

Gellinudd Care Home, Gellinudd

Remediation Strategy



Report for:

Rhodos Properties (No 22) Ltd

Reference:

P1188/CS-1272

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1 INTRODUCTION

1.1 Background

Following instruction from Rhodos Properties (No 22) Ltd (the 'client'), this report presents a Remediation Strategy for a proposed residential development at Gellinudd Care Home, Gellinudd (the 'site').

1.2 Site Location and Description

The site is approximately centred on National Grid Reference 273660, 204316. The nearest postcode is SA8 3DX. A site location plan is included within Appendix A.

The site comprises an irregular shaped parcel of land measuring approximately 76m north to south by 43m east to west, with an area of 0.23ha. The site currently comprises hardstanding in use as the Gellinudd Hospital carpark, with an existing building across the centre of site and an area of soft landscaping along the southern border of the building and south of site.

The site is located on the north-eastern edge of Gellinudd village with residential development to the south and east.

1.3 Proposed Development

Information presented to T&P Regeneration Ltd (T&P) indicates that the proposed development is intended to comprise the construction of 16N° residential flats and a number of communal living spaces with associated areas of communal soft landscaping with hard landscaped access and parking.

A Proposed Development Plan is included within Appendix A.

1.4 Previous Reports

A Desk Study and Ground Investigation report¹ was previously produced by T&P. Pertinent information is summarised in this report where appropriate. However, reference should be made to this report directly for further detail.

1.5 Objectives

The objective of this remediation strategy is to outline the risk mitigation measures required to address identified unacceptable risks presented to human health or the environment in the context of the site's proposed future end use as a residential development.

1.6 Report Limitations

The recommendations, interpretations and conclusions of this report are based solely on the site conditions observed and the ground conditions revealed during previous site investigation works undertaken by T&P and/or third parties. No responsibility can be accepted for the accuracy of third-party data. Due to the inherent variability of the ground conditions between exploratory hole positions these conditions can only be interpreted and are accurate only for the date of the investigation works.

¹ Gellinudd Care Home, Swansea Ground Investigation Report. T&P Regeneration. 2024.

2 BACKGROUND INFORMATION AND SITE SETTING

2.1 Information Sources

Reference has been made to previous reports and publicly available information from the Environment Agency, MAGIC and BGS websites, as relevant. Background and site setting information has been summarised below to provide context to the site, proposed development and remediation strategy.

2.2 Geology, Hydrology and Hydrogeology

Available geological records show the site to be directly underlain by the Swansea Member, which is understood to comprise sandstones with thin mudstone, siltstone and seatearth interbeds. Superficial deposits are not indicated to be present, but nearby Glacial Till is recorded.

The underlying bedrock geology is classified as a Secondary A Aquifer. The site is not located in a groundwater Source Protection Zone. There are no records of licensed groundwater or surface water abstractions within 500m of the site.

The nearest surface water feature is the culverted stream which crosses the southeastern corner of site and drains eventually into the river Tawe, 300m west.

2.3 Site History

The site history is summarised from publicly available historical maps.

Earliest historical maps from 1878 indicate the site was predominantly undeveloped agricultural land. By 1918 an isolation hospital had been constructed on the site with four separate buildings, access tracks and soft landscaping. The site had remained relatively unchanged until 1994, whereby the buildings on site had been replaced by the present-day layout, marked as 'Gellinudd Hospital'.

2.4 Summary of Previous Findings

A summary of principal findings of the previous ground investigation is provided below. Further detail can be obtained with reference to the original report.

2.4.1 Ground Conditions

Reworked topsoil was encountered in TP03 only, located in an area of soft landscaping in the east of site. Beneath the hardstanding (or reworked topsoil in TP03), made ground was encountered in all exploratory hole locations to a maximum depth of 0.8mbgl. This comprised dark grey sandy gravel, where gravel was of concrete, asphalt, brick, wood and limestone.

