform to encourage surface water run-off.

The leachate lagoon was operational throughout 2006. The total volume of leachate removed from the lagoon was 19,783 m³. All leachate was transferred to Bandon treatment plant in 2006. A summary of the monthly water balance calculations is shown in Table D-1. Once the landfill is closed and capped leachate quantities will reduce considerably.

Table D-1: Leachate Predictions for 2007

Month	Cummulative Predicted Leachate generation (m ³)
January	781
February	100
March	538
April	1232
May	1633
June	1836
July	2300
August	2447
September	3052
October	4470
November	5095
December	5552
Cumulative total	5552

The composition of the leachate was measured on 27/11/2006 and is shown to be typical of the leachate composition for non-hazardous waste landfills:

Table D-2: Composition of Leachate

PARAMETER	UNITS	Average of Monitoring Points	Lagoon
Ammoniacal N	mg/l	193.45	88.3
BOD	mg/l	151	264
COD	mg/l	404	538
Chloride	mg/l	243	217
Conductivity	µs/cm	463	565
pH		7.45	7.5
Temperature	°C	10	8.9
Iron	ug/l	8082	252
Potassium	mg/l	115	111
Sodium	mg/l	237.5	170
TON	mg/l	<0.3	<0.3
Boron	ug/l	552.5	342
Cadmium	ug/l	<1	<1
Calcium	ug/l	98525	137300
Chromium (T)	mg/l	<0.05	<0.05
Copper	ug/l	<1	<1
Cyanide (Total)	mg/l	<0.05	<0.05
Fluoride	mg/l	0.55	0.5
Lead	ug/l	<1	<1
Magnesium	ug/l	48630	-
Manganese	ug/l	8946	-
Mercury	ug/l	<0.05	-
Sulphate	mg/l	123	-
Total alkalinity	mg/l	1340	-
Total P	mg/l	0.575	-
Orthophosphate	mg/lP	0.04	1.06
Zinc	ug/l	18.5	-
Faecal coliform	cfu/100ml	110	-
Total coliform	cfu/100ml	3950000	-

Attachment D.4.d – Details of Cell Sizes

Waste was deposited in Cell no. 2 until its closure in August 2006 when waste deposition in Cell no. 3 commenced. The working area of the landfill is limited to an area of 50 m x 50 m. The cells sizes are listed below and shown in Drawing 2528-2610A:

Table D-3: Cell Sizes

Cell	Area (m ²)
Old Landfill Site (pre-1999)	6000
Cell no. 1	1080
Cell no. 2	3069
Cell no. 3	2550

Attachment D.4.e – Details of Leachate Collection System

The leachate collection system within cells no 1, 2 and 3 consists of 100 – 200 mm perforated HDPE pipes in a 500mm deep bed of pea gravel on a HDPE lined landfill base. The side slopes of the landfill are covered with pea gravel to a depth of 500 mm. The leachate collection pipework, in each cell, drains into a leachate collection manhole or sump. Leachate build up in the manholes and the pump sumps is pumped to the leachate storage lagoon in a 500mm diameter HDPE leachate rising main. The leachate is subsequently removed off site to the Bandon WWTP for treatment.

Attachment D.4.f – Details of Leachate Storage System

The leachate storage lagoon has total storage capacity of 3208m³. It is lined with HDPE and has a basal area of 7m x 7m. The walls of the lagoon are sloped at a gradient of 3:1 horizontal to vertical. The minimum freeboard in the lagoon is 0.5m.

Attachment D.4.g - Leachate Monitoring

Leachate collection chambers with submersible pumps are installed within the lined cells as well as in the old landfill cell. The sumps are also equipped with an ultrasonic leachate level monitoring system which is linked to the reception building.

Schedule E.5 of waste licence no. W0089-01 specifies that monitoring of leachate is to be undertaken at eight locations: L1, L2, L3, L4, L5, L6, L7 and the leachate lagoon. However, as requested by the EPA, leachate monitoring was reduced to the following points for Quarter 2 of 2004: L1, L4 (unlined area), collection point in lined cell and leachate lagoon. The parameters and frequency of testing are included in Table D-4.

Table D-4: Parameters and frequency to be tested in Leachate

Parameter	Frequency
Visual Inspection / Odour	quarterly
Leachate Level	weekly
Ammoniacal Nitrogen	monthly
BOD	monthly
COD	monthly
Chloride	quarterly
Electrical Conductivity	Quarterly
pH	Monthly
Temperature	Quarterly
Boron	annually
Cadmium	annually
Calcium	annually
Chromium (total)	annually
Copper	annually
Cyanide	annually
Fluoride	annually
Iron	annually
Lead	annually
List I/II Organic Substances	once
Magnesium	annually
Manganese	annually
Mercury	annually
Potassium	annually

Sulphate	annually
Sodium	annually
Total Alkalinity	annually
Total Phosphorus	Quarterly
Total Oxidised Nitrogen	Annually
Zinc	annually
Faecal Coliform	Annually
Total Coliform	annually

Leachate monitoring results are shown in Attachment F.8. The leachate monitoring locations are shown in Drawing 2528-2616A and their NGR are listed in Attachment F.8.

Attachment D.4.h - Leachate Recirculation Details

It is proposed to install a leachate recirculation system as part of the restoration and aftercare of the landfill.

Attachment D.4.i - Leachate Removal

Leachate arising from the facility is collected in the leachate collection system, stored in the leachate lagoon and transferred using an articulated tanker to Bandon WWTP for treatment.

The following is the procedure followed for the removal of leachate from the lagoon.

- The empty tanker is parked along side the leachate lagoon, adjacent to the pumping unit.
- Electronic probes within the tanker unit are connected to the pumping unit.
- A hosepipe is connected to the rear of the tanker unit and locked into position.
- The pumping unit is powered on and filling of the tanker commences.
- As the cut out level near the top of the tanker unit is reached, the electronic probes cut out the pumping unit.
- All remaining leachate remaining in the hosepipe is fed back to the lagoon by gravity.
- The pumping unit is switched off and the hosepipe is unlocked and removed.
- The electronic probes are disconnected.
- The tractor unit removes the fuel tanker after depositing an empty tanker unit for refilling.
- The tractor unit transports the leachate to Bandon Wastewater Treatment plant for disposal.
- The hosepipe is locked into position in the tanker.
- The adjacent pump is initiated and the leachate is discharged to the primary settlement tank.
- The tractor unit transports the empty tanker to Derryconnell Landfill for filling.

Procedures in the case of "Damage to the Integrity of the Leachate Management System" and for "Spillage of Leachate" are included in the Emergency Response Plan in Attachment J.

Attachment D.4.j - Off-site Leachate Treatment

The leachate from the Derryconnell Waste Facility is transferred using an articulated tanker to the WWTP in Bandon, Co. Cork. The amount of leachate sent to Bandon in 2006 is shown in the table overleaf.

Table D-5: Leachate disposal per month 2006

Month	Volume (L)
January	2226694
February	2205865
March	1383788
April	1618128
May	1635958
June	1202248
July	125233
August	0
September	1322727
October	2464144
November	2822531
December	2775285

The WWTP is owned and operated by Cork County Council. An agreement exists with the operators of the Bandon WWTP, to allow the disposal of waste water from the activities onsite to their facility. A letter confirming the agreement is attached.

Attachment D.5: Landfill Gas Management

Derryconnell Landfill has been operating since 1985 years but due to lack of available space, it is likely to close in early 2008. For this reason and the fact that no changes to the landfill itself are proposed as part of the Waste Licence Review, items D.5.g to D.5.m of Section D.5 were not completed as indicated in the EPA Waste Licence Application Form.

Attachment D.5.a –Landfill Gas Management Plan

An extensive landfill gas management plan has been implemented onsite. Assuming that each tonne of waste will have a typical yield of 200 m³ of gas, it is estimated that the facility will produce in the order of 23M m³ of gas in its lifetime. The monitoring of landfill gas extends from the site of the old cell which is now capped to the area covered by the 3 no. new lined cells.

Permanent gas monitoring boreholes have been constructed within the perimeter of the site so that any migration of gas can be discovered quickly and controlled.

The gas extracted from the wells is carried via a buried pipework to an enclosed gas extraction/flare unit. Continuous monitoring of the exhaust gases is conducted. If monitoring indicates that the concentration of flammable gas exceeds 1% v/v or the concentration of carbon dioxide exceeds 1.5% in any buildings or confined spaces then the site management and the licensing authority are informed immediately.

All incidences relating to the uncontrolled migration of gas are noted in a detailed report and sent to the licensing authority after the incident has been investigated and the hazard has been equalised.

All existing and proposed site buildings are designed with gas detection systems and all electrical and electronic equipment located in enclosed spaces or down boreholes/leachate pipes will be certified intrinsically safe.

Monitoring of landfill gas emissions will continue onsite on a biannual basis following closure of the landfill. The proposed Waste Transfer Station and Civic Amenity Facility will not generate any landfill gas.

Attachment D.5.b –Passive Venting System

The type of landfill gas control system is used in Derryconnell is an active control system. An induced vacuum is used to control the flow of gas and vertical gas extraction wells are installed to control the movement of gas.

As stated above, the landfill gas is monitored at locations within the old landfill area as well as within the 3 no. lined cells shown on Drawing 2528-2610A.

Attachment D.5.d – Gas Alarm System

The pump/flare unit is fitted with an auto-ignition device and alarm system which warns of system failure. Gas detection and protection systems are installed in all the buildings on site and will be installed in the new buildings. The gas alarm systems will be initiated when the trigger levels of 1% v/v and/or 20% of the LEL (Lower Explosive Limit) of methane or flammable gas and 1.5% by volume of carbon dioxide are exceeded in any space occupied or near an occupied area e.g. rooms, garages etc.

Attachment D.5.e – Gas Barrier Details and Measures for the Prevention of Landfill Gas Migration

The active gas control system induces a vacuum which controls the flow of gas to adjacent properties. Additionally, permanent gas monitoring boreholes have been constructed within the perimeter of the site to identify and control any migration of gas.

Attachment D.5.f – Other Landfill Gas Infrastructure

The gas flare unit is located in the gas compound as shown in Drawing 2528-2614A. The flare stack is enclosed to avoid risk of fire and to minimise night-time visual impact. The compound is approximately 10m X 10 m and is routinely cleared of vegetation to avoid the danger of fire. It is surrounded by a 2.5 m high palisade fence for security reasons.

The flarestack is equipped with the following equipment to ensure safe and efficient operation:

- a temperature indicator and recorder
- an automatic pilot restart system
- a failure alarm system with an automatic isolation system
- automatically controlled combustion air louvers
- a heat shield
- source test ports
- view ports
- duty and standby motors
- a flame arrestor

Attachment D.6: Capping System

Derryconnell Landfill has been operating for since 1985 years but due to lack of available space, it is likely to close in early 2008. For this reason and the fact that no changes to the landfill itself are being made at this time, items D.6.e to D.6.k of Section D.6 were not completed as indicated in the EPA Waste Licence Application Form.

Attachment D.6.a – Daily Landfill Cover

The waste arriving on site is disposed of on the working face of the landfill, spread and covered daily. A Hitachi EX200 excavator or similar is used for the compaction and spreading of waste on the working face. The daily cover used is a combination of construction and demolition waste and a biodegradable film.

Attachment D.6.b – Intermediate Landfill Cover

C&D waste is used as intermediate cover.

Attachment D.6.c – Temporary Capping

The temporary capping is installed between completion of filling and installation of the final cap. It has a minimum thickness of 0.5m.

Attachment D.6.d – Capping System

The final cap will meet the requirements of Condition 4.16.2 of WL0089-01

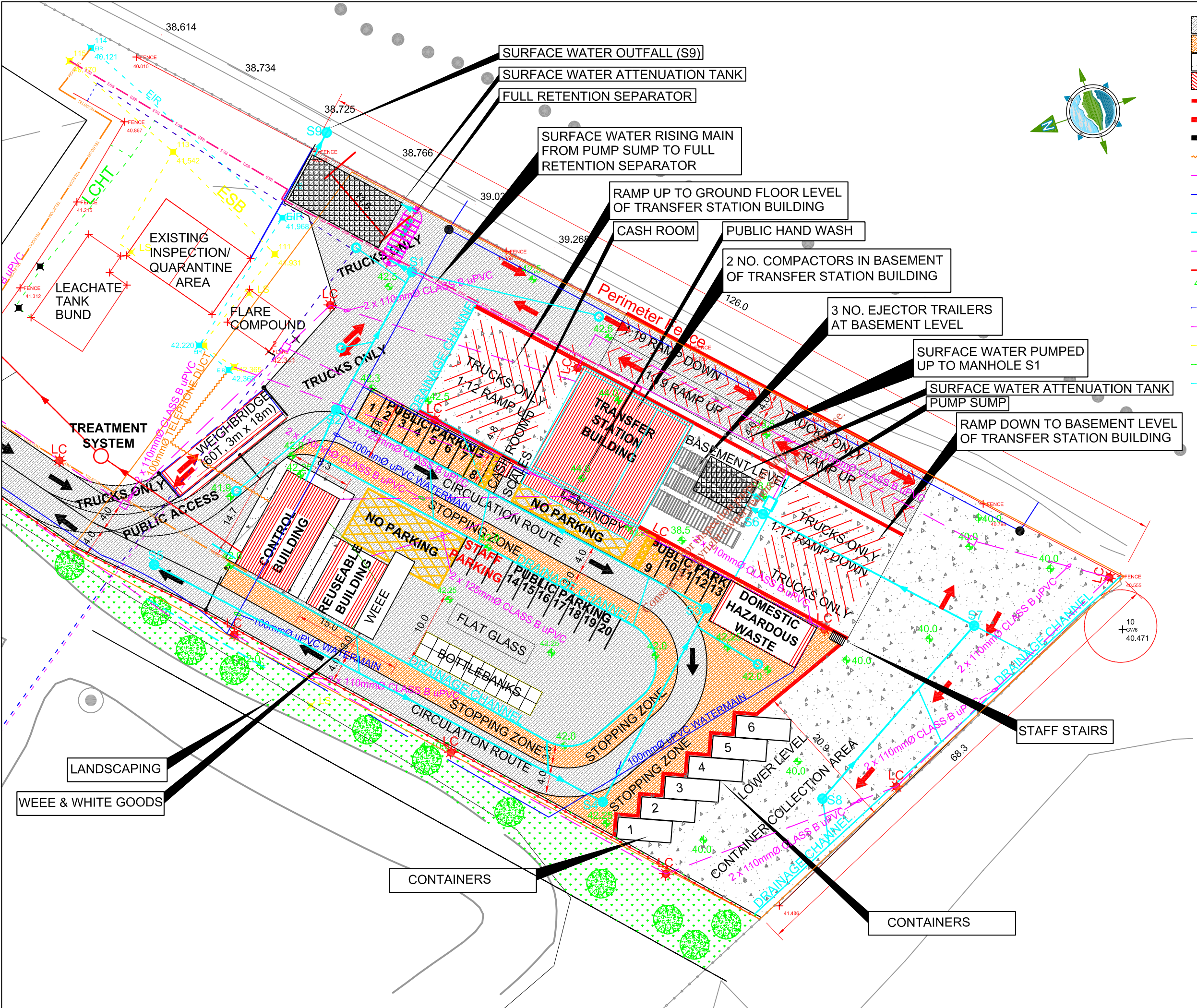
Capping of the old portion of the landfill was started in October 2004 and completed in April 2005. The capping for this area consisted of the following layers:

Table D-6: Capping Composition

Component	Description
Topsoil	150 mm
Subsoil	850 mm silty sandy gravel
Surface water drainage layer	Geocomposite layer with geotextile filter/separator on top and bottom equivalent to Finess Pozidrain 6S240D/NW8. Approximately 5 mm deep.
Barrier layer	Geotextile protection layer equivalent to Bentomat Cap 75. Approximately 6 mm deep. Maximum permeability of 1×10^{-9} m/s
Gas collection system	Non-woven needle-punched geocomposite equivalent to Finess Pozidrain 6S240D/NW8. Approximately 5 mm deep.
Total	1,016mm

The capping system meets the requirements set by the Landfill Directive Annex 1. Capping of the remaining cells will be carried out in accordance with the relevant EPA manuals.

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- LEGEND**
- ASPHALT CIRCULATION AREA
 - COLOURED ASPHALT STOPPING ZONE
 - CONCRETE HARDSTAND
 - BUILDINGS
 - RETAINING WALL
 - TRUCK CIRCULATION ROUTE
 - PUBLIC CIRCULATION ROUTE
 - TELEPHONE DUCTING
 - ELECTRICAL DUCTING
 - WATERMAIN
 - DRAINAGE CHANNELS
 - SURFACE WATER DRAINAGE
 - SURFACE WATER RISING MAIN
 - FOUL SEWERAGE
 - PROPOSED LEVELS
 - EXISTING SURFACE WATER DRAINAGE
 - EXISTING GAS COLLECTION
 - EXISTING ESB DUCTING
 - EXISTING LEACHATE PIPEWORK
 - EXISTING EIRCOM DUCTING

- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES
WASTE LICENCE APPLICATION

Title: DERRYCONNELL SITE LAYOUT PLAN SHOWING SERVICES (SHEET 1 OF 2)

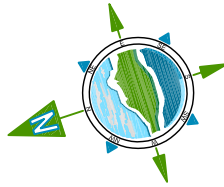
Scale @ A3: 1:500

Prepared by: JO'B Checked: Date: JUNE '07

Project Director: B. DOWNES

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e-mail: info@tobin.ie
www.tobin.ie

Drawing No.: 2528-2613 Issue: A



- LEGEND**
- ASPHALT CIRCULATION AREA
 - COLOURED ASPHALT STOPPING ZONE
 - CONCRETE HARDSTAND
 - BUILDINGS
 - RETAINING WALL
 - TRUCK CIRCULATION ROUTE
 - PUBLIC CIRCULATION ROUTE
 - TELEPHONE DUCTING
 - ELECTRICAL DUCTING
 - WATERMAIN
 - DRAINAGE CHANNELS
 - SURFACE WATER DRAINAGE
 - SURFACE WATER RISING MAIN
 - FOUL SEWERAGE
 - 40.0 PROPOSED LEVELS
 - EXISTING SURFACE WATER DRAINAGE
 - EXISTING GAS COLLECTION
 - EXISTING LEACHATE PIPEWORK
 - EXISTING EIRCUM DUCTING

- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION		OD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES
WASTE LICENCE APPLICATION

Title: DERRYCONNELL SITE LAYOUT PLAN SHOWING SERVICES (SHEET 2 OF 2)

Scale @ A3: 1:500

Prepared by: JO'B Checked: Date: JUNE '07

Project Director: B. DOWNES

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Drawing No.: 2528-2614 Issue: A

EXISTING RECYCLING AREA TO BE DECOMMISSIONED ON COMPLETION OF PROPOSED WASTE TRANSFER STATION

TEMPORARY STORAGE OF BOTTLE BANKS FOR COLLECTION

PROPOSED GATES

EFFLUENT FROM SEPTIC TANK PUMPED UP TO LAGOON

Consent of copyright owner required for any other use.

