

DESCRIPTION OF DEVELOPMENT 2

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APPENDICES

Appendix 2-A	Bord na Mona MBBR Aeration System Operations & Maintenance Manual
Appendix 2-B	Environmental Management System (EMS)

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PRINCIPAL ELEMENTS

- 2.1 The proposed development will comprise of the continuance of all existing authorised facilities and activities within a planning application area of c.167 hectares as followings:
- 2.2 Extraction, crushing, screening and processing of rock (authorised by Reg. Ref. No. F03A/1430 / PL06F.206789) from the Northern, Western, Central and Southern Deposits for a period of 35 years.
- Total extraction area of c.55.9 hectares within a total landholding of c.211 hectares
 - Crushing, Screening and Processing Plant
 - Block Manufacturing Facility
 - Block Yard
 - Paving Display Centre & Offices
 - Machinery Maintenance Building
 - Offices
 - Staff Facilities
 - Laboratory
 - Concrete Batching Plant & Associated Plant
 - Asphalt Plant & Associated Plant
 - Stockpile Materials Shed associated with Asphalt Plant, granted under P. Reg. Ref. F06A/0923 (*ABP Ref: PL06F.219655*).
 - Weighbridge, Bunded Fuel Storage & Oil Interceptor
 - Security Huts (3 no.), Truck Wash Bays & HGV Load Spray Bars (P. Ref. FW09A/0099 in respect of amendment to Condition 14 of F03A/1430)
 - Bord na Mona Moving Bed Biological Reactor & Percolation Area
 - Stockpiles Storage Areas
 - Plant Storage Yard
 - Stables (22 no.) & Horse exercise paddock
 - Existing Site Accesses (2 no.) onto the R135 North Road (Revised Entrance P. Ref. F06A/0164 & *ABP Ref: PL06F.217413P*) & Kilshane Road.
 - Restoration of any worked out extraction areas, including for 5 years after the cessation of quarrying activities.
 - All other ancillary buildings, plant and facilities for the production of building products, including aggregates, ready-mix concrete, asphalt, tarmacadam and architectural blocks and all ancillary site works.
 - To extend the current operational hours at the site by an additional one hour in the morning resulting in a commencement time of 06.00 hours.
- 2.3 The applicant would propose that as part of this planning application that all existing ancillary facilities be retained indefinitely for the duration of extraction operations at the site. Therefore, any future planning applications would

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relate only to the extraction areas and be controlled by a time limit as imposed by way of a planning condition.

- 2.4 The proposed continuance of the above activities will be carried out at the existing Huntstown Quarry Complex, located in the townlands of Coldwinters, Kilshane, Huntstown, Johnstown, Grange and Cappogue, Finglas, Co. Dublin.
- 2.5 Previous grants of planning permission for the development, namely F93A/1134 (Condition No. 2) and F03A/1430 (Condition No.4) limited the extraction and processing operations at Huntstown to a ten year life. As stated in 2.2 above, this planning application seeks planning permission for a duration of c.35 years.
- 2.6 Planning permission durations, well in excess of ten years have been permitted by many local authorities for similar 'quarrying' type activities, a selection of which are provided in Table 2-1 below.

**Table 2-1
Other Planning Permissions Granted in Excess of 10 Year Durations**

Local Authority	Planning Reference No.	Duration	Development Type
Carlow Co. Co.	P. Ref. No. 10/130	50 Years	Rock Quarry
Kildare Co. Co.	Section 47 Agreement	50 Years	Rock Quarry
Mayo Co. Co.	P. Ref. No. 07/2577 – ABP PL16.235133	25 Years	Rock Quarry
Wicklow Co. Co.	P. Ref. No. 07/1248 – ABP PL27.232095	25 Years	Rock Quarry
Roscommon Co. Co.	P. Ref. No. 04/1479 – ABP PL20.215417	20 Years	Rock Quarry
Kilkenny Co. Co.	P. Ref. No. 05/1927	20 Years	Rock Quarry
Monaghan Co. Co.	P. Ref. No. 06/255 – ABP PL18.225398	20 Years	Rock Quarry
Carlow Co. Co.	P. Ref. No. 07/976 – ABP PL01.238679	20 Years	S&G Pit
Carlow Co. Co.	P. Ref. No. 07/769 – ABP PL01.232017	20 Years	S&G Pit

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SITE INFRASTRUCTURE

Site Access

- 2.7 Vehicular access into Roadstone Wood's landholding at Huntstown is primarily via an access road on the eastern site boundary which leads off the R135 Regional Road, known locally as the North Road (the former N2 National Primary Road) between the M50/N2 Interchange at Finglas and Kilshane Cross.
- 2.8 A new site entrance was granted permission in 2006 (P. Reg. Ref. F06A/0164 & ABP Ref. PL06F.217413 for a new 7.3m wide vehicular access located approx. 140 metres to the north of the old permitted access at North Road. The new access is now used by quarry traffic and Huntstown Power Plant traffic with the former access onto the North Road now closed.
- 2.9 Access to the site can also be made via a local (county) road, known locally as the Kilshane Road, to the west of the landholding, refer to Figure 2-1.
- 2.10 This secondary entrance is used to gain access to markets in the greater Blanchardstown area and the N3/M3 motorway. The primary gains for utilising this entrance are the resulting saving in fuel, less CO² emissions and less traffic congestion at Kilshane Cross roads. HGV traffic accessing Blanchardstown via the North Road main entrance would result in an additional 7km being travelled on a return journey over HGV traffic utilising the Kilshane Road entrance. Further details are provided in Chapter 13 – Roads and Traffic.

Site Security

- 2.11 Access to the existing quarry and construction materials production facilities is controlled by security barriers along both the access roads leading off the North Road and Kilshane Road. These barriers are manned by security staff on a 24 hour, 7 day a week basis.
- 2.12 The applicant would seek to extend the current operational hours at the site by an additional one hour in the morning resulting in a commencement time of 06.00 hours.
- 2.13 At the present time, Roadstone Wood's property boundary is closed off by post and wire fencing and/or hedgerows. Regular inspections of the entire property boundary are undertaken and where necessary existing fencing is repaired and/or replaced and hedgerows are strengthened or fortified by additional planting.

Site Roads and Parking Areas

- 2.14 All trucks entering the site will be confined within the Applicant's landholding, through the internal road network and traffic management plan. Trucks travelling to the weighbridge initially travel over paved road surfaces on the access road to the central infrastructure and production area. Aggregates from the operational quarry / mobile processing areas also use the network of

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- internal roads to transport the materials to the central infrastructure and production area.
- 2.15 Provision for employee and visitor car parking is currently provided on a paved ground area surrounding the existing office building at the central infrastructure and production area in the centre of the Huntstown quarry complex. Existing paved and unpaved haul roads across the site are indicated on the existing site layout plan in Figure 2.-1, together with the location of the car parking area.
- 2.16 The access road and car parking areas surrounding the office building are sealed by concrete. Surface water falling across these areas is currently intercepted by drains which ultimately discharge via the existing settlement ponds to a tributary stream of the Ward River, to the north of the central processing / infrastructure area.

Traffic Control

- 2.17 Traffic to and from the site at present travel along the North Road (the R135 Regional Road and former N2 National Primary Road). Traffic coming from Dublin City Centre or the nearby M50 Motorway turns onto the N2 Dual Carriageway and travels a short distance before turning (west) off a dedicated slip road onto the North Road. Thereafter traffic continues south for a short distance along the North Road before turning right (west) via a dedicated right–turn junction onto the access road leading into the Huntstown Quarry complex. Traffic travelling south from Ashbourne to the site exits the N2 Dual Carriageway at the Cherryhound Interchange and continues south along the North Road until it turns right (west) onto the access road leading into the Huntstown Quarry complex. Existing notices along the North Road and Kilshane Road provide advance warning to drivers that there is an existing quarry facility entrance ahead.
- 2.18 Internally, within the Huntstown Complex, warning notices, direction signs and speed restriction signs are in place along paved and/or unpaved roads leading to and from the central infrastructure and production area. Additional direction and speed restriction signs are erected between this area and the active quarry extraction areas.
- 2.19 All HGV traffic entering and egressing the application site are required to pass over the existing weighbridge facility which is located along the access road and shown on Figure 2-1.

Hardstanding Areas

- 2.20 At present, within the existing/proposed planning application area, there are permanent concrete hardstanding areas located around the central infrastructure and production area. These hardstanding areas are sealed and any rain falling over them runs over ground to the surface water drainage network and via settlement ponds to the tributary stream of the Ward River.
- 2.21 In other areas within the application area, there are some unpaved hardstanding areas around the worked out quarry voids. Rain falling across

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these areas either percolates downwards into the underlying soil / bedrock or runs-off over the existing ground surface, toward the existing quarry voids.

Weighbridge

- 2.22 All heavy good vehicles (HGVs) accessing the site are required to pass over the existing weighbridge which is located at the infrastructure and production area in the centre of the Huntstown quarry complex.
- 2.23 In order to track and record the amount of material leaving the application site, all loaded HGV traffic is again directed to the existing weighbridge. Records of all loaded HGV traffic is maintained for company auditing purposes.

Wheelwash

- 2.24 There is currently no wheelwash present at the site which is compliant with the current planning permission P. Reg. Ref. No. F03A/1430 / PL06F.206789 – Condition No. 16 which states:

'Effective steps shall be taken by the operator to prevent the deposition of mud, dust and other materials on the adjoining public highways caused by vehicles visiting and leaving the site. Any accidental deposition shall be immediately removed by the operator to the satisfaction of the Planning Authority, to the event that mud/dust is being carried onto the adjoining public highway from vehicles visiting and leaving the site, then the operators shall install and thereafter utilise as appropriate, wheel washing facilities on the site for the duration of the operation. Should such equipment prove necessary, then prior to its installation on site, full details of its specification and siting shall be first agreed with the Planning Authority.'

- 2.25 The distances from the weighbridge facility to the North road entrance and the Kilshane entrance are 1.25km and 1.0km respectively. These internal site roads are paved roads which minimises the transport of fines and mud by HGVs on to the public road network. In addition, regular water is be sprayed from a tractor drawn bowser on dry exposed surfaces (paved roads, unsealed haul roads and hardstand areas) along with road sweeping being carried out on all internal paved roads.
- 2.26 The above measures have proved effective and acceptable to-date and will be maintained in the future. The applicant will continue to regularly monitor the situation and will notify the Local Authority of any change in circumstances.

Fuel and Oil Storage

- 2.27 Fuels for the existing site operations are stored in existing fuel storage tanks within the Huntstown facility which are bunded to provide a storage volume equivalent to 110% of the tank storage volume. These tanks are constructed on a sealed concrete surface.

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- 2.28 Plant and machinery maintained on site will principally comprise mechanical excavators, bulldozers, front-end loaders, mobile crushing and screening plant. Mobile plant and equipment undertaking excavation and processing works will be refuelled from mobile, double skin fuel bowsers or at existing maintenance sheds within the Huntstown facility. Oil and lubricant changes and servicing of wheeled or tracked plant will be undertaken at the existing maintenance sheds. Re-fuelling of HGV trucks takes place at the auto-diesel tank located over the concrete surface at the central infrastructure and production area (refer to Figure 2-1).
- 2.29 A small bunded area for waste oils is provided within the maintenance shed. Oil collected in tanks will be emptied at intervals by a licensed waste contractor and disposed off-site at a suitably licensed waste facility.

Site Accommodation

- 2.30 The existing site office and canteen at Huntstown will continue to be used. All administration and management functions for the site are based at the site office. Staff changing, washing and cooking facilities are provided at the separate canteen facility, located east of the site office and weighbridge.

Plant Sheds and Equipment Compounds

- 2.31 Plant and equipment used in the quarry activities are stored on the sealed hardstand area in the centre of the Huntstown Complex.
- 2.32 Any plant or equipment requiring specialist repair or overhaul will be taken to the existing maintenance sheds within the Huntstown Complex. Small items of mobile or hand-held plant and equipment will also be stored as required in the existing maintenance sheds.

Site Services

- 2.33 Electric power, lighting and heating are all currently provided via the electricity network to existing site offices and staff welfare facilities at Huntstown.
- 2.34 There are existing toilets, washbasins and sink units at the site offices in the central infrastructure area at Huntstown Quarry. There are further toilets, washbasins and sink units at the canteen facility. Wastewater from both these locations is currently collected and fed via a sewerage pipe to the on-site effluent treatment system (Bord na Mona MBBR Aeration System) which services the Huntstown Complex. The location of the treatment plant is shown in Figure 2-1. Details of the Moving Bed Biological Reactor (MBBR) Aeration system are provide in Appendix 2-A.
- 2.35 A potable water supply is provided to the site office, canteen and construction materials production facilities via a Local Authority water main.
- 2.36 High voltage overhead electricity transmission cables (38kV) traverse the application site, to and from the electricity substation north-west of the

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- M50/N2 Interchange. Lower voltage overhead cable and telephone cables also run across the Huntstown Complex.
- 2.37 A gas pipeline runs to the nearby electricity generating plant operated by Huntstown Power (Viridian). The plan layout of existing sites services is shown on Figure 2-1.
- 2.38 A range of fire extinguishers (water, foam and CO₂) are kept at the site office to deal with any localised small scale fires which might occur.

Operating Hours

- 2.39 The current operational hours at the site are 07.00 hours to 18.00 hours each weekday (Monday to Friday) and on Saturdays. These operating hours are consistent with the operational hours set by Condition 11 of the 2004 planning permission for quarrying and production of construction materials at the Huntstown Quarry complex.
- 2.40 As part of this planning application the applicant would seek to extend the current operational hours at the site by an additional one hour in the morning resulting in a commencement time of 06.00 hours.

Sewerage and Surface Water Drainage

- 2.41 Existing site staff at the Huntstown complex use toilet, hand washing and welfare facilities provided at the existing site offices or staff canteen. The location of these facilities and the septic tanks servicing them are shown on the site services drawing in Figure 2-1.
- 2.42 The only surface water drainage infrastructure at the site exists across the central infrastructure area where aggregate processing and concrete production activities are currently concentrated. Rain falling across the remainder of the application area either
- runs over unsealed ground into the existing quarry void and a small pond on the eastern side of the quarry floor
 - percolates down through the existing soil / rock at the ground surface as recharge to groundwater, at which point it joins groundwater flow toward the quarry face.
- 2.43 At the present time, groundwater levels at the North Quarry are lowered by means of sumps in the quarry floor. Surface water and dewatered groundwater are collected in the pond on the quarry floor and pumped to the ground surface via an existing pipe network.

Environmental Management System and Environmental Monitoring

Environmental Management System (EMS)

- 2.44 Roadstone Wood Ltd. has implemented an EMS at Huntstown Quarry. This includes the ongoing environmental monitoring programme. Details of the EMS are provided in Appendix 2-B.

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- 2.45 Roadstone Wood Ltd. is a member of the Irish Concrete Federation (ICF), and complies with the requirements of the ICF Environmental Code (October 2005).
- 2.46 In addition, Roadstone Wood Ltd. and Huntstown Quarry comply with all relevant statutory and regulatory guidelines in terms of environment and health and safety. This includes implementation of current best practice mitigation measures as set in the DoEHLG (2004) and EPA (2006) guidelines.

Environmental Monitoring

- 2.47 There is an existing environmental monitoring programme in place at Huntstown Quarry covering:
- Dust deposition
 - Noise
 - Blasting
 - Surface water
 - Groundwater

EXTRACTION ACTIVITIES

Method of Extraction

- 2.48 Extraction and processing of rock at Huntstown Quarry is typically carried out as follows:
- Where still in-situ, overburden is stripped in advance of rock blasting in accordance with the quarry development plan. Stripped overburden is used to construct screening berms at the periphery of the quarry in order to screen the quarry workings.
 - Limestone is extracted using conventional blasting techniques. Prior to drilling, the face is surveyed in order to ensure safe and efficient blasting. Drilling is then carried out in accordance with the blast design. Finally, the holes are filled with bulk emulsion explosives and the blast is carried out. All blasting is carried out in accordance with the health & safety regulations, and environmental guidelines for the sector.
 - The fragmented rock is processed using fixed and mobile crushing, screening and washing plant located within the quarry.
 - The aggregate products are stored in stockpiles located within the quarry.

Blasting Operations

- 2.49 Blasting will continue to be used within the quarry to fragment the stone prior to processing (crushing / screening etc.). A programme of mitigation measures will continue to be implemented to ensure that the blasting

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- operations do not result in any significant impact on residential amenity of the area, refer to Section 9 – Noise & Vibration.
- 2.50 The blasting practices used for blasting operations at Huntstown Quarry are currently in line with best industry practice. Roadstone Wood Ltd. employs a dedicated blasting team who ensure that all new technologies are used where appropriate.
- 2.51 There are currently no proposed changes to working operations at Huntstown Quarry.
- 2.52 Each working area will continue to be worked in a manner that minimises the risk of any potential flyrock.
- 2.53 The quarry development will continue to monitor groundborne vibration and air overpressure emission limit values applied at the nearest sensitive location (e.g. residential property), as set out in the DoEHLG (2004) and EPA (2006) guidelines for the sector, refer to EIS Section 9.
- 2.54 Historically, blasting at the site would have been carried out 1 – 2 times per week. Owing to more efficient blasting procedures implemented at the site, blasting is now carried out less frequently.

Stability of the Quarry

- 2.55 Based on the available geological information and a stability assessment carried out by a geotechnical engineer, final bench slope angles of 85°, bench heights of c.15-20m metres, and bench widths of 5 to 10 metres have been adopted for the quarry design. Overburden slopes are designed with a slope angle of 34° from the horizontal (i.e. 1:1.5).
- 2.56 The working scheme for the quarry will comply with the *Safety, Health and Welfare at Work (Quarries) Regulations 2008*, S.I. NO. 28 of 2008.

Design of Quarry Workings

- 2.57 The proposed quarry extraction areas cover approximately 55.9 hectares.
- 2.58 The quarry is being developed over four operational quarry areas designated as the northern, western, central and southern deposits, refer to Figure 2-2.
- 2.59 The quarry faces will be divided into a number of benches with a width of 5 to 10 metres and a maximum height of 20m.
- 2.60 The proposed quarry floor levels for each of the four quarries will be north quarry c.23mOD; west quarry c.25mOD; central quarry c.18mOD and the southern quarry c.-65mOD.
- 2.61 The boundaries of the four working quarries are already defined at Huntstown and are shown on Figure 2-1. Quarrying will continue in these established deposits using the same extraction methods in accordance with the quarry production plan. In terms of the overall volumes, it is anticipated that an average of c.1 million tonnes will be extracted annually over the life of the development of 35 years, subject to market conditions.

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North Quarry Area: Design & Layout

- 2.62 All overburden and topsoil has previously been removed from the proposed final north quarry footprint. The area to the southeast, roughly square in shape, will be extracted down to the existing quarry floor level in this area of c.39mOD. Thereafter, the southern half of the excavation will be lowered by a further bench to a datum of c.21mOD, refer to Figure 2-2 for plan details and Figure 2-3 for cross section details. The current permitted depth of extraction in the north quarry area is to c.29mOD granted under planning permission F03A/1430 (ABP PL06F.206789).
- 2.63 Restoration (infilling) of the northeast section of the North Quarry with inert soils only has been carried out previously. It is proposed to continue this restoration work from the northeast in a south westerly direction subject to obtaining the necessary waste licence for the activity from the Environmental Protection Agency (EPA Reg. No. W0277-01).

West Quarry Area: Design & Layout

- 2.64 This area has mostly been stripped of overburden and topsoil. No extraction of limestone had been carried out within this area to date. It is a long term limestone reserve within the site. The current permitted depth of extraction in the western quarry area is to c.29mOD granted under planning permission F03A/1430 (ABP PL06F.206789).

Central Quarry Area: Design & Layout

- 2.65 The central quarry to date has been excavated to varying depths due to the varying nature of the material as there is significant development of clay-infilled solution features. The lowest quarry floor in this area at present is c.58mOD. Further extraction can be carried out to the east, south and west of the existing central quarry void area. The current permitted depth of extraction in the central quarry area is to c.44mOD granted under planning permission F03A/1430 (ABP PL06F.206789).

Southern Quarry Area: Design & Layout

- 2.66 Extraction from the south quarry has taken place over the last ten years. All overburden and topsoil has previously been removed from the proposed final south quarry footprint. Current operations are concentrated on the third bench of extraction although the final surface limits of the operation have not yet been achieved, refer to Figure 2-2 for plan details and Figure 2-3 for cross section details. The lowest quarry floor in this area at present is c.33mOD. The current permitted depth of extraction in the south quarry area is to c.8mOD granted under planning permission F03A/1430 (ABP PL06F.206789).
- 2.67 No further lateral expansion of the quarry is proposed in the areas to the east, northeast and west of the existing void.
- 2.68 The main area of change to the south quarry footprint between what is now being proposed and what was granted permission under P. Ref. F03A/1430

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(ABP PL06F.206789) is the 'squaring off' of the north west area. This will involve the removal of the remaining old settling ponds to allow extraction of the reserves beneath.

RESTORATION PROPOSALS

- 2.69 The extraction of aggregates is essentially a temporary use of lands, which ceases when the deposit is fully exhausted or it is no longer economically viable to continue extraction. Upon the cessation of extraction operations the opportunity arises to return the worked lands to a beneficial after-use by infilling of the quarry voids to original ground levels, thereby eliminating the presence of large open water areas that could create a potential increase in bird numbers in the area and subsequent hazard to Dublin Airport.
- 2.70 The backfilling of the ultimate quarry voids will be through the importation of inert soils and stone which is deemed to constitute inert waste recovery through deposition for the purposes of land improvement or restoration. These recovery operations will be through the issuing of a waste licence from the Environmental Protection Agency (EPA).
- 2.71 A current waste licence application has been submitted to the EPA for an exhausted portion of the north quarry, outside the proposed ultimate extraction footprint for the north quarry (EPA Ref. No. W0277-01). The amount of inert material to be backfilled and placed at the proposed site is 7.3M tonnes of which approximately 7.2M tonnes must be imported. The application area comprises a worked out quarry and surrounding land measuring covering an area of approximately 35.9 hectares (86.5 acres).
- 2.72 The proposed recovery of inert soils at the four quarry areas will provide for complete backfilling of large open voids above the groundwater table, facilitate the restoration of the worked out lands to agricultural use and improve protection of the underlying groundwater resource, which is currently classified as 'extremely vulnerable' due to the absence of any protective soil cover.
- 2.73 Whilst the restoration plan describes the general pattern quarry reinstatement and the associated physical processes of restoring ground levels over the site, it does not address the issue of a post quarrying use of the said lands. Given the close proximity of the quarry site to Dublin, the M50, M1, M2 and M3 Motorways, the site lends itself to a possible future use of light industrial / science and technology park / business campus development similar to existing land zoning around the periphery of the site.
- 2.74 Given the longevity of the proposed quarrying operations and the current available reserves at the site, any final post-quarrying plan will be prepared as the quarry enters into the final phase of its working life and the current restoration plan will form the basis for the post-quarrying land-use plan.

Backfilling / Restoration Schedule

- 2.75 Backfilling of the quarry void spaces will progress upwards from the former quarry floor and on completion; the restored site will be returned to its original ground level and will merge back into the surrounding pastoral landscape.

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An outline of the proposed restoration scheme and the final ground level contours are shown in Figure 2-4. In addition to imported materials, some soil in existing screening berms and/or stockpiles across the existing site will be used to backfill the quarry. Cross-sections through the final landform are shown in Figure 2-5.

- 2.76 It is currently envisaged that backfilling of the existing void will be undertaken in a number of 'lifts' from the existing quarry floor. It is envisaged that backfilling will proceed in phases and that each phase will be broadly defined by the depth and extent of existing benches within the worked-out quarry.
- 2.77 On final completion of the restoration, a cover layer of subsoil (approximately 350mm thick) and topsoil (approximately 150mm thick) will be placed and graded across the backfilled mineral soil. This will then be rolled and planted with grass in order to promote stability and minimise soil erosion and dust generation. The proposed restoration scheme also envisages that hedgerows will be planted across the restored areas in an effort to re-establish some of the former field boundaries which pre-dated the development of the site as a quarry.