Beneath the made ground was the residual soil of the weathered Swansea Member, encountered in all exploratory holes. This was encountered as firm, becoming stiff, sandy gravelly clay in the majority of locations. However, beneath the made ground in TP01 and beneath the clay in TP02, the weathered Swansea Member was encountered as a clayey granular soil. These residual soils were proven to a maximum depth of 2.4 and 2.5mbgl in TP02 and TP03. Grey sandstone bedrock of the Swansea Member was encountered below the residual soils to a maximum proven depth of 30mbgl within the boreholes.

2.4.2 Evidence of Contamination

With the exception of the presence of made ground encountered across site, no visible or olfactory evidence of contamination was noted during the ground investigation.

2.4.3 Groundwater

Groundwater was encountered within all boreholes at depths between 0.80 and 3.55mbgl. during the 2No subsequent monitoring visits, groundwater levels were recorded to vary between 1.98 and 4.00mbgl across the three boreholes.

2.4.4 Human Health Risk Assessment

All soil concentrations in topsoil and natural soils were found to be below the adopted human health screening levels.

2.4.5 Controlled Waters Risk Assessment

Although made ground was encountered across the whole site, no significant visual or olfactory evidence of gross contamination was observed. As such, while a contaminant pathway migration pathway may be present between the made ground and underlying groundwater/surface water, the risk to controlled waters was considered to be acceptably low owing to the lack of identified contamination or an observed significant vertical leaching pathway.

2.4.6 Phytotoxic Risk Assessment

No unacceptable concentrations were previously reported with respect to phytotoxic screening levels. However, on-site made ground soils were determined to be physically unsuitable for use at shallow depth within areas of soft landscaping due to the frequent presence of anthropogenic materials such as concrete, brick, plastic and asphalt, and therefore unlikely to provide a favourable growth medium.

2.4.7 Ground Gas Risk Assessment

Based upon the calculated GSVs and gas concentrations recorded during ground gas monitoring, Characteristic Situation 1 (CS1) is considered suitable for the site. As such, no gas protection measures are required in the proposed development.

The site is also within a low-risk radon area. Therefore, no radon protection measures are required.

2.4.8 Potable Water Supply

Soil concentrations of benzo(a)pyrene were found to be endemically elevated across the site within the made ground, when compared with potable pipework screening criteria. As such, upgraded water supply pipework should be utilised.

3 REFINED CONCEPTUAL SITE MODEL

3.1 General

Following completion of previous ground investigation and risk assessment, a refined conceptual site model has been developed as detailed below. Further detail of the assessment undertaken is provided in previous reports as detailed in 1.4.

3.2 Sources

With consideration of the assessment summarised in Section 2, the following Areas of Potential Concern (APC) have been identified which require risk mitigation:

- **APC 1:** Made ground associated with existing and previous development.
 - Elevated BaP within made ground posing a risk to water supply pipework.
 - Physically unsuitable to remain at shallow depth in soft landscaping.

3.3 Risk evaluation

National guidance^{2,3} has been considered in the development of the conceptual model for the site to inform an estimation of risk in relation to each plausible source-pathway-receptor (SPR) identified. Table 3.1 presents a summary of the (SPR) relationships identified as a moderate/low risk or higher which will require remedial action and/or management to mitigate unacceptable risks identified, further detail of which will be provided in later sections of this report.

² Contaminated Land Risk Assessment. A Guide to Good Practice. CIRIA C552. 2001.

³ Land contamination risk management - <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>.

Table 3.1 Source-Pathway-Receptor (SPR) Relationships Requiring Risk Mitigation

APC N°	Source	Pathway (s)	Receptor	Consequence	Probability	Risk*	Comment
1	On-site Made ground associated with existing and previous development.	Permeation into drinking water supplies	Future residents	Medium	Low likelihood	Moderate/Low	Elevated concentrations of BaP. Upgraded water supply pipework required.
		Uptake via root system	On-site flora	Medium	Low likelihood	Moderate/Low	Contaminants below adopted screening levels but poor physical quality.