EXISTING LEACHATE LAGOON

SURFACE WATER ATTENUATION TANK

EXISTING INSPECTION/QUARANTINE AREA

LEACHATE TANK BUND

FLARE COMPOUND

TREATMENT SYSTEM

WEIGHBRIDGE (60T, 3m x 18m)

TRUCKS ONLY

TRUCKS ONLY

TRUCKS ONLY

100mmØ uPVC WATERMAIN

2 x 110mmØ CLASS B uPVC

2 x 110mmØ CLASS B uPVC

114
40.121

113
41.542

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41.968

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CL 41.745

CL 41.492

CL 41.766

CL 41.925

CL 42.220

CL 42.365

CL 42.365

CL 42.3

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CL 42.3

38.614

38.734

38.725

42.220

42.365

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10
km/h

NO PUBLIC ENTRY

NO CHILDREN OR PETS ALLOWED

HAZARDOUS WASTE COMPOUND
PLEASE CONSULT WITH SITE STAFF

PLASTIC BOTTLES

PAPER

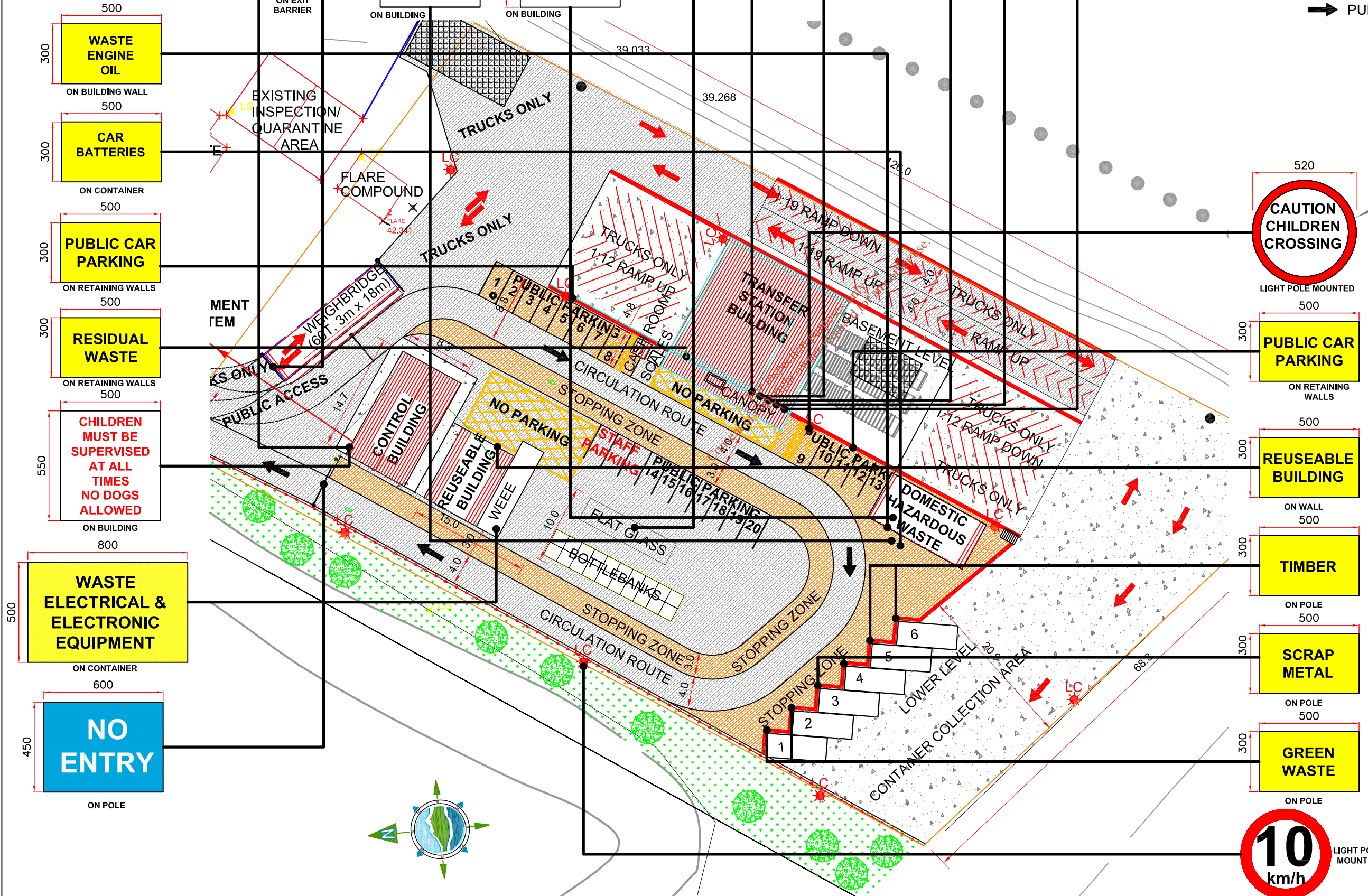
FLAT GLASS

WRAPPING

CARDBOARD

TETRA PAKS

- LEGEND**
- ASPHALT CIRCULATION AREA
 - COLOURED ASPHALT STOPPING ZONE
 - CONCRETE HARDSTAND
 - BUILDINGS
 - RETAINING WALL
 - TRUCK CIRCULATION ROUTE
 - PUBLIC CIRCULATION ROUTE



GRAPHIC OF CHILDREN CROSSING

- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
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 4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES
WASTE LICENCE APPLICATION

Title: DERRYCONNELL SITE SIGNAGE DETAILS

Scale @ A3: 1:500, 1:20

Prepared by: JO'B Checked: Date: JUNE '07

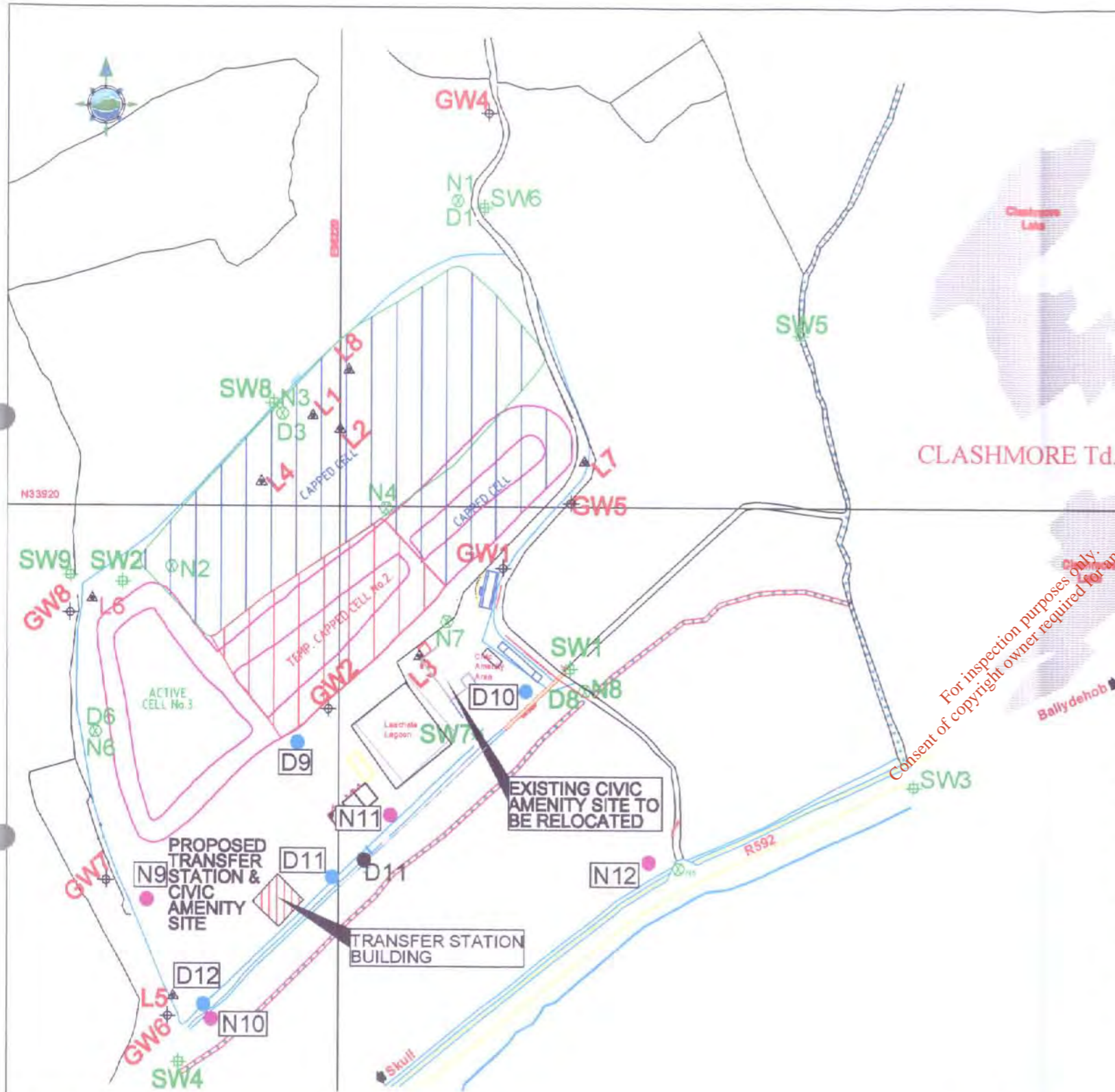
Project Director: B. DOWNES

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Drawing No.: 2528-2615 Issue: A

10
km/h

LIGHT POLE MOUNTED



(A) COMBINED LEACHATE AND GAS MONITORING.

L1	96206 E	33964 N
L2	96220 E	33957 N
L3	96260 E	33847 N
L4	96181 E	33932 N
L5	96138 E	33683 N
L6	96097 E	33875 N
L7	96342 E	33942 N
L8	96225 E	33986 N

(B) SURFACE WATER

SW1	96335 E	33841 N
SW2	96112 E	33883 N
SW3	96507 E	33785 N
SW4	96140 E	33651 N
SW5	96450 E	34003 N
SW6	96292 E	34064 N
SW7	96290 E	33810 N
SW8	96187 E	33970 N
SW9	96086 E	33886 N

(C) NOISE AND DUST

N1, D1	96279 E	34068 N
N2	96136 E	33890 N
N3, D3	96191 E	33965 N
N4	96243 E	33919 N
N5	96390 E	33745 N
N6, D6	96098 E	33811 N
N7	96274 E	33864 N
N8, D8	96343 E	33831 N

(D) GROUNDWATER

GW1	96302 E	33890 N
GW2	96215 E	33822 N
GW3	96225 E	33986 N
GW4	96294 E	34110 N
GW5	96336 E	33922 N
GW6	96135 E	33874 N
GW7	96104 E	33739 N
GW8	96085 E	33868 N

LEGEND

- N12 ● NOISE MONITORING POINTS (ADDITIONAL)
- D12 ● DUST MONITORING POINTS (ADDITIONAL)
- SW9 # SURFACE WATER MONITORING POINTS (EXISTING)
- GW8 + GROUND WATER MONITORING POINTS (EXISTING)
- L6 ▲ LEACHATE MONITORING POINTS (EXISTING)
- D6, N6 ⊙ DUST & NOISE MONITORING POINTS (EXISTING)

ADDITIONAL MONITORING POINTS

(C) NOISE AND DUST		
N9	096124 E	033730 N
N10	096156 E	033672 N
N11	096246 E	033770 N
N12	096375 E	033748 N
D9	096199 E	033805 N
D10	096314 E	033831 N
D11	096217E	033741 N
D12	096152 E	033679 N

- NOTES**
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 - ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	JUNE 2007	WASTE LICENCE APPLICATION	JOB	CD

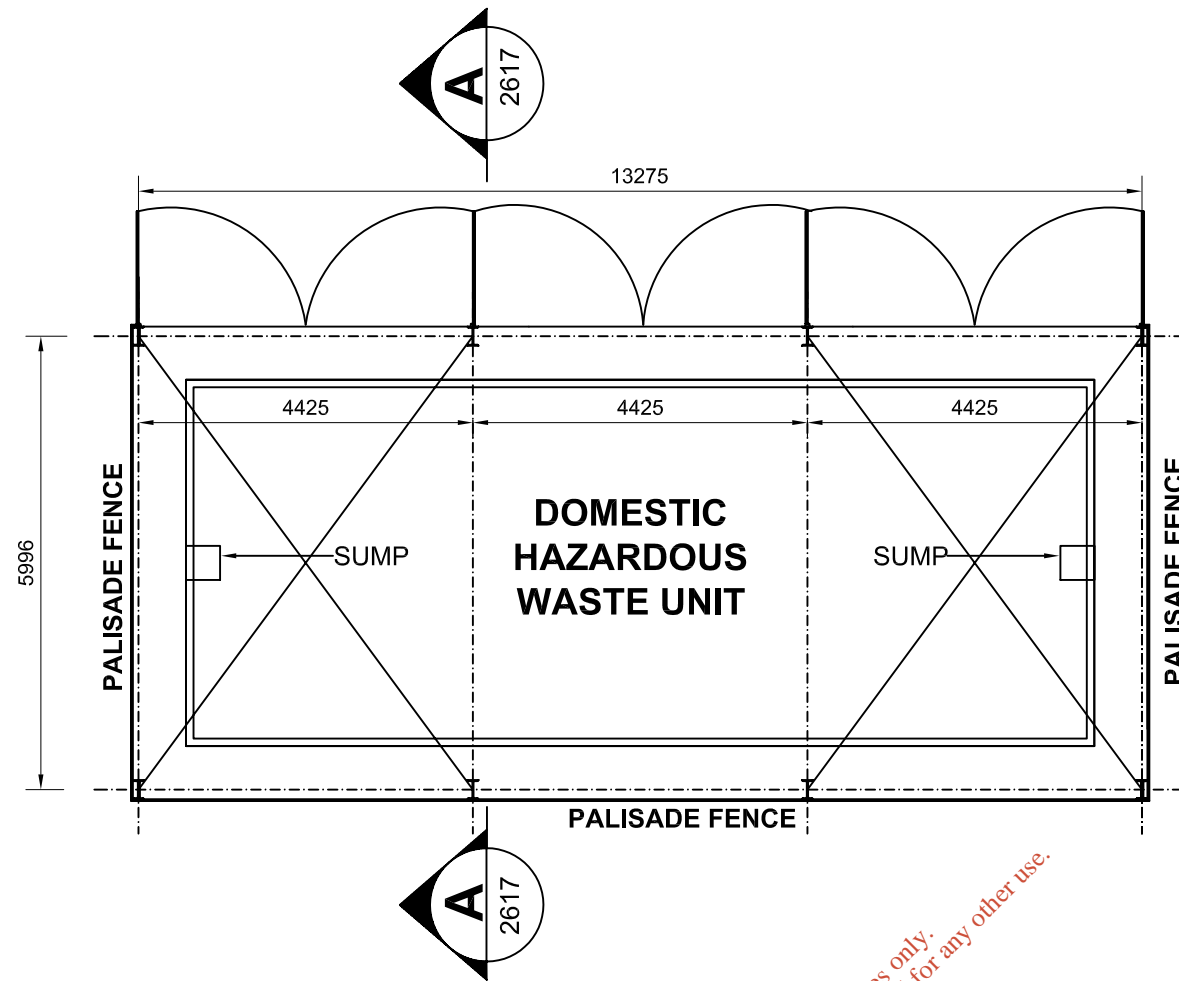
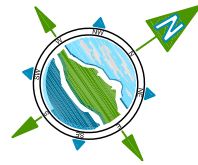
Client:	CORK COUNTY COUNCIL	Prepared by:	JOB
Project:	WEST CORK WASTE MANAGEMENT FACILITIES	Checked:	C.D
Title:	DERRYCONNELL MONITORING POINT LOCATIONS	Date:	JUNE '07
		Project Director:	B.DOWNES
		Scale @ A3:	1:2500

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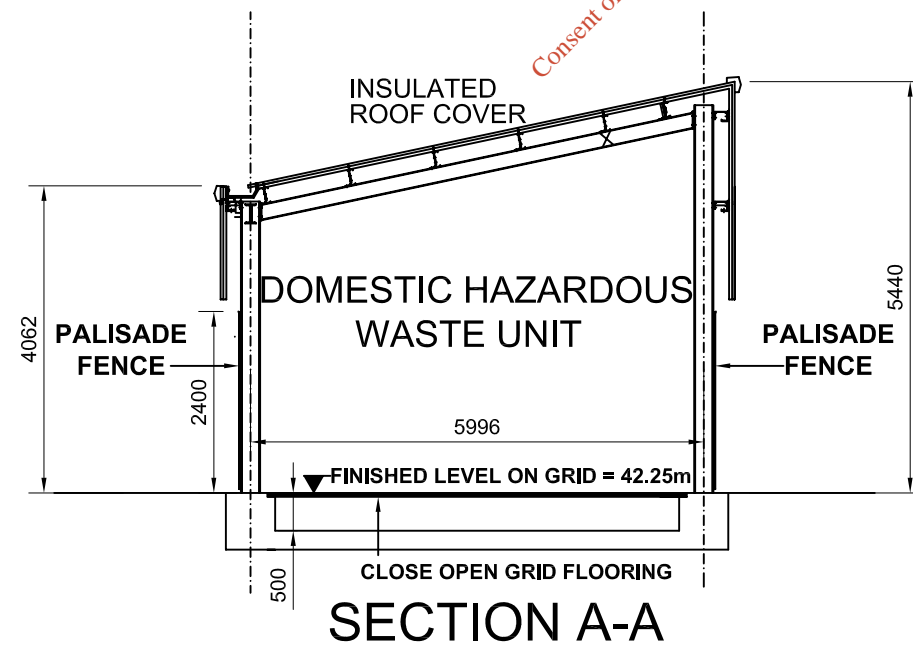
Issue:

Drawing No.: **2528-2616** A



PLAN OF DOMESTIC HAZARDOUS WASTE UNIT

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SECTION A-A

NOTES

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Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	CD