Landform and Drainage

- 2.78 The proposed restoration scheme for the overall quarry site is illustrated in Figures 2-4 and 2-5. The worked out areas of the quarry will be restored to a beneficial agricultural after-use using imported inert soils, and overburden and topsoil stored on site from previous stripping operations.
- 2.79 The final restored levels will be similar to previous ground levels prior to extraction works taking place with two exceptions;
- 1 The western face of the North quarry will be retained in part (above the 68mOD level) to facilitate nesting for the existing peregrine falcons resident at the site, refer to Figure 2-4 and Figure 2-5A Cross Sections A-A' and B-B'.
 - 2 Huntstown Quarry is listed on the Geological Survey of Ireland (GSI) database of geological heritage sites as a potential geological NHA, under the IGH8 Lower Carboniferous theme, for its significance in showing the base of the Tober Colleen Formation directly overlying Waulsortian Limestone. This has only been reported elsewhere in a recorded borehole at Feltrim Quarry.
- The GSI have requested that provision is made in the restoration plan for the preservation of, and access to, a representative section of this significant part of Ireland's Carboniferous stratigraphy.
- Therefore both sides of the existing access road to the current Central quarry will be retained for future access to view the relevant exposures of the Tober Colleen Formation overlaying Waulsortian Limestone, refer to Figure 2-4 and Figure 2-5A Cross Section I-I'.
- 2.80 It is proposed that restoration would take place in a phased manner, as extraction operations cease in a given area.
- 2.81 Any surface water falling on the site will naturally infiltrate into the ground.

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Restoration Materials and Soil Handling

- 2.82 The only material requirements in respect of the proposed restoration scheme will be inert soil, stone and rock to be used in backfilling the final quarry voids. Clean, inert soil and stone is likely to be sourced from green field development sites. At the present time, it is considered that potential sources of such materials will include future large scale infrastructural projects in the greater Dublin region.
- 2.83 Aside from inert soil, a relatively small quantity of directly imported inert concrete or brick or recovered (i.e. processed) secondary aggregate will be required to construct temporary haul roads across and through the site as the backfilling works proceed.
- 2.84 The total volume of backfilled soil required to create the restored landform will ultimately be determined by the actual extent of quarrying within each quarry area and the resultant void space which exists at the time of restoration. The actual volumes of material required for the restoration works will be detailed in any future planning application / waste licence application closer to the time of restoration.

Cultivation, Grass Seeding & Establishment

- 2.85 Following cessation of landform construction, i.e. post inert soil importation, topsoil and soil forming materials, from storage mounds on site, are to be spread over the areas to be restored to agricultural land to a depth of 20mm.
- 2.86 Prior to sowing, the upper 50mm are to be reduced to a fine tilth and fertiliser to be evenly distributed, as required, and raked in. Cultivated soils to be graded to even falls removing localised low and high points.
- 2.87 An agricultural seed mix suitable for the intended land use is to be used and to be applied at rates as per the manufacturer's instructions. The seed to be used is to be fresh and for use in the season of seeding. A certificate is to be provided in respect of each consignment of seed mix giving the supplier's name, the proportions of constituents of the mixture and a signature of the representative of the supplier.
- 2.88 The contractor shall mix the seed well with bulking agent, e.g. dry sand, in order to assist and even distribution. Mix well before application and frequently during application. Divide the seed into two equal sowings in two transverse directions at the specified rates. After seeding, lightly harrow or rake surface and roll lightly.
- 2.89 The seed to be used on the screening berms is to be fresh and for use in the season of seeding. A certificate is to be provided in respect of each consignment of seed mix giving the supplier's name, proportions of constituents of the mixture and a signature of representative of the supplier. Typical seed to be used shall be of the following constituents (120 kg. per Ha.; mixtures as per 50kg):
- Perennial Ryegrass 12.5kg 25%
 - Strong Creeping Red Fescue 10.0kg 20%
 - Hard Fescue 15.0kg 30%

DESCRIPTION OF DEVELOPMENT 2

- Smooth – Stalked Meadow Grass 5.0kg 10%
 - Highland Browntop Bent 5.0kg 10%
 - Huia White Clover 2.5kg 5%
- 2.90 The contractor shall mix seed well with bulking agent, e.g. dry sand, in order to assist an even distribution.
- 2.91 Fertiliser applied shall consist of 10% nitrogen, 15% phosphoric acid and 10% potash. Spot treatment using a selective herbicide shall be applied to pernicious agricultural weeds such as thistle, docks and ragwort.

Native Hedgerow / Tree / Scrub Planting

- 2.92 Approximately 3,000 sq.m. of woodland screen planting is to be carried out, with tree groups to be randomly spread throughout the planting blocks.
- 2.93 Approximately 4,620 lin.m. of hedgerows to be planted in total as detailed on Figure 2-4 Restoration Plan. The hedgerows will be planted in two staggered rows, with plants within each row 50cm apart (i.e. 4 plants per m) and rows 50cm apart. The new hedgerows will be planted with trees at distances of 8-16m and staked.
- 2.94 All plant handling, planting works and aftercare to be carried out in accordance with the CPSE Recommendations for Plant Handling. Establishment maintenance will be carried out for 12 months following the completion of each planting phase. Trees/Shrubs will be planted and maintained as follows:
- Trees shall conform to BS 3936 for nursery stock and shall be supplied true to size and species name. Planting to take place between the months of October and May.
 - All trees to be planted upright to the same depth as grown in the nursery. Fork base of tree pit to a depth of 150mm and remove stones over 75mm in dimension before positioning tree stake. The roots shall be spread evenly around the bottom of the pit and finely broken down topsoil returned and carefully worked between the roots and firmly consolidated. Trees, transplants and shrubs to be protected by spiral tree guards or equivalent after planting.
 - All tall feathered trees are to have to have low single stakes driven into the pit before the tree is placed in the hole and backfilling commences.
 - The tree stakes will be pressure impregnated peeled soft wood round stakes. Preservative shall be non-injurious to plant material. Stakes will be pointed at one end and free from protrusions. The tree stakes will be 1200mm, two thirds of their length to be driven into the ground.
 - Between the tree and the stake a rubber tree collar tree tie shall be entered, linked by a rubber strap running through the collar and around the tree, the collar will be fixed to the stake with two galvanised nails.

DESCRIPTION OF DEVELOPMENT 2

- Bareroot transplants to be planted upright to their natural level. The pit holes shall be larger than the extent of the root system. Roots shall be spread out. Topsoil mixed with additives is to be placed around root, gently shaking them to and fro to avoid air pockets and trodden down firmly and filled in with topsoil.

Decommissioning of Plant & Machinery

- 2.95 Redundant structures, plant equipment and stockpiles will be removed from site on permanent cessation of quarry activity. Machinery and buildings will be sold as working machinery or scrap.
- 2.96 As part of the decommissioning process all fuel and oil storage tanks will be removed from the site by a licensed waste contractor. The effluent treatment system will also be removed from the site. There will be no potential for fuel, oil or sewage to cause groundwater pollution following cessation of quarrying activities / completion of the quarry restoration works.

Aftercare Maintenance

- 2.97 The maintenance period shall be a minimum of 24 months from the date of practical completion of each of the separate planting 'phases'. The contractor shall make 4 visits (2 during each growing season) to the site during this period to maintain the site to the specified standard and:
- Notify the client if he believes water would be beneficial during this period.
 - Remove and replace immediately dead or diseased plants.
 - Remove any dead wood from trees or plants
 - Re-firm loose trees, shrubs and plants as necessary.
 - Check stakes and re-affirm ties as necessary.
 - Check spiral tree protection and replace where necessary.
 - Prune shrubs, bushes etc. removing excessively strong/weak growth to promote healthy, even and well-balanced plants.

Long Term Safety & Security

- 2.98 The final quarry extraction area will be fenced to prevent unauthorised access by third parties.
- 2.99 Cautionary signage will also be placed at intervals along the perimeter fencing to warn against unauthorised trespass by the public. The existing site entrance gate will be retained and locked at all times. Access to the quarry site will be available by arrangement with the Applicant

DESCRIPTION OF DEVELOPMENT 2

Restoration Bond

- 2.100 The Applicant is prepared to submit a restoration bond Fingal County Council as financial security for future restoration works.

ENVIRONMENTAL NUISANCE CONTROL

General

- 2.101 Extraction, processing and ultimately restoration activities at the application site require a number of environmental controls to eliminate or minimise the potential nuisance to the public arising from the importation, placement and compaction of inert soils. The environmental control measures in place at the quarry are outlined in detail in the following sections.
- 2.102 The existing quarry operations at the site are currently regulated by conditions attaching to P. Ref. No. F03A/1430 / PL06F.206789 issued by Fingal County Council.

Bird Control

- 2.103 As the process of rock extraction (operational phase) and soil and stones being placed / recovered at the application site (restoration phase) are free of putrescible (food / kitchen) waste, site activities are unlikely to attract scavenging birds such as gulls and crows for the duration of works. Accordingly, it is not intended to implement any specific bird control measures at the site as is the case at present. Over the life of quarrying operations at the site, no bird control measures have been required to be implemented at the site.
- 2.104 Notwithstanding this, and due to the site proximity to Dublin Airport flight path, the situation in relation to bird congregations at the site is monitored regularly. Should the situation change in the future, the Applicant will immediately consult with the Dublin Airport Authority, the Irish Aviation Authority and Fingal County Council to establish and agree appropriate measures to be implemented.

Dust Control

- 2.105 In dry, windy weather conditions, the quarry activities may give rise to dust blows across, and possibly beyond the application site. In order to control dust emissions, the following measures are implemented:-
- water is sprayed from a tractor drawn bowser on dry exposed surfaces (paved roads, unsealed haul roads and hardstand areas)
 - dust blows will be partially screened by the quarry side walls as extraction operations continue downwards.
 - the area of bare or exposed soils will, insofar as practicable, be kept to a minimum. Consideration will be given to establishing temporary

DESCRIPTION OF DEVELOPMENT 2

vegetation cover over temporary exposed soil surfaces and stockpiles pending backfilling and restoration to final ground levels;

- The distances from the weighbridge facility to the North road entrance and the Kilshane entrance are 1.25km and 1.0km respectively. These internal site roads are paved roads which minimises the transport of fines by HGVs on to the public road network;
- stockpiling of imported soil materials will be minimized. Soils will ideally be placed and compacted in-situ immediately after being imported to site and end tipped. If and when temporary stockpiling of soil is required, it will be placed as far as practicable from nearby residences.

2.106 The amount of dust or fines carried onto the public road network will be further reduced by periodic sweeping of internal paved site roads and the existing public roads.

Traffic Control

2.107 As the planning application relates to the continuance of use of the existing quarrying operation, the proposed development will continue to utilise the primary site entrance accessed off North Road located on the eastern edge of the site. The secondary entrance accessed off Kilshane Road located on the western edge of the site will also remain operational.

2.108 Both access points on North Road and Kilshane Road have historically been shown to function satisfactorily at their present locations. As such, it is considered unnecessary to alter the existing access points in terms of geometry and/or location. The Kilshane Road access however, will be subject to minor improvements such as the cutting back of overgrown vegetation.

Litter Control

2.109 It is unlikely that site activities will give rise to problems with windblown litter. Accordingly, it is not intended to implement any specific litter control measures at the site.

Odour Control

2.110 As the rock extraction activities at the site are not biodegradable and do not therefore emit odorous gases, site activities do not give rise to odour nuisance. Accordingly, it is not intended to implement any specific odour control measures at the site.

Fire Control

2.111 The following operational practices are implemented in order to prevent fire at the site:

DESCRIPTION OF DEVELOPMENT 2

- smoking at the site office or canteen will be prohibited
 - plant and equipment will be removed if they exhibit signs of overheating etc.
- 2.112 In the unlikely event that a fire does occur, the local fire stations in Finglas and Swords will be contacted and emergency response procedures will be implemented. Fire extinguishers (water and foam) will be provided at the site office to deal with any small outbreaks which may occur.

ENVIRONMENTAL MONITORING

General

- 2.113 There is an established programme of environmental monitoring in connection with ongoing rock extraction, aggregate processing and concrete / asphalt production activity across the Huntstown Complex. This environmental monitoring programme complies with the requirements of existing planning permissions in respect of these activities granted by Fingal County Council.
- 2.114 In addition, Roadstone Wood operates an environmental management programme to monitor and manage emissions from established operations. Limit values for environmental emissions arising from these activities are identified by existing consents.
- 2.115 Environmental sampling, monitoring and testing will generally be undertaken by the Applicant's in-house environmental staff as required. Records of environmental monitoring and testing are maintained on-site and forwarded to Fingal County Council.

Dust Monitoring

- 2.116 As part of the ongoing environmental monitoring programme, dust emissions associated with activities within Roadstone Wood's landholding are monitored on a quarterly (i.e. three monthly) basis using Bergerhoff dust gauges at 5 No. locations (designated D1 to D5) as shown on Figure 2-6 and Figure 8-1. These gauges are located close to emission sources and potentially sensitive receptors beyond the Applicant's property boundary.
- 2.117 It is currently envisaged that the existing dust monitoring stations D1 and D4 will remain in their current locations and that monitoring station D2, D3 and D5 will be moved to closer to the site boundary as close to the locally sensitive receptors, refer to Figure 8-2.
- 2.118 These will continue to be monitored for the duration of the operational life of the quarry and site backfilling and restoration activities and for a short duration thereafter.

Groundwater Monitoring

- 2.119 At the present time, there are 6 No. groundwater monitoring wells installed across the Huntstown Quarry Complex, at locations shown in Figure 2-6.

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- 2.120 At the present time, it is envisaged that groundwater sampling and testing will be undertaken on a bi-annual basis at the 6 No. groundwater monitoring wells. Groundwater levels will also be recorded on a bi-annual basis.
- 2.121 As part of the ongoing environmental monitoring programme, groundwater samples are currently tested for a wide range of physical and chemical parameters in order to assess water quality and detect possible contamination at the site. Further detail on these data is presented in Section 6 of this Environmental Impact Statement.
- 2.122 It is currently envisaged that the existing groundwater monitoring regime will remain in place for the duration of any quarry extraction and restoration works. Groundwater sampling and monitoring will continue as long as backfilling activities continue and for a short period thereafter.

Noise Monitoring

- 2.123 As part of the ongoing environmental monitoring programme, noise emissions associated with ongoing rock extraction, aggregate processing and concrete / asphalt production activities within Roadstone Wood's landholding are monitored on an annual basis at 5 No. locations (designated N1 to N5) of which 4 No. are close to the site boundary and 1 No. is at the central infrastructure area.
- 2.124 It is envisaged that the existing noise monitoring regime will continue for the duration of any quarry extraction and restoration activities and for a short period thereafter.
- 2.125 Noise monitoring will be undertaken using a Larson Davis Model 824 Sound Level Meter, calibrated using a Larson Davies Acoustic Calibrator CAL 200 (or equivalent). Noise monitoring locations are indicated in Figure 2-6.

Surface Water Monitoring

- 2.126 As part of the ongoing environmental monitoring programme, surface water sampling and testing is undertaken on a bi-annual basis (i.e. six monthly) at any temporary surface water features which may either be created or form naturally at low points within the application site.
- 2.127 As part of the ongoing environmental monitoring programme, surface water sampling and testing is undertaken immediately downstream of the existing settlement lagoons beyond the eastern face of the North Quarry and upstream of its discharge to the tributary stream of the Ward River. The surface water monitoring locations across the application site are shown on Figure 2-6.
- 2.128 Surface water samples are tested for a wide range of physical and chemical parameters in order to assess water quality and detect possible contamination at the site. Further detail is presented in Section 6 of this EIS.
- 2.129 It is currently envisaged that the existing surface water monitoring regime will remain in place for the duration of any quarry extraction and restoration works and for a short period thereafter.

DESCRIPTION OF DEVELOPMENT 2

FINAL RESTORATION AND AFTERCARE

- 2.130 The principal activity which will be undertaken at the application site is the extraction and processing of the in-situ rock with ultimate backfilling and restoration of lands within the existing site. As previously noted the restored site will be returned to its original ground level and will for the most part merge back into the surrounding pastoral landscape, refer to the proposed site restoration plan provided in Figure 2-4.
- 2.131 A cover layer comprising 150mm of topsoil and approximately 350mm of subsoil shall be placed over the inert backfilled materials on completion of the backfilling activities. This will then be planted with grass in order to promote stability and minimise soil erosion and dust generation. Thereafter the lands will be progressively returned to use as agricultural grassland. The proposed restoration scheme also envisages that hedgerows will be planted across the restored area in an effort to re-establish some of the former field boundaries which pre-dated the development of the site as a quarry.
- 2.132 On completion, the final landform will be modified as necessary to ensure that surface water run-off across the restored site is directed toward the existing natural drainage network, falling eastward toward the tributary stream of the Ward River which runs northward out of the Applicant's landholding.
- 2.133 Following final completion of the restoration and site decommissioning works, provision will be made for further, short-term (<1year) environmental monitoring of air, surface water and groundwater.

NEED FOR THE DEVELOPMENT

- 2.134 The quarry provides for continued extraction of high quality limestone from proven aggregate resources of strategic national and regional importance.
- 2.135 The quarry and associated concrete, road-making / surfacing materials development will ensure a long term secure supply of quality aggregates to the greater Dublin region.
- 2.136 Continued development and operation of the Huntstown site will provide continued employment for approximately 49 personnel directly employed at the site and c.12-15 personnel for associated and downstream activities.
- 2.137 The continued development of proven aggregate reserves at the Huntstown Complex is required to ensure Roadstone Wood Ltd. meets the demands of the market(s) they have built up over the past 70 years in the region, including supply, to the local construction industry and infrastructure projects and Local Authorities.
- 2.138 Continued development of Huntstown Quarry is consistent with the policies set out in the National Planning Guidelines for the sector; the Dublin Regional Planning Guidelines and the Fingal County Development plan recognise that the requirement for:
- A secure supply of construction aggregates and related products is necessary for the continued development of the region.

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- Proven aggregate reserves need to be safeguarded for future extraction.
- 'Best environmental management practice' to be implemented within quarry developments.

CONSIDERATION OF ALTERNATIVES

2.139 In the consideration of alternatives below, the issues of alternative sources of aggregates; and alternative site locations have been addressed. Owing to this being an existing and long established quarrying / aggregate processing site, consideration of an alternative location is not considered.

Recycled Aggregates

- 2.140 The supply of recycled aggregates is dependent on a consistent long term supply of suitable construction and demolition (C & D) waste.
- 2.141 For 2008, the Environmental Protection Agency (EPA) has reported that the collected C & D waste stream typically comprised 78% soil and stones (10.5 million tonnes) and 22% concrete / rubble, wood, glass, metal and plastic (3.0 million tonnes). Of this 13.5 million tonnes total volume, approximately 10.2 million tonnes was recovered.
- 2.142 For 2009, the most recent year for published data from the EPA titled 'National Waste Report 2009' states that a reported 5.1 million tonnes of C&D waste was recovered which represented a 51% decrease on that reported in 2008.
- 2.143 Contaminated soil (usually generated in land development/redevelopment projects) exported for treatment/disposal reduced sharply from 449,574 tonnes in 2008 to 476 tonnes in 2009, which shows a direct correlation between the amount of activity in the construction industry and the amount of C&D waste generated.
- 2.144 It should be noted that very little of this recovered soil and stone material would have been suitable for use as construction aggregates, and most of the recovered material would have been used in the restoration of poorly drained lands to agriculture or for daily cover / capping materials in existing landfill facilities. If conservatively, (from the aggregate supply perspective) 25% of the annual recovered C & D waste stream in 2008 (10.2 million tonnes) was considered suitable for reuse as recycled aggregate (2.5 million tonnes) this would represent less than 4% of the overall annual aggregate demand (70 million tonnes).

Marine Aggregates

- 2.145 In the longer term (20 to 25 years), there may be scope for extraction of marine aggregates. Development of a future marine aggregates supply is currently constrained by the lack of an appropriate regulatory framework.
- 2.146 In the absence of a significant increase in the sources of recycled and marine aggregate, it is clear that land-based deposits (such as the limestone

DESCRIPTION OF DEVELOPMENT 2

resource at Huntstown) will continue to be the main source of construction aggregates to the Region over the next 25 years, at least.

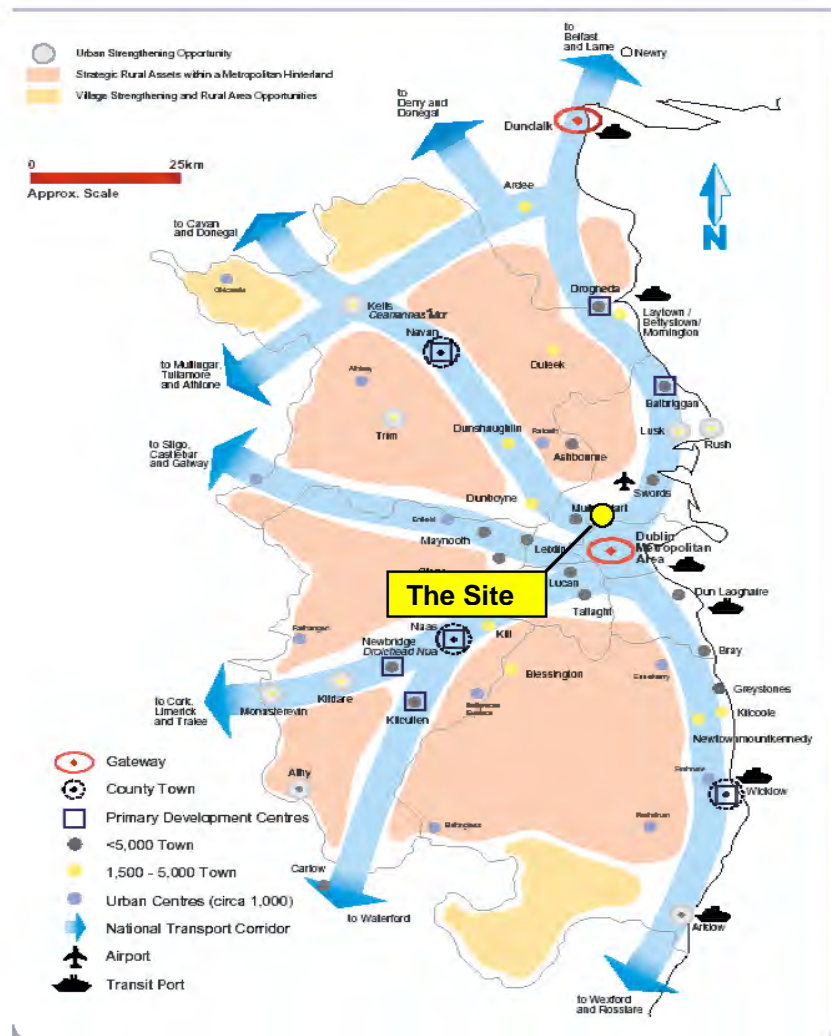
PLANNING POLICY

National Spatial Strategy

- 2.147 The National Spatial Strategy (NSS) was prepared for the period 2001 – 2020. Although the current economic conditions could not have been forecasted as part of the NSS implementation; the fundamental policies still have relevance on development.
- 2.148 Huntstown is located within the Dublin and Mid-East Regions. The NSS sets out objectives for the region:

‘Enhancing the competitiveness of the Greater Dublin Area (GDA), so that it continues to perform at the international level as a driver of national development, means physically consolidating the growth of the metropolitan area i.e. Dublin City and suburbs. At the same time, development in the hinterland of the metropolitan area is to be concentrated in strategically placed, strong and dynamic urban centres i.e. the ‘ Primary Development Centres’ identified in the Strategic Planning Guidelines. These development centres have a unique role in Irish terms, given the scale of the Dublin City region and the need for internal balance between the city and its surrounding counties’.