**Where multiple receptors exist the risk classification is based on most sensitive receptor for conservatism.*

4 REMEDIATION STRATEGY

4.1 Remediation Objectives

The objective of the proposed remediation strategy is to render the site suitable for a proposed residential end-use. In addition, the remediation strategy will address statutory risks, such that the site would not be determined as Contaminated Land under Part 2A of the Environmental Protection Act 1995.

4.2 Remediation Strategy

Remedial recommendations are made in the context of the proposed development which will comprise the construction of 16N° residential flats and a number of communal living spaces. The development will have areas of Public Open Space (POS) and hard landscaped parking areas in the south of site.

In the absence of confirmed cut/fill estimates and information on proposed level changes within the development, remediation measures have been presented in the context of existing site levels. However, in the event that site levels are raised, this may in effect provide a suitable capping thickness and could achieve the remedial requirements set out below subject to the placement/import of chemically and physically suitable material.

4.3 Risk Mitigation

As summarised in Table 3.1, the SPR relationships have been identified which are considered to present an unacceptable risk to identified receptors, and which will require risk mitigation measures to be applied, as discussed further in subsequent sections. Reference should be made to the Remediation Strategy Plan included within Appendix A. Recommendations for risk mitigation actions are made in the context of client supplied development information including landscaping proposals. In the event that significant changes to the development proposals are made, these recommendations should be reviewed and updated as necessary.

Remediation verification requirements are set out within Section 6.

4.3.1 Area of POSresi

- In the defined areas of communal soft landscaping as shown on the plan within Appendix A, made ground and or reworked topsoil shall be removed down to 150mm below finished level or the top of the natural soils, whichever is least, to provide a more favourable growth medium.
- Levels shall be reinstated to reflect engineering requirements utilising either:
 - Chemically and physically suitable imported topsoil, as detailed within Section 6.1.
 - Alternatively, due to the acceptably low contaminant concentrations within on-site reworked topsoil, these soils may be riddled to remove anthropogenic materials and then reused once an appropriate texture is achieved, negating the requirement for import of capping material.

4.3.2 General Recommendations

- Upgraded water supply pipework shall be used within the development.
- Any positively identified or suspected contaminated soils shall be stockpiled upon an impermeable barrier to mitigate the potential for cross contamination of underlying soils.
- Where specialist planting is dictated by landscaping proposals, a deeper growth medium may be required, including up to 450mm in areas of proposed shrubs and up to 900mm for tree pits (which may also require specialist installation in line with BS 5837⁴). These details should be confirmed with the project landscaping adviser.

⁴ Trees in relation to design, demolition and construction. Recommendations. BS 5837 2012.

- In root protection areas (if imposed), it may not be possible to excavate to the required depth using conventional machinery, to provide clean capping. In such circumstances, it is considered that staged excavation of soils, undertaken with an air lance or vacuum excavation equipment would be achievable, with capping soils placed as excavations progress laterally to minimise root disturbance. Alternatively, in the event that excavations within root protection areas cannot be achieved, a 100mm 'no-dig' Cellular Confinement System (CCS) should be placed above existing soils, with a minimum of 100mm of suitable topsoil placed above to provide appropriate risk mitigation. The above should be discussed and agreed with the project landscaping advisor.
- Vigilance should be employed for any unforeseen ground conditions when excavating and when grubbing out, where specialist advice may be required. If during the subsequent construction works additional suspected contaminated soils are subsequently revealed, it will be necessary to contact a suitably qualified environmental consultant who will be able to attend site and advise upon the most appropriate course of action.
- On-site boreholes should be protected until such time as the regulators have confirmed agreement with the gas risk conclusions. Following approval from the regulators, the monitoring boreholes should be decommissioned in line with Environment Agency guidance.

4.4 Soil Re-Use Opportunities

As with all construction projects, it is preferable to maximise the reuse of soils on-site and minimise the amounts of off-site disposal. To achieve this whilst accomplishing the remedial objective, a number of potential re-use opportunities have been identified and which are described in later sections of this report which may be undertaken in line with the CL:AIRE Definition of Waste Code of Practice (DoW:CoP).