Client: **CORK COUNTY COUNCIL**

Project: **WEST CORK WASTE MANAGEMENT FACILITIES**
WASTE LICENCE APPLICATION

Title: **DERRYCONNELL DOMESTIC HAZARDOUS WASTE BUILDING PLAN, SECTION & ELEVATIONS**

Scale @ A3: **1:100**

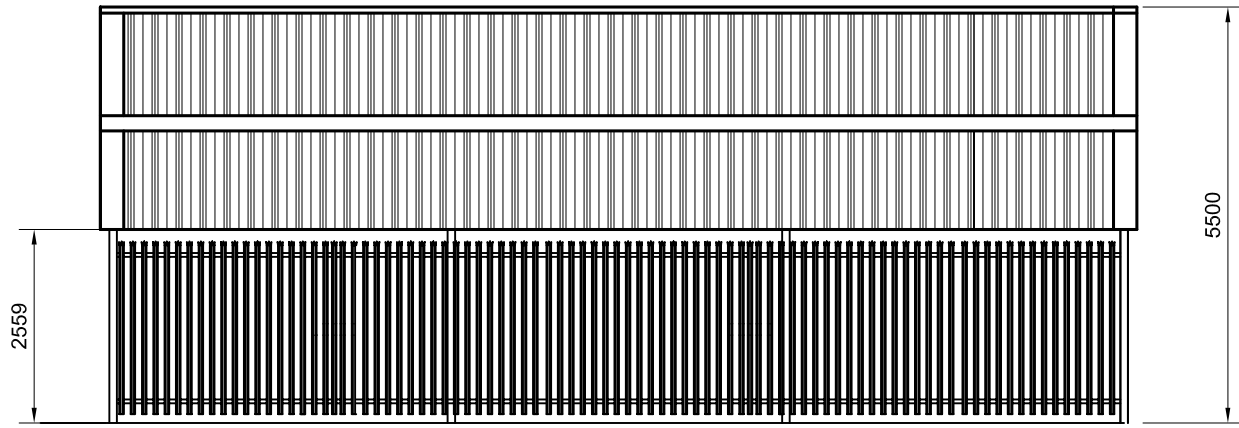
Prepared by: **JO'B** Checked: **CD** Date: **JUNE '07**

Project Director: **B. DOWNES**

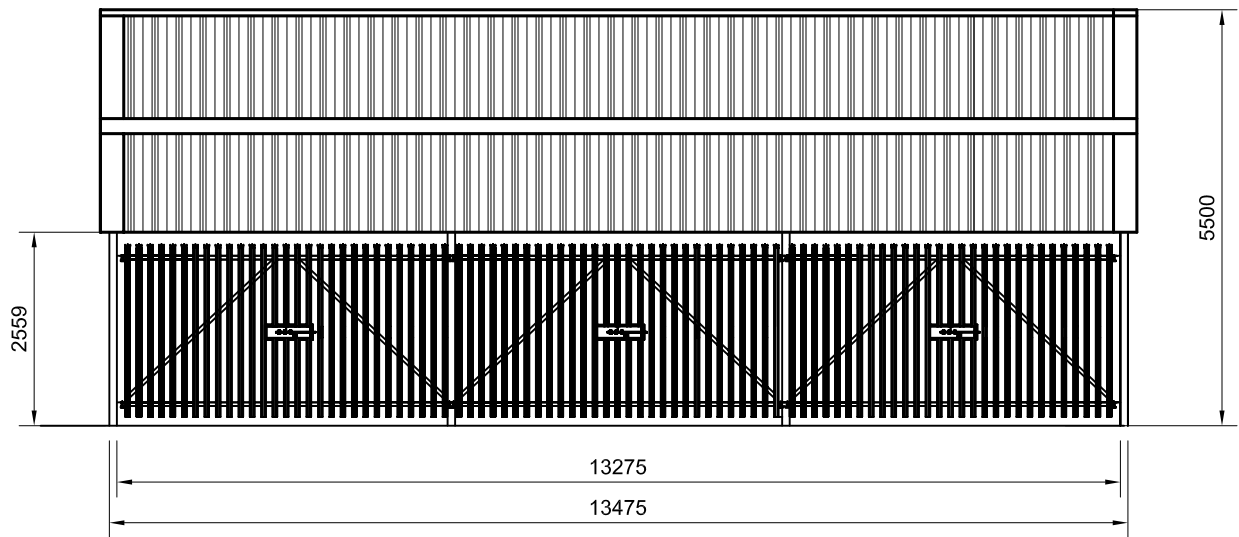
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Drawing No.: **2528-2617** Issue: **A**

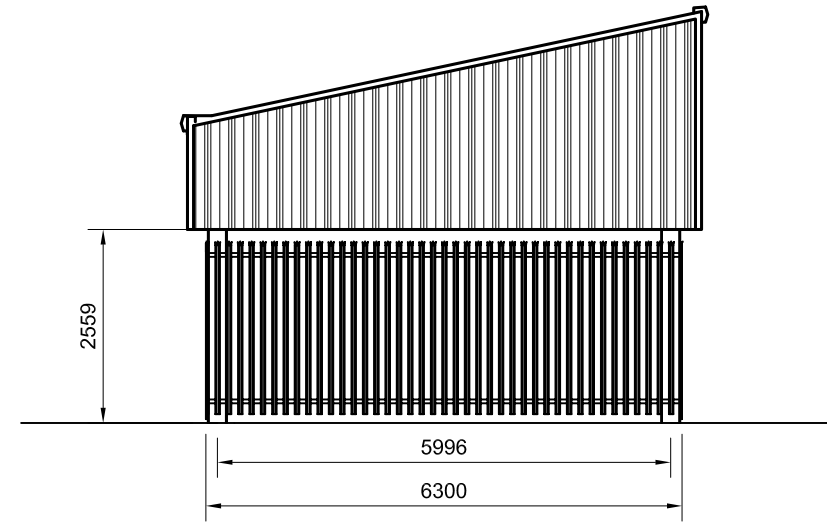


EAST ELEVATION

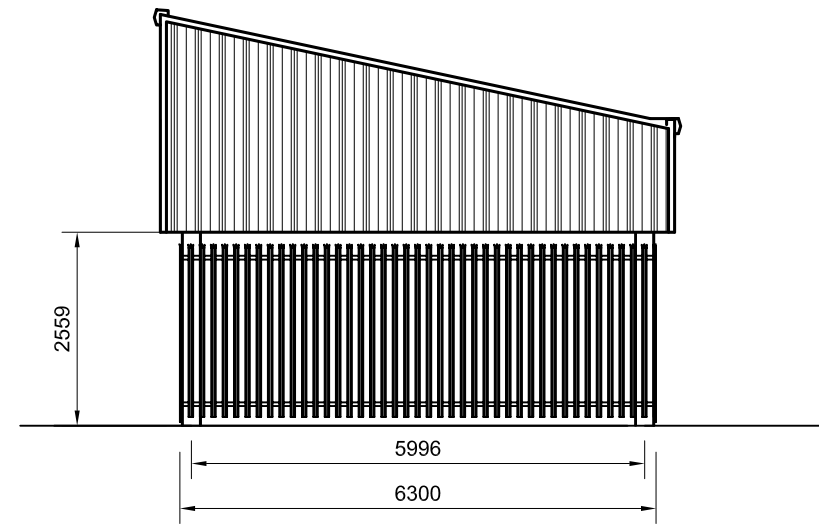


WEST ELEVATION

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SOUTH ELEVATION



NORTH ELEVATION

NOTES

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4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	JUNE'07	WASTE LICENCE APPLICATION	A.K	O.D

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES
WASTE LICENCE APPLICATION

Title: DERRYCONNELL DOMESTIC HAZERDOUS WASTE BUILDING ELEVATIONS

Scale @ A3: 1:100

Prepared by: A.K
Checked: O.D
Date: JUNE'07

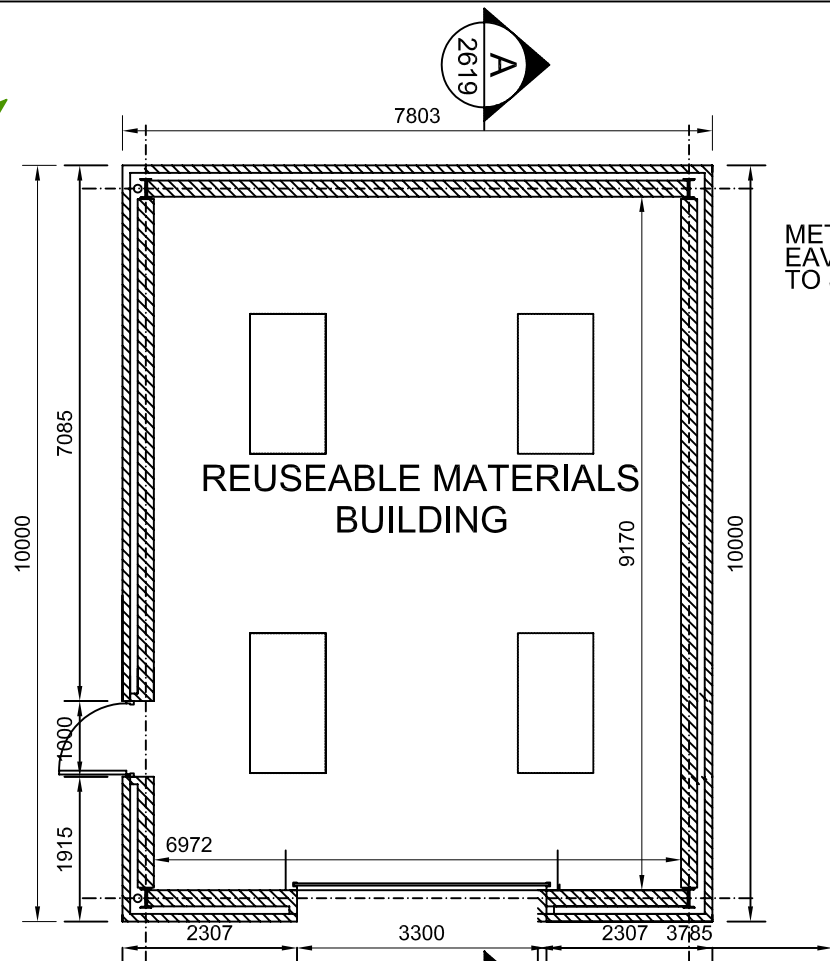
Project Director: B.DOWNES



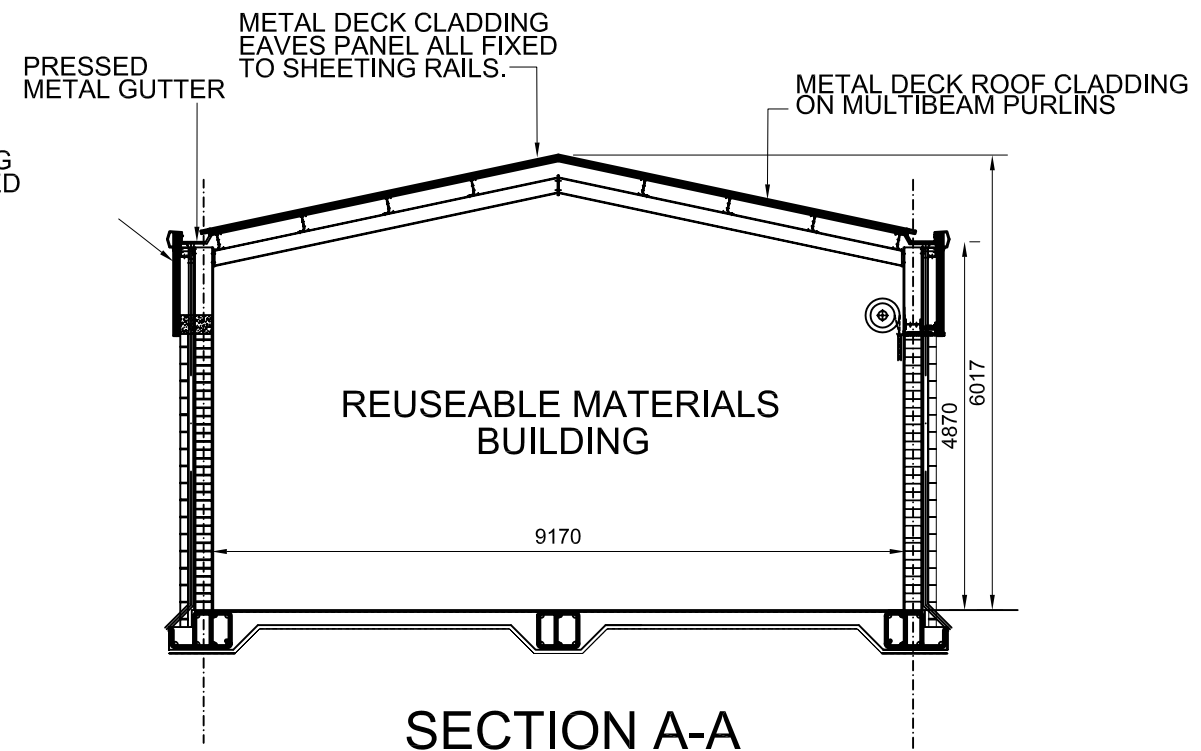
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Drawing No.: 2528-2618
Revised: A

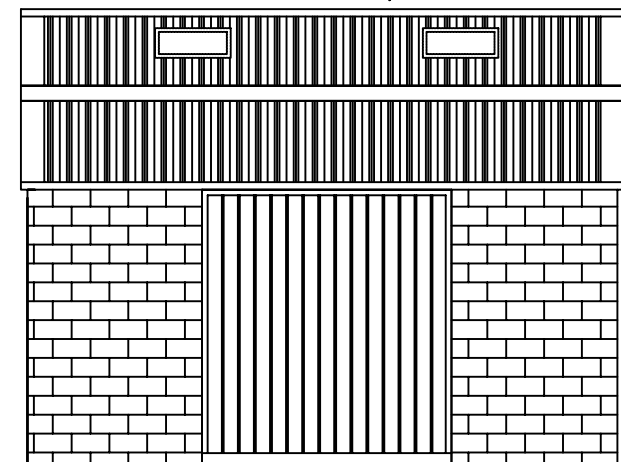


PLAN

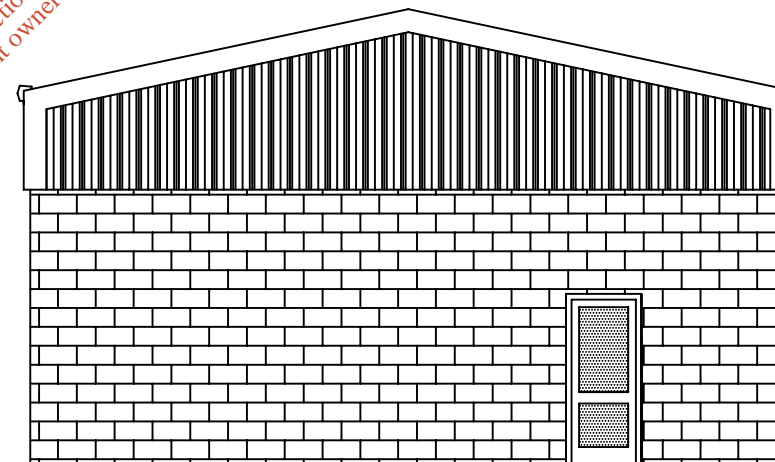


SECTION A-A

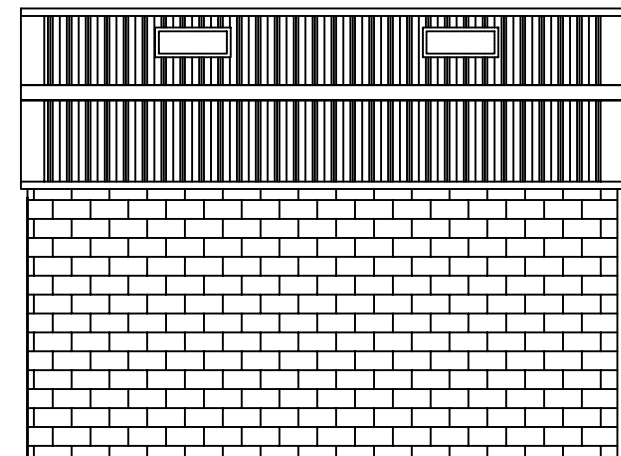
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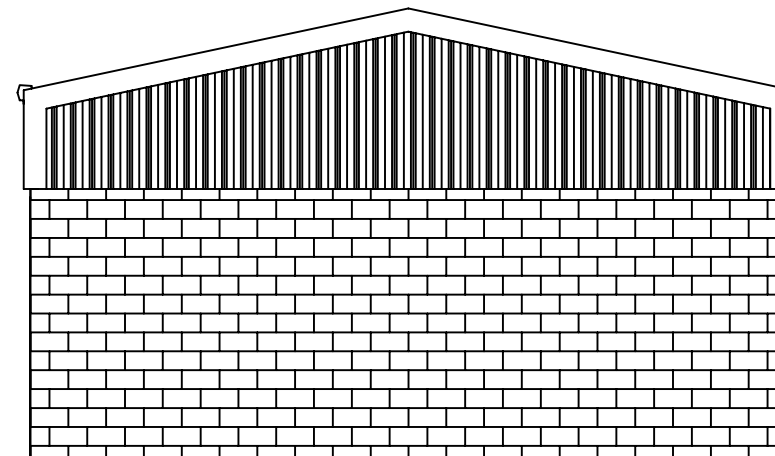
SOUTH EAST ELEVATION



SOUTH WEST ELEVATION



NORTH WEST ELEVATION



NORTH EAST ELEVATION

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
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4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES
WASTE LICENCE APPLICATION