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National Spatial Strategy: Dublin & Mid East Region – Map 5 (DoEHLG, 2002)

- 2.149 Section 5 of the NSS sets out that *‘the agriculture, food, forestry, fishing and aquaculture sectors and other activities in the natural resource sector have a key role to play as a primary economic basis for vibrant and diversified rural communities and the retention of the rural population.’*
- 2.150 Sustainable development is one of the key concepts of this strategy; from the point of view of strategic spatial planning, sustainable development will, amongst other things, mean *“maximising access to and encouraging use of public transport, cycling and walking...developing sustainable urban and rural settlement patterns and communities to reduce distance from employment...and to make better use of existing public transport”*

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Regional Planning Guidelines 2010 – 2022

- 2.151 The Regional Planning Guidelines (RPG) for the Greater Dublin Region 2010-2022 was adopted by the Dublin Regional Authority & Mid-Eastern Regional Authority on 15th June 2010. The Guidelines direct the physical, economic and social development for each region in Ireland, of which Fingal forms one of local authorities within the region.
- 2.152 Section 5.4.3 of the Plan relates to Quarrying & Extraction and states;
‘Extractive industries are essential to the economy in terms of supply of aggregate materials for the construction sector, delivering transport infrastructure projects, and for the export market. There is, however, potential for conflict in the operation of these industries with wider environmental considerations. The role of the planning system is therefore to regulate, promote or control the exploitation of natural resources taking into account these other issues. Preventing and Recycling Waste – Delivering Change (March 2002) calls for the re-use or recycling of 85% Construction and Demolition (C and D) waste by 2013 and if achieved, this together with other national level sustainable development objectives, and a levelling off of construction activity, is likely to have a steadying influence on the rate of extraction of aggregates in the future. In planning policy terms and in order to strategically plan for future needs, there is a need to take stock of existing aggregate resources and other valuable minerals/ores and identifying potential sources which have major deposits of regional and county importance. Local authorities should engage with GSI, in so far as feasible, in mapping exercises designed to identify aggregate potential within their respective county and across a wider regional scale. Suitable protection measures for such sites should be considered to ensure their potential may be realised. Planning, heritage and environmental guidance together with legislative requirements should be used to frame policies for extractive industries. In assessing applications for extractive industries, considerations and impacts as they relate to the objectives of the Water Framework Directive (and therefore River Basin Management Plans) and other EU Directives (such as those regarding wildlife and habitats) should be central to the decision making process. Secondary impacts such as increased HGV traffic on adjoining communities and screening are key issues, and the use of levies to compensate the surrounding areas through investment in local social and other infrastructure is supported.’

Fingal County Development Plan 2011 – 2017

- 2.153 The planning and development controls pertaining to the application site are those outlined in the current Fingal County Development Plan (2011-2017).
- 2.154 The application site is located within land-use zoning objectives RU *‘Protect and promote in a balanced way, the development of agriculture and rural-related enterprise, biodiversity, the rural landscape, and the built and cultural heritage’* and HI *‘Provide for Heavy Industry’* in the current Fingal County Council, County Development Plan 2011- 2017, refer to Figure 2-7.
- 2.155 The site primarily remains within the same land-use zoning under the previous Fingal County Council, County Development Plan 2005- 2011,

DESCRIPTION OF DEVELOPMENT 2

albeit with an amended wording from *'Protect and promote in a balanced way, the development of agriculture and rural-related enterprise, biodiversity, the rural landscape, and the built and cultural heritage'*.

- 2.156 Section 2.6 of the current CDP 2011-2017 relates to Extractive Industries and states that:

'The aggregate industry provides an essential input to the construction industry. By their nature, aggregates can only be worked where they occur. There is a continuing need for new and expanded aggregate quarrying operations on land to meet regional and local requirements. There is thus a need to identify and protect aggregate resource areas to meet the likely scale of future demand while at the same time protecting the natural environment and communities from environmental impacts including noise, dust, traffic and vibration. Guidelines for Planning Authorities on Quarries and Ancillary Guidelines recognise the contribution that extractive industries make to economic development but they also identify the land use and environmental issues which require mitigation and management through the planning system. Proposed development which would compromise aggregate rich areas requires careful consideration to avoid compromising aggregate reserves. The potential use of environmentally friendly products should be employed where possible to reduce the need for excessive quarrying. A number of guidelines relating to quarrying have been produced by various bodies for example 'Geological Heritage Guidelines for the Extractive Industry' (GSI) and 'Wildlife, Habitats and the Extractive Industry' (NoticeNature). The various guidelines, not all of which are listed here, provide useful references and suggestions for potential restoration and reuse.

Objective EE35

Consider proposals for aggregate extraction only where the Council is satisfied through an environmental assessment that environmental quality and amenity will be protected and appropriate provision for the restoration of the landscape and habitat is being made.

Objective EE36

Encourage the recycling of builders' rubble to reduce the need for extraction in accordance with Best Practice Guidelines on the Preparation of Waste.

- 2.157 There are no designated or proposed Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or proposed Natural Heritage Areas (NHA's) within or contiguous to Roadstone Wood's landholding at Huntstown. It is understood that a geological exposure of the contact between the Tober Colleen and Waulsortian formations at the Central Quarry (outside of the application area) has been identified as a possible geological / geomorphological heritage feature by the Geological Survey of Ireland although, to date, no formal designation as an NHA has occurred.
- 2.158 Records held by the National Monuments Service of the Department of Environment, Heritage and Local Government indicate that there are a number of national monuments within and in the immediate vicinity of Roadstone Wood's landholding. At the northern end of the application site, the ruins of Kilshane Church, a graveyard and holy well (Ref. DU014-012) are identified as part of an extended archaeological site. These features are

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also included in the list of protected structures in the Fingal County Development Plan. There are no visible remains of these monuments remaining in situ.

- 2.159 Immediately east of Roadstone Wood's landholding, the National Monuments Record (NMR) indicates that there is an enclosure (Ref. DU014-015) and ring fort (Ref DU014-016) located in Coldwinter townland, on the opposite side of the North Road. These features are also included in the list of protected structures in the County Development Plan. A castle, motte (earthen mound) and bailey (courtyard) (Ref. DU014-013) is located north-east of the landholding in Newtown townland, while a fulacht fia (Ref. DU014-050), a Bronze Age cooking site, is located west of the landholding in Grange townland.
- 2.160 The Fingal County Development Plan indicates that the landholding lies within a landscape area which is characterised as low lying agricultural land. There are no protected views or prospects into or out of the application site identified in the Plan.

REFERENCES

National Spatial Strategy 2001 – 2020, Dept of Environment, Heritage and Local Govt.

Fingal County Development Plan 2011- 2017, Fingal County Council.

Regional Planning Guidelines 2010-2022, Midland Regional Planning Authority.

DESCRIPTION OF DEVELOPMENT 2

FIGURES

Figure 2-1
Existing Site Layout

Figure 2-2
Proposed Final Extraction Layout

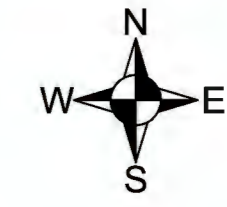
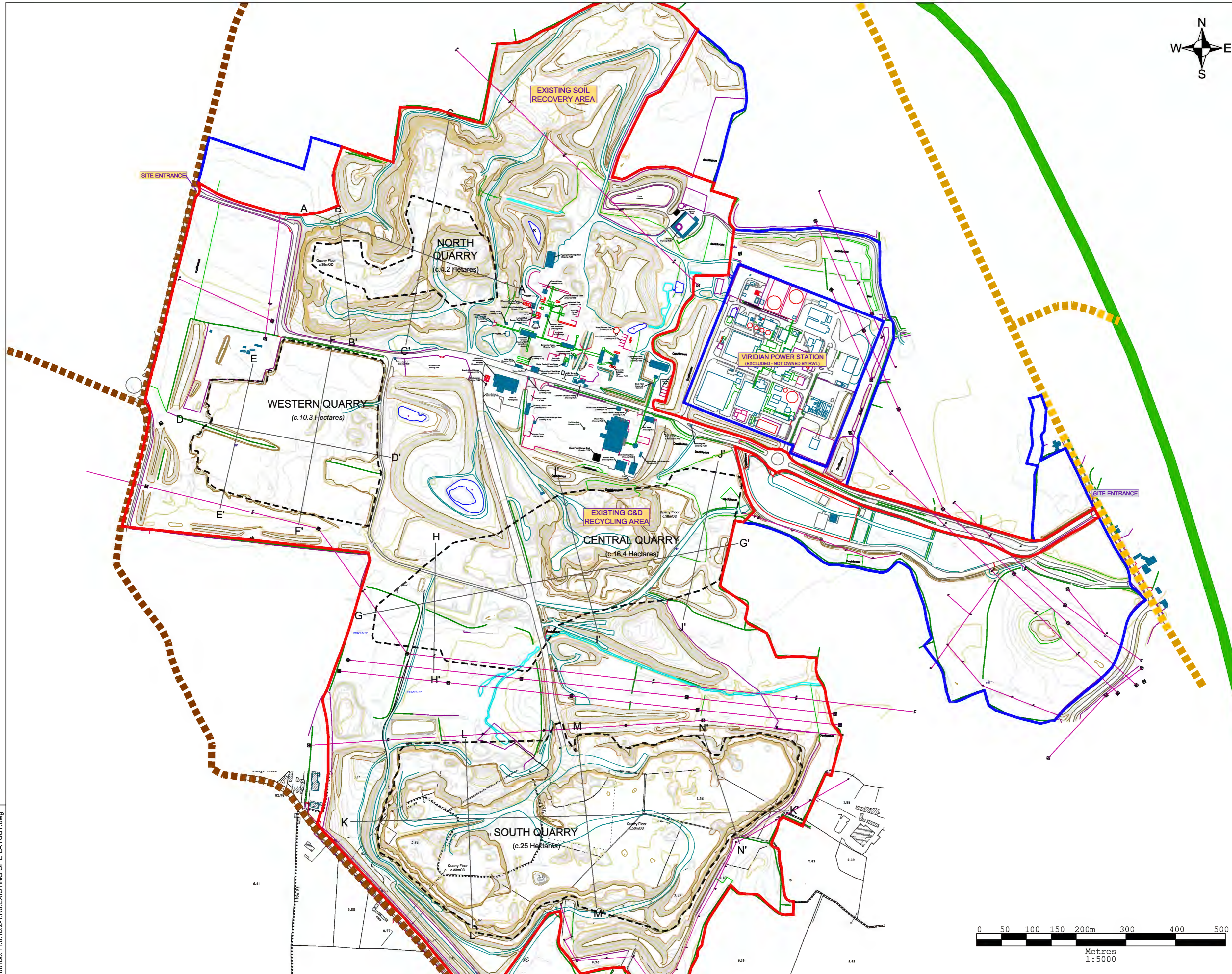
Figure 2-3
Existing & Proposed Cross Sections

Figure 2-4
Proposed Restoration Surface

Figure 2-5
Restoration Cross Sections

Figure 2-6
Environmental Monitoring Locations

Figure 2-7
Current Land Zoning Map



- NOTES**
- EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NOS. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
 - ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000712 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
 - TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

- LEGEND**
- ROADSTONE WOOD LTD. LANDHOLDING (c. 211 ha)
 - PLANNING APPLICATION AREA (c. 167.5 ha)
 - PROPOSED OVERALL EXTRACTION AREAS (55.9 HECTARES)
 - N2 NATIONAL PRIMARY ROUTE (DUAL CARRIAGEWAY)
 - NORTH ROAD (R135)
 - LOCAL ACCESS ROAD
 - WASTE LICENCE APPLICATION AREA - W0277-01 (c.35.9 ha)
 - OVERHEAD POWER LINES & PYLONS
 - 1M CONTOURS
 - WATER DRAINAGE CHANNEL

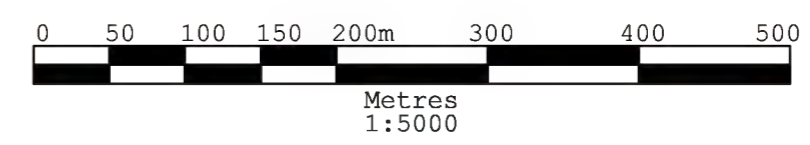
Refer to Figure 2-3 for Cross Sections

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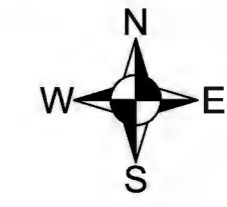
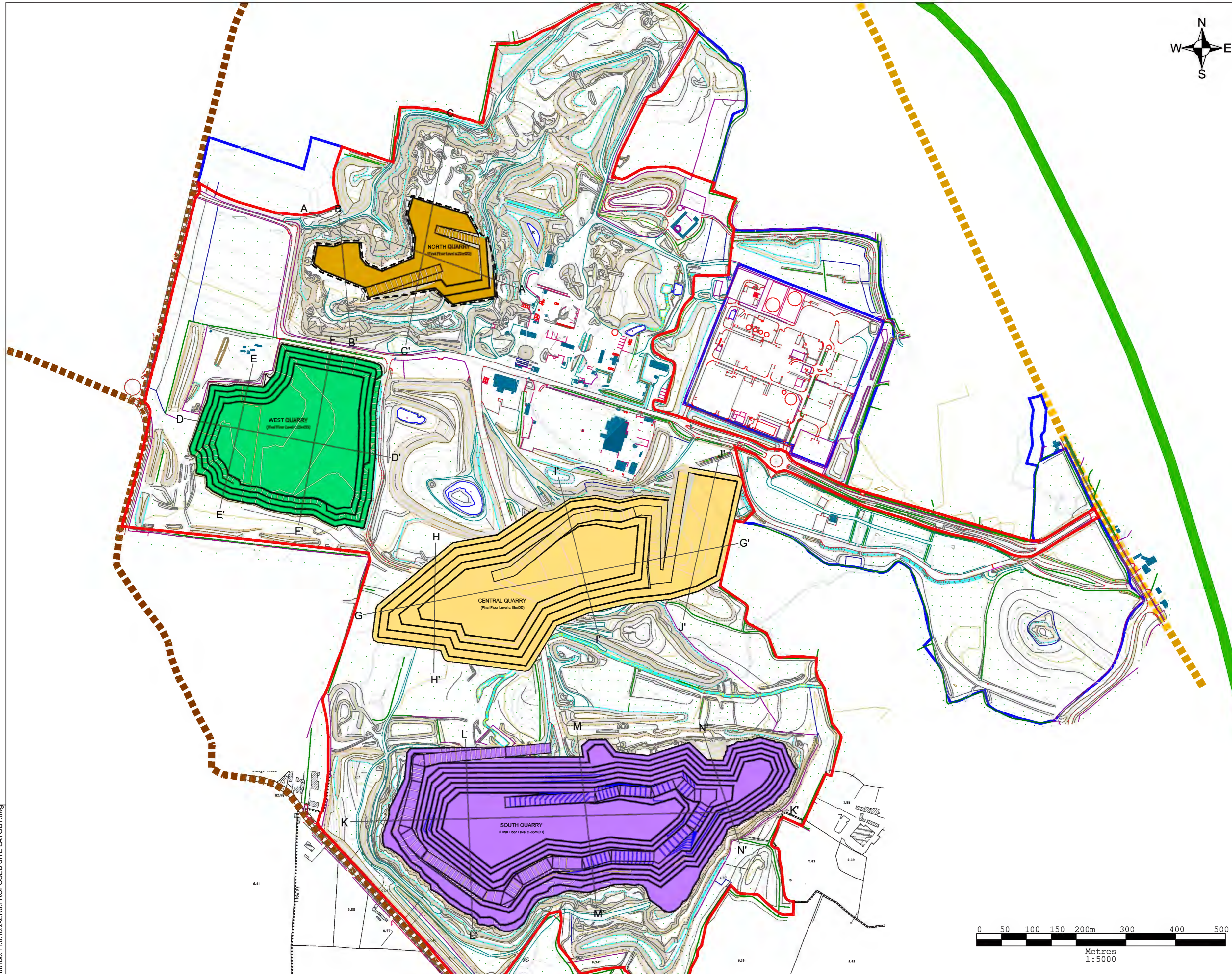
ROADSTONE WOOD LTD.
ENVIRONMENTAL IMPACT STATEMENT
 CONTINUANCE OF USE
 HUNTSTOWN QUARRY,
 NORTH ROAD, FINGLAS, DUBLIN 11
EXISTING SITE LAYOUT

FIGURE 2-1

Scale: 1:5,000 @ A2 Date: FEBRUARY 2012



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NOTES

- EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
- ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000712 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
- TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

LEGEND

	ROADSTONE WOOD LTD. LANDHOLDING (c. 211 ha)
	PLANNING APPLICATION AREA (c. 167.5 ha)
	N2 NATIONAL PRIMARY ROUTE (DUAL CARRIAGEWAY)
	NORTH ROAD (R135)
	LOCAL ACCESS ROAD
	NORTH QUARRY EXTRACTION AREA
	WEST QUARRY EXTRACTION AREA
	CENTRAL QUARRY EXTRACTION AREA
	SOUTH QUARRY EXTRACTION AREA

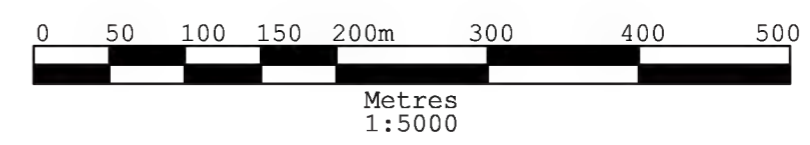
Refer to Figure 2-3 for Cross Sections

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 CONTINUANCE OF USE
 HUNTSTOWN QUARRY,
 NORTH ROAD, FINGLAS, DUBLIN 11
 PROPOSED FINAL
 EXTRACTION LAYOUT

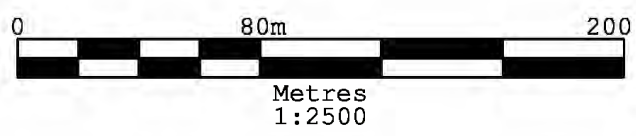
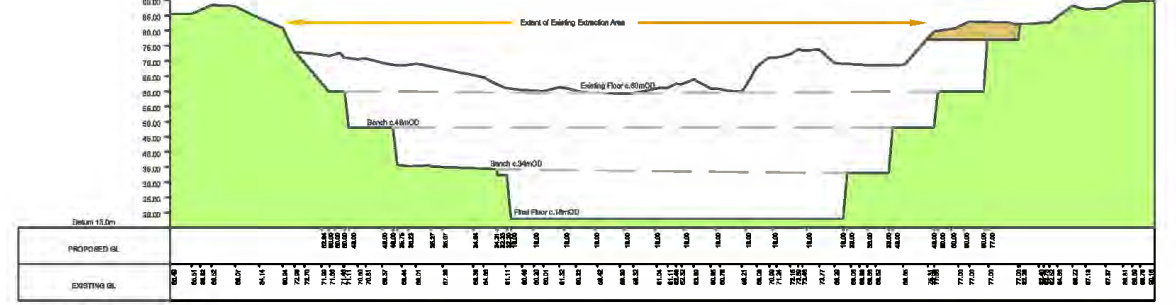
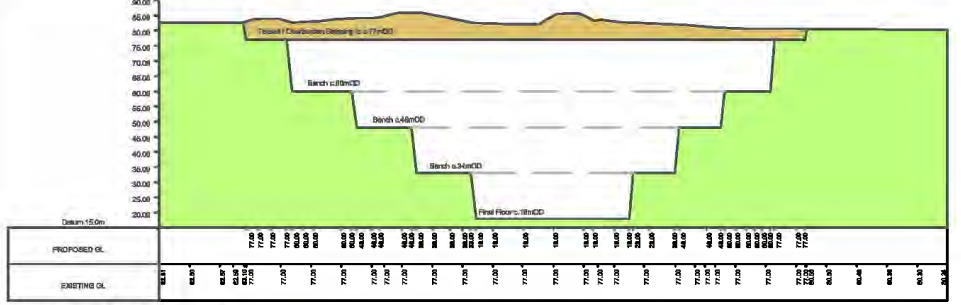
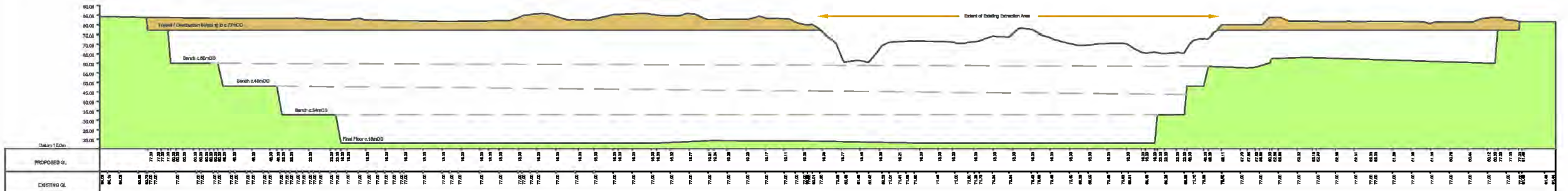
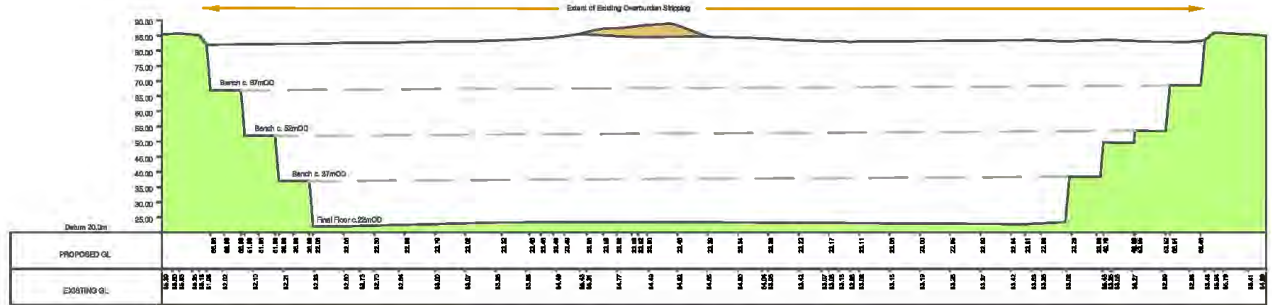
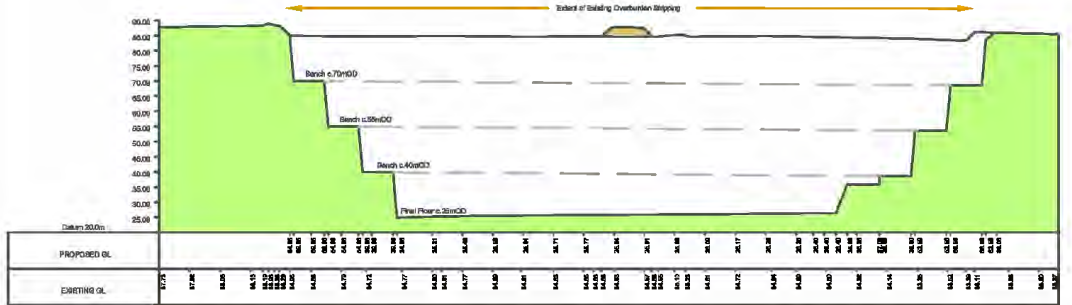
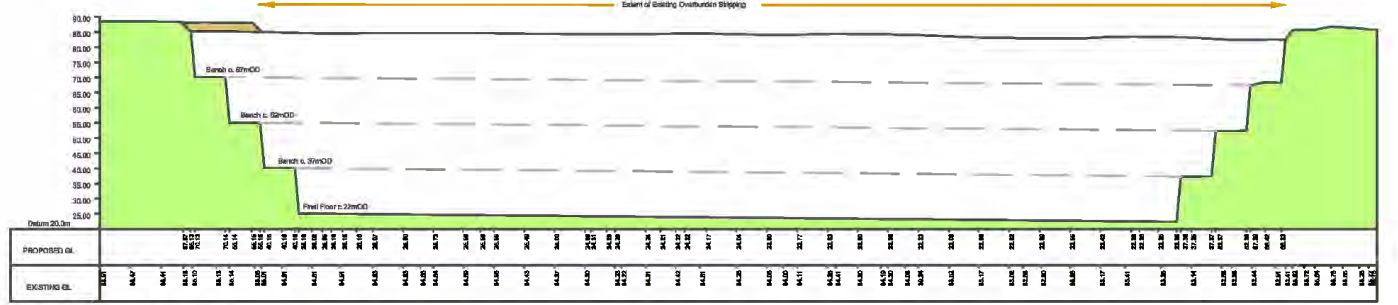
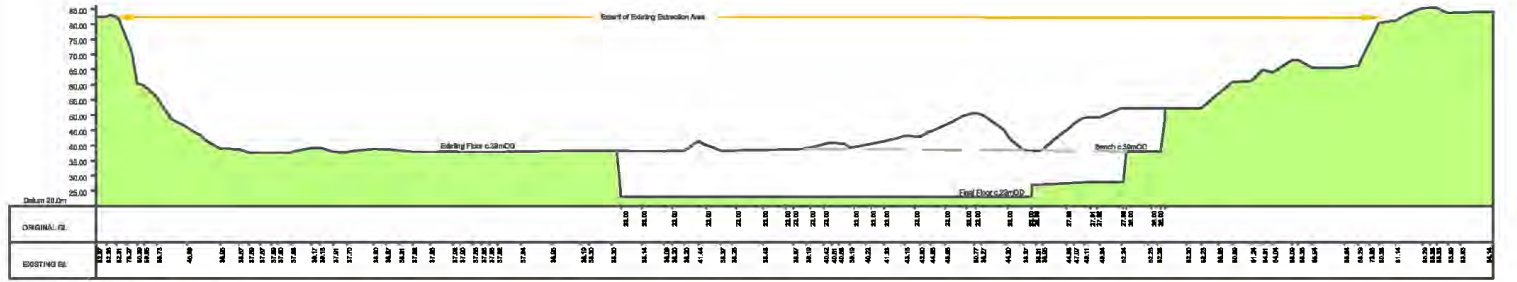
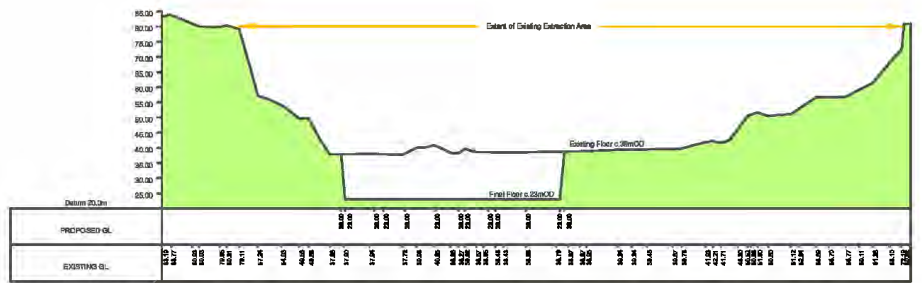
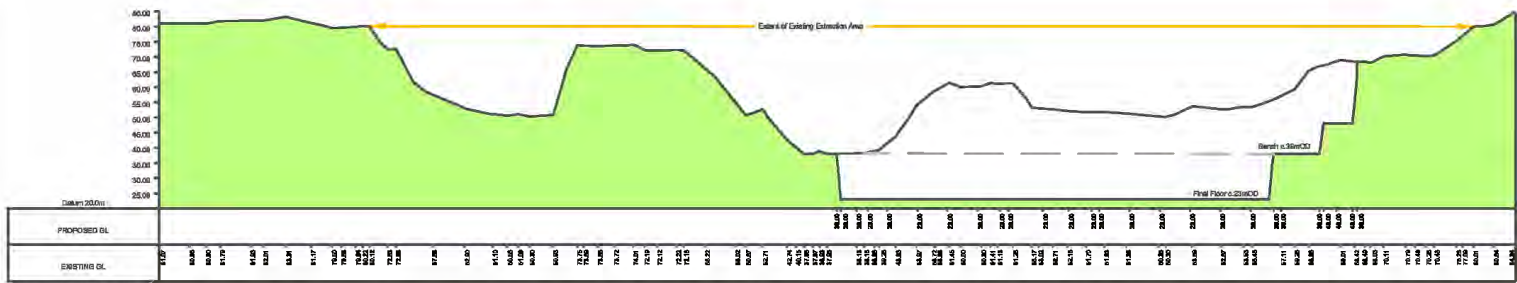
FIGURE 2-2