4.4.1 Made ground

Shallow made ground was encountered across site. Whilst chemical concentrations did not identify it as a risk to human health, it was found to be physically unsuitable for private and common landscaped areas. This material could be considered for re-use in less sensitive parts of the development such as beneath hard cover.

4.4.2 Natural Soils

Natural soils of the weathered Swansea Member encountered beneath the made ground across site are considered to be chemically and physically suitable to remain beneath areas of soft landscaping across site. Additionally, subject to confirmation of geotechnical properties, it may be possible to re-use this material as engineering fill in line with the project earthworks strategy.

4.5 Residual Risk and Uncertainty

Subject to implementation of the risk mitigation measures described throughout Section 4.3, it is considered that no areas of uncertainty or residual risk will remain.

5 MANAGEMENT OF WORKS

5.1 Health and Safety

The works should be carried out in accordance with the Construction (Design & Management) Regulations 2015. These regulations place specific responsibilities on the Principal Contractor, Principal Designer and Employer. The Employer should appoint a Principal Designer and a Principal Contractor for the works.

The Principal Contractor shall develop appropriate methods of working to ensure the health and safety of workers, visitors and neighbours and also protect the environment, in accordance with management procedures outlined in their Construction Phase Plan.

Following completion of the remediation works, pertinent information shall be supplied to the Principal Designer for incorporation into the site Health and Safety File.

5.2 On-Site Material Management

In the event that on-site re-use of made ground is proposed, this may be undertaken in accordance with the CL:AIRE Development Industry Definition of Waste Code of Practice. In this case, a Materials Management Plan (MMP) shall be prepared to document the principles of re-use outlined within this Remediation Strategy prior to any excavation or stockpiling works commencing on site.

Alternatively, application of a U1 waste exemption may be an appropriate route to support re-use of smaller volumes of site won soils in construction projects. This allows re-use of suitable waste rather than virgin raw material providing site complies with standard rules as set out by the Environment Agency⁵.

Re-use of aggregates from inert waste may also be undertaken in line with the WRAP Quality Protocol.

5.3 Waste Management Strategy

It is a requirement of the Landfill Regulations 2002 that all waste must be treated to reduce its quantity and/or its environmental impact before being disposed of to landfill. This process has been undertaken as part of this remediation design and is demonstrated by the following:

- Intrusive ground investigation has been undertaken at the site in order to identify areas where contamination deemed to present an unacceptable risk to identified receptors is present. Reference should be made to the previous ground investigation report for further details.
- The Principal Contractor is required to further reduce the volume of material for off-site disposal and/or treatment by the sorting of inert rubble, metal, etc. from all excavated and/or stockpiled soils where practically possible.

In accordance with the waste hierarchy, it is preferable to retain as much site won material as possible, in line with the reuse opportunities set out in Section 4.4.

Excavated soils requiring off-site disposal will be transported in road going lorries, in accordance with appropriate duty of care requirements⁶. The waste haulier will be a licensed waste carrier, with evidence of registrations obtained prior to consigning waste for off-site treatment and/or disposal. Appropriate controls will be put in place for handling/transportation of materials including any which may contain asbestos. Laboratory results of the excavated material will be passed on to the haulier and the material will be transported and disposed of accordingly.

⁵ <https://www.gov.uk/guidance/waste-exemptions-using-waste>

⁶ Waste Duty of Care Code of Practice. Defra. 2018.

Demolition rubble or other recyclable aggregates, metals or other inert and recoverable materials may be segregated for re-use on-site or sent for off-site recycling to an appropriately licensed facility.

5.4 Waste Characterisation

A review of ground investigation data has been completed to support waste characterisation and pre-classification in the event that off-site disposal of soils is required, which is separate to human health or other environmental risk assessment completed to support the remediation strategy. Reference should be made to the previous report for detail on this assessment.