Title: DERRYCONNELL
REUSEABLE MATERIALS BUILDING PLAN, SECTION & ELEVATIONS

Scale @ A3: 1:100

Prepared by: JO'B Checked: CD Date: JUNE '07

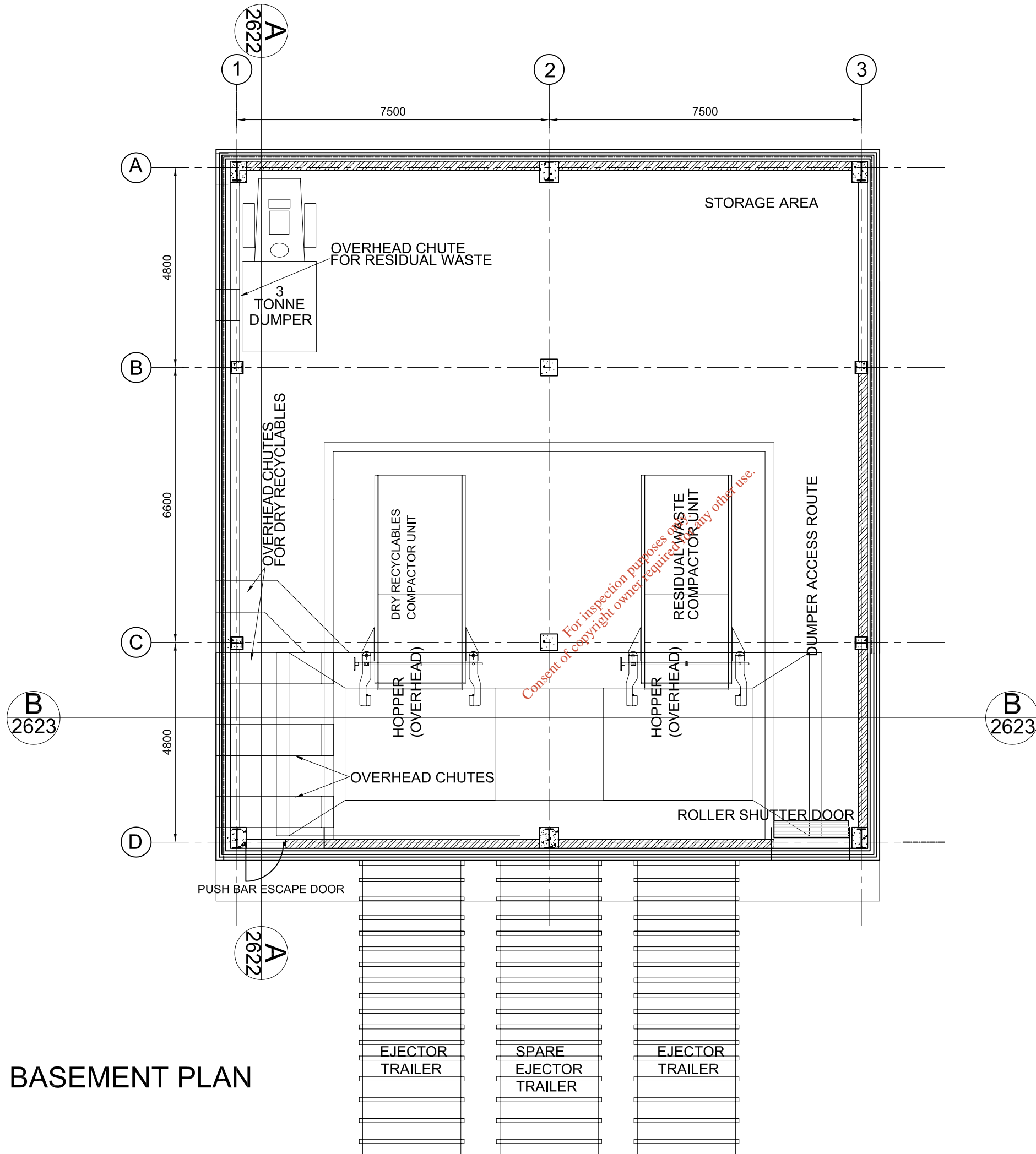
Project Director: B. DOWNES



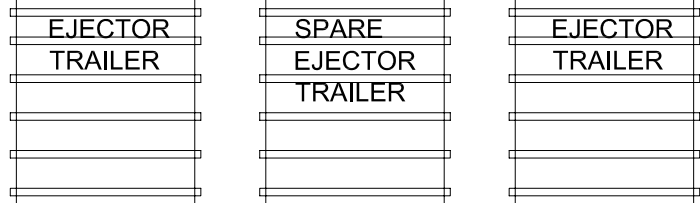
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Drawing No.: 2528-2619 Issue: A



BASEMENT PLAN



- NOTES**
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Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	CD

Client: **CORK COUNTY COUNCIL**

Project: **WEST CORK WASTE MANAGEMENT FACILITIES**
WASTE LICENCE APPLICATION

Title: **DERRYCONNELL TRANSFER STATION BUILDING BASEMENT PLAN**

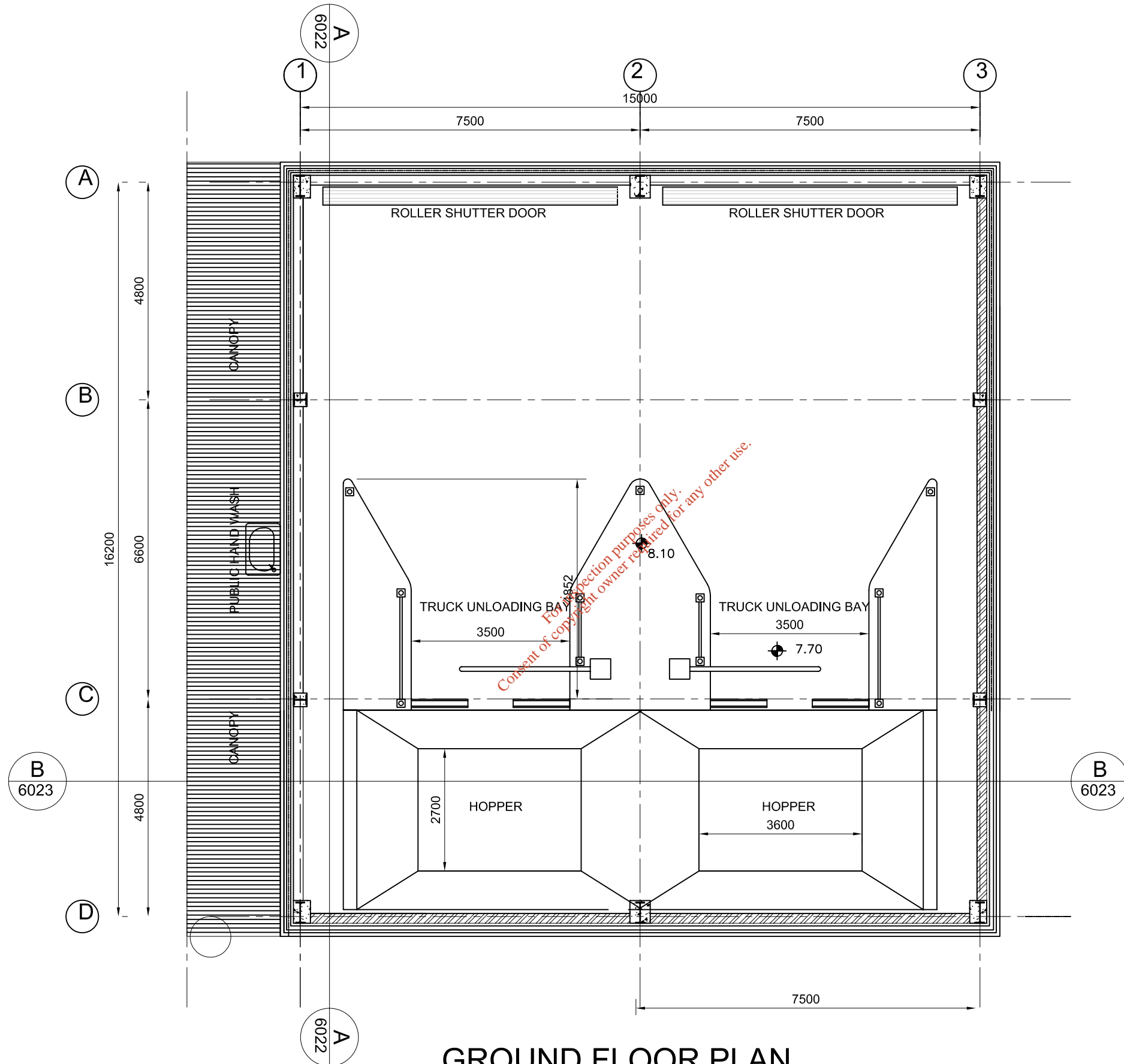
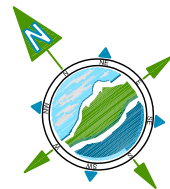
Scale @ A3: **1:100**

Prepared by:	Checked:	Date:
JO'B	CD	JUNE '07
Project Director:	B. DOWNES	

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Drawing No.:	2528-2620	Issue:	A
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GROUND FLOOR PLAN

- NOTES**
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 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS SHOWN RELATE TO ORDANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: **CORK COUNTY COUNCIL**

Project: **WEST CORK WASTE MANAGEMENT FACILITIES**
WASTE LICENCE APPLICATION

Title: **DERRYCONNELL TRANSFER STATION BUILDING**
GROUND FLOOR PLAN

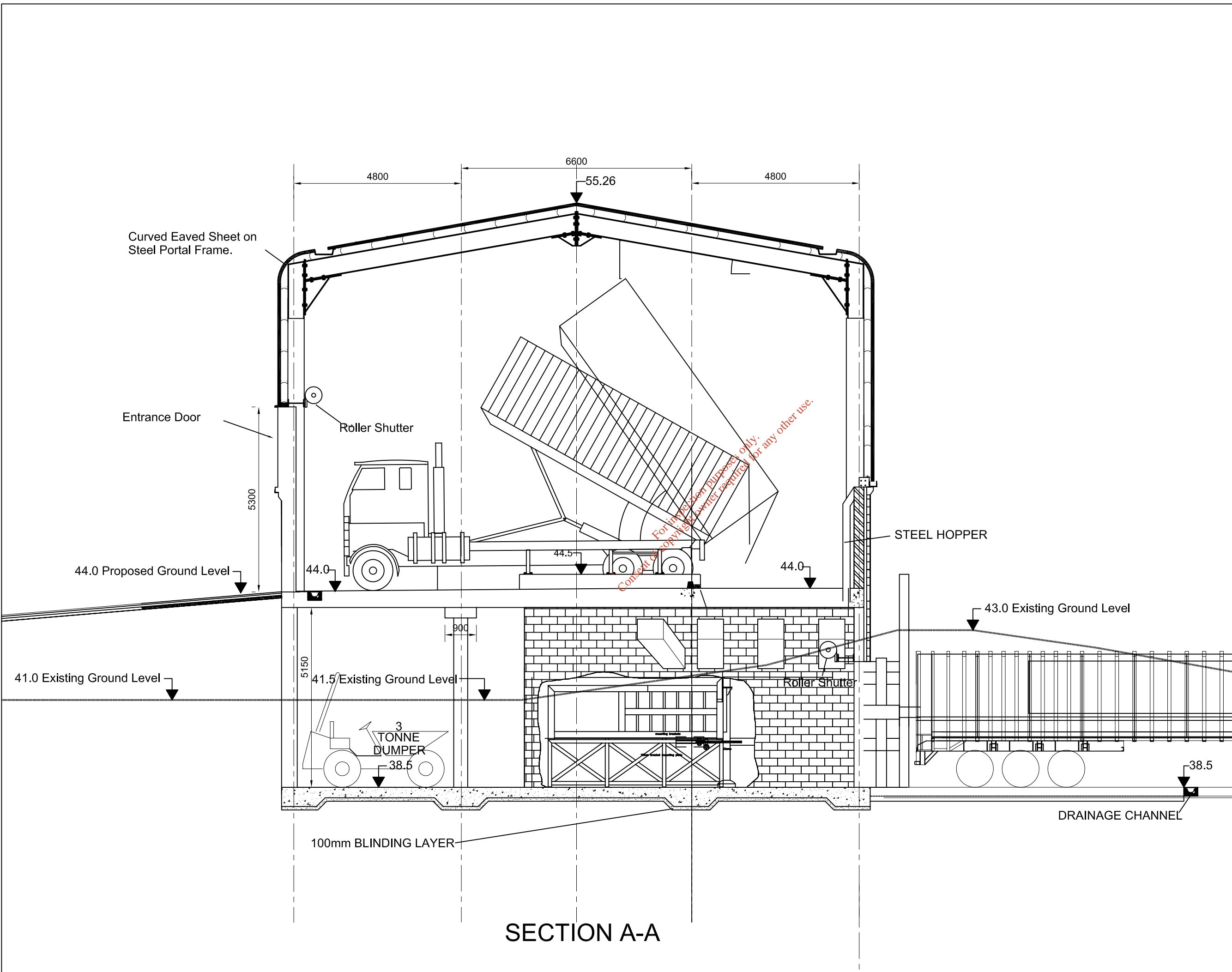
Scale @ A3: **1:100**

Prepared by:	Checked:	Date:
JO'B	OD	JUNE '07
Project Director:	B. DOWNES	

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Drawing No.: **2528-2621** Issue: **A**



SECTION A-A

- NOTES
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 4. ALL LEVELS SHOWN RELATE TO ORDINANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES
WASTE LICENCE APPLICATION

Title: DERRYCONNELL TRANSFER STATION BUILDING SECTION A-A

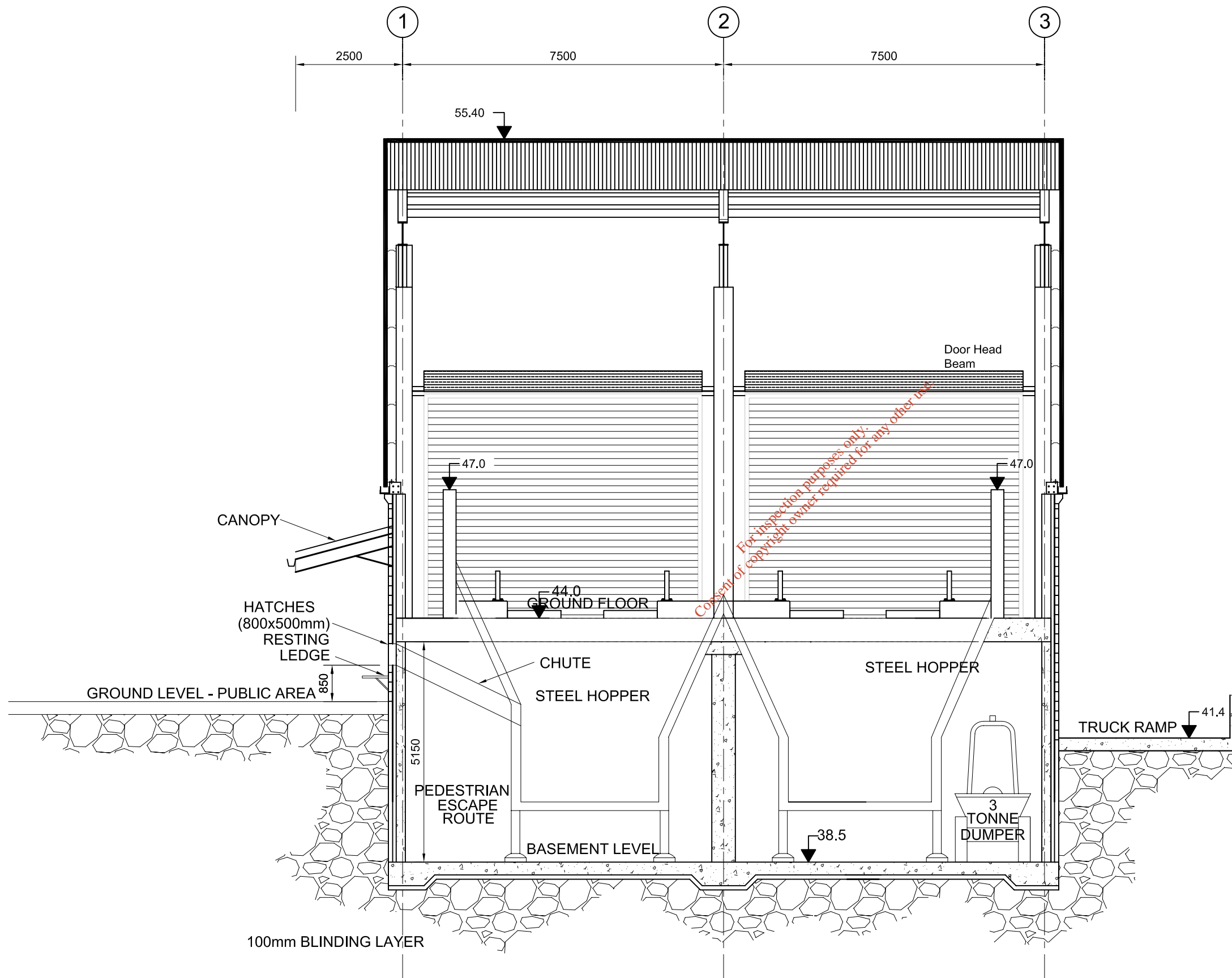
Scale @ A3: 1:100

Prepared by: JO'B	Checked: OD	Date: JUNE '07
Project Director: B. DOWNES		

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SECTION B-B

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Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: **CORK COUNTY COUNCIL**

Project: **WEST CORK WASTE MANAGEMENT FACILITIES**
WASTE LICENCE APPLICATION

Title: **DERRYCONNELL TRANSFER STATION BUILDING SECTION B-B**

Scale @ A3: **1:100**

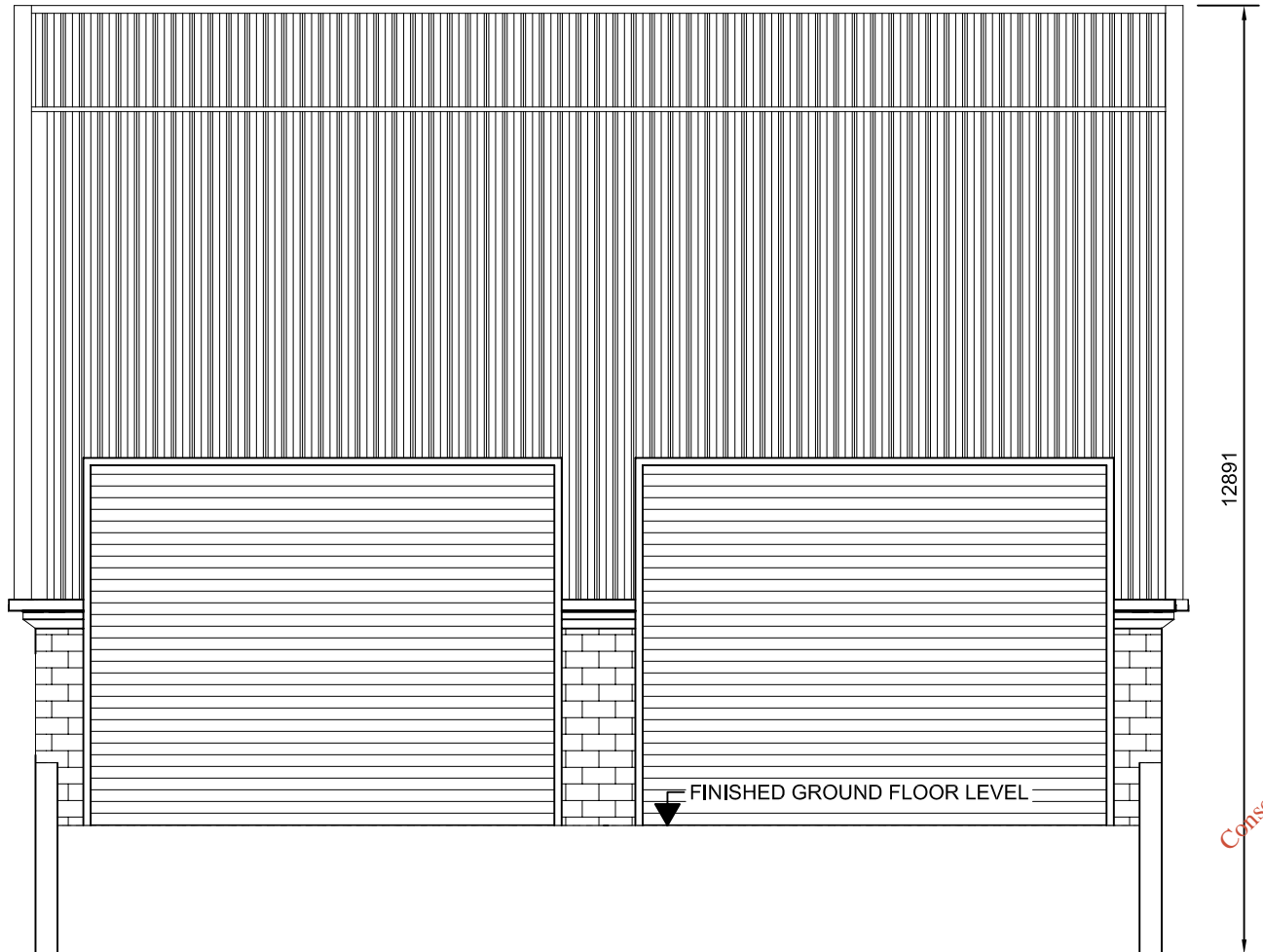
Prepared by:	Checked:	Date:
JO'B	OD	JUNE '07
Project Director:	B. DOWNES	