Scale: 1:5,000 @ A2 Date: FEBRUARY 2012



00180.1.1.0.18.2.2.R0.PROPOSED SITE LAYOUT.dwg

00180.1.1.0.18.2-3.R0.CROSS SECTIONS.dwg



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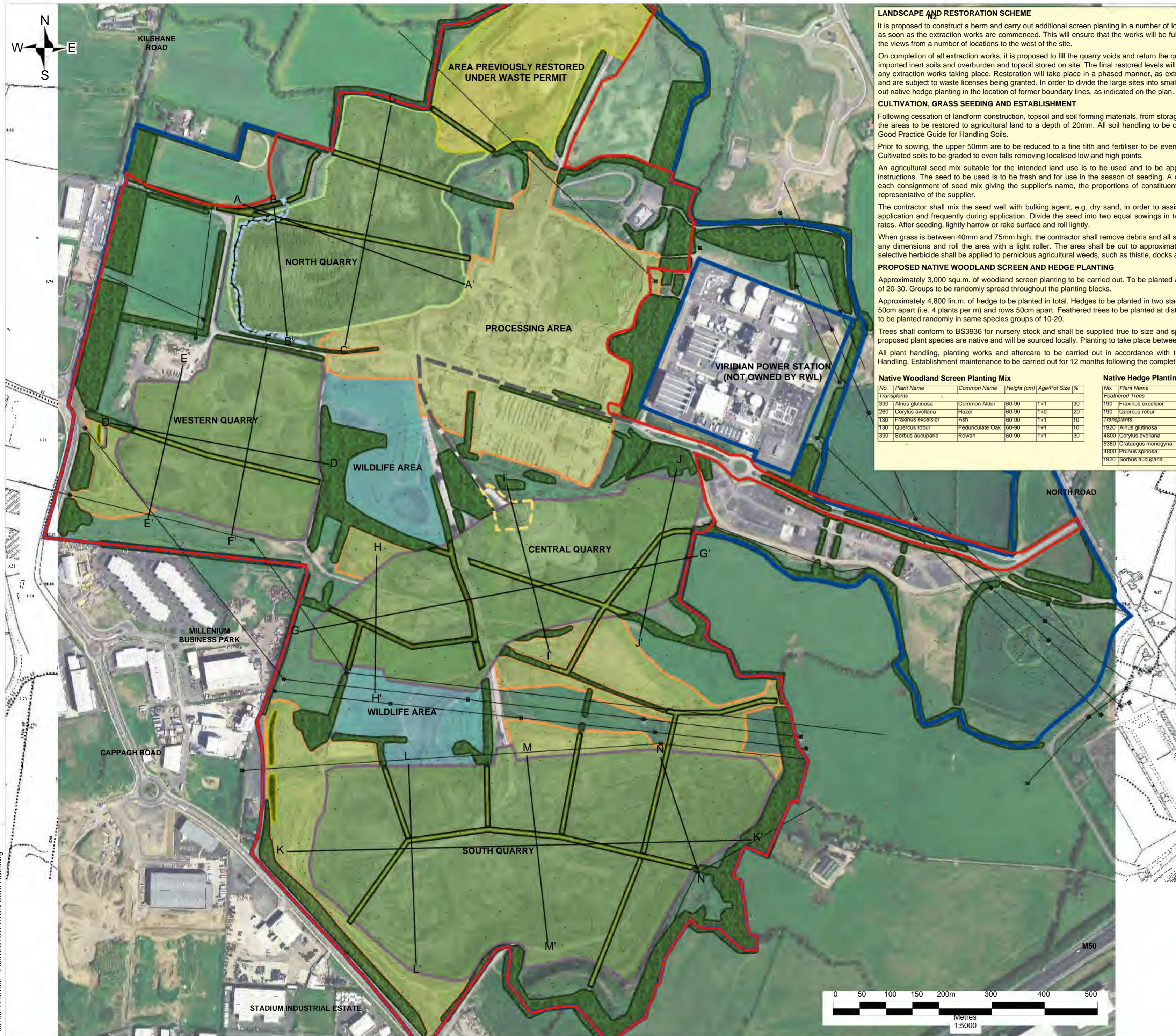
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ENVIRONMENTAL IMPACT STATEMENT

CONTINUANCE OF USE
HUNTSTOWN QUARRY,
NORTH ROAD, FINGLAS, DUBLIN 11

**EXISTING & PROPOSED
CROSS SECTIONS**

FIGURE 2-3A

Scale 1:2,500 @ A3 Date FEBRUARY 2012



LANDSCAPE AND RESTORATION SCHEME

It is proposed to construct a berm and carry out additional screen planting in a number of locations along the western site boundary, as soon as the extraction works are commenced. This will ensure that the works will be fully screened at all times and will improve the views from a number of locations to the west of the site.

On completion of all extraction works, it is proposed to fill the quarry voids and return the quarry areas to agricultural after-use using imported inert soils and overburden and topsoil stored on site. The final restored levels will be similar to the previous levels, prior to any extraction works taking place. Restoration will take place in a phased manner, as extraction operations cease in a given area and are subject to waste licenses being granted. In order to divide the large sites into smaller compartments, it is proposed to carry out native hedge planting in the location of former boundary lines, as indicated on the plan.

CULTIVATION, GRASS SEEDING AND ESTABLISHMENT

Following cessation of landform construction, topsoil and soil forming materials, from storage mounds on site, are to be spread over the areas to be restored to agricultural land to a depth of 20mm. All soil handling to be carried out in accordance with the MAFF Good Practice Guide for Handling Soils.

Prior to sowing, the upper 50mm are to be reduced to a fine tilth and fertiliser to be evenly distributed, as required, and raked in. Cultivated soils to be graded to even falls removing localised low and high points.

An agricultural seed mix suitable for the intended land use is to be used and to be applied at rates as per the manufacturer's instructions. The seed to be used is to be fresh and for use in the season of seeding. A certificate is to be provided in respect of each consignment of seed mix giving the supplier's name, the proportions of constituents of the mixture and a signature of the representative of the supplier.

The contractor shall mix the seed well with bulking agent, e.g. dry sand, in order to assist and even distribution. Mix well before application and frequently during application. Divide the seed into two equal sowings in two transverse directions at the specified rates. After seeding, lightly harrow or rake surface and roll lightly.

When grass is between 40mm and 75mm high, the contractor shall remove debris and all stones and clay balls larger than 40mm in any dimensions and roll the area with a light roller. The area shall be cut to approximately 35mm high. Spot treatment using a selective herbicide shall be applied to pernicious agricultural weeds, such as thistle, docks and ragwort.

PROPOSED NATIVE WOODLAND SCREEN AND HEDGE PLANTING

Approximately 3,000 sqm. of woodland screen planting to be carried out. To be planted at 1.5m centres, in same species groups of 20-30. Groups to be randomly spread throughout the planting blocks.

Approximately 4,800 lin.m. of hedge to be planted in total. Hedges to be planted in two staggered rows, with plants within each row 50cm apart (i.e. 4 plants per m) and rows 50cm apart. Feathered trees to be planted at distances of 8-16m and staked. Transplants to be planted randomly in same species groups of 10-20.

Trees shall conform to BS3936 for nursery stock and shall be supplied true to size and species name, as per the table below. All proposed plant species are native and will be sourced locally. Planting to take place between the months of November and March.

All plant handling, planting works and aftercare to be carried out in accordance with the CPSE Recommendations for Plant Handling. Establishment maintenance to be carried out for 12 months following the completion of each planting phase.

Native Woodland Screen Planting Mix

No.	Plant Name	Common Name	Height (cm)	Age/Pot Size	%
<i>Transplants</i>					
390	<i>Alnus glutinosa</i>	Common Alder	60-90	1+1	30
260	<i>Corylus avellana</i>	Hazel	60-90	1+0	20
130	<i>Fraxinus excelsior</i>	Ash	60-90	1+1	10
130	<i>Quercus robur</i>	Pedunculate Oak	60-90	1+1	10
390	<i>Sorbus aucuparia</i>	Rowan	60-90	1+1	30

Native Hedge Planting Mix

No.	Plant Name	Common Name	Height (cm)	Age/Pot Size	%
<i>Feathered Trees</i>					
190	<i>Fraxinus excelsior</i>	Ash	200-250	2xTR	1
190	<i>Quercus robur</i>	Pedunculate Oak	150-175	2xTR	1
<i>Transplants</i>					
1920	<i>Alnus glutinosa</i>	Common Alder	60-90	1+1	10
4800	<i>Corylus avellana</i>	Hazel	60-90	1+0	25
5380	<i>Crataegus monogyna</i>	Hawthorn	60-90	1+1	28
4800	<i>Prunus spinosa</i>	Blackthorn	60-90	1+0	25
1920	<i>Sorbus aucuparia</i>	Rowan	60-90	1+1	10

NOTES

- EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S: 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
- ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000712 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
- TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY
- ALSO REFER TO DRAWINGS PLO6 A, B & C AND PLO7 A & B: LANDSCAPE & RESTORATION PLAN AND RESTORATION SECTIONS

LEGEND

- ROADSTONE WOOD LTD. LANDHOLDING (c. 211 ha)
- PLANNING APPLICATION AREA (c.167.5 ha)
- EXISTING FEATURES TO BE RETAINED
- HEDGEROWS AND SCREEN PLANTING BELTS
- WILDLIFE AREAS
- AREA PREVIOUSLY RESTORED UNDER EXISTING WASTE LICENCE PERMIT
- ELECTRICITY LINES CROSSING OVER THE APPLICATION SITE
- PROPOSED LANDSCAPE FEATURES (to be carried out at the beginning of the extraction works)
- PROPOSED SCREENING BERM TO WEST OF WESTERN QUARRY
- PROPOSED WOODLAND SCREEN PLANTING ALONG PARTS OF WESTERN BOUNDARY
- PROPOSED RESTORATION FEATURES (to be carried out on completion of all extraction works)
- PROPOSED RESTORATION CONTOURS
- QUARRY AREAS TO BE INFILLED AND RESTORED TO AGRICULTURAL LAND SUBJECT TO PENDING WASTE LICENCE APPLICATION (REF: W0277-01)
- QUARRY AREAS TO BE INFILLED AND RESTORED TO AGRICULTURAL LAND SUBJECT TO FUTURE WASTE LICENCE APPLICATIONS
- PROCESSING AREA, DISTURBED GROUND & OVERBURDEN AREAS TO BE LEVELED AND RESTORED TO AGRICULTURAL LAND
- PROPOSED HEDGEROWS IN THE APPROXIMATE LOCATIONS OF FORMER BOUNDARY LINES
- RETAINED QUARRY FACE FOR EXISTING PERIGRINE FALCONS ON SITE
- RETAINED QUARRY FACE FOR FUTURE ACCESS TO VIEW TOBER COLLEEN FORMATION OVERLAYING WAULSORTIAN LIMESTONE
- RETAINED INTERNAL ACCESS ROAD TO VIEW QUARRY FACE



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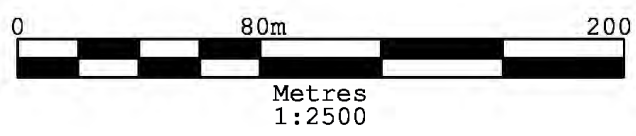
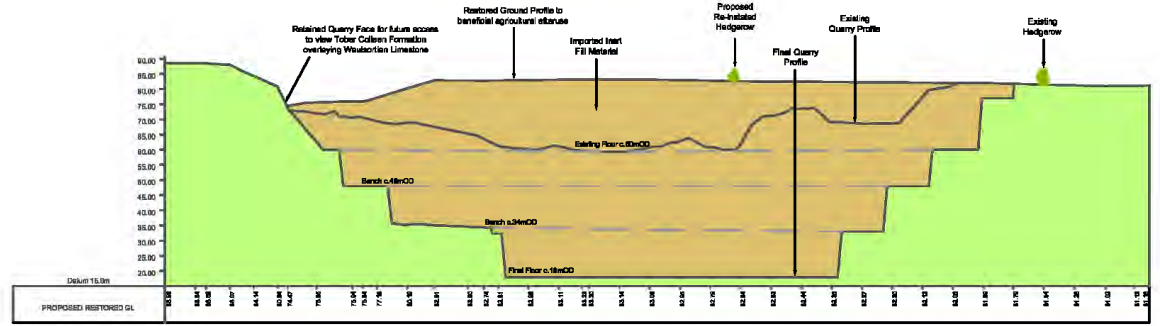
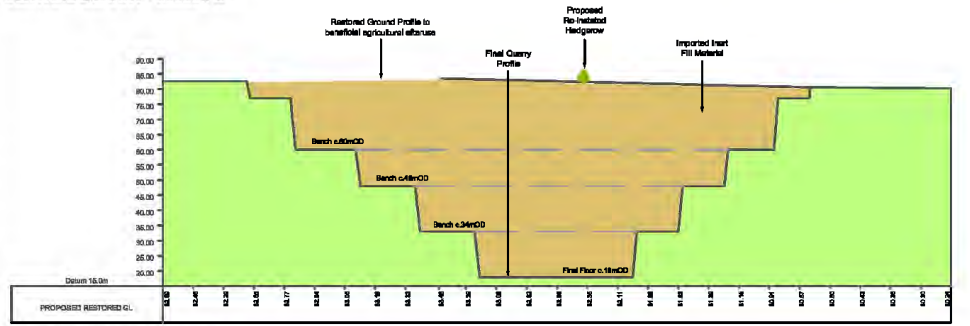
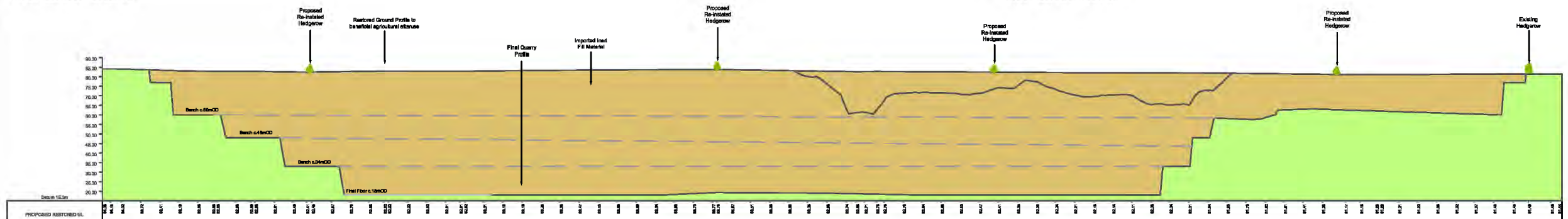
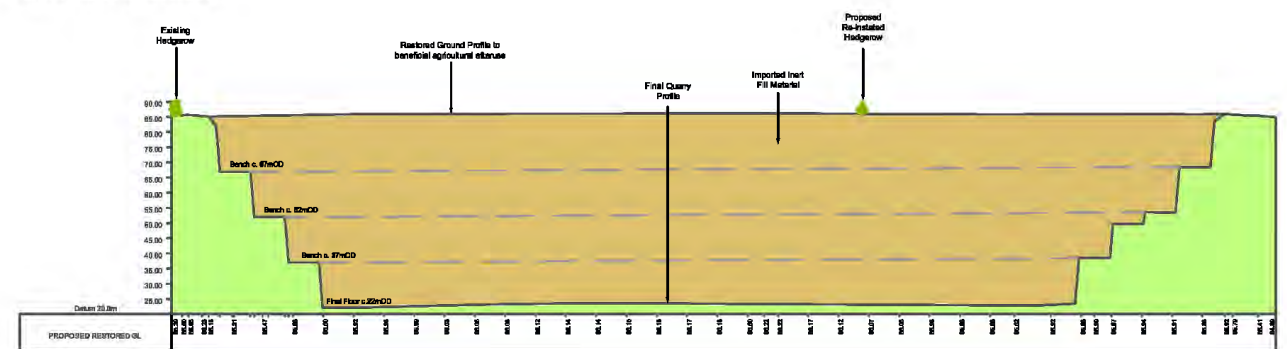
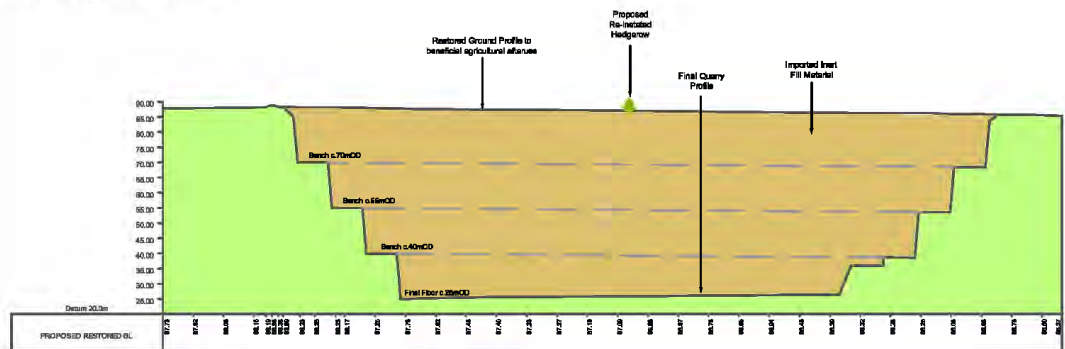
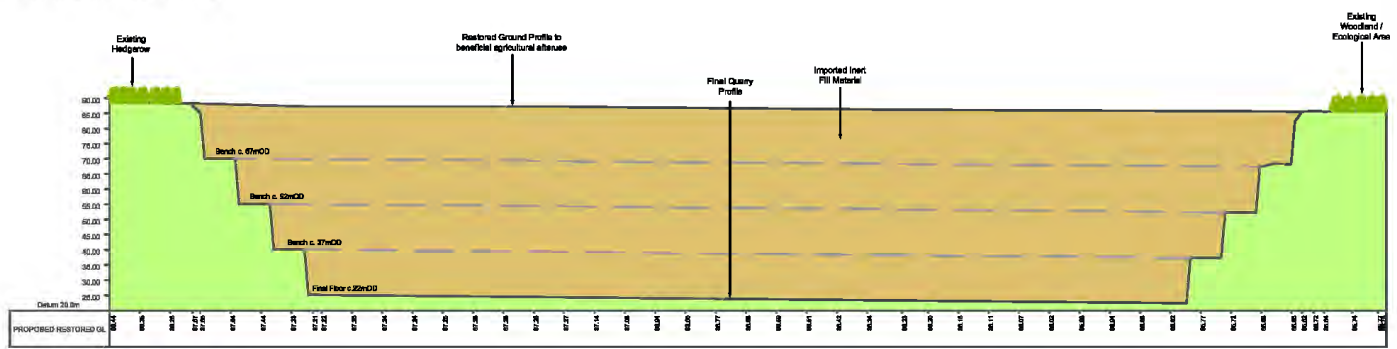
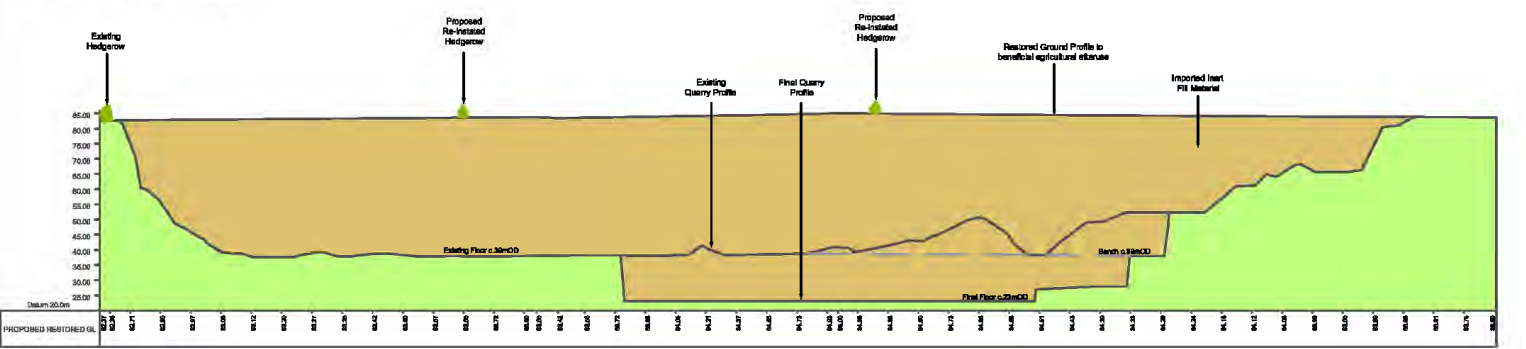
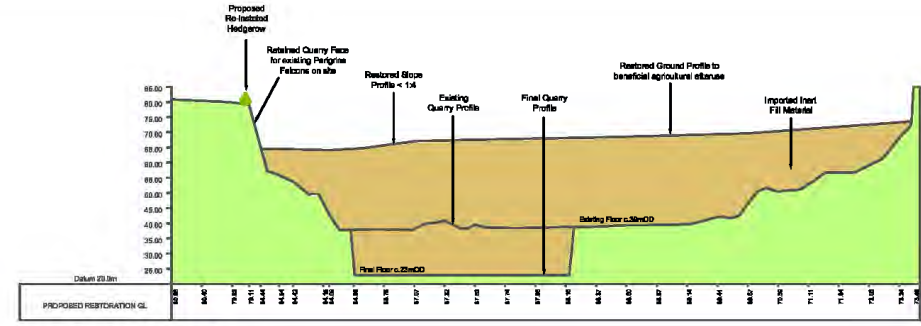
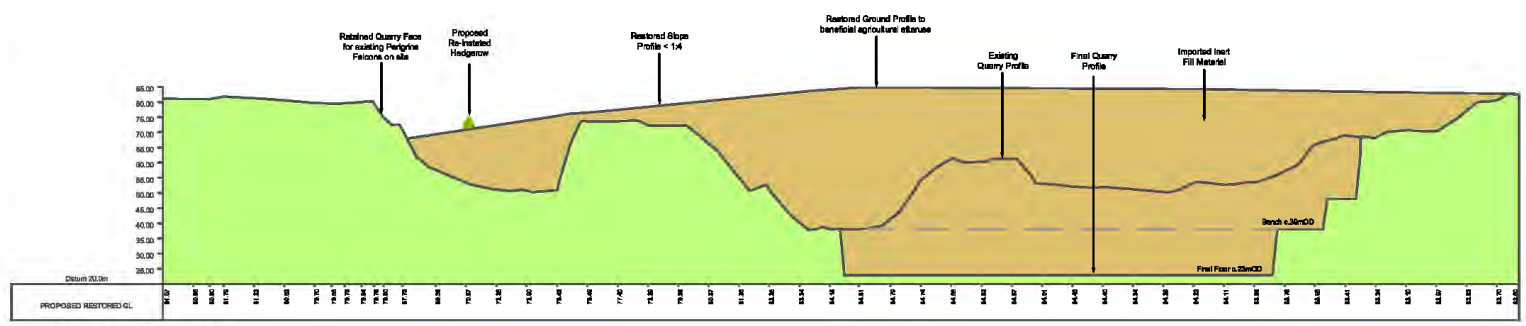
ROADSTONE WOOD LTD
CONTINUANCE OF USE
HUNTSTOWN QUARRY
NORTH ROAD, FINGLAS, DUBLIN 11
LANDSCAPING &
RESTORATION PLAN