In summary, this waste assessment indicated that the made ground encountered across site will be treated as non-hazardous. However, WAC testing was not carried out as part of the previous investigation. Chemical results should be supplied to the receiving facility to confirm they will be able to accept the material. Additionally, supplementary WAC testing may be required if destined for inert landfill to confirm the preliminary waste characterisation assessment.

5.5 Control Measures and Monitoring

An environmental risk assessment shall be undertaken by the Principal Contractor which shall establish appropriate environmental control measures and monitoring protocols required during the works, which should be documented within a site-specific Environmental Management Plan. The Principal Contractor shall implement appropriate dust and noise control measures as appropriate and shall ensure that competent staff are on-site to implement the controls when necessary. Where/if movement of asbestos impacted soils/material is required, appropriate controls shall be implemented e.g. damping down and monitoring undertaken as required.

6 VERIFICATION

6.1 Capping Soils in Soft Landscaping Areas

6.1.1 Imported Soils

Where imported topsoil is within the development as capping soil within areas of communal soft landscaping, they shall comply with the soil criteria in Appendix B for a 'POSresi' end use. All imported soils shall be free of asbestos (<0.001%w/w).

Details of the proposed source of material shall be supplied. It is recommended that soils are tested at source prior to movement and importation to confirm suitability.

Additionally, representative soil samples should be collected of imported soils for chemical analysis once received at site, at a minimum frequency of 1 per 250m³. A minimum of three samples shall be collected.

All samples shall be submitted to a laboratory with UKAS and MCERTS accredited methods (as appropriate).

Testing shall comprise the following, as a minimum:

- Metals.
- Speciated Polycyclic Aromatic Hydrocarbons (PAHs).
- pH.
- Phenols.
- Total organic carbon.
- Asbestos screening.

Additionally, where the origin of the material is a brownfield site or an undefined source, testing shall include petroleum and diesel hydrocarbons within the carbon range C6-C35, including aliphatic/aromatic split.

6.1.2 Site Won Soils

Existing ground information has determined that contaminant concentrations within existing on-site reworked topsoil are within acceptable limits. As such, these soils may be riddled to remove anthropogenic materials and then reused once an appropriate texture is achieved, negating the requirement for import of capping material. However, testing should be undertaken in line with the frequencies detailed in Section 6.1.1 to ensure the chemical quality has not been detrimentally impacted during the riddling process.

6.1.3 Visual Inspections

Visual inspection should be undertaken to confirm placement of appropriate thickness of capping soils and presence of geotextile membrane is in line with requirements of Section 4.3. Inspections should be undertaken at 3N° locations within communal soft landscaping. Anticipated communal soft landscaping inspection locations are shown on the plan in Appendix A.

6.2 Record Keeping

Records of operations relating to the remediation works will be maintained on-site by the Principal Contractor and provided to the client for inclusion within the Remediation Completion Report. These records shall include the following, where relevant/appropriate:

- Photographic records during construction works showing extents of excavation and placement of imported material for capping layers, where appropriate;
- Photos from inspection pits confirming required thickness of capping soils;
- Environmental monitoring undertaken (if required);
- Volumes of waste materials disposed off-site including tickets/waste consignment notes;
- Volumes of imported fill;
- Validation sample locations;
- Chemical validation test results including supplier certificates for imported fill; and,
- Details of variations and/or contingency arrangements as a result of design variation.

In addition, where reuse of materials is undertaken in line with an MMP the following shall be recorded:

- Wagon movements on- and off-site;
- On- and off-site soil movement records; and,
- Volumes and placement locations/depths of soil reuse.

6.3 Remediation Completion Report

A Remediation Completion Report will be prepared that will include a summary of the works undertaken to demonstrate that the remediation objectives have been met. Supporting information will be provided as summarised in Section 6.2, the report will also serve to demonstrate compliance with the principles of material re-use outlined within the supporting MMP and will be submitted to CL:AIRE as a final record, if required.

The Remediation Completion Report shall be issued to the regulators upon completion of the works.