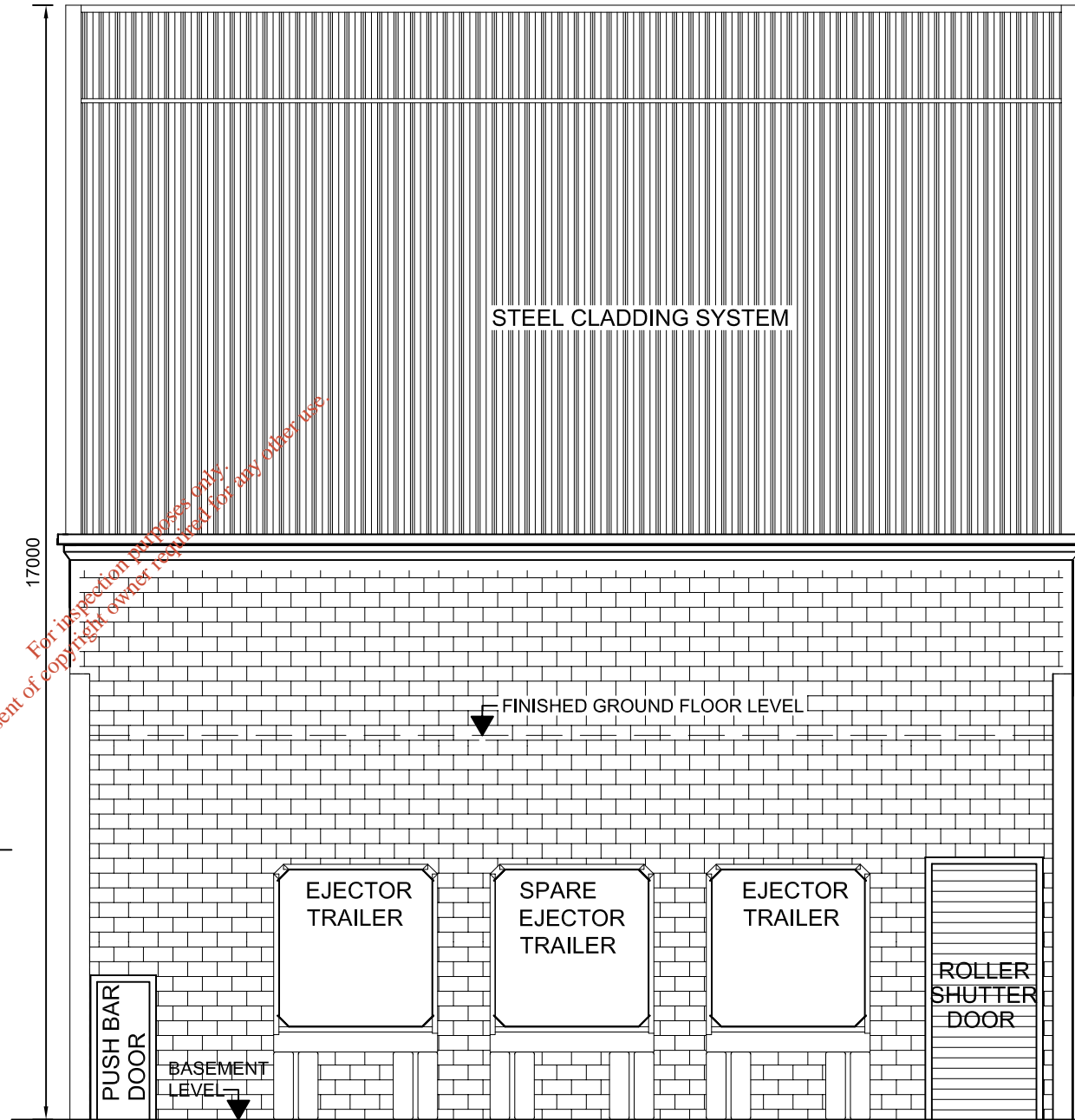
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NORTH EAST ELEVATION



SOUTH WEST ELEVATION

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Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: **CORK COUNTY COUNCIL**

Project: **WEST CORK WASTE MANAGEMENT FACILITIES**
WASTE LICENCE APPLICATION

Title: **DERRYCONNELL TRANSFER STATION BUILDING NORTH & SOUTH ELEVATIONS**

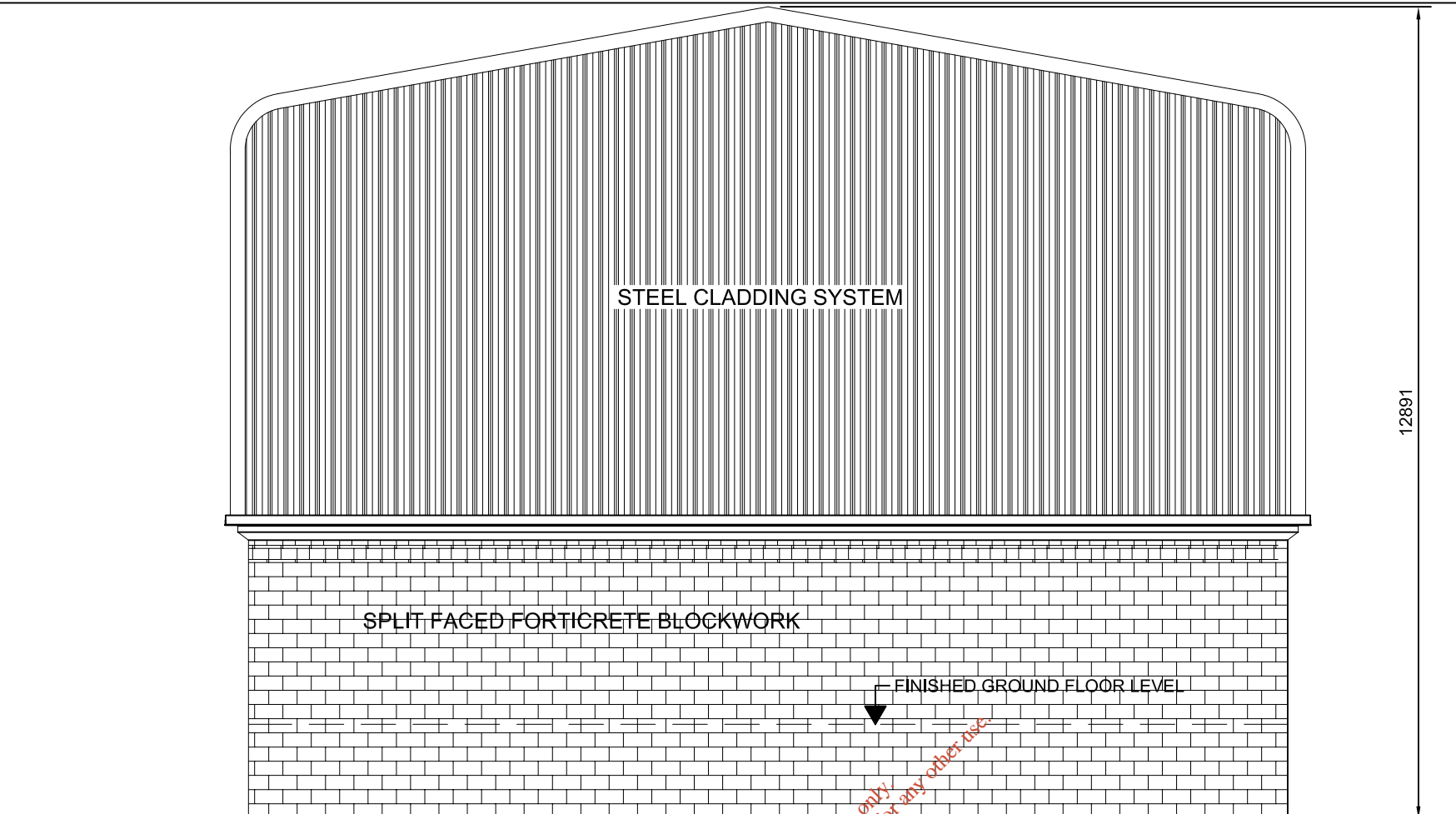
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Prepared by: **JO'B** Checked: **OD** Date: **JUNE '07**

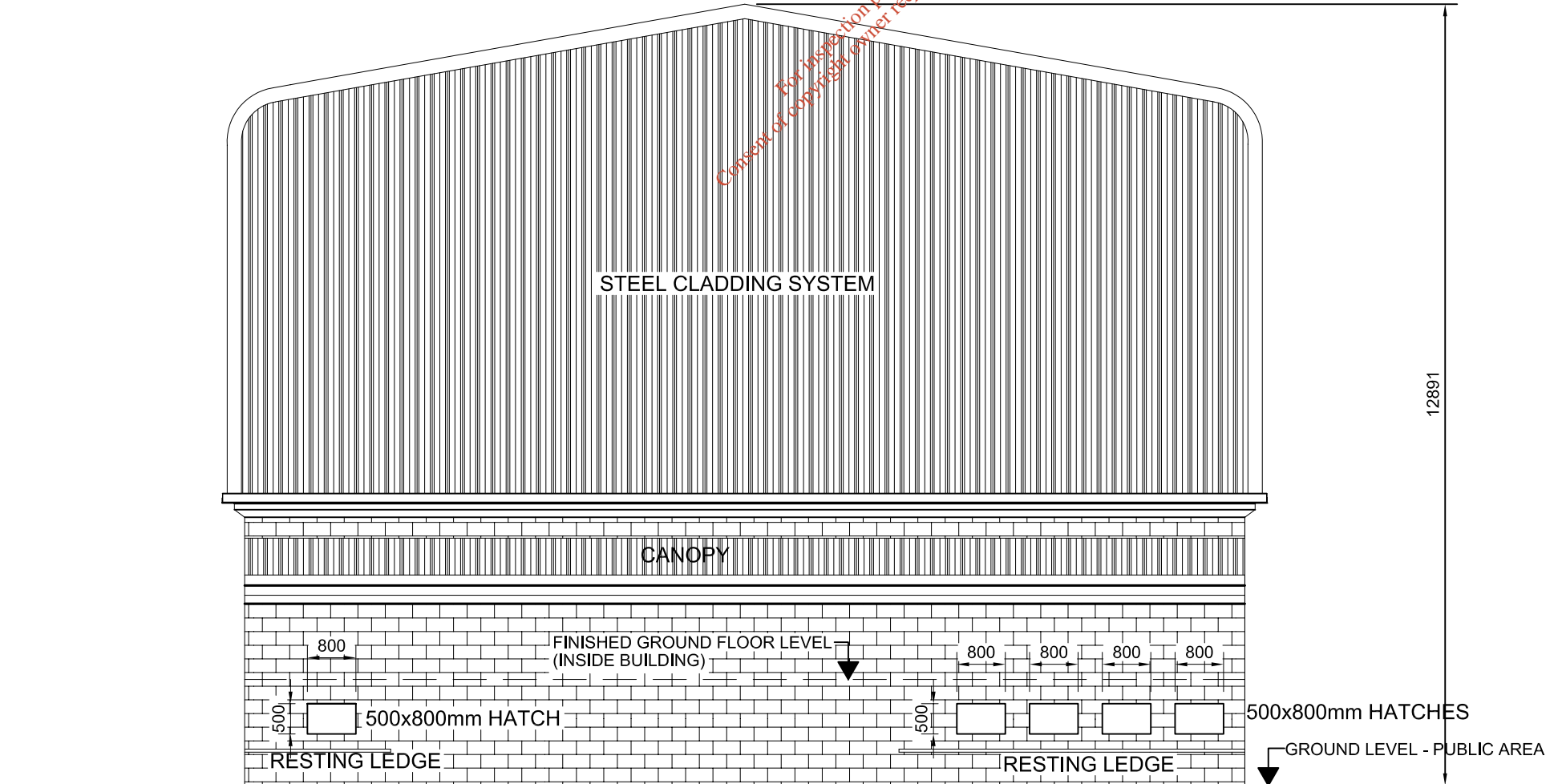
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EAST ELEVATION



WEST ELEVATION

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Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: **CORK COUNTY COUNCIL**

Project: **WEST CORK WASTE MANAGEMENT FACILITIES**
WASTE LICENCE APPLICATION

Title: **DERRYCONNELL TRANSFER STATION BUILDING EAST & WEST ELEVATIONS**

Scale @ A3: **1:100**

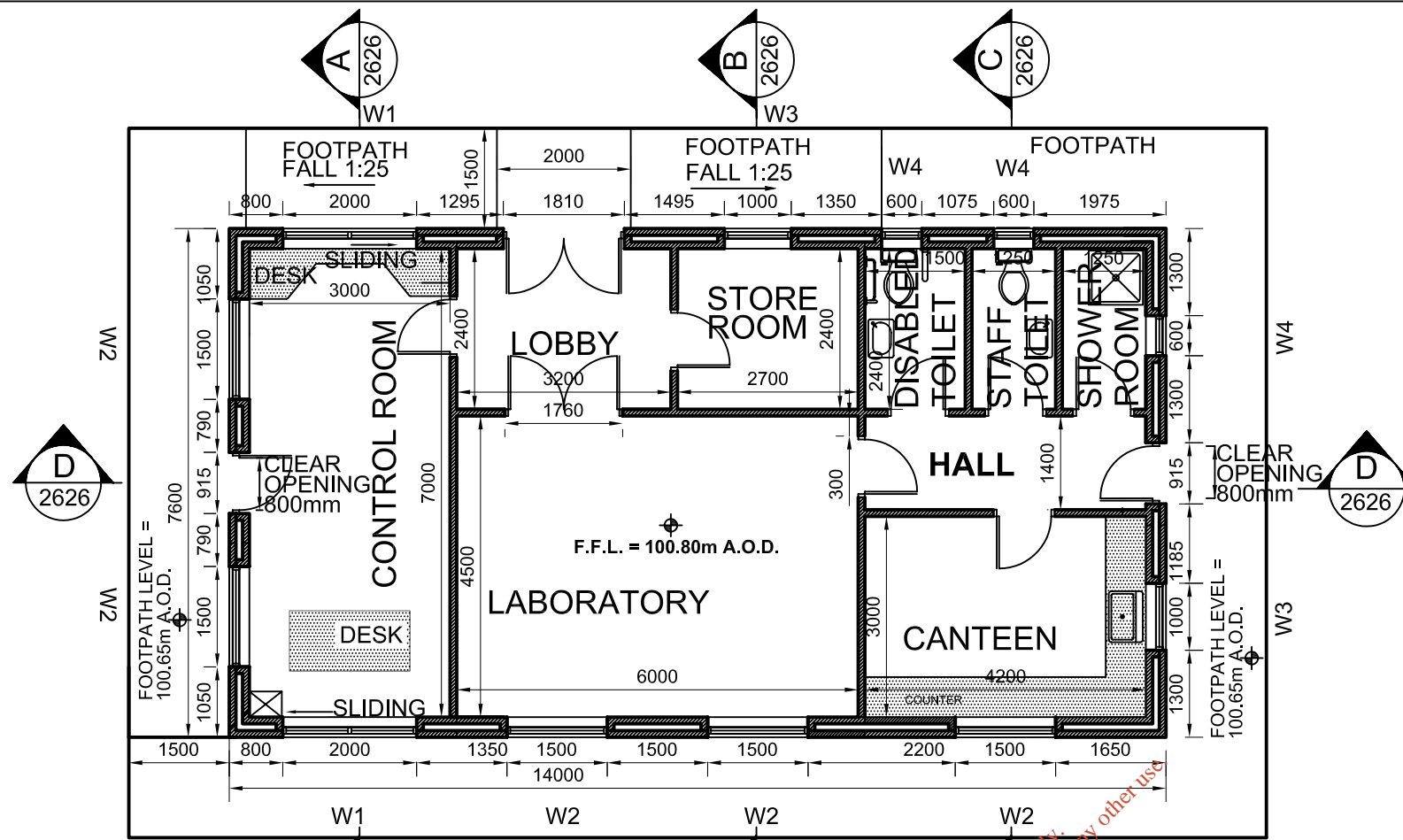
Prepared by: **JO'B** Checked: **CD** Date: **JUNE '07**