FIGURE 2-4

Scale: 1:5,000 @ A2 Date: FEBRUARY 2012

00180.11.0.18.2-4-R0-RESTORATION SURFACE (DWG)

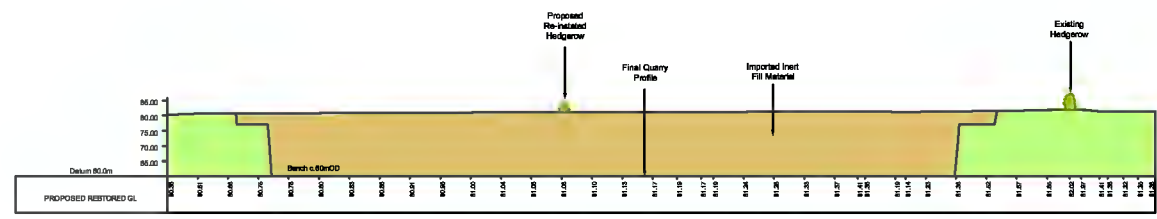
00180.11.0.18.2-5.R0.RESTORATION CROSS SECTIONS.dwg



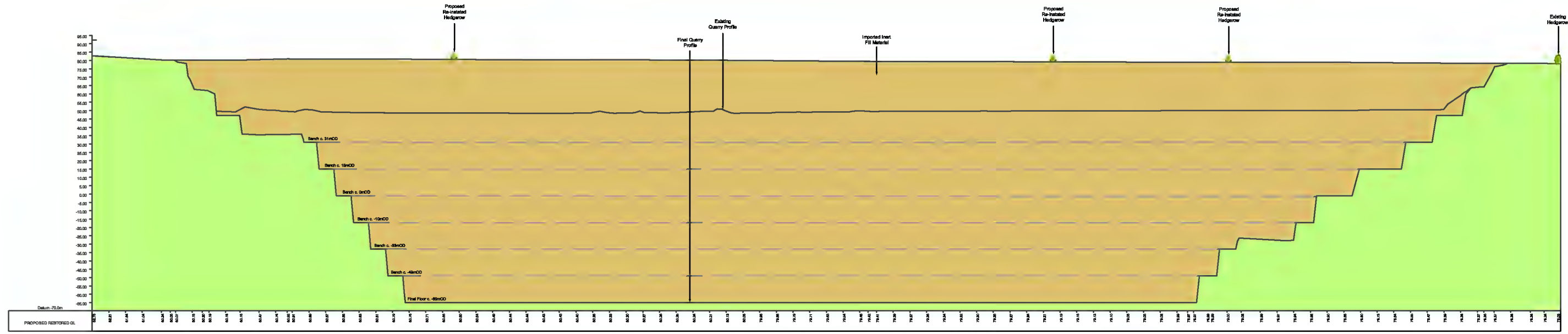
Refer to Figure 2-4 for Restoration Plan

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	ROADSTONE WOOD LTD. ENVIRONMENTAL IMPACT STATEMENT CONTINUANCE OF USE HUNTSTOWN QUARRY, NORTH ROAD, FINGLAS, DUBLIN 11 RESTORATION CROSS SECTIONS FIGURE 2-5A
Scale 1:2,500 @ A3	Date FEBRUARY 2012

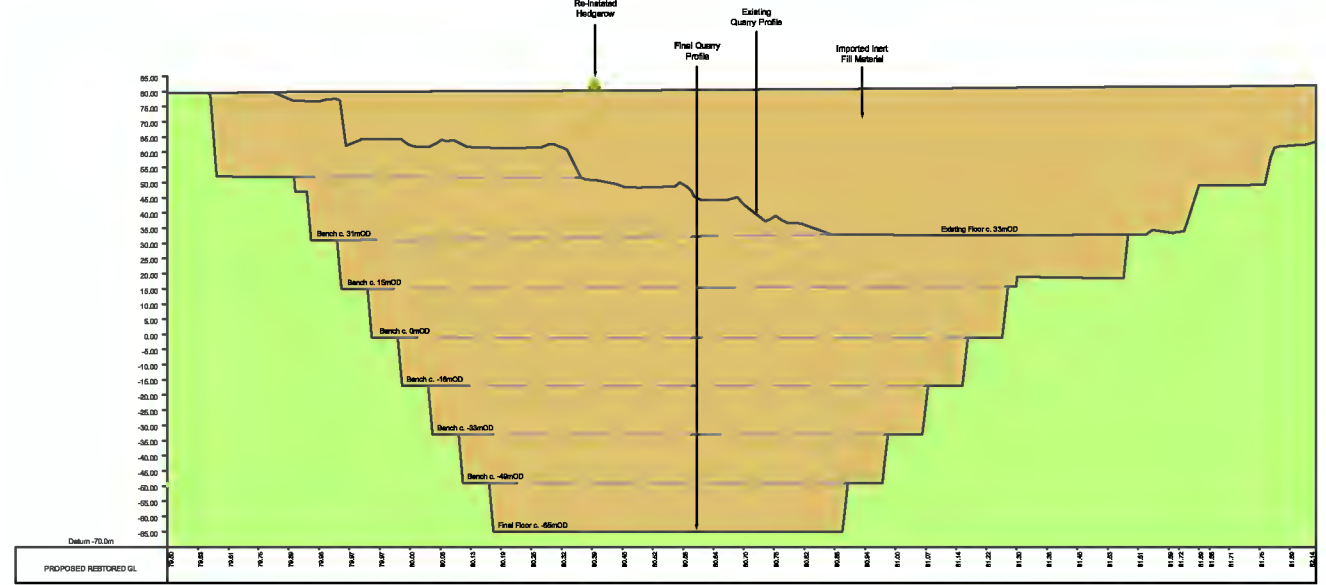
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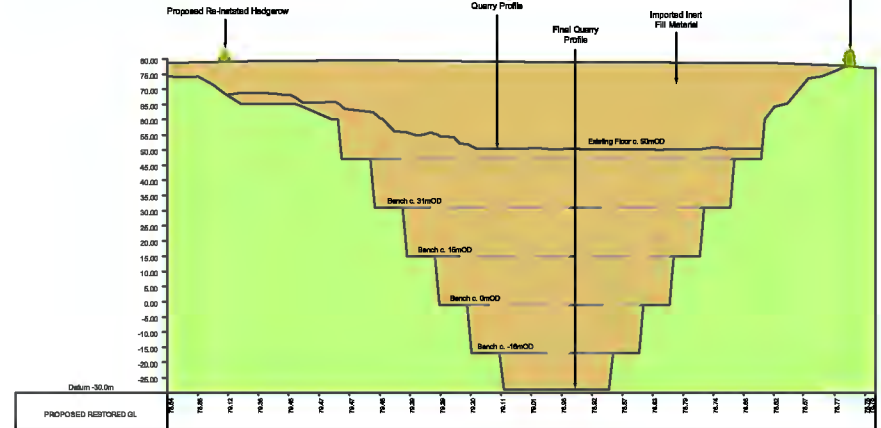
CENTRAL QUARRY - Section J - J'



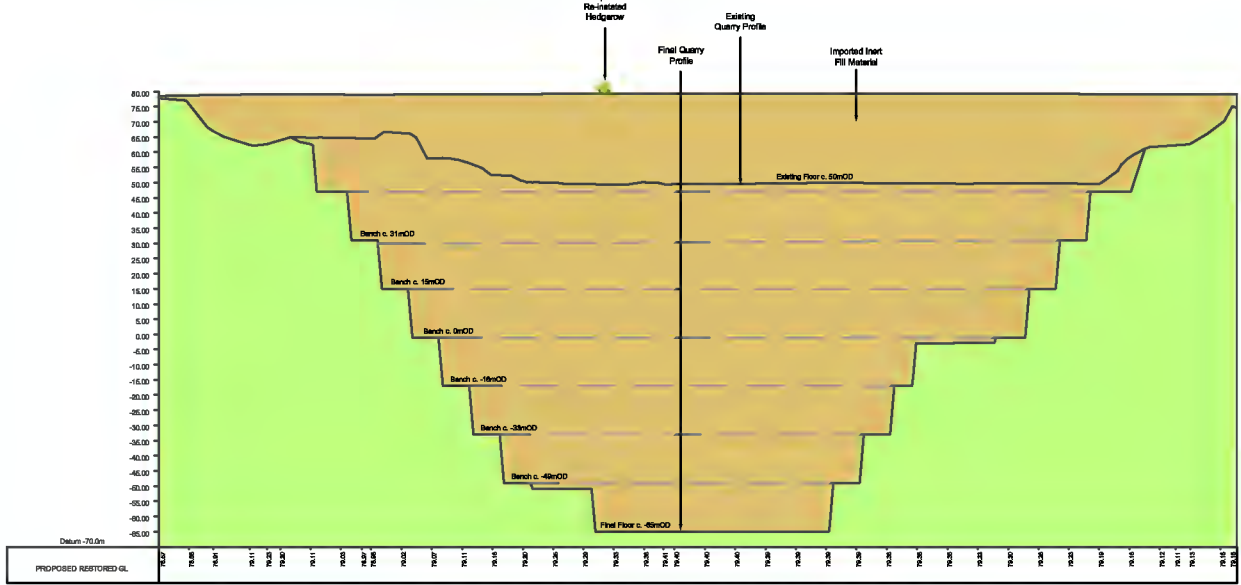
SOUTH QUARRY - Section K - K'



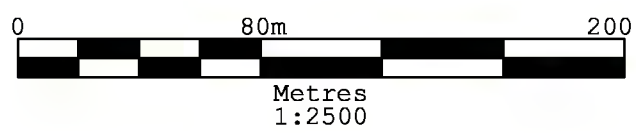
SOUTH QUARRY - Section L - L'



SOUTH QUARRY - Section N - N'



SOUTH QUARRY - Section M - M'



Refer to Figure 2-4 for Restoration Plan

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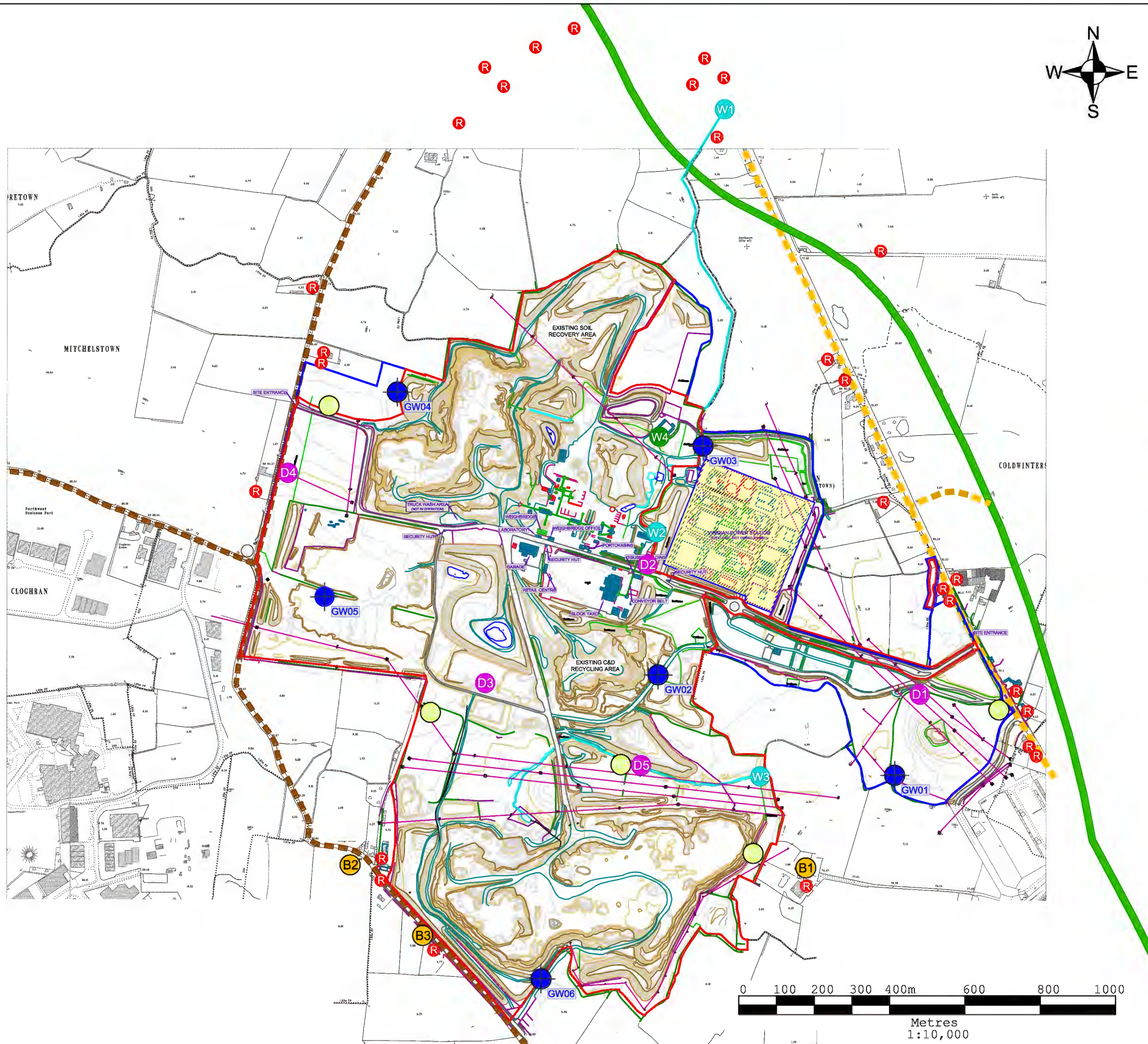
ROADSTONE WOOD LTD.
 ENVIRONMENTAL IMPACT STATEMENT
 CONTINUANCE OF USE
 HUNTSTOWN QUARRY,
 NORTH ROAD, FINGLAS, DUBLIN 11
RESTORATION CROSS SECTIONS

FIGURE 2-5B

Scale 1:2,500 @ A3 Date FEBRUARY 2012



00180.11.0.18.2-6-R0.ENVIRONMENTAL MONITORING LOCATIONS.dwg



NOTES

- EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
- ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000712 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
- TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

LEGEND

	ROADSTONE WOOD LTD. LANDHOLDING (c. 211 ha)
	PLANNING APPLICATION AREA (c.167.5 ha)
	N2 NATIONAL PRIMARY ROUTE (DUAL CARRIAGEWAY)
	NORTH ROAD (R135)
	PROPOSED OVERALL EXTRACTION AREAS (XX HECTARES)
	EXISTING NOISE MONITORING LOCATIONS
	EXISTING DUST MONITORING LOCATIONS
	EXISTING GROUNDWATER WELL MONITORING LOCATIONS
	EXISTING SURFACEWATER MONITORING LOCATIONS
	PROPOSED NEW SURFACEWATER MONITORING LOCATION
	BLAST MONITORING LOCATION

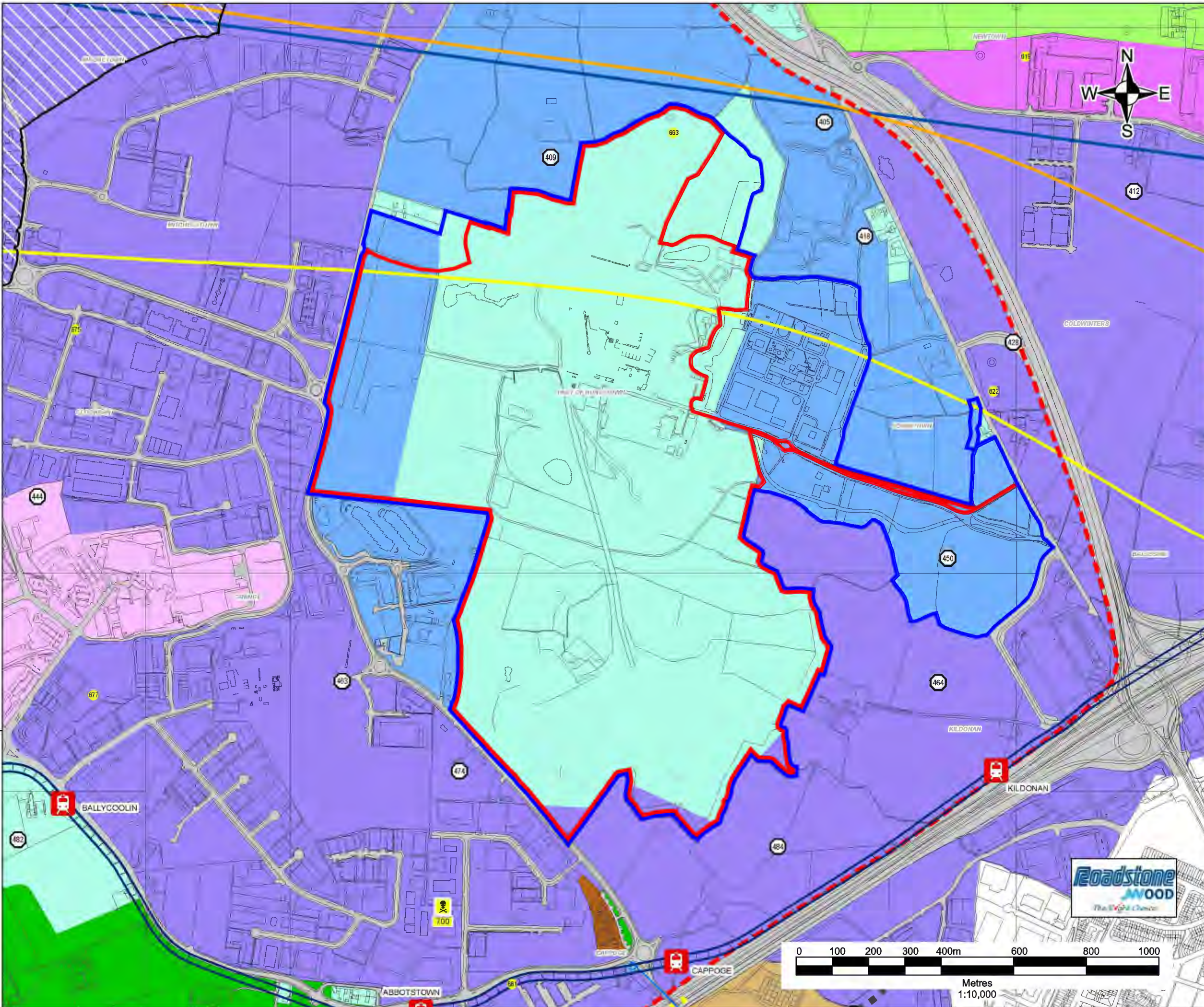


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 HUNTSTOWN, CO. DUBLIN
**ENVIRONMENTAL
 MONITORING LOCATIONS**

FIGURE 2-6
 Scale 1:10,000 Date FEBRUARY 2012

00180.11.0.18.2-7.R0.EXIST LAND ZONING.dwg



NOTES

- EXTRACT FROM FINGAL COUNTY DEVELOPMENT PLAN (2011-2017) ZONING OBJECTIVES MAP - MAP NO. 12 BLANCHARDSTOWN NORTH
- ORDNANCE SURVEY (IRELAND) LICENCE NO. SU 0000712 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND

LEGEND

- ROADSTONE WOOD LTD. LANDHOLDING (c. 211 ha)
- PLANNING APPLICATION AREA (c.167.5 ha)

ZONING OBJECTIVES

- Objective C1 Provide for and protect civic, religious, community, education, health care and social infrastructure
- Objective G8 Protect and provide for a Greenbelt
- Objective GE Provide opportunities for general enterprise and employment
- Objective HA Protect and enhance high amenity areas
- Objective HI Provide for heavy industry
- Objective HT Provide for office, research and development; and high technology/high technology manufacturing type employment in a high quality built and landscaped environment
- Objective LC Protect, provide for and/or improve local centre facilities
- Objective OS Preserve and provide for open space and recreational amenities
- Objective RA Provide for a rural amenity (rural amenity) which may support both the planning and objectives of the surrounding rural and physical infrastructure
- Objective RB Provide for and facilitate rural-related business which has a demonstrated need for a rural location
- Objective RS Provide for residential development and protect and improve residential amenity
- Objective RU Protect and promote in a balanced way, the development of agriculture and rural-related enterprise, biodiversity, the rural landscape, and the built and cultural heritage
- Objective RV Protect and provide the framework for the provision of services which contribute to the overall improvement of the environment and the availability of physical and community infrastructure
- Objective WD Provide for distribution, warehouse, storage and logistics facilities which require good access to a major road network within a good quality environment

SPECIFIC OBJECTIVES

- Proven and/or provide for a burial ground
- Subject to Local Area Plan
- Development Boundary
- Indicative Cycle/Pedestrian Route
- Quality Bus Corridor
- Road Proposal
- Site Specific Discharge Boundary
- Inner Airport Noise Zone
- Outer Airport Noise Zone
- Outer Public Safety Zone
- Metro Proposal
- Urban Centre Strategy/Study Area
- Indicative Metro Stop
- 20 Provide for residential development at a density per hectare as shown
- Severely Site and consultation distances (metres)
- Proposed School
- Provide for Traveller Accommodation
- Protect & preserve trees, woodlands and hedgerows
- Protected Structure
- Recorded Monument
- Local Objective

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 CONTINUANCE OF USE
 HUNTSTOWN QUARRY,
 NORTH ROAD, FINGLAS, DUBLIN 11
CURRENT LAND ZONING MAP

FIGURE 2-7

Scale: 1:10,000 Date: FEBRUARY 2012

DESCRIPTION OF DEVELOPMENT 2

APPENDICES

Appendix 2-A

Bord na Mona MBBR Aeration System Operations & Maintenance Manual

Appendix 2-B

Environmental Management System

DESCRIPTION OF DEVELOPMENT 2

Appendix 2-A

Bord na Mona MBBR Aeration System Operations & Maintenance Manual



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Co. Kildare
Ireland

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F +353 (0) 45 432312
e env.info@anua.ie
w www.anuaenv.ie

Shane Geraghty
Roadstone Wood Ltd
Fortunestown
Tallaght
Dublin 24

15th December 2011

**REF: AR58 - System installed at Huntstown Quarry, North Road, Finglas,
Dublin 11**

Dear Shane,

I wish to confirm that there was an aeration system installed at the above address on 15th January 2003.

On the 3rd August 2011 you entered into a service agreement with us to have the system inspected.

The system was inspected on 10th August 2011 and the blower had to be taken away and repaired.

The blower has since been repaired and is now installed back into the system.

I wish to confirm that the plant is fully functional both mechanically and electrically.

If you have any queries, please do not hesitate to contact us.

Kind regards,

Liz Dobbryn
**Customer Services Unit
Anua**

BORD NA MÓNA

BORD NA MÓNA ENVIRONMENTAL LIMITED

MBBR AERATION SYSTEM OPERATIONS & MAINTENANCE MANUAL

**AR58 – CRM Roadstone, Huntstown Quarry, North
Road, Finglas, Dublin 11.**

Contents

1.0 Introduction

2.0 Description of Bord na Móna Waste Water Treatment System

- 1 Primary Settlement Tank(s)**
- 2 MBBR Aeration Tank(s)**
- 3 Secondary Settlement Tank(s)**
- 4 Optional Extras**
 - 2.4.1 Denitrification**
 - 2.4.2 Phosphorous Removal**
 - 2.4.3 Pump Stations**
 - 2.4.4 Flow Meter**
 - 2.4.5 Composite Samples**

3.0 Maintenance of the Bord na Móna Waste Water Treatment System

- 1 Primary Settlement Tank(s)**
- 2 MBBR Aeration Tank(s)**
- 3 Secondary Settlement Tank(s)**
- 4 Optional Extras**
 - 3.4.1 Denitrification**
 - 3.4.2 Phosphorus Removal**
 - 3.4.3 Pump Stations**
 - 3.4.4 Flow Meter**
 - 3.4.5 Composite Sampler**

4.0 Safety

- 1 Manholes/Lids**
- 2 Primary Settlement Tank(s)**
- 3 Aeration Tank(s) and Secondary Settlement Tank(s)**
- 4 Site**
- 5 Manholes/Lids**
- 6 Electrical**

5.0 Start Up

6.0 Maintenance Check List

Appendix

- 1 Holding Tanks**
- 2 Air Blower**
- 3 Effluent/Sludge Pumps**
- 4 System Drawings**
- 5 Electrical Diagrams**

1.0 Introduction

The following manual provides a description of the Bord na Móna MBBR Aeration System for the treatment of sewage effluent. Included in this manual are operating instructions and essential maintenance requirements.

Important: Section 4.0 describes safety precautions, which must be adhered to. Please read this section carefully.

The Bord na Móna aeration system is a Moving Bed Biological Reactor (MBBR), highly efficient system for the treatment of sewage effluent. The raw effluent is subjected to a primary settlement stage where the gross solid material is allowed to settle. The effluent is then directed to an extensively aerated biofilm stage where an accumulated population of biodegradative microorganisms is allowed to develop and actively degrade the effluent. The final stage in the treatment process consists of a secondary settlement stage, where any remaining biomass is allowed to settle, allowing the clarified final treated effluent to be discharged. Alongside with solids and organic matter removal MBBR offers the nutrient (Nitrogen, Ammonia and Phosphate) removal as an optional extra. These incorporate an anoxic stage after the primary settlement stage and chemical dosing system encompassed in conjunction with the aerated biofilm stage.

2.0 Description of the Bord na Móna Aeration System

2.1 Primary Settlement Tank

The raw effluent is first directed to the primary settlement tank(s). These tanks are designed to allow settlement of the primary solid material. A baffling system in conjunction with filter(s) prevents the transfer of gross solids from the primary to secondary stage.

2.2 MBBR Aeration Tank

Following the primary settlement tank (or anoxic tank), the effluent is then directed to an aeration tank, or a series of tanks, depending on the hydraulic loading to the system. These tanks are fitted with a network of floor mounted membrane diffusers which actively release fine bubbles of air upwards through the incoming effluent. Above these diffusers, suspended in the effluent is a volume of specific inert media. Shortly after start-up, a population of biodegradative microorganisms attaches to the media, growing on the interior surface of the media rings. As these microbes receive oxygen from the underlying diffusers, they subject the organic fraction, contained within the effluent, to extensive biodegradation. Any excess microbial growth attached to the media is sloughed off continually by the gentle shearing action of the bubble movement through the media. This excess biomass passes through the aeration tanks with the treated effluent and is allowed to settle in the secondary settlement tank. As the effluent exits the aeration tank (or the final aeration tank in the larger systems) it will have undergone extensive secondary treatment.

The oxygen, central to the aeration process, is delivered to the floor mounted diffusers via blowers situated outside the aeration tanks.

2.3 Secondary Settlement Tank

Following secondary treatment in the aeration zone the final effluent undergoes secondary settlement. This ensures that any biomass sloughed off from the inert media during the aeration phase is allowed to settle to the base of the tank. The clarified final treated effluent is then discharged.

In order to ensure minimum disturbance of the settled biomass within the secondary settlement tank, incoming effluent into this tank is directed upward through a cylindrical stilling well. This ensures maximum settling of biomass within the tank, and maximum clarification of the final effluent.

A sludge return pump is located at the base of the secondary settlement tank. This pump is operated on a timer basis. For a fixed period every 24 hours the pump is activated and pumps the secondary sludge material from the secondary settlement tank back to primary settlement tanks. This ensures that secondary sludge does not accumulate within the secondary settlement tank, and therefore is not discharged with the final treated effluent. Also, since all sludge (both primary sludge and secondary sludge) is directed to the primary settlement tank, only the primary settlement tank requires routine desludging.

2.4.1 Anoxic Zone (optional)

The optional "Anoxic Zone" is established by circulation of the effluent to the anoxic tank in which the process of "Denitrification" - the conversion of nitrate to nitrogen gas and water using suitable heterotrophic bacteria - is achieved.

2.4.2 Phosphorous Removal Facility (optional)

In conjunction with the aeration a second process; Phosphorous removal can be achieved by chemical dosage to the aeration stage from a dosing tank located above the aeration chamber. This automated dosing system reduces the phosphate ratio within the effluent.

2.4.3 Pump Stations (optional extra)

Following the secondary settlement or clarifying chamber the effluent proceeds to the forward feed chamber. This chamber allows for treated/untreated effluent/influent to be pumped to or from the treatment system.

2.7 Flowmeters (optional extra)

There are usually three types of flowmeters available:

1. Ultrasonic,
2. Electromagnetic
3. Mechanical (see Appendix for details)

3.0 Maintenance of the Bord na Móna MBBR Aeration System

The Bord na Móna MBBR Aeration system should be checked for the following:

1. Evidence of sludge carryover (as seen by excessive solid material floating in the inlet or outlet pipe work of the aeration tank(s), or by uneven distribution of air bubbles in the inspection port of the aeration tank(s)).
2. Evidence of restricted diffuser grid (as seen by uneven distribution of bubbles or lack of bubbles in the aeration tank(s) when the air blower is operational)
3. Evidence of operation of blower (as seen by abundance of bubbles in the aeration tank).

3.1 Primary Settlement Tank

The Bord na Móna MBBR Aeration System is designed for continuous operation. To ensure optimum performance from the Aeration system, ensure that the recommended maintenance procedures are carried out and the following points are adhered to:

1. Ensure that all storm water is not channeled to the primary settlement tank.
2. Ensure that the waste from domestic meat/food mincers, or other sources of excessive food particles are not emptied down the waste drain to the primary settlement tank, but collected and disposed off separately.
3. Ensure that greases or fats are not emptied down the waste drain to the primary settlement tank, but collected and disposed off separately.
4. Ensure that non-biodegradable materials are not flushed to the primary settlement tank.
5. Ensure that excessive volumes of detergents, disinfectants etc. are not flushed into the primary settlement tank.

It is recommended that the primary settlement tank be desludged on a quarterly basis.

The importance of desludging cannot be overstated, as only clarified effluent should be treated in the aeration tank. Failure to desludge regularly can result in solids carry over into the aeration tanks, clogging of the diffusers, and ultimate failure of the treatment system.

In the event of blockage:

1. Inspect the inlet manhole of the primary settlement tank and remove any solid matter, which may clog the inlet T-pipe. Determine the cause of any blockage.
2. If possible, inspect and rod the Inlet T-pipe of the primary settlement tank to ensure that scum has not accumulated, and that vertical legs are clear.
3. If possible, inspect any filters (if applicable) to ensure they have not become blocked or clogged up.

3.2 Aeration Tanks

1. Periodically remove the inspection manholes on the aeration tanks and ensure that the air bubbles are present and evenly distributed throughout the surface of the liquid.
2. Ensure that no excess solid material is present in the inlet or outlet pipe work of the aeration tanks. If so, then the primary settlement tanks(s) could require desludging. It may be necessary to rod the inlet and outlet pipe work.
3. Ensure that the air blower is operating normally by checking for an abundance of bubbles in the aeration tank. If no bubbles are observed then check that the aeration system is switched on at the control panel. If the blower is switched on at the panel but is not operating, then contact Bord na Móna Environmental Division immediately.
4. If the blower appears to be operating normally, but no bubbles are observed in the aeration tanks then switch off blower and contact Bord na Móna Environmental Ltd immediately.

3.3 Secondary Settlement Tank

1. Periodically observe the effluent being discharged. If this effluent is clear then the system is operating normally. If there is evidence of sludge carry over, (dark suspended matter in the effluent sample) then check that the system is switched on. If the system is switched on, but the sample appears to contain sludge, then check the primary tanks and aeration tanks as described in 3.1 and 3.2 above.

2. If everything appears to be normal with the primary tanks and aeration tanks and blower, and the system is switched on, yet there is evidence of sludge carry over, then it is likely that the sludge return pump needs attention. Contact Bord na Móna Environmental Division.

3.4.1 Denitrification (Optional extra)

Visual inspection of the Anoxic tank and Recirculation tank are necessary. If there is evidence of sludge build up, desludging may be necessary. Maintenance of the anoxic and recirculation pumps are necessary (see Appendix)

3.4.2 3.4.2 Phosphorous Removal Facility (Optional extra)

Residual levels of ferric sulphate within the phosphorous removal facility should be checked periodically and standby supplies of ferric sulphate should be sufficient.

3.4.3 3.4.3 Pump Stations (Optional extra)

Visual inspections are required periodically to ascertain the effluent composition; if this effluent is clear then the system is operating normally. If there is evidence of sludge carry over, (dark suspended matter in the effluent sample) then check that the system is switched on. If the system is switched on, but the sample appears to contain sludge, then check the primary tanks and aeration tanks as described in 3.1 and 3.2 above. Maintenance of the pumps as required (see Appendix for details) Visual inspections of the pump chambers should be regularly carried out. All floats must be cleaned. Any evidence of sludge build up should be addressed immediately.

3.4.4 3.4.4 Flow Meter (Optional extra)

Please ref. to Appendix for details of maintenance

3.4.5 3.4.5 Composite Samples (Optional extra)

Please ref. to Appendix for details of maintenance

NOTE: IF YOU ARE IN ANY DOUBT ABOUT YOUR SYSTEM, PLEASE CONTACT BORD NA MONA ENVIRONMENTAL DIVISION AT THE NUMBER GIVEN AT THE END THIS MANUAL.

4.0 Safety

4.1 General

Protective gloves, Goggles and/or clothing should be worn when contact is made with any effluent sample, or internal component of this system.

Important: - when handling Ferric Sulphate Solution please refer to Material safety data sheet contained in section 8.0.

4.2 Primary Settlement Tank(s)

Primary settlement tanks are potentially dangerous when being desludged and desludging must not be carried out alone.

The person doing so has successfully completed the relevant Health & Safety training and have support from trained colleagues on the ground.

Naked lights should not be used in the vicinity of the tank due to the real danger of explosion.

The manhole covers should **NEVER** be left off an unattended tank. These tanks are 1 - 3.5 m in depth; therefore due care should be taken at all times. Disused or abandoned tanks should be demolished, filled in, or sealed so that accidental entry is impossible.

4.3 Aeration Tank(s) and Secondary Settlement Tank(s) and Anoxic Tank(s) (where applicable)

All points listed in 4.2 above are relevant, however, please note that the Aeration tank(s) do not need to be desludged (under normal operating conditions)

4.4 Site (where applicable)

Where a boundary fence is erected around an aeration system, then the fence itself should have a padlocked gate to exclude trespassers.

4.5 Manholes/Lids

Ensure that all manholes and lids are secure, and in the correct position at all times unless under instruction from relevant personnel of for maintenance/inspection purposes.

5.0 Start up

The following should be undertaken following start up:

1. Check that the blower is operating normally.
2. It may be necessary to empty the Primary and Secondary settlement tanks.
3. Check all tanks for blockages as outlined in **Section 3.1.**
4. Check the aeration tanks as outlined in **Section 3.2.**
5. Each day after start up, check the final effluent, to ensure that sludge is not being carried over. If sludge is evident after a number of days, then it is possible that the sludge return pump in the secondary settlement tank needs attention.

6.0 Maintenance Check List

Item	Recommended Inspection Interval	Normal Condition
Chemical Storage Tank (optional extra)	Every Week	Sufficient chemical
Primary settlement tank(s) inlet and outlet T-pieces	Monthly	Clear
Primary settlement tank sludge depth	Every 6 - 8 weeks	<0.75m depth
Anoxic tank(s) (optional extra)		Visual inspection / no evidence of sludge
Aeration tank(s)	Monthly	Bubbles diffusing No solid material
Blower	Monthly	Normal abundance of bubbles
Secondary Settlement	Monthly	<0.2m sludge
Final sample	Monthly	Clear liquid No evidence of sludge
Control panel	Monthly	MCB switch on, Alarm switch on, Overload trip lamp off

The standard plant is equipped with a visual alarm light. If the alarm light is on contact BnM (contact details overleaf)

IF IN ANY DOUBT PLEASE CONTACT

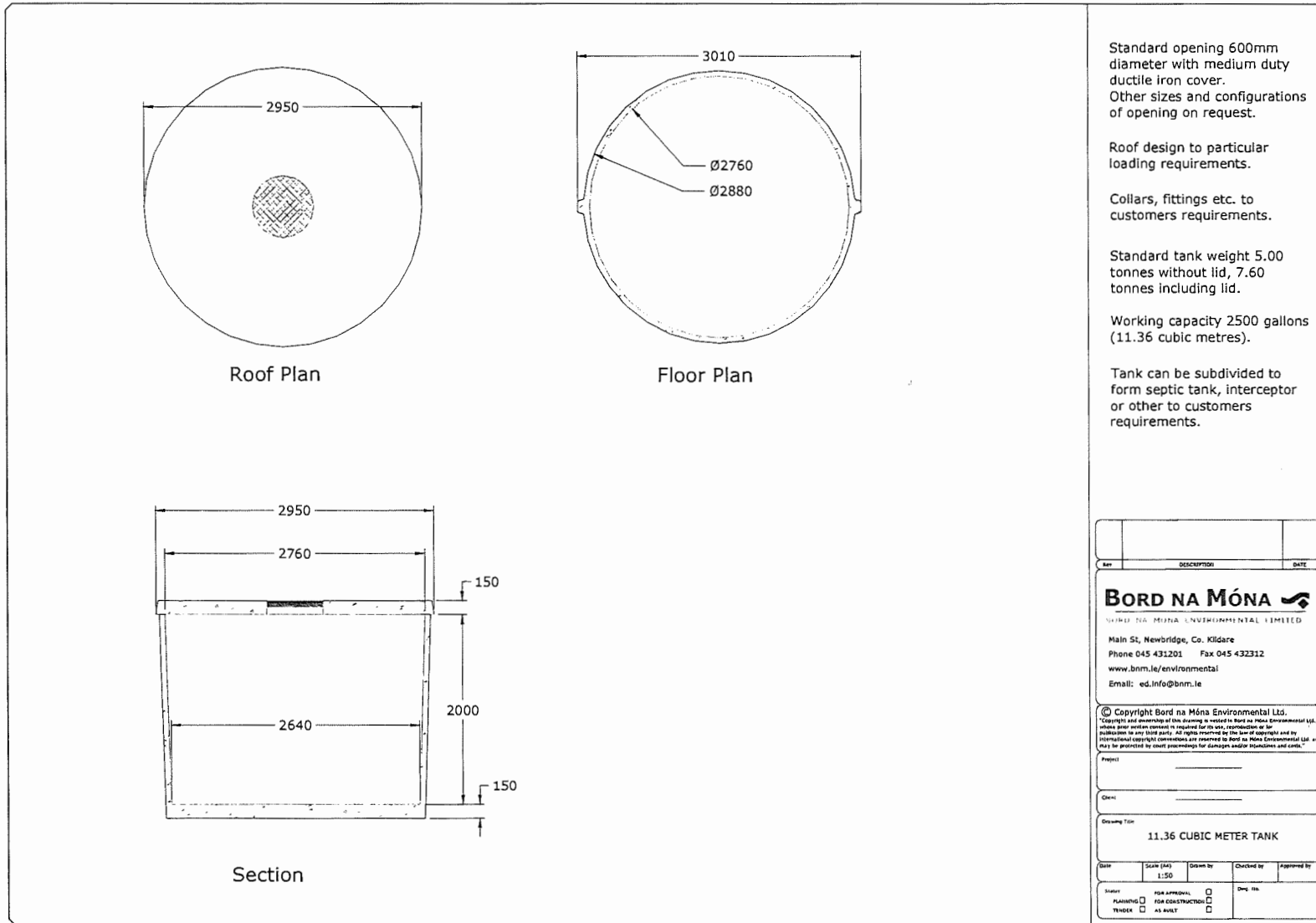
BORD NA MONA ENVIRONMENTAL DIVISION AT:

TEL: 045 439 580

FAX: 045 432 312

**MAIN STREET,
NEWBRIDGE,
CO. KILDARE.**

Appendix 1: Holding Tanks



Standard opening 600mm diameter with medium duty ductile iron cover. Other sizes and configurations of opening on request.

Roof design to particular loading requirements.

Collars, fittings etc. to customers requirements.

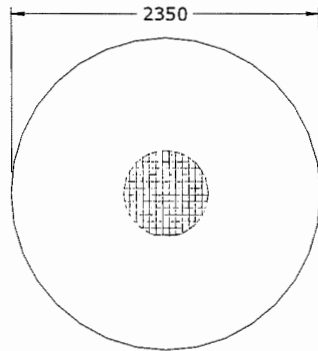
Standard tank weight 5.00 tonnes without lid, 7.60 tonnes including lid.

Working capacity 2500 gallons (11.36 cubic metres).

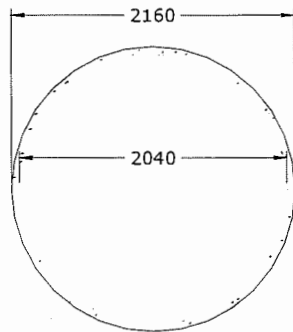
Tank can be subdivided to form septic tank, interceptor or other to customers requirements.

REV	DESCRIPTION	DATE
BORD NA MÓNA  <small>BORD NA MÓNA ENVIRONMENTAL LIMITED</small> Main St, Newbridge, Co. Kildare Phone 045 431201 Fax 045 432312 www.bnm.ie/environmental Email: ed.info@bnm.ie		
<small>© Copyright Bord na Móna Environmental Ltd. Copyright and ownership of this drawing is vested in Bord na Móna Environmental Ltd. where prior written consent is required for its use, reproduction or for publication in any form or part. All rights reserved by the laws of copyright and by international copyright conventions are reserved to Bord na Móna Environmental Ltd. and may be protected by court proceedings for damages and/or injunctions and costs.</small>		
Project: _____		
Client: _____		
Drawing Title: 11.36 CUBIC METER TANK		
Date	Scale (A4)	Drawn by
	1:50	
Checked by	Approved by	
Status: FOR APPROVAL: <input type="checkbox"/> PLANNING: <input type="checkbox"/> FOR CONSTRUCTION: <input type="checkbox"/> TENDER: <input type="checkbox"/> AS BUILT: <input type="checkbox"/>		Dwg. No: _____

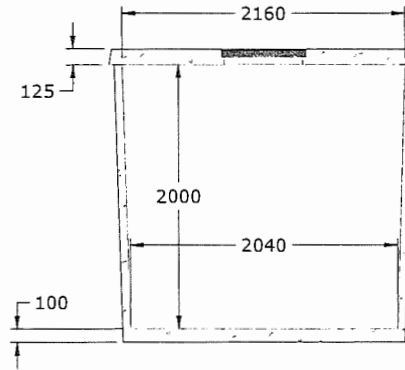
1500 Gallon (6.92 cubic metre) Tank



Roof Plan



Floor Plan



Section

Standard opening 600mm diameter with medium duty ductile iron cover.
Other sizes and configurations of opening on request.

Roof design to particular loading requirements.

Collars, fittings etc. to customers requirements.

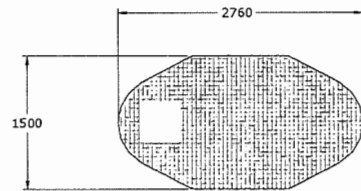
Standard tank weight 3.00 tonnes without lid, 4.40 tonnes including lid.

Working capacity 1525 gallons (6.93 cubic metres).

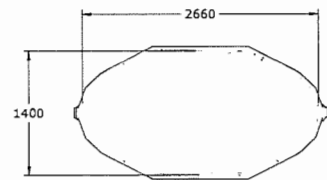
Tank can be subdivided to form septic tank, interceptor or other to customers requirements.

Rev.	DESCRIPTION	DATE
BORD NA MÓNA  <small>BORD NA MÓNA ENVIRONMENTAL LIMITED</small> Main St, Newbridge, Co. Kildare Phone 045 431201 Fax 045 432312 www.bnm.ie/environmental Email: ed.info@bnm.ie		
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Project: _____ Client: _____ Drawing Title: <p style="text-align: center;">6.92 CUBIC METER TANK</p>		
Date	Scale (AS) N.T.S.	Drawn by
		Checked by
		Approved by
Submit FOR APPROVAL <input type="checkbox"/> FOR CONSTRUCTION <input type="checkbox"/> TENDER <input type="checkbox"/> AS BUILT <input type="checkbox"/>		Drawn No. _____ Check No. _____ Appr. No. _____

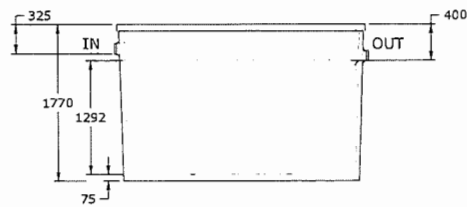
4.0 cubic metre Chamber



Roof Plan



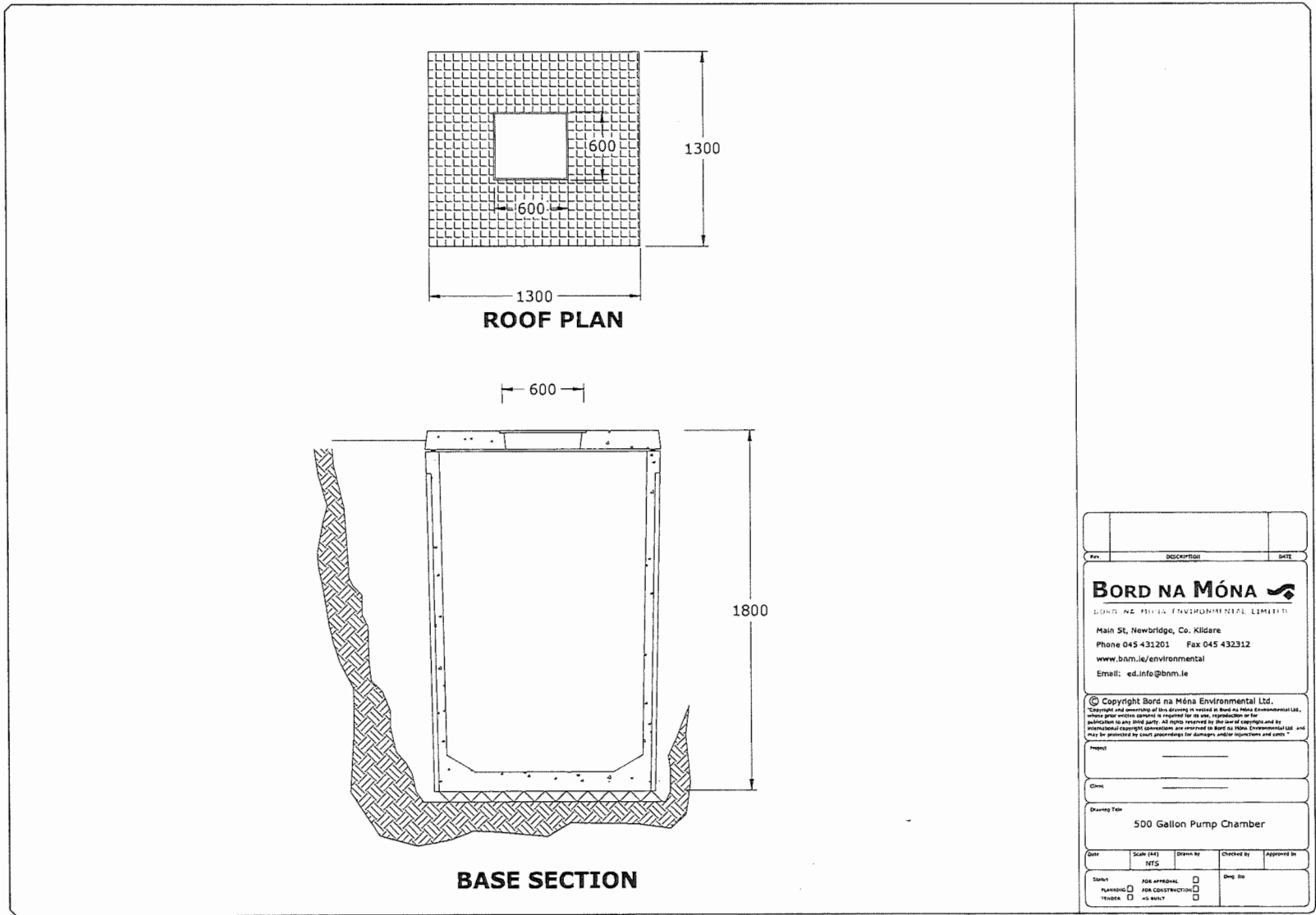
Floor Plan



Section

- 450mm x 450mm Access opening.
- Chequer plate pattered top surface to roof.
- Roof design to particular loading requirements.
- 110mm Wavin fittings typical. (Others available to order).
- Standard tank weight 3.75 tonnes.
- Working capacity 840 gallons (3.82 cubic metres).