Project Director: **B. DOWNES**

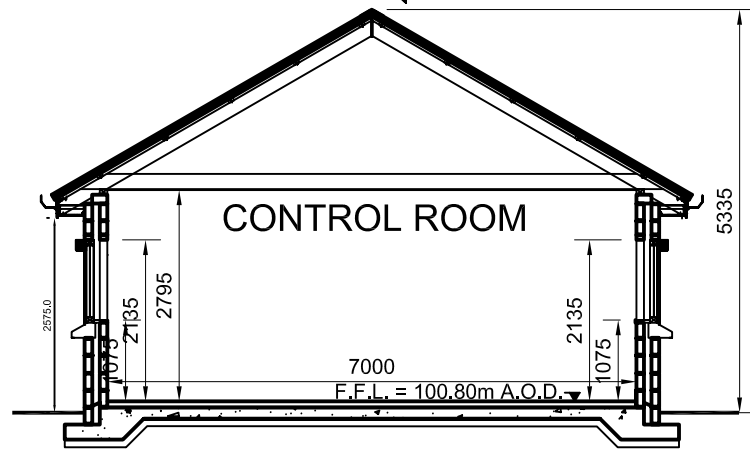
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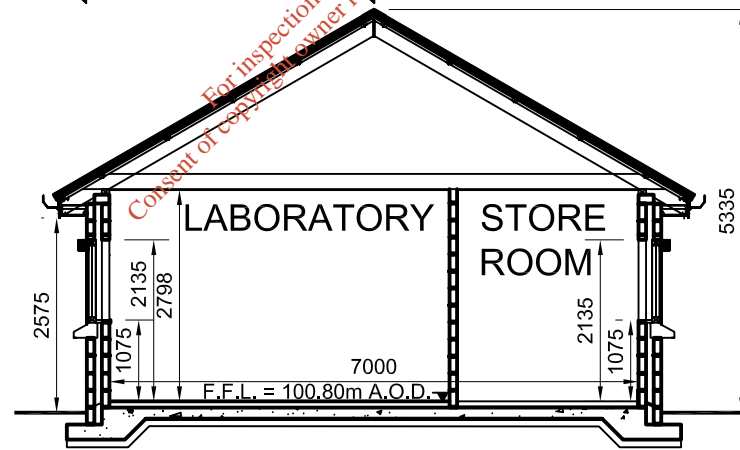
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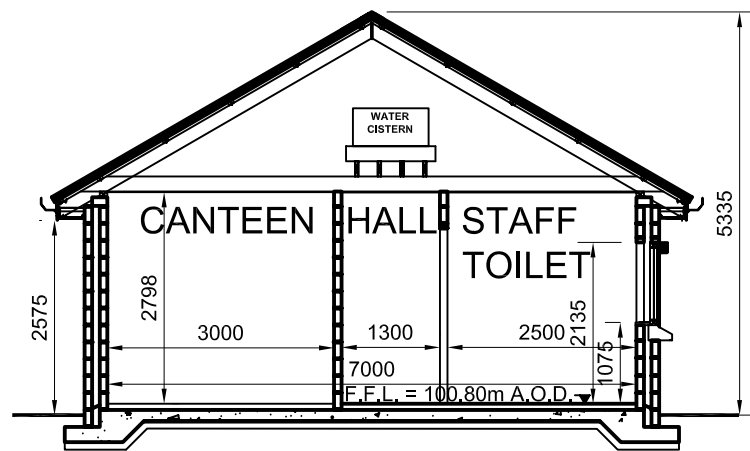
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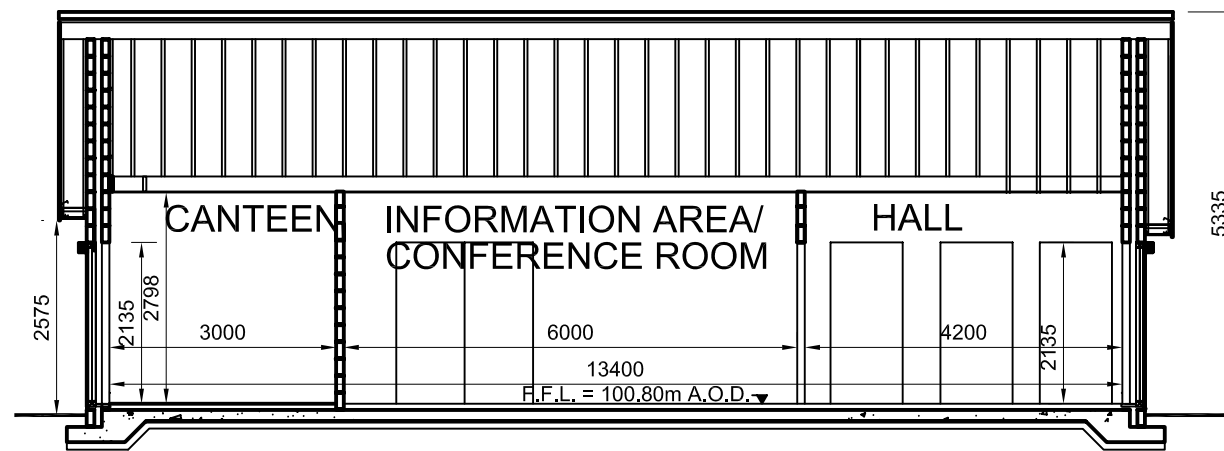
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

NOTES

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Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES
WASTE LICENCE APPLICATION

Title: DERRYCONNELL CONTROL BUILDING PLAN & SECTIONS

Scale @ A3: 1:100

Prepared by: JO'B Checked: CD Date: JUNE '07

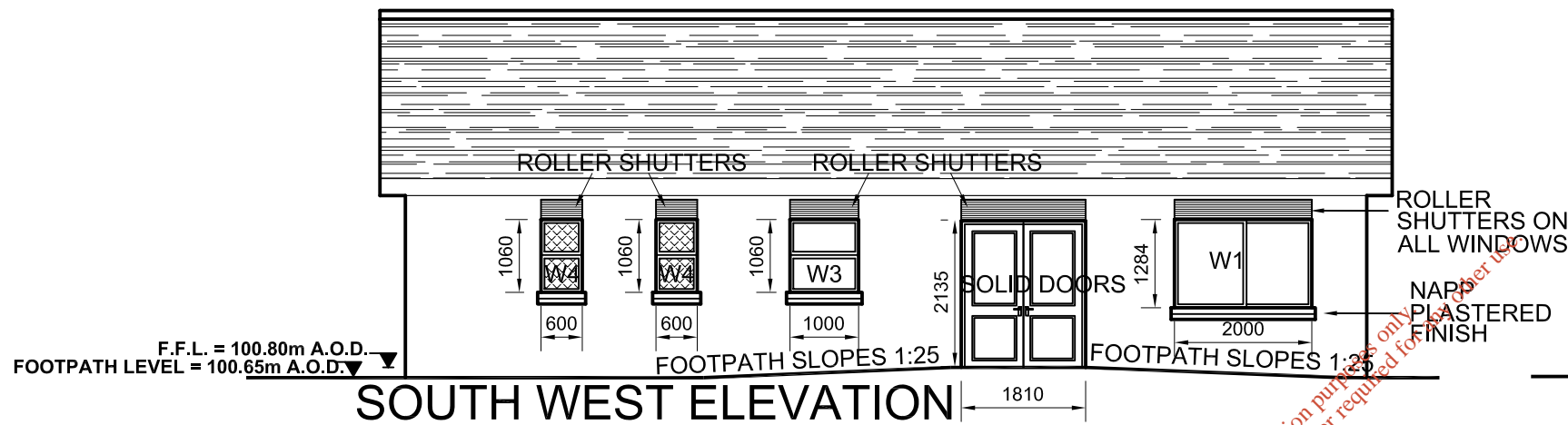
Project Director: B. DOWNES



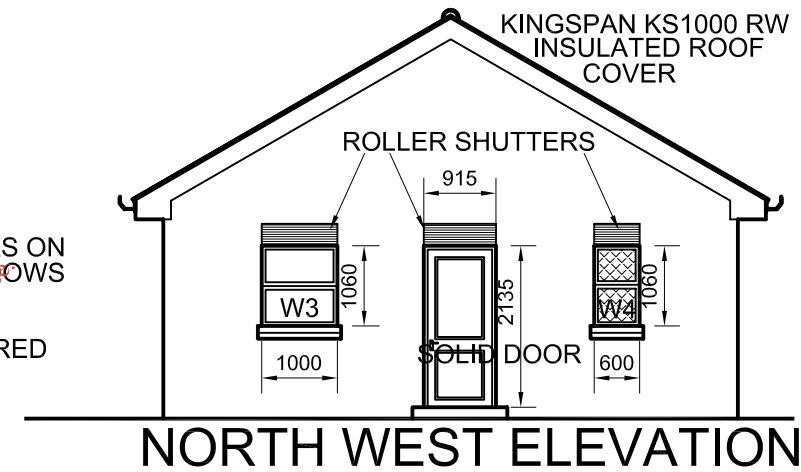
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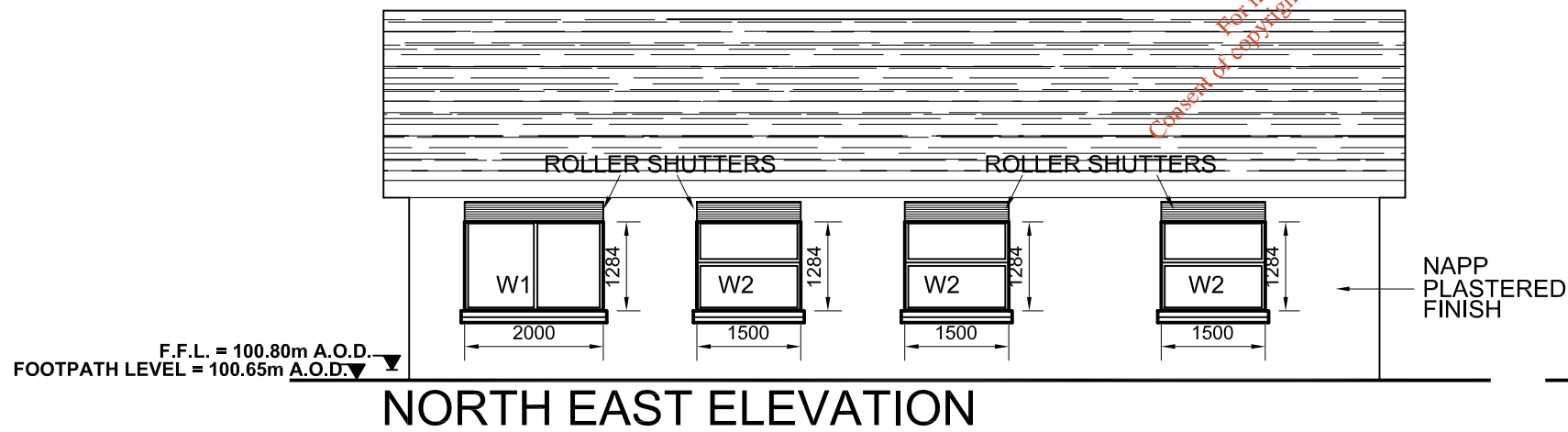
Drawing No.: 2528-2626 Issue: A



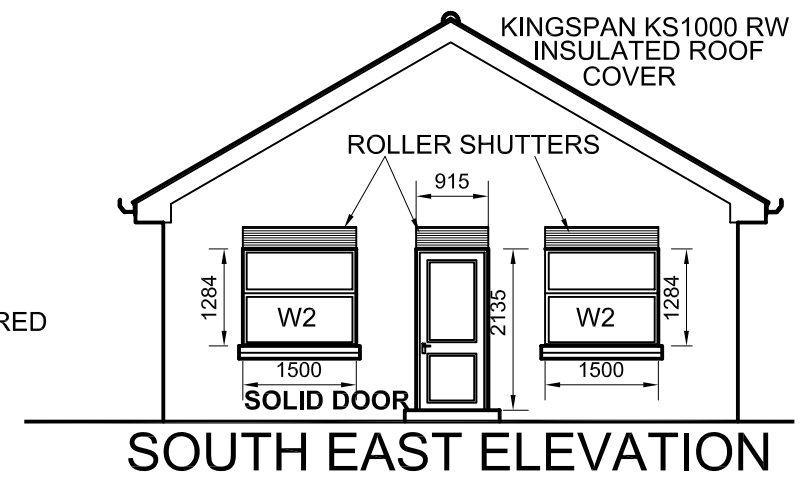
SOUTH WEST ELEVATION



NORTH WEST ELEVATION



NORTH EAST ELEVATION



SOUTH EAST ELEVATION

- NOTES**
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Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: **CORK COUNTY COUNCIL**

Project: **WEST CORK WASTE MANAGEMENT FACILITIES**
WASTE LICENCE APPLICATION

Title: **DERRYCONNELL CONTROL BUILDING ELEVATIONS**

Scale @ A3: **1:100**

Prepared by: **JO'B** Checked: **CD** Date: **JUNE '07**

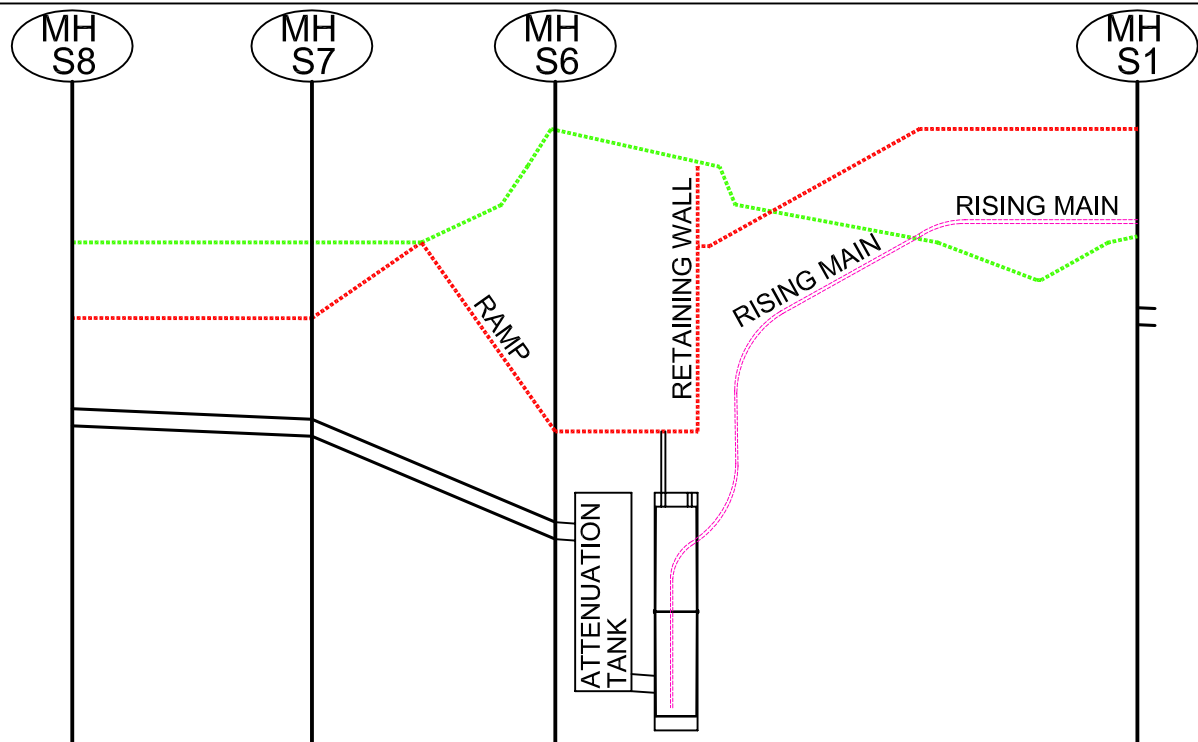
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Issue: **A**
Drawing No.: **2528-2627**



LEGEND

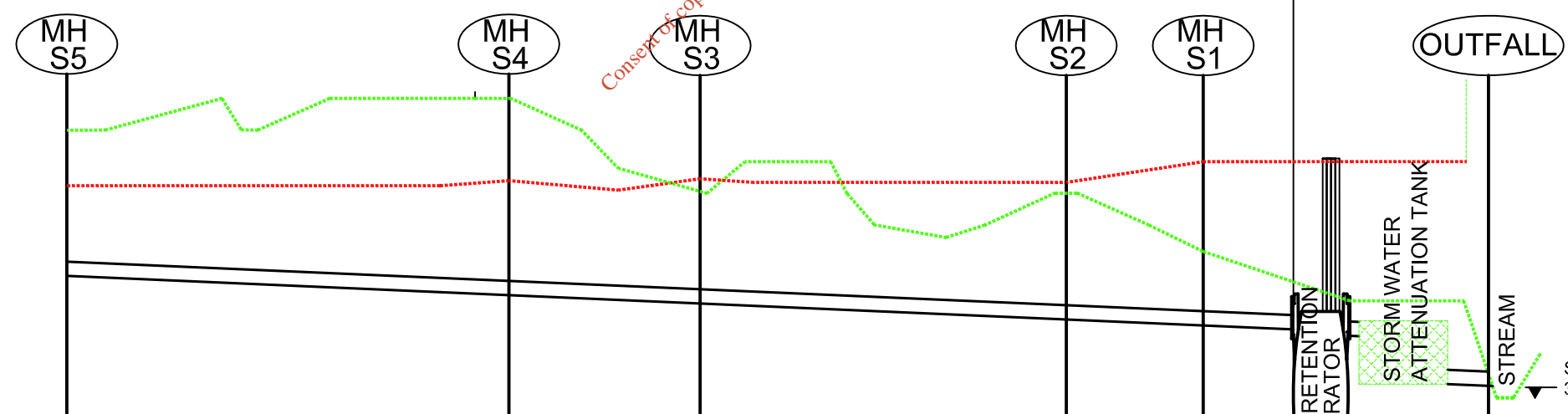
- EXISTING GROUND LEVEL
- PROPOSED GROUND LEVEL
- PROPOSED 225mmØ SURFACE WATER GRAVITY DRAINAGE
- PROPOSED SURFACE WATER RISING MAIN

DATUM 34.00m O.D.

EXISTING GROUND LEVEL	43.00	43.00	42.47	41.08
PROPOSED GROUND LEVEL	42.12	42.12	38.50	42.50
PROPOSED STORM INVERT LEVEL	38.58	38.44	37.07	41.25
CHAINAGE	0m	32m	64m	141m
PIPE GRADIENT	1:225 STORM PIPE	1:24 STORM PIPE	VARIES	
PIPE SIZE	225mm Ø uPVC STORM PIPE		100mm Ø uPVC RISING MAIN	

HORIZONTAL SCALE 1:1000, VERTICAL SCALE 1:100

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DATUM 38.00m O.D.

EXISTING GROUND LEVEL	43.00	43.50	42.00	42.00	41.08	40.59	38.95
PROPOSED GROUND LEVEL	42.12	42.00	42.23	42.23	42.50	42.50	38.74
PROPOSED STORM INVERT LEVEL	40.70	40.39	40.26	40.01	39.91	39.85	38.95
CHAINAGE	0m	70m	100m	158m	180m	194m	225m
PIPE GRADIENT	1:225 STORM PIPE						
PIPE SIZE	225mm Ø uPVC STORM PIPE						

HORIZONTAL SCALE 1:1000, VERTICAL SCALE 1:100

- NOTES**
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Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES
WASTE LICENCE APPLICATION

Title: DERRYCONNELL STORM WATER LONGITUDINAL SECTIONS

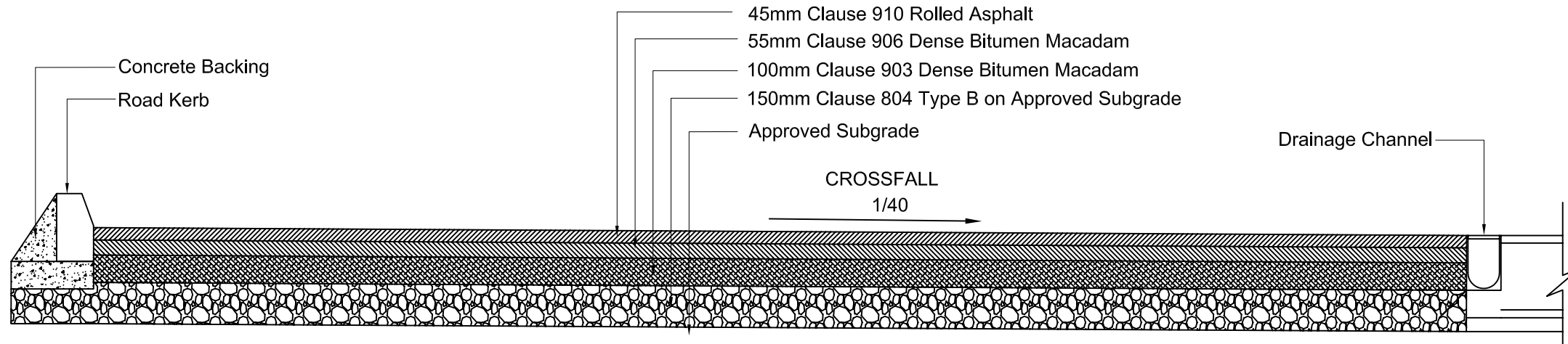
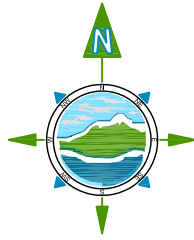
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Prepared by:	Checked:	Date:
JO'B	OD	JUNE '07

Project Director: B. DOWNES

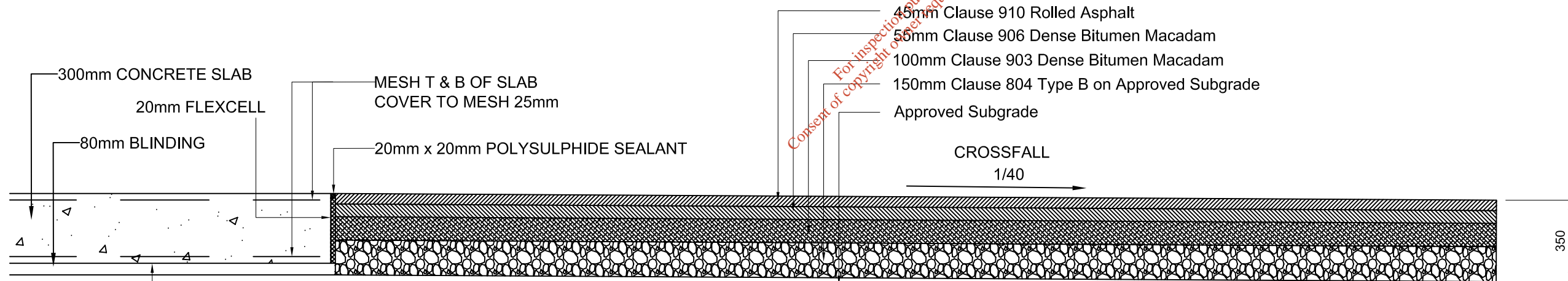
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Drawing No.: 2528-2628 Issue: A



SECTION THROUGH ACCESS ROAD/ CIRCULATION ROUTE

SCALE 1 : 25



1000- GAUGE VISQUEEN
SEPARATING LAYER ON 80mm
CONCRETE BLINDING ON CLAUSE
804
ON APPROVED SUBGRADE

ISOLATION JOINT DETAIL

SCALE 1 : 25

NOTES

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Rev	Date	Description	By	Chkd.
A	JUNE 2007	WASTE LICENCE APPLICATION	JO'B	OD

Client: **CORK COUNTY COUNCIL**

Project: **WEST CORK WASTE MANAGEMENT FACILITIES**
WASTE LICENCE APPLICATION

Title: **DERRYCONNELL ROAD CONSTRUCTION DETAILS**

Scale @ A3:	1:25	
Prepared by:	Checked:	Date:
JO'B	C.D.	JUNE 2007
Project Director:	B. DOWNES	

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Drawing No.: **2528-2629**

Revsion: **A**

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Attachment E: Emissions

Contents

Subsection	Title	Page no.
E.1	Emissions to Atmosphere	E-2
E.2	Emissions to Surface Waters	E-4
E.3	Emissions to Sewers	E-4
E.4	Emissions to Groundwater	E-4
E.5	Noise Emissions	E-4
E.6	Environmental Nuisances	E-5

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Attachment E.1: Emissions to Atmosphere

Derryconnell Landfill has been operating since 1985 years but due to lack of available space, it is likely to close in early 2008. A Waste Transfer Station and Civic Amenity Area is proposed for the site but no changes are being made to the landfill itself at this time. Once the landfill section of the site is closed, domestic waste will continue to be accepted onsite but will be compacted and transferred to another licensed facility for disposal. Following closure, the site will therefore act as a transfer station as opposed to a landfill.

Attachment E.1.a – Landfill Gas Emissions

Landfill gas emitted from the decaying landfill waste must be currently monitored at 14 no. locations (L1, L2, L4 L5, L6, L7, L8, the site office and the landfill gas flare as well as all groundwater wells) as specified in Schedule F.5 of Waste Licence W0089-01. These are tested on a monthly basis at the gas boreholes, vents and wells and weekly at the site office. Measurement of the following parameters is conducted: methane (CH₄), carbon dioxide (CO₂), oxygen (O₂), atmospheric pressure and temperature. The licence also specifies methane and carbon dioxide limits of 20% LEL (1% v/v) and 1.5% v/v respectively in any building on or adjacent to the landfill, including the site office.

Results from monitoring in 2006 indicate that, as expected, the highest levels of methane are being produced within the landfilled area at four boreholes L1, L2, L4 and L8 (previously L3) with a maximum level of methane at L2 in July and August (61%). Elevated levels were also recorded at L8 in July and August (57%) and L4 in November (57%). The greatest fluctuation occurred at L2 where values ranged from 61% to 4.9%. Levels were more stable at the remaining leachate wells.

Two of the leachate wells are located outside of the landfilled area L5 and L6. At L5 methane was detected on one occasion at a low concentration of 0.1%. Carbon dioxide was detected throughout the monitoring period with the exception of four samples and ranged from 0.1% (August and September 2006) to 7.6% (November 2006). Results from L6 indicated levels of methane at a concentration of 0.1% methane on one occasion in November. Carbon dioxide in L6 was detected in all but two samples and ranged from 0.2% (November and December 2006) to 6.9% (August).

An AFS gas flare unit is used to burn landfill gas emitted from the landfill. Monitoring of the exhaust is undertaken for NO_x, SO₂, CO, HCl, HF, TA Luft Organics and particulate matter, either on an annual or biannual basis (depending on the parameter). Further information on the monitoring schedule is detailed in attachment F.9. The gas was tested in May 2006 for the listed parameters.

Table E-1: Landfill Gas Monitoring

Parameter	Emission Value	Emission Limit ¹
Nitrogen Oxides (mg/m ³)	36	150
Carbon Monoxide (mg/m ³)	6	50
Sulfur Dioxide (mg/m ³)	6	-
Temperature (oC)	877.2	-
TA Luft Class I	<1.90	20
TA Luft Class II	<1.90	100
TA Luft Class III	<1.90	150
HCl	2.66	50
HF	0.1	5
Particulate	2.54	130

¹ As specified in Schedule F.5 of Waste Licence W00089-01

All parameters tested in the emissions from the flare unit were found to be within the limits specified by the waste licence.

The landfill operating on this site is expected to close in early 2008 however, landfill gas monitoring will continue. Aftercare and monitoring of the facility will continue on a biannual basis and will measure the gas emissions at L1, L2, L3, L4, L5, L6 and L7. Less gas will be produced as the decomposition of the landfilled material occurs and therefore the impact caused by the production of landfill gas will decrease.

The Waste Transfer Station and Civic Amenity Facility proposed for the site will not produce any landfill gas. For this reason, there will be no additional impacts on air quality caused by landfill gas from the proposed development.

Attachment E.1.b – Leachate Gas Emissions

See Attachment E.1.a

Attachment E.1.c - Odour Emissions

An odour assessment was conducted in 1999 which consisted of a full simulation of the landfill gas emissions and air dispersion modelling. The model determined that the worst case condition would arise in 2003 at a point 165 metres from the landfill. The predicted odours levels were all below the odour detection limits under this worst case scenario with a minimum safety factor of 2. It identified that the most significant odour problems were likely to arise from three landfill gas pollutants; ethyl mercaptan, hydrogen sulphide and methyl mercaptan which are likely to be emitted from the leachate lagoon. Following installation of the flare there have been no odour complaints at the site.

It is unlikely that there will be any generation of odours as a result of the proposed waste transfer and civic amenity facility operatives onsite. The potential for odour generation at the site will be minimised as follows:

- landfilling operations will cease in early 2008 and the landfill will be capped in accordance with Licence W0089-01.
- waste for disposal shall be compacted within 12 hrs of acceptance at the facility.
- the waste will have undergone relatively little decomposition due to the quick turnaround times for removal of waste from site.
- all compacted mixed municipal waste or waste with the potential to cause odour nuisance, shall be removed from the facility within 48 hrs of being compacted at the site, with the exception of Bank Holiday weekends, when a limit of 72 hrs shall apply.
- the transfer and compaction of waste will take place in sealed containers.
- construction and demolition waste, dry recyclable materials and wood will not be stored on site for a period longer than 3 months.

Attachment E.1.d - Dust Emissions

Dust monitoring is conducted on site 3 times per year in accordance with licence W0089-01. The level of dust deposition is measured at four locations around the site as shown on Drawing 2528-2616A. Results for 2006 are included in Table I-1 and I-2 of Attachment I. Levels measured at three of the four monitoring locations were below the limit of 350mg/m²/day as specified in Schedule F.3 of the licence.

Further dust monitoring was conducted from the 14/03/07 to 12/04/07 at 4 no. points in the location of the development now proposed. These results are shown in Table I-2. Dust levels around the proposed Transfer Station and Civic Amenity Facility were all below the limit of 350mg/m²/day except for D9 (585 mg/m²/day). The elevated results are likely to have been caused by rotary drilling for Subsoil Investigation purposes which was being undertaken in the vicinity of the monitoring station.

The impact of exhaust emissions on ambient air quality, from vehicles entering the site, is expected to be minimal.

These measures, together with good housekeeping practices and staff awareness will minimise dust emissions therefore it can be concluded that the dust emissions to atmosphere from operations at the facility will be minimal.

Attachment E.2: Emissions to Surface Waters

Landfill

Surface water in the landfill area is managed in two sections. First, surface water collecting in the perimeter drain along the western and southern boundaries of the site drains to pump sump no. 1. Then, the surface water collecting in the perimeter drain along the eastern and northern boundaries of the site drains to the monitoring sump adjacent to the reception area. A silt trap is installed upstream of both monitoring sumps before being discharged to surface water at SW7 and SW4 respectively.

Continuous monitoring of flow, electrical conductivity, pH and TOC is undertaken as per condition 9.5 of the licence. If these parameters are measured to be above the emission limits set out in the licence, flow is diverted to the leachate lagoon via a 80mm HDPE rising main and a 100mm HDPE rising main respectively.

Details of the surface water collection system and emission points for surface water are shown in Drawing 2528-2613A.

Civic Amenity Facility and Transfer Station

Surface water onsite is managed in two sections. Firstly, surface water is collected via drainage channels at the container collection level and basement level to the Southern and Eastern parts of the site as shown in drawing 2528-2613A. This area drains to a surface water attenuation tank. Surface water is pumped from the pump sump, which is downstream of the attenuation tank, up to manhole S1.

In section 2 of the surface water management system, surface water is collected at the public and upper truck areas via drainage channels and gulleys along the Western and Northern boundaries of the site. This surface water flows to manhole S1, through the surface water attenuation tank, through the Oil Interceptor and finally discharges to the stream at manhole S9.

Foul sewage from the existing activity is treated by means of a septic tank and percolation area. Foul sewage from the proposed facility will flow to a wastewater treatment plant and the effluent will be pumped up to the existing leachate lagoon.

Attachment E.3: Emissions to Sewer

There will be no emissions to sewer from the facility.

Existing Foul Emissions are gravity fed to the septic tank and percolation area on site. Foul sewage from the proposed facility will flow to a wastewater treatment unit and the effluent will be pumped up to the existing leachate lagoon. The leachate is removed by Cork County Council on a regular basis and sent to Bandon WWTP for treatment.

All Storm Water collected on site will pass through a full retention separator (Oil Interceptor) prior to being discharged to adjoining boundary stream.

Attachment E.4: Emissions to Groundwater

The proposed Waste Transfer Station and Civic Amenity Facility will be located on areas of hardstanding and will not have any emissions to groundwater. Monitoring of groundwater quality is undertaken at 7 no. locations: GW1, GW2, GW4, GW5, GW6, GW7 and GW8 on a quarterly basis as per Schedule E of licence W0089-01.

Attachment E.5: Noise Emissions

Noise surveys are carried out at the existing landfill as required by schedule E.4 of licence W0089-01.

Schedule F.1 of the licence specifies maximum noise levels which are applicable to the noise sensitive location NSL1 of 55 dB(A) L_{Aeq} (30min) for Daytime (08:00-22:00) and 45 dB(A) L_{Aeq} (30min) for Nighttime (22:00-08:00)

The licence does not specify limits at the noise monitoring stations N1-N8. However, the above is used as a guideline for all noise monitoring points.

Noise from the proposed Waste Transfer Station and Civic Amenity Facility is unlikely to increase significantly the noise levels currently experienced. Noise may arise from operational plant at the proposed Waste Transfer Station and Civic Amenity Facility as well as from traffic to and from the site. Compaction operations, however, will be housed in a building to minimise noise emissions and traffic movements will be limited to normal opening hours and so operations at the facility will not be expected to have a significant impact on existing background noise levels. The maximum annual tonnage of municipal waste to be brought to the site will remain at the licensed figures of 14,000 tpa.

A noise monitoring survey for the proposed waste recovery facility has been carried out to establish background noise levels at 4 no. monitoring points. This will allow a comparison to be done to assess the impact of noise at the new facility once it is operational. Results from the noise survey range from 45.4 dB(A) L_{Aeq} (30min) at N9 to 69.4 dB(A) L_{Aeq} (30min) at N12. Noise at N12 was found to be higher than the guidance specifies however, the dominant noise at this location was passing traffic. This point is located adjacent to a busy road (R592) and 118 vehicles were counted during the 30-minute period. See Attachment I.6 for full report.

Further noise monitoring on all points will be carried out annually.

Attachment E.6: Environmental Nuisances

Attachment E.6 (i) – Bird Control

The facility operates a bird control programme with Bird Control Ireland. The project consists of a monthly visit by the specialists. Good housekeeping measures and the daily coverage of the working landfill area reduces the risk of attracting birds to the site.

Also, a supply of the following items is kept onsite to assist in the prevention of scavenging birds.

- Helekite
- Hawk Kites
- Helegas 7.82cuM & Regulator
- Winch & Base plate
- Planner Board
- Bird Scaring Pistol
- 50 M Bang Cartridge

Attachment E.6 (ii) - Dust Control

Dust levels will be kept to a minimum on site as all areas with the proposed Transfer Station and Civic Amenity Facility will be paved and high levels of housekeeping will be maintained.

Attachment E.6 (iii) - Fire Control

Fires will be treated as an accident/emergency situation and dealt with in accordance with the site emergency procedures (see attachment J – Emergency Response procedures).

The following measures will minimise the risk of fire:

- Site staff will be trained in the site emergency procedures in the event of fire
- Site visitors will be made aware of emergency procedures
- Appropriate fire fighting equipment will be available on site
- Storage of flammable liquids on site will be kept to a minimum
- Fire fighting equipment will be maintained and inspected regularly
- Fire alarms will be tested regularly

Attachment E.6 (iv) - Litter

Operational procedures at the facility will ensure that litter generation is minimised at all times. Waste will be deposited directly into the appropriate storage containers and any waste that escapes will be immediately collected. The site staff will collect any loose litter that may occur at the site on a daily basis. The ongoing daily coverage of the working landfill area will reduce the risk of causing litter onsite.

The site did previously experience problems with litter control but in 2004, the litter netting system was upgraded. An entirely new litter netting system was put in place, which was twice the height of the previous system. The netting was moved from cell 2 to cell 3 as cell 2 is no longer in use. This system has proven to be very efficient in the prevention of litter blowing away from the working cell.

Attachment E.6 (v) - Traffic Control

Vehicles disposing of municipal waste at the site will be weighed at the weighbridge on entry and exit and the weights of waste recorded. Loaded ejector trailers of compacted waste will be weighed when leaving the site in order to record the weight of waste leaving the site.

Movement of vehicles over the weighbridge and into the site will be controlled using electric traffic control barriers operated from the Control Building.

All public traffic throughout the Civic Amenity Area will move in a one-way system, which will be clearly marked as shown on drawing 2528-2612A. Site signage will direct the public to the appropriate container. Adequate parking for staff and visitors will be provided throughout the site.

Attachment E.6 (vi) – Vermin and Flying Insects

At the Transfer Station and Civic Amenity Area, good housekeeping measures will reduce the risk of attracting vermin and insects to the site. These measures include:

- the compaction of waste into sealed containers
- the removal of any litter accumulating in the area and disposal on a regular basis,
- the immediate compaction of all mixed waste materials and subsequent storage in a sealed container.
- the regular removal of all biodegradable waste from the civic amenity area.

Cork County Council employ Arrest A Pest Ltd., a pest control specialist for vermin control. Fly spraying will occur periodically as required. These pest control specialist visits the site as required.