Rev	DESCRIPTION	DATE
BORD NA MÓNA		
<small>BORD NA MÓNA ENVIRONMENTAL LIMITED</small>		
Main St, Newbridge, Co. Kildare Phone 045 431201 Fax 045 432312 www.bnm.ie/environmental Email: ed.info@bnm.ie		
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Project _____		
Client _____		
Drawing Title 4 CUBIC METER TANK		
Date	Scale (A4) NOT SCALED	Drawn by
		Checked by
		Approved by
Scale	FOR APPROVAL	Drawn No.
PLANNING <input type="checkbox"/>	FOR CONSTRUCTION <input type="checkbox"/>	
TENDER <input type="checkbox"/>	AS BUILT <input type="checkbox"/>	



REV.	DESCRIPTION	DATE
<p style="margin: 0;">BORD NA MÓNA BORD NA MÓNA ENVIRONMENTAL LIMITED</p> <p style="margin: 0; font-size: x-small;">Main St, Newbridge, Co. Kildare Phone 045 431201 Fax 045 432312 www.bnm.ie/environmental Email: ed.info@bnm.ie</p>		
<p>© Copyright Bord na Móna Environmental Ltd. *Copyright and ownership of this drawing is vested in Bord na Móna Environmental Ltd. where prior written consent is required for its use, reproduction or for publication in any third party. All rights reserved by the law of copyright and by international copyright conventions are reserved to Bord na Móna Environmental Ltd. and may be protected by court proceedings for damages and/or injunction and costs.*</p>		
Project: _____		
Client: _____		
Drawing Title: 500 Gallon Pump Chamber		
Date	Scale (1:1) NYS	Drawn by
Checked by	Approved by	Drawn by
Status:	FOR APPROVAL	Drawn by
PLANNING	FOR CONSTRUCTION	DRAWN
TENDER	AS BUILT	CHECKED

Appendix 2: Air Blower



F.P.Z. effepizeta s.r.l.
Via F.lli Cervi 16/18
20049 Concorezzo - (MI) - ITALIA
Tel. +39 039 604 1820
Fax +39 039 604 1296
E-mail italia@fpz.com

PRESSURE - VACUUM REGENERATIVE BLOWER 'SCL'

INSTRUCTIONS

GB

SN 1473.2

READ ALL INSTRUCTIONS CAREFULLY AND RETAIN

CAUTION!

The 'SCL' blowers - exhausters have been designed and manufactured for use in an industrial environment, operated by qualified personnel and as a unit to be incorporated in a machine which conforms to the CE Machinery Directive.



The 'SCL' blowers - exhausters, like all machinery and equipment with live and moving parts, can be a source of serious hazards unless properly used and protected.



The user is committed to ensure that:

All handling, assembly, installation, connection, maintenance and repair operations are undertaken by qualified personnel. As required by IEC standard 364, such people who by their background, training and experience as well as through their knowledge of statutory regulations, legislation, safety measures and operating conditions are able to carry out any necessary steps avoiding all possible risks to health and damage.

Such personnel shall have received all the instructions and information, including any local legislation, and will follow them during the performance of any operation.

It shall be forbidden for unqualified personnel to carry out any operation, even indirectly, on the machines and equipment.

During the installation, all the prescribed working conditions, including any possible local requirements, shall be observed.

Additionally it is forbidden to put the unit in service before the machines of which they are a part are declared to conform to the CE Machinery Directive.

The user must be aware that in operation:

- the surface temperatures can reach 160°C;
- the unit cannot contain high internal pressures, no greater than P_s referred to in SN 1472;
- there is small loss of the fluid handled;
- the level of noise may be unacceptable in certain applications.

1. CONDITIONS OF USE

The 'SCL' blowers - exhausters are designed for the continuous movement of air or non-explosive, non-hazardous and non-flammable gases and for service in non-explosive environments.

Solid particules, however small, including dirt can cause serious damage; therefore it is essential that such substances should be removed from the gas by suitable filters upstream of the inlet. (Units which do not have an adequate filter ARE NOT COVERED BY THE GUARANTEE).

The maximum driving pressure must never be exceeded (dP_{max} of SN 1472).

UNDER NO CIRCUMSTANCES OPERATE THE UNIT WITH THE GAS INLET OR OUTLET CLOSED. IN PARTICULAR THIS APPLIES TO THE UNITS WITH THE CAPACITY FOR HIGHER DRIVING PRESSURES.

Protect the units with an appropriate safety valve.

The performance characteristics are liable to variations due to the following factors:

- Differences of the suction or discharge pressures from the reference conditions;
- Operation in a system with both a low suction pressure and a high back pressure;
- Operation with a gas at a different temperature or of a different specific gravity from the reference data;
- Variations in the rotational velocity of the fan with respect to the reference value.

Both the gas inlet temperature and the ambient temperature must be in the range of -15°C to $+40^{\circ}\text{C}$.

At the same time, ensure that the unit has good ambient ventilation, especially when subjected to severe operating conditions.

A unit subjected to frequent starting or to high ambient temperatures may be prone to overheating and in such cases further information should be requested.

Similarly, where flammable gases may be present, information must be requested for alternative models certified for the Ex. environment..

2. STORAGE AND SHIPPING

Store the unit in a dry place, preferably in the packaging.

Do not remove the protection plugs from the ports.

Avoid stocking anything on top of the packaging.

To move the packed boxes, use the largest pallet or support base possible to obtain the maximum stability.

Lifting eyes are provided to unpack units weighting more than 25 kg.
(The weight of the unit is m in SN 1472).

On all occasions handle the units with care and avoid sudden impacts.

3. INSTALLATION

3.1 'SCL' BLOWER - EXHAUSTER

It is important that the unit is installed in a well ventilated environment where the temperature does not exceed 40°C .

If outside, protect the unit from direct sunlight and avoid the possibility of water collecting in the external crevices especially when installed with the axis vertical.

IMPORTANT !

Ingress of foreign matter, however small, will cause serious damage.

Such matter includes dust, sand, masonry debris, impurities in the tubes, cutting burrs or filings, welding or soldering slag and splatter, metal burrs and any residues from sealing and making the tube connections.

The unit can be mounted with the axis in any position.

As supplied, the unit is balanced and will not transmit vibrations, however it is recommended that it is mounted on vibration damping supports.

To connect the accessories, remove the flanges from the unit and then seal and tighten.

Do not overtighten remembering that the operating pressures are low.

Tube connections must be made with flexible couplings.

Avoid using rigid couplings which will induce stress and cause harmful vibrations.

Remember to protect the inlet with suitable filters.

If it is necessary to regulate the flow, install a bypass valve (refer to section 5).

Only remove the plugs on the ports when making the final connections.

Select the tube size and the couplings to minimize the pressure drop, in particular:

- Do not use tubing of a smaller diameter than the ports of the unit;
- When installing units in parallel, size the manifold and main conduit accordingly;
- Utilise large radius bends and avoid using elbows;
- Avoid using valves which have a reduced orifice relative to the general system;

- Use swing check valves (utilising lightweight discs) which have the lowest pressure drop, rather than spring loaded check valves;
- For oxygenation select low loss diffusers (lowest pressure drop) and note that the pressure drop across plugs and porous membranes will increase over time due to progressive clogging.

A safety relief valve should be installed to avoid overloading the unit as a result of pressure variations.

Make the electrical connections to the motor and check the direction of rotation before connecting the conduit.

The 'SCL' blowers - exhausters are already supplied as standard with silencers in the suction and exhaust ports (the maximum noise levels L_p and L_w , with piped inlet and outlet flow, are detailed in SN 1472).

For operation into free air (either suction or discharge) the free flow noise can be muffled with additional silencers.

In every situation avoid installing the unit on a structure which can transmit or amplify any noise (tanks, sheet metal etc.).

Further information should be requested regarding additional noise reduction by installing the unit in sound proof enclosures.

3.2 ELECTRIC MOTOR

WARNING
BEFORE UNDERTAKING ANY OPERATION
ENSURE THAT THE UNIT IS DISCONNECTED
FROM THE ELECTRICITY SUPPLY.

The electric motor has been selected for service in an ambient temperature between -15°C and $+40^{\circ}\text{C}$ at an altitude no higher than 1000 m.

Ensure that the information on the name plate is consistent with the supply voltage and frequency. Variations in the supply voltage up to $\pm 10\%$ are acceptable.

Outside the normal operating conditions the motor can not deliver full power and problems can arise with starting, especially for single phase motors.

Make the electrical connections referring to the wiring diagram in the terminal box, connecting an earth cable of adequate capacity to the earth terminal.

The fuses are designed only for short circuit protection and not to safeguard the motor.

Therefore overload cutouts (temperature or current) are essential to guard against the risk of overloads on the motor for example failure of one line in a three phase supply, an excessively high start up frequency, unacceptable variations in the supply voltage, stalled rotor, etc..

Set the overload cutouts at the nominal current specified on the name plate.

The fuses should be rated for the peak currents especially in applications of direct starting.

THE ENTIRE GUARANTEE SHALL CEASE TO APPLY WHEN INADEQUATE PROTECTION IS PROVIDED.

3.2.1 CURRENT MEASUREMENT

The current drawn refers to normal operating conditions.

Departures from the nominal operating conditions can result in variations of 5%.

There can be small differences in the measured value of each phase. These are tolerable up to a maximum deviation of 9% (ref. IEC 34-1).

4. COMMISSIONING

To commission the unit:

- Set the operating pressure or vacuum using a suitable gauge.
- Check the relieving pressure of the safety valve.
- Measure the current drawn by the motor and verify that it is within the limit stated on the name plate (refer to para. 3.2.1).
- Adjust the overload cutouts accordingly.
- After one hour's operation, repeat the current measurements and verify that they are still within the stated limits.

5. OPERATING ADJUSTMENTS

The 'SCL' blowers - exhausters will automatically generate the driving pressure required at the point of use.

Since the power absorbed and the operating temperature are primarily a function of the driving pressure, it is possible that these can exceed the permitted operating conditions for the unit.

Frequently the pressure losses of the tubing are frequently overlooked as the major factor determining the driving pressure.

The driving pressure can be reduced by eliminating all possible obstructions and restrictions in the flow path.

If it is still too high, the flow can be reduced by installing a bypass valve (ref. SN 1474).

Never choke the flow by throttling the suction or the discharge.

6. MAINTENANCE

After every 10-15 days of use clean the cartridge filter.

Replace the cartridge frequently in dusty environments.

(A dirty filter will create a strong suction resistance and consequently a higher driving pressure, a higher operating temperature and an increase in the absorbed power.)

Check that the driving pressure does not change over time.

Periodically remove any surface deposits which otherwise can cause the operating temperature to rise.

To clean the internal components refer to the additional instructions for disassembly, cleaning and reassembly.

It is important that a unit in service is subjected to periodic inspections by qualified personnel to

insure against failures which, directly or indirectly, could cause damage.

Departures from the normal operating conditions (e.g a rise in the absorbed power, unusual operating noises, vibrations, etc.) are a sign of abnormal operation which can lead to failure.

In the event of difficulties please contact FPZ Effepizeta srl or the relevant sales agent.

Please note that repairs undertaken by a third party will invalidate the guarantee.

Commitments, agreements or legal relationships are governed by the corresponding sales contract. The above items are in no way limited by the contents of this manual.

The quality of the materials and of the workmanship is guaranteed as set out by the standard conditions of sales.

The guarantee is not valid for the following: damage incurred during transport; inadequate storage; faulty installation; incorrect use; exceeding performance limits; electrical or mechanical mis-use.

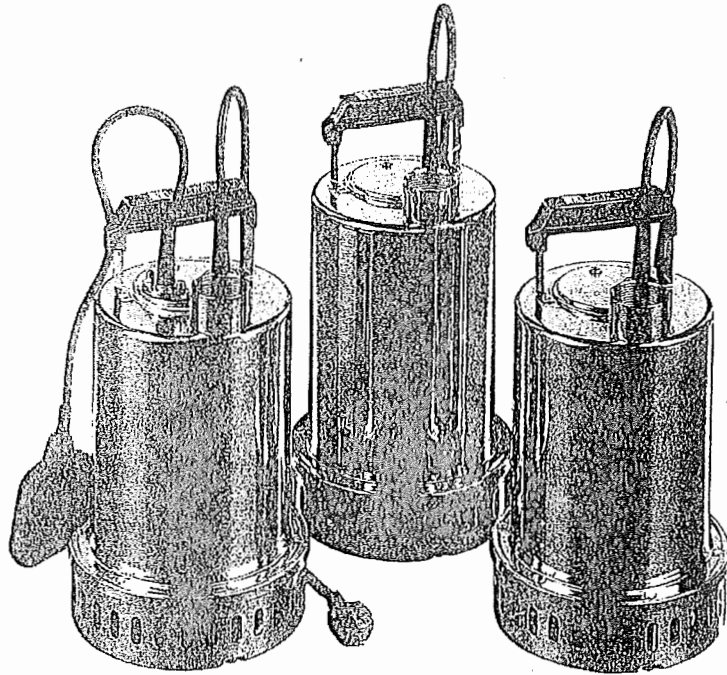
Store the packaging for possible future use.

Appendix 3: Effluent/Sludge Pumps

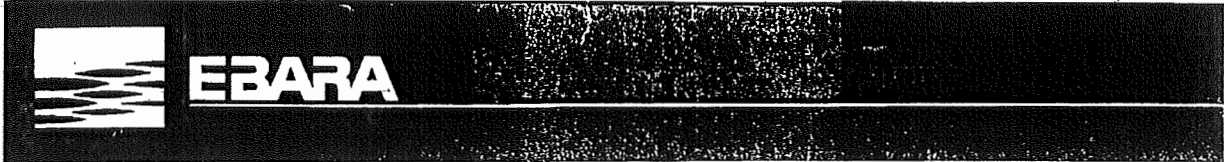


EBARA

ELETTROPOMPE SOMMERGIBILI SERIE BEST 2-3-4-5
SUBMERSIBLE ELECTROPUMPS SERIE BEST 2-3-4-5
ELECTROPOMPES SUBMERSIBLES SERIE BEST 2-3-4-5
ELEKTRISCHE TAUCHPUMPEN SERIE BEST 2-3-4-5
ELECTROBOMBAS SUBMERGIBLES SERIE BEST 2-3-4-5



MANUALE D'ISTRUZIONE ALL'USO E ALLA MANUTENZIONE
USE AND MAINTENANCE INSTRUCTIONS MANUAL
INSTRUCTIONS POUR L'EMPLOI ET L'ENTRETIEN
ANLEITUNGSHEFT FÜR GEBRAUCH UND WARTUNG
LIBRO DE INSTRUCCIONES



APPLICATIONS

DOMESTIC:

Drainage of garages, basements, small and medium sized yards
Fast emptying of swimming pools or other water storage structure
Creation of decorative fountains or water features

AGRICULTURAL:

Removal and disposal of slurry, dirty or semi-dirty waters
Re-oxygenate stale water
Irrigation

INDUSTRIAL:

Drainage of sumps

TECHNICAL FEATURES

Manufactured entirely from stainless steel: pump body, motor casing, volute, suction grid, impeller, motor cover, tie rods, bolts... all in AISI 304 stainless steel.

The pump shaft is made from stainless steel grade AISI 303. Double shaft mechanical seal lubricated in an intermediate oil chamber for enhanced durability: tungsten carbide/ceramic on the pump side, graphite/ceramic on the motor side.

Designed and built for continuous duty operation - even if the pumps are only partially submerged.

TECHNICAL DATA

PUMP:

Max liquid temperature: 50°C

Outlet: 1" 1/2

Max immersion: 10m

Feeding cable: 10m

Max solid particle size: 10mm

MOTOR:

Protection class: IP5B

Insulation class: F

Continuous duty

Single phase version

* Standard voltage: 220V - 50Hz. - 2800rpm

Built in overload motor protector with automatic reset

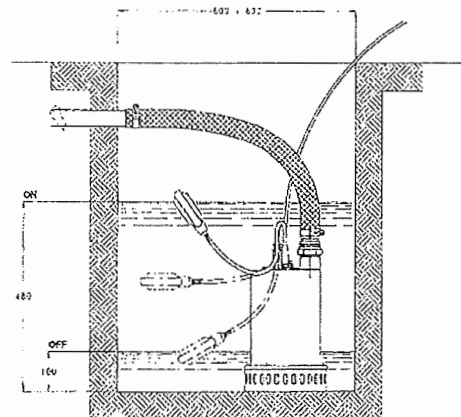
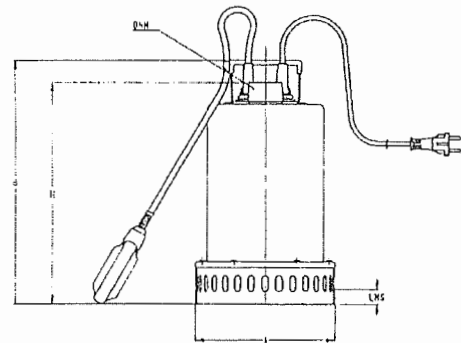
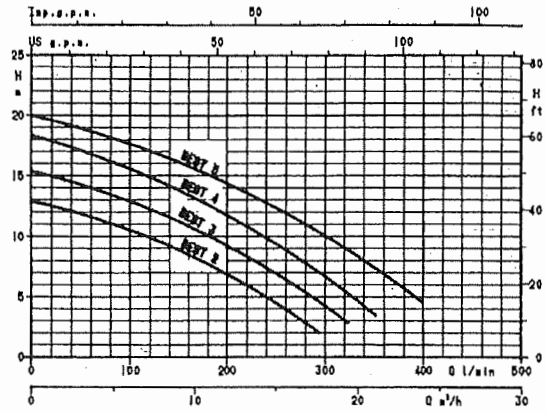
Permanent split capacitor.

Three phase version

* Standard voltage: 380V - 50Hz. - 2800rpm

Motor protection must be provided by the user.

When using the pump in a sump, the recommended minimum size of the pit is 600mm x 600mm x 600mm to allow unrestricted movement of the automatic float switch.



PUMP TYPE	DIMENSIONS in mm					WEIGHT Kg
	A	B	H	LMS	DNM	
BEST 2	210	362	315	20	1" 1/2	12
BEST 3	210	362	315	20	1" 1/2	12,7
BEST 4	210	377	340	20	1" 1/2	13,6
BEST 5	210	377	340	20	1" 1/2	13,5



EBARA UK LIMITED

REGAL HOUSE, LONDON ROAD,
TWICKENHAM, MIDDLESEX, TW1 3QS
Tel: 081-892-8971
Facsimile: 081-891-6730

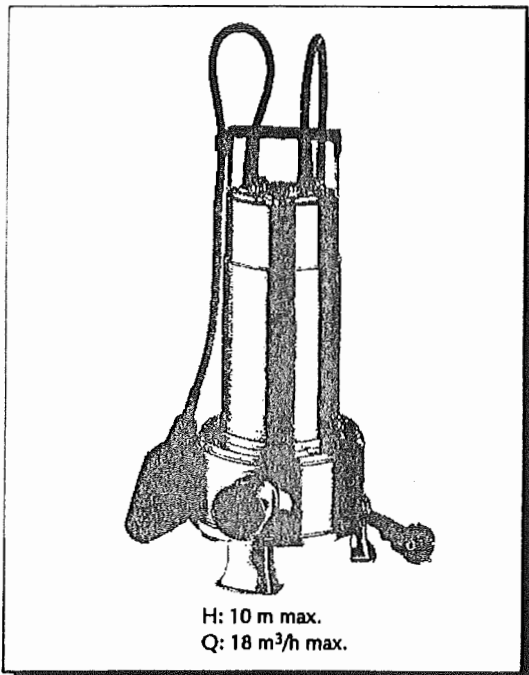
EBARA reserves the right to amend specifications without prior notice.



EBARA RIGHT

SUBMERSIBLE PUMP FOR DIRTY WATER

entirely in stainless steel



APPLICATIONS

- Construction entirely in stainless steel and with a vortex impeller in a recessed position make these pumps particularly suitable for handling dirty liquids, even with solid and/or filamentous substances in suspension
- Draining filtered water
- Handling drain water
- Emptying cess pits and discharge of the relative waters into the sewers
- Small-scale irrigation
- Emptying pools, cisterns, storage tanks, etc.
- Fountains and water displays
- Automatic dirty water pumping stations

CONSTRUCTION

Pump casing, bottom suction plate,	AISI 304 stainless steel
motor casing	
Motor shaft	AISI 303 stainless steel

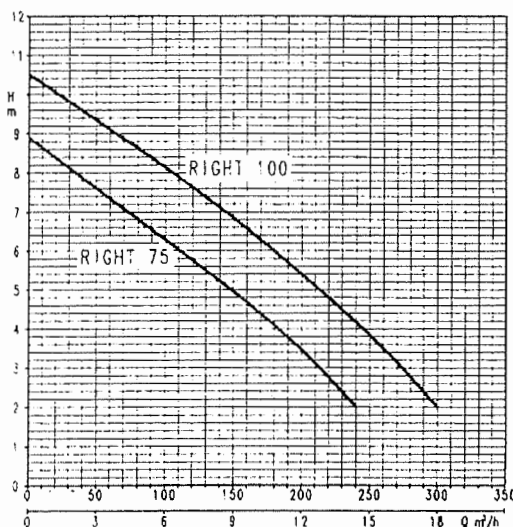
Impeller	Recessed, open, in AISI 304 stainless steel
Handle	AISI 304 stainless steel, with insulating coating
Float	Provided with standard single phase version, (absent in 3-phase version and special single phase ones)

PERFORMANCE LIMITS

- Max. liquid temperature: 50°C
- Outlet: 1 1/2" gas
- Max. immersion: 10 m
- Power cable: 10 m
- Passage of solids: max. 35 mm
- Minimum dimensions of the pit for operation with float: 600x600x600 mm

MOTOR

- Insulation: class F
- Protection: IP 68
- Power supply: single phase 230 V 50 Hz
three-phase 400 V 50 Hz
- Built in thermal over load protection with automatic reset and capacitor permanently on in single-phase version; thermal protection to be provided by the customer in 3-phase version



DIMENSIONAL TABLE

Type	H mm	Weight Kg
RIGHT 75M	405	10
RIGHT 75	405	10
RIGHT 100M	430	11,5
RIGHT 100	430	11,5

PERFORMANCE TABLE

Single-phase 230 V 50 Hz	Three-phase 400 V 50 Hz	HP	KW	Capac. µF	Absorbed Intensity (A)	Absorbed Power W	Q = Capacity								
							L/m ³ /h	40	80	120	160	200	240	300	
RIGHT 75M	RIGHT 75	0,75	0,55	20	4,8	2,1	1000	950	7,8	6,8	5,7	4,7	3,4	2	
	RIGHT 100	1,0	0,75	31,5	5,7	2,5	1250	1200	9,6	8,6	7,6	6,6	5,5	4,2	2

H = Total head in metres





**USE AND MAINTENANCE INSTRUCTIONS MANUAL
TO BE KEPT BY THE USER**

**1. MANUFACTURER AND ELECTROPUMP
IDENTIFICATION DATA** (as per EEC 89/392 p. 1.7.4.a)

1.1. MANUFACTURER DATA

EBARA ITALIA S.p.A.