A written record will be kept at the facility of the programme for the control and eradication of vermin. These records shall include the following:

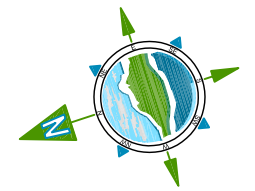
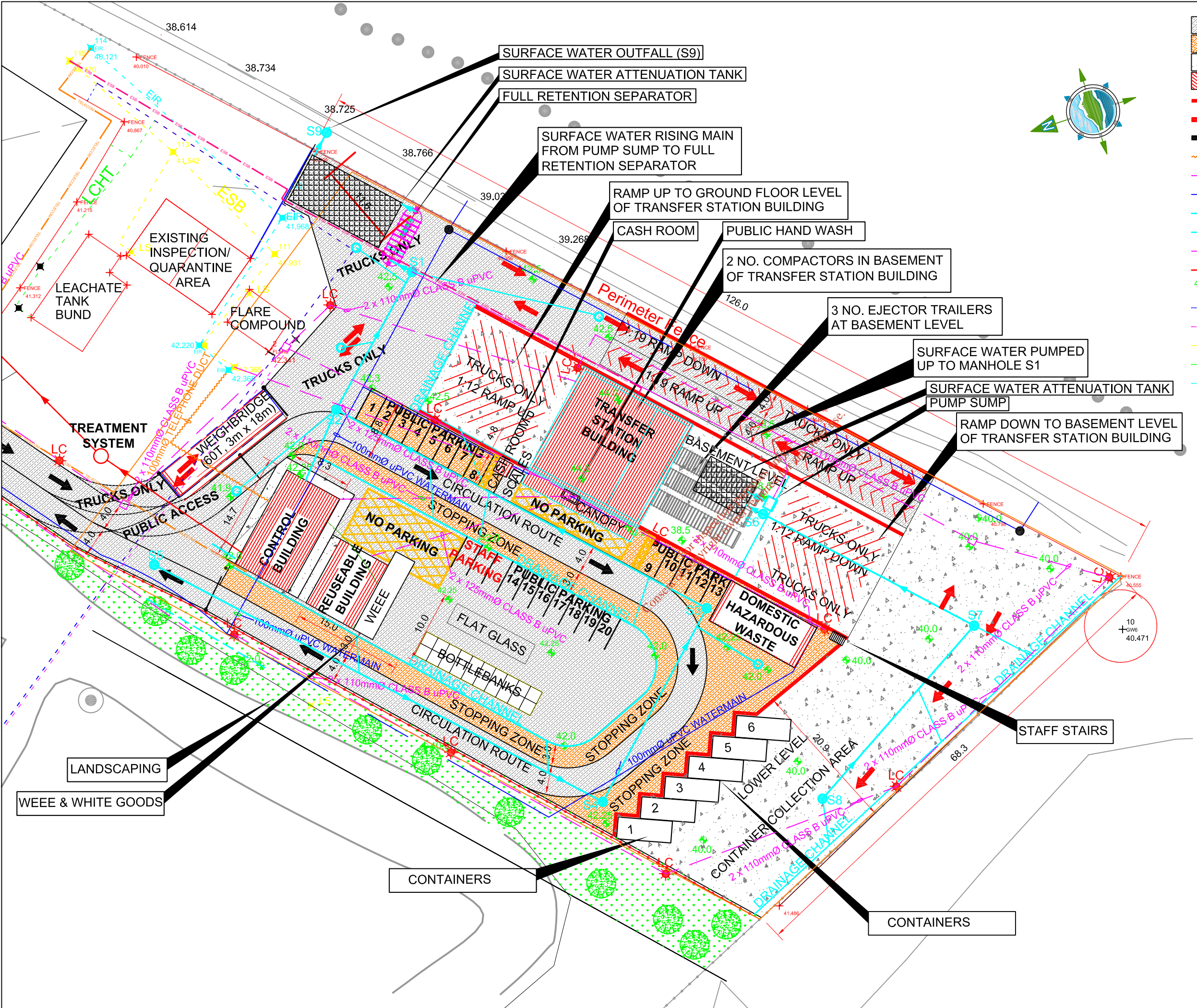
- Contractors details
- Contractors logs and site inspection reports
- Details of pesticides used
- Operator training details
- Details of any infestations
- Mode, frequency, location and quantity of application
- Measures to contain pesticides within the facility boundary

Attachment E.6 (vii) - Road Cleansing

The site roads are maintained in a clean and tidy state at all times. This eliminates any potential for soiling of the public roads outside the site. In the unlikely event of public roads being soiled, Cork County Council road sweeper vehicles will be employed to clean up. The use of the wheel wash during landfilling and restoration operations will reduce the risk of the access roads becoming soiled.

Attachment E.6 (viii) - Scavenging

Scavenging does not take place on site. Cork County Council has installed a CCTV system on site at Derryconnell.



- LEGEND**
- ASPHALT CIRCULATION AREA
 - COLOURED ASPHALT STOPPING ZONE
 - CONCRETE HARDSTAND
 - BUILDINGS
 - RETAINING WALL
 - TRUCK CIRCULATION ROUTE
 - PUBLIC CIRCULATION ROUTE
 - TELEPHONE DUCTING
 - ELECTRICAL DUCTING
 - WATERMAIN
 - DRAINAGE CHANNELS
 - SURFACE WATER DRAINAGE
 - SURFACE WATER RISING MAIN
 - FOUL SEWERAGE
 - PROPOSED LEVELS
 - EXISTING SURFACE WATER DRAINAGE
 - EXISTING GAS COLLECTION
 - EXISTING ESB DUCTING
 - EXISTING LEACHATE PIPEWORK
 - EXISTING EIRCOM DUCTING

- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES
WASTE LICENCE APPLICATION

Title: DERRYCONNELL SITE LAYOUT PLAN SHOWING SERVICES (SHEET 1 OF 2)

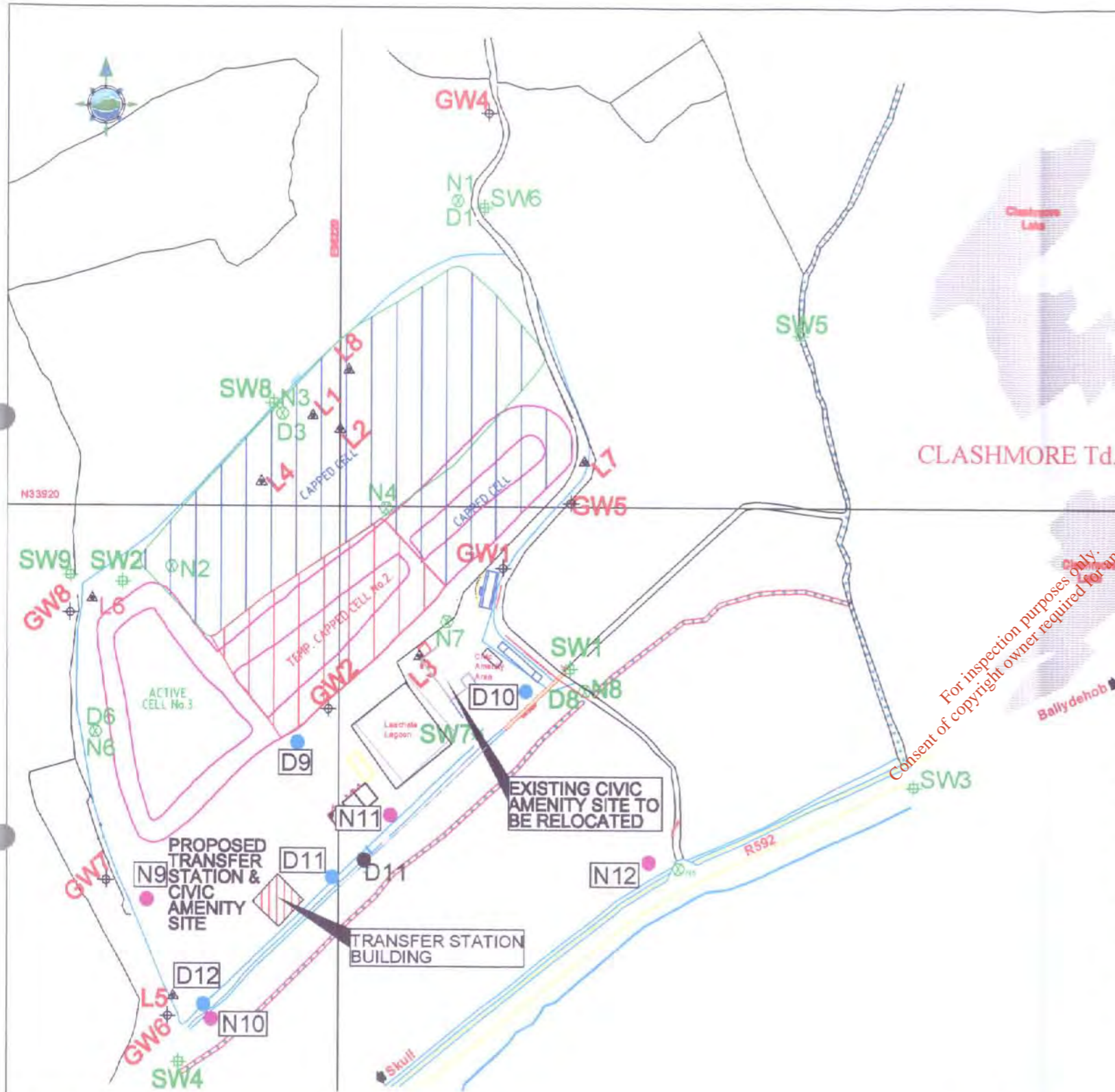
Scale @ A3: 1:500

Prepared by: JO'B Checked: Date: JUNE '07

Project Director: B. DOWNES

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www.tobin.ie

Drawing No.: 2528-2613 Issue: A



(A) COMBINED LEACHATE AND GAS MONITORING.

L1	96206 E	33964 N
L2	96220 E	33957 N
L3	96260 E	33847 N
L4	96181 E	33932 N
L5	96138 E	33683 N
L6	96097 E	33875 N
L7	96342 E	33942 N
L8	96225 E	33986 N

(B) SURFACE WATER

SW1	96335 E	33841 N
SW2	96112 E	33883 N
SW3	96507 E	33785 N
SW4	96140 E	33651 N
SW5	96450 E	34003 N
SW6	96292 E	34064 N
SW7	96290 E	33810 N
SW8	96187 E	33970 N
SW9	96086 E	33886 N

(C) NOISE AND DUST

N1, D1	96279 E	34068 N
N2	96136 E	33890 N
N3, D3	96191 E	33965 N
N4	96243 E	33919 N
N5	96390 E	33745 N
N6, D6	96098 E	33811 N
N7	96274 E	33864 N
N8, D8	96343 E	33831 N

(D) GROUNDWATER

GW1	96302 E	33890 N
GW2	96215 E	33822 N
GW3	96225 E	33986 N
GW4	96294 E	34110 N
GW5	96336 E	33922 N
GW6	96135 E	33674 N
GW7	96104 E	33739 N
GW8	96085 E	33868 N

LEGEND

- N12 ● NOISE MONITORING POINTS (ADDITIONAL)
- D12 ● DUST MONITORING POINTS (ADDITIONAL)
- SW9 # SURFACE WATER MONITORING POINTS (EXISTING)
- GW8 + GROUND WATER MONITORING POINTS (EXISTING)
- L6 ▲ LEACHATE MONITORING POINTS (EXISTING)
- D6, N6 ⊙ DUST & NOISE MONITORING POINTS (EXISTING)

ADDITIONAL MONITORING POINTS

(C) NOISE AND DUST		
N9	096124 E	033730 N
N10	096156 E	033672 N
N11	096246 E	033770 N
N12	096375 E	033748 N
D9	096199 E	033805 N
D10	096314 E	033831 N
D11	096217E	033741 N
D12	096152 E	033679 N

- NOTES**
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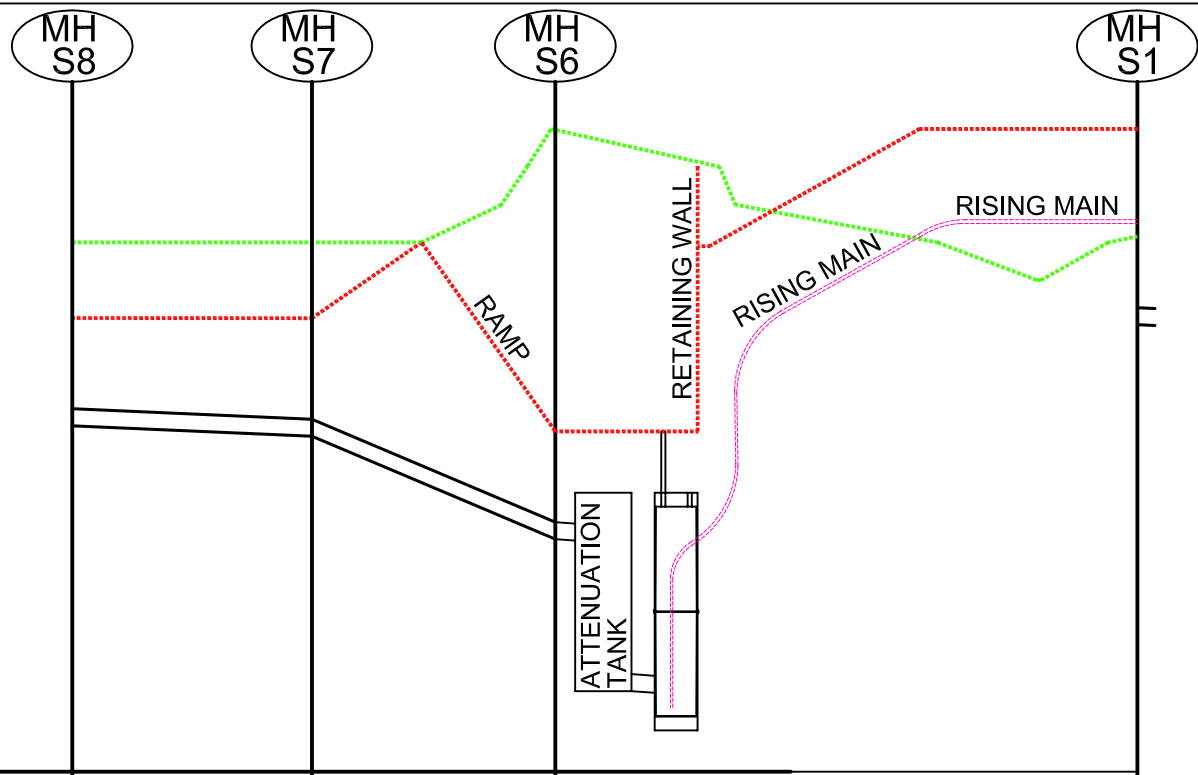
Issue	Date	Description	By	Chkd.
A	JUNE 2007	WASTE LICENCE APPLICATION	JOB	CD

Client:	CORK COUNTY COUNCIL	Prepared by:	JOB
Project:	WEST CORK WASTE MANAGEMENT FACILITIES	Checked:	C.D
Title:	DERRYCONNELL MONITORING POINT LOCATIONS	Date:	JUNE '07
		Project Director:	B.DOWNES
		Scale @ A3:	1:2500

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Drawing No.: **2528-2616** A



LEGEND

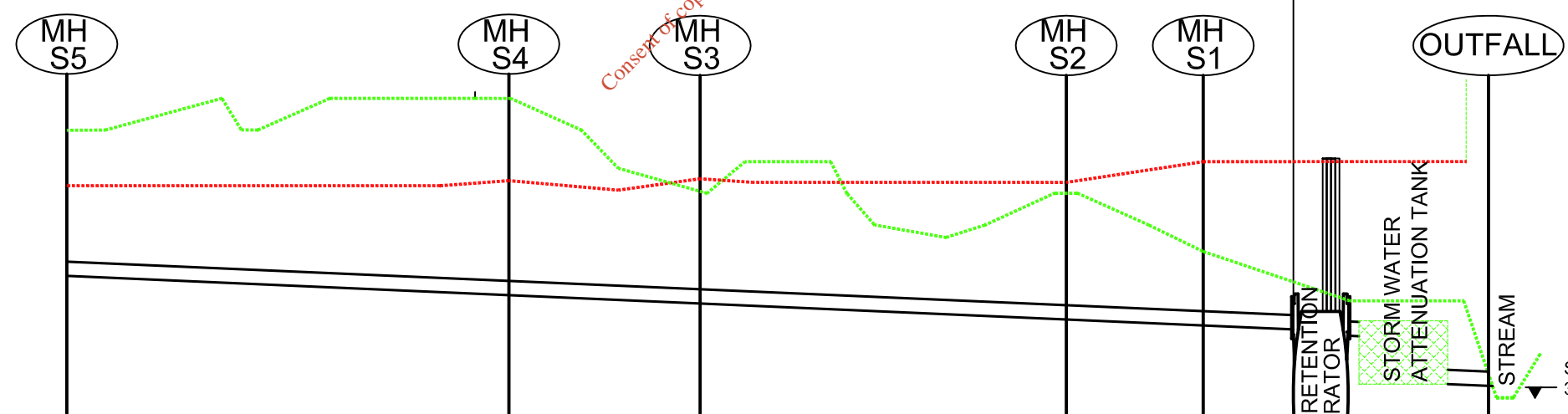
- EXISTING GROUND LEVEL
- PROPOSED GROUND LEVEL
- PROPOSED 225mmØ SURFACE WATER GRAVITY DRAINAGE
- PROPOSED SURFACE WATER RISING MAIN

DATUM 34.00m O.D.

EXISTING GROUND LEVEL	43.00	43.00	42.47	41.08
PROPOSED GROUND LEVEL	42.12	42.12	38.50	42.50
PROPOSED STORM INVERT LEVEL	38.58	38.44	37.07	41.25
CHAINAGE	0m	32m	64m	141m
PIPE GRADIENT	1:225 STORM PIPE	1:24 STORM PIPE	VARIES	
PIPE SIZE	225mm Ø uPVC STORM PIPE		100mm Ø uPVC RISING MAIN	

HORIZONTAL SCALE 1:1000, VERTICAL SCALE 1:100

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DATUM 38.00m O.D.

EXISTING GROUND LEVEL	43.00	43.50	42.00	42.00	41.08	40.59	38.95
PROPOSED GROUND LEVEL	42.12	42.00	42.23	42.23	42.50	42.50	38.74
PROPOSED STORM INVERT LEVEL	40.70	40.39	40.26	40.01	39.91	39.85	38.74
CHAINAGE	0m	70m	100m	158m	180m	194m	225m
PIPE GRADIENT	1:225 STORM PIPE						
PIPE SIZE	225mm Ø uPVC STORM PIPE						

HORIZONTAL SCALE 1:1000, VERTICAL SCALE 1:100

- NOTES**
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Issue	Date	Description	By	Chkd.
A	JUNE '07	WASTE LICENCE APPLICATION	JO'B	OD

Client: **CORK COUNTY COUNCIL**

Project: **WEST CORK WASTE MANAGEMENT FACILITIES**

WASTE LICENCE APPLICATION

Title: **DERRYCONNELL STORM WATER LONGITUDINAL SECTIONS**

Scale @ A3: 1:1000, 1:100

Prepared by:	Checked:	Date:
JO'B	OD	JUNE '07

Project Director: **B. DOWNES**

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Drawing No.: **2528-2628** Issue: **A**