Head office and factory
Via Pacinotti, 32
36040 BRENDOLA (VI) ITALY
Telephone: 0444/401145
Telefax: 0444/400018
Telex: 480536

Legal office
Via Campo Sportivo, 30
38023 CLES (TN) ITALY
Telephone: 0463/24500
Telefax: 0463/22782

1.2. ELECTROPUMP DATA

Description:
SUBMERSIBLE ELECTROPUMP
Model:
BEST 2-3-4-5
Year of manufacture:
SEE PLATE ON THE ELECTROPUMP

2. INFORMATION ON TECHNICAL ASSISTANCE

If the malfunction of the electropump is not among those included in the TROUBLESHOOTING table (chapter 14.1), contact the nearest appointed dealer.

3. INTRODUCTION

This publication contains all the necessary information and instructions for use and maintenance of your BEST electropump. Follow the advice given to obtain optimum performance and correct operation of the electropump. For any other information you may require, please contact the nearest appointed dealer.

IT IS STRICTLY FORBIDDEN TO REPRODUCE THE ILLUSTRATIONS AND THE TEXT, EVEN IN PART.

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5. GENERAL SAFETY WARNINGS

FAILURE TO OBSERVE THESE WARNINGS AND/OR TAMPERING WITH THE ELECTROPUMP RELIEVES EBARA ITALIA S.p.A. OF ANY RESPONSIBILITY IN THE EVENT OF DAMAGE TO PERSONS OR THINGS AND/OR TO THE ELECTROPUMP.

Before starting up the electropump it is indispensable for the user to know how to perform all the operations described in this manual and to apply them at all times during use or maintenance of the electropump.

There are no RESIDUAL RISKS on BEST electropumps. No particular technical skills are required to use a BEST electropump. No personal protections are required to use a BEST electropump.

5.1 PREVENTIVE MEASURES TO BE TAKEN BY THE USER

-  a) The user must absolutely comply with all the accident-prevention regulations in force in the country in which the pump is being used; the indications given in chapters 7.1 and 7.2 must be scrupulously followed.
-  b) If the electropump is being used in a swimming pool, there must be no people in the pool.
- c) During electropump repairs or maintenance, remove the plug from the socket and/or switch off the switch (if provided), thus interrupting the supply of electric power to the electropump. This will prevent accidental starting which could cause damage to persons and/or things.
- d) All maintenance operations, installations or shifting of the



electropump with the electric system live may cause severe and even mortal accidents.

- e) During operation, avoid moving or shifting the electropump.
- f) Before using the electropump, always check that the cable and all the electric devices are efficient.
- g) Never start the electropump (by inserting the plug in the socket and/or switching on the switch) with bare feet or, worse, with your feet in the water, or with wet hands.
- h) The user must not carry out under his own initiative any operations or jobs not contemplated in this manual.

5.2. GENERAL SAFETY WARNINGS
(as per EEC 89/392 p.1.1.2 and 1.7.2; EN 292-2 p.5)



BEST electropumps are designed in such a way that all the moving parts are rendered inoffensive by the use of casings. ERBARA ITALIA S.p.A. declines all responsibility in the event of damage caused as a result of tampering with these devices.



Each lead or live part is electrically insulated to earth; there is also a further safety device in that the accessible conductive parts are connected to an earth lead so that the parts within reach cannot become dangerous in the event of failure of the principal insulation.

6. DESCRIPTION

6.1 GENERAL DESCRIPTION

BEST series electropumps are all similar from the functional and constructive point of view; the only differences are the following:

- power
- flow rate
- head
- electric power supply (single-phase or three-phase)
- weight
- dimensions

BEST series electropumps are used for handling water, even at high temperatures (chapter 7.1). Thanks to their small bulk and ease of transport, they may be used for fixed or temporary installations, with or without automatic start.

These electropumps, made entirely of stainless steel, guarantee long life and constant performance if used according to the indications given in chapter 8 and chapter 14.

6.2. TECHNICAL AND CONSTRUCTIVE CHARACTERISTICS

BEST series electropumps are designed and built according to the following design and/or construction standards:

RISKS OF A MECHANICAL NATURE (Annex 1, Machines Directive):
- EN 292-1 and EN 292-2

RISKS OF AN ELECTRICAL NATURE (Annex 1, Machines Directive):
- EN 292-1 and EN 292-2
- CEI 61-69 (EN 60 335-2-41)

RISKS OF VARIOUS NATURE (Annex 1, Machines Directive):
- EEC 89/392 - Annex 1

The electric components and their circuits installed on the electropumps comply with standards CEI 44-5.

7. TECHNICAL DATA CARD

(as per EEC 89/392 p.1.1.2 and 1.7.2; EN 292-2 p.5)

7.1. PUMP TECHNICAL DATA UNIT BEST 2 - BEST 3 - BEST 4 - BEST 5

Max. temperature pumped fluid °C	50
Max. dimension suspended solids	mm 10
Max. immersion depth	m 10
Length of power cable	m 10
Type of impeller	semi-open
Type of seal on the shaft	double mechanical seal in an oil chamber shielded ball bearing
Type of bearing	shielded ball bearing
Delivery diameter	Inches G 1 1/2
Impeller material	stainless steel
External liner material	stainless steel
Seal cover material	stainless steel
Intake grid material	stainless steel

7.2. MOTOR TECHNICAL DATA UNIT BEST 2 - BEST 3 - BEST 4 - BEST 5

Power	KW	0.55	0.75	1.1	1.5
Type		dry submerged			
Poles	no.	2			
Insulation class		F			
Degree of protection		IP58			
Type of duty		continuous			
Phase - frequency - voltage		single-phase-50Hz-220-240 V±5%			
Phase - frequency - voltage		three-phase-50Hz-380-415 V±5%			
Overload protection		thermal protection (single-phase only)			
Motor structure material		stainless steel			
Shaft material		stainless steel			
Cable material		neoprene			

ERBARA ITALIA S.p.A. RESERVES THE RIGHT TO ALTER THE TECHNICAL DATA IN ORDER TO MAKE IMPROVEMENTS AND BRING THEM UP-TO-DATE.

8. CONTEMPLATED AND NOT CONTEMPLATED

USE (as per EEC 89/392 p.1.7.4a; EN 292-1 p.5.7.1 and EN 292-2 p.5.1.1)

ATTENTION Failure to respect the prescribed limits constitutes a situation of use that is technically improper and endangers the safety of persons, RELIEVING ERBARA ITALIA S.p.A. OF ANY RESPONSIBILITY IN THE EVENT OF ACCIDENTS TO PERSONS OR DAMAGE TO THINGS OR TO THE ELECTROPUMP, AND ALSO RENDERING THE GUARANTEE INVALID.

8.1. CONTEMPLATED CONDITIONS OF USE

BEST series electropumps may be used for handling clean water or water with suspended bodies with a diameter no greater than 10 mm; for draining garages, cellars, basements, swimming pools, basins, tanks, fountains, rainwater ??? drains, for garden irrigation and for water oxygenation.

Use the electropump in keeping with its technical characteristics (chapter 7).

8.2. NOT CONTEMPLATED CONDITIONS OF USE

BEST series electropumps cannot be used for handling dirty water, water containing acids and corrosive liquids in general, water with temperatures higher than 50°C, sea-water, inflammable and generally dangerous liquids. BEST electropumps must never be allowed to run without water.



9. HANDLING AND TRANSPORT
(as per EEC 89/392 p.1.7.4.a; EN 292-2 p.5.1.1.a)

9.1. UNPACKING

Check that there are no breakages or severe dents in the packing; if there are, point this out immediately to the person who delivers the material. After removing the electropump from the package, check that it has not suffered any damage during transport; if damage is found, inform the dealer within 8 days of delivery. Then check that the characteristics stated on the plate of the electropump are the same as you requested in your order.

9.2. HANDLING AND DISINSTALLATION

ATTENTION - FAILURE TO FOLLOW THESE INSTRUCTIONS MAY CAUSE THE ELECTROPUMP TO FALL, SUFFERING SEVERE DAMAGE.
- ABSOLUTELY DO NOT USE THE POWER CABLE TO LIFT OR DRAG THE ELECTROPUMP.



To handle or disinstall the electropump you must:

- remove the plug from the power socket and/or switch off the switch, if provided;
- roll up and hold the electric power cable in your hand;
- lift the electropump and the delivery pipe with the handle provided.

If the electropump is set up for fixed applications, perform the following operations before handling it:

- remove the plug from the power socket and/or switch off the switch, if provided;
- unscrew any clamps and remove the delivery pipe;
- roll up and hold the electric power cable in your hand;
- lift the electropump and the delivery pipe with the handle provided.

9.3. TRANSPORT

The electropump is packed in a cardboard box for transport; as its total weight and bulk are not excessive (fig. 1), transport presents no problems. However, check the total weight marked on the box.

10. INSTALLATION
(as per EEC 89/392 p.1.7.4.a; EN 292-2 p.5.1.1.b)

ATTENTION TO LIFT OR LOWER THE ELECTROPUMP, USE A ROPE FIXED TO THE HANDLE; NEVER USE THE ELECTRIC POWER CABLE.

10.1. FIXED INSTALLATION

- a) The electropump must be placed on a level surface.
- b) When positioning the electropump, observe the minimum required distances (fig. 2) from walls, from the sides of the drain or other location, so as to allow functioning, use and maintenance operations in safe conditions (as per EN 292-2 p.5.5.1.b).
- c) It is recommended to use G 1 1/2 flexible pipes, with couplings of the same size if required.
- d) It is recommended to fit a no-return valve on the delivery pipe.

10.2. TEMPORARY INSTALLATION (FOR TEMPORARY USE)

- a) The electropump must be placed on a level surface.
- b) When positioning the electropump, observe the minimum required distances (fig. 2) from walls, from the sides of the drain or other location, so as to allow functioning.

8- BEST 2-3-4-5

- c) It is recommended to use G 1 1/2 flexible pipes, with couplings of the same size if required.
- d) It is recommended to fit a no-return valve on the delivery pipe.

11. ASSEMBLY AND DISASSEMBLY
(as per EEC 89/392 p.1.7.4.a)

The electropump has no separate accessories, so no assembly is required for installation.

If the electropump has to be disassembled (due to breakage or any other reason), the user must apply to the dealer or to the assistance service.

FAILURE TO COMPLY WITH THIS RULE RENDERS THE GUARANTEE INVALID.

12. PREPARATION FOR USE
(as per EEC 89/392 p.1.7.4.a; EN 292-2 p.5.1.3)

On three-phase BEST electropumps, check the direction of rotation of the motor. The impeller must turn in a clockwise direction when viewing the electropump from above (see the arrow on the pump).

As it is not possible to check the direction of rotation of the impeller visually, proceed as follows: before anchoring the electropump in the system, connect the power cables to the electric panel and switch on the main switch for a moment; the electropump will start up immediately with a recoil. If the pump is turning in the right direction, the recoil will be anti-clockwise, viewing the pump from the top.

12.1. ELECTRIC CONNECTION

- ATTENTION**
- a) For connection to the power mains, the electropump is provided with a 10-metre cable complying with IEC standards; when connecting, consider the installed power (0.55-1.5 KW), the mains voltage and the number of phases (chapter 7.2).
 - b) The mains must have an efficient earth system complying with the electrical standards in force in the user's country; the installer is responsible for checking this.
 - c) The single-phase version has a plug complying with EEC Publ. 7, with double earth contact (fig. 3); earthing is provided by the plug itself when it is inserted in the socket.
 - d) The three-phase version has a power cable with a yellow/green earth lead (fig. 4); connect the yellow/green lead in the power cable to an efficient earth system which complies with the electrical standards in force in the user's country. The three-phase version has no internal motor protector, so overload protection must be provided by the user. The electropump must be fed by means of an electric panel with a switch, fuses and a magnetothermal switch set at the current absorbed by the electropump. The electric panel must be prepared by a skilled technician or bought from EBARA ITALIA S.p.A.
 - e) For both the three-phase and the single-phase version, we advise fitting a high-sensitivity differential switch in the electric system (0.03 A).

The electric connection must be carried out by a skilled technician.

12.2. ADJUSTING AND REGISTERING
(as per EEC 89/392 p.1.7.4.a; EN 292-2 p.5.5.1.d)

The only thing that needs checking once installation is complete is the length of the cable with float (in both versions that have one) with respect to the minimum and maximum water level (fig. 6).



13. USE AND START-UP
(as per IEC 89/392 p.1.6; EN 292-2 p.5.5.1.e)

13.1. VERSION WITH FLOAT SWITCH

Insert the plug and/or switch on the switch; the electropump starts operating; once the electropump has taken in water up to the minimum level (fig. 2) regulated by the float, it will cut out automatically.

13.2. VERSION WITHOUT FLOAT SWITCH

Insert the plug and/or switch on the switch; the electropump starts operating; once the electropump has taken in water up to the minimum level (fig. 2), remove the plug and/or switch off.

14. MAINTENANCE AND REPAIRS
(as per IEC 89/392 p.1.6; EN 292-2 p.5.5.1.e)

ATTENTION BEFORE CARRYING OUT ANY MAINTENANCE OPERATIONS, DISCONNECT THE PLUG AND/OR SWITCH OFF. THE ELECTROPUMP MUST BE DISMANTLED ONLY BY SKILLED TECHNICIANS. FAILURE TO OBSERVE THIS RULE RENDERS THE GUARANTEE INVALID. THE SAME APPLIES TO REPAIR JOBS AND/OR REPLACEMENTS.



To ensure correct functioning and long life of the electropump, the filter and the impeller must be kept clean at all times; this is the only maintenance required by the electropump.

To dismantle the filter and gain access to the impeller, proceed as follows (fig. 7):

- wear protective gloves to avoid cutting your hands;
- unscrew the three filter retaining screws (1);
- remove the filter (2);
- remove the volute (3), unscrewing the three bolts (4) and the three nuts (5);
- using a small straight screwdriver, remove the nylon washers (6) and change them before reassembly, because they break when the volute is removed;
- remove the O-ring (7).

The impeller is now uncovered; check that it is clean. To reassemble, perform the operations listed above in inverse order.

Check the condition of the electric power cable; if it is damaged, contact the dealer or the assistance service to have it replaced.

14.1. TROUBLESHOOTING

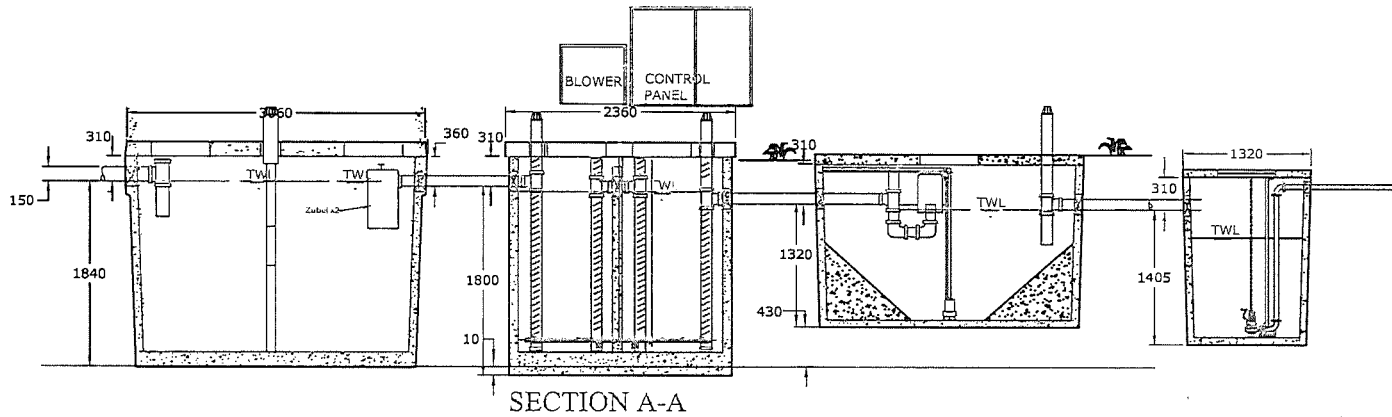
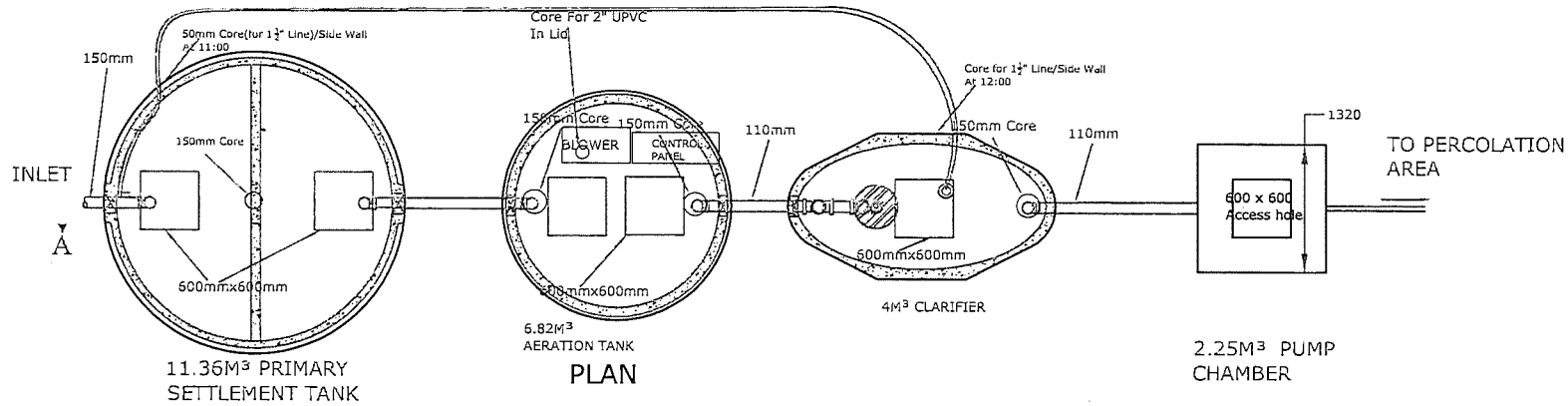
TYPE OF FAULT	
The pump does not work (the motor does not turn over)	
CAUSE	REMEDY
No electric power.	Check the contactor on the electric line.
Plug not inserted.	Check power connection to the line.
Automatic switch has tripped.	Reset the switch and check the cause.
Float blocked.	Check that the float reaches ON level.
Impeller blocked.	Check cause of blockage (ch. 14).
Thermal protection has tripped (single-phase)	This resets automatically (single-phase only).
Protection fuses are burnt out (three-phase).	Replace the fuses with others of the same type.
Faulty motor or capacitor.	Contact the nearest dealer.


TYPE OF FAULT	
The pump does not work (the motor turns over)	
CAUSE	REMEDY
Intake filter blocked.	Clean the filter (ch. 14).
No-return valve blocked.	Clean the valve and check its operation.

TYPE OF FAULT	
The pump works at a low flow rate	
CAUSE	REMEDY
Dirty impeller, grid or delivery pipes.	Clean them (ch. 14).
No-return valve blocked.	Clean the valve and check its operation.
Water level too low.	Switch off the pump.
Wrong direction of rotation.	Check the direction of rotation (three-phase only, ch. 12).
Wrong supply voltage.	Feed the pump with the voltage indicated on the data plate.

TYPE OF FAULT	
The pump stops after brief periods of operation (tripping of the thermal protection):	
CAUSE	REMEDY
Impeller blocked by foreign bodies.	Remove the foreign bodies (ch. 14).
Liquid temperature too high.	The temperature exceeds the technical limits of the pump.
Internal defect.	Contact the nearest dealer.

Appendix 4: System Drawings



Rev.	DESCRIPTION	DATE
BORD NA MÓNA  BORD NA MÓNA ENVIRONMENTAL LIMITED Main St, Newbridge, Co. Kildare Phone 045 431201 Fax 045 432312 www.bnm.ie/environmental Email: ed.info@bnm.ie		
<small>© Copyright Bord na Móna Environmental Ltd. "Copyright and ownership of this drawing is vested in Bord na Móna Environmental Ltd., whose prior written consent is required for its use, reproduction or for publication by any third party. All rights reserved by the law of copyright and by international copyright conventions are reserved to Bord na Móna Environmental Ltd. and may be protected by court proceedings for damages and/or injunctions and costs."</small>		
Project		
Client CRM Roadstone		
Drawing Title MBBR AR58		
Date	Scale (A4)	Drawn by
	NTS	NTS
Checked by	Approved by	
DP	DP	
Status	FOR APPROVAL	Draw. No.
PLANNING <input checked="" type="checkbox"/>	FOR CONSTRUCTION <input type="checkbox"/>	
TENDER <input type="checkbox"/>	AS BUILT <input type="checkbox"/>	AR58

DESCRIPTION OF DEVELOPMENT 2

Appendix 2-B Environmental Management System

Roadstone Wood Ltd.

Master List of Documents

Doc. No. EMS/02

Ref No.	Document Title	Approval	Rev No.	Distribution		
				Electronically		
EMS/01	Master List of Documents	EO	00	EO	LM	NSM
EMS/02	Company Environmental Manual	EO	00	EO	LM	NSM
EMS/03	Annual Environmental Review	EO	00	EO	LM	NSM
EMS/04	Register of Aspects	EO	00	EO	LM	NSM
EMS/05	Assessing Impacts Procedure	EO	00	EO	LM	NSM
EMS/06	Summary of Assessments of Environmental Aspects	EO	00	EO	LM	NSM
EMS/07	Register of Legislation & Other Requirements Procedure	EO	00	EO	LM	NSM
EMS/08	Environmental Improvement Program	EO	00	EO	LM	NSM
EMS/09	Environmental Training Procedure & Plan	EO	00	EO	LM	NSM
EMS/10	Monitoring & Measurement Procedure	EO	00	EO	LM	NSM
EMS/11	Monitoring Matrix	EO	00	EO	LM	NSM
EMS/12	Archaeology, Ecology & Landscaping Procedure	EO	01	EO	LM	NSM
EMS/13	Dust Suppression Guidelines	EO	00	EO	LM	NSM
EMS/14	Noise Abatement Guidelines	EO	00	EO	LM	NSM
EMS/15	Receiving Oil, Fuel & Chemicals Procedure	EO	00	EO	LM	NSM
EMS/16	Maintenance of Bulk fuel Storage & Bund Procedure	EO	00	EO	LM	NSM
EMS/17	Environmental Emergency Response Procedure	EO	00	EO	LM	NSM
EMS/18	Transport Guidelines	EO	00	EO	LM	NSM
EMS/19	Energy Efficiency Guidelines	EO	00	EO	LM	NSM
EMS/20	Communications Procedure	EO	00	EO	LM	NSM

Roadstone Wood Ltd.

Master List of Documents

Doc. No. EMS/02

Ref No.	Document Title	Approval	Rev No.	Distribution		
				Electronically		
EMS/21	Waste Management Procedure	EO	00	EO	LM	NSM
EMS/22	Restoration/after-use Guidelines	EO	00	EO	LM	NSM
EMS/23	Sub-Contractors Green Guide	EO	00	EO	LM	NSM
EMS/24	Screening for New Chemicals	EO	00	EO	LM	NSM
EMS/25	Plant Decommissioning Procedure	EO	00	EO	LM	NSM
EMS/26	Maintenance of settlement tanks	EO	00	EO	LM	NSM
EMS 27	Control of Documents Procedure	EO	00	EO	LM	NSM
EMS 28	Procedure for Non-Conformances	EO	00	EO	LM	NSM
F/01	Waste Register	EO	00	EO	LM	NSM
F/02	Environmental Monthly Report	EO	00	EO	LM	NSM
F/03	Bund Integrity	EO	00	EO	LM	NSM
F/04	Audit Trail	EO	00	EO	LM	NSM