Appendix A – Drawings



PLANTING SPECIFICATION				
Trees				
Number	Species	Girth	Specification	
1	Acer campestre	14-16cm	RB - Extra Heavy Standard	
1	Acer platanoides 'Emerald Queen'	14-16cm	RB - Extra Heavy Standard	
1	Alnus cordata	14-16cm	RB - Extra Heavy Standard	
2	Betula pendula	14-16cm	RB - Extra Heavy Standard	
1	Prunus avium	14-16cm	RB - Extra Heavy Standard	
1	Prunus padus	14-16cm	RB - Extra Heavy Standard	
2	Sorbus aucuparia	14-16cm	RB - Extra Heavy Standard	
Total 9				

Shrubs						
Number	Species	Height	Pot Size	Specification	Density	
32	Berberis cordifolia	20-30cm	5L	C	4/m²	
31	Choisya ternata 'White Dazzler'	40-60cm	5L	C	4/m²	
56	Geranium macrorrhizum 'Ingwersen's variety'	30-40cm	3L	C	4/m²	
40	Hebe buxifolia	30-40cm	3L	C	4/m²	
32	Hebe rakaiensis	30-40cm	3L	C	4/m²	
6	Hydrangea arborescens 'Annabelle'	40-60cm	5L	C	4/m²	
32	Lonicera pileata 'Maygreen'	40-60cm	3L	C	4/m²	
34	Potentilla fruticosa	40-60cm	3L	C	3/m²	
62	Viburnum davidii	40-60cm	3L	C	4/m²	
Total 328						

Native Hedge				
Number	Species	Height	Specification	Percentage Contribution
28	Acer campestre	60-80cm	B	10%
28	Corylus avellana	60-80cm	B	10%
110	Crataegus monogyna	40-60cm	B	40%
14	Ilex aquifolium	40-60cm	B	2%
42	Prunus spinosa	40-60cm	B	15%
28	Rosa carina	60-80cm	B	2%
28	Sambucus nigra	60-80cm	B	10%
Total 278				

Rain Garden Mix 3						
Number	Species	Height	Pot Size	Specification	Density	Percentage Contribution
28	Auiga reptans	20-30cm	2L	C	6/m²	25%
14	Allium schoenoprasum	2L	C	6/m²	25%	
14	Juncus effusus	30-40cm	2L	C	4/m²	20%
12	Osmunda regalis	3L	C	4/m²	15%	
14	Polystichum setiferum	3L	C	2m	15%	
8	Rudbeckia fulgida	3L	C	4/m²	10%	
Total 80						

Hedge planting to be established in double staggered rows, 300mm between rows, plants equally spaced with 6no plants per linear metre.
Rain Garden plants to be established in single species groups of between 7 and 11

TREE REPLACEMENT STRATEGY:

The existing trees to be removed are all noted in the tree report as either Category C or Category U. Whilst the majority of those being removed are Category U, it is acknowledged that they currently contribute positively to amenity and ecology and an adequate level of mitigation is required.

Due to the site containing a large number of existing mature trees, there is very little suitable space for replacement trees. Therefore, the replacement strategy includes an appropriate number of trees, planted in suitable locations where there is sufficient space to allow the trees to develop to their full potential.

In addition to the replacement tree planting, a new mixed native hedge is proposed along the south west boundary. This will provide a broad range of native tree and shrub species, a food source and nesting opportunities for birds.

Finally, the inclusion of new shrub planting to building edges and in rain gardens, including plants known to benefit wildlife, further enhances site ecology and biodiversity.

TABLE OF REPLACEMENT TREES

T6	Cat U poor Goat Willow to be removed.	Replace with 3no trees as space allows.
T16	Cat C young Beech to be removed.	Replace with 2no trees in same location.
T26	Cat U dying Ash to be removed.	Replace with 1no tree in nearby location.
T28	Cat U dying Ash to be removed.	Replace with 1no tree in nearby location.
G32	Cat U dying Ash group to be removed.	Replace with 1no tree in nearby location.
T34	Cat U suppressed Birch to be removed.	Replace with 1no tree in nearby location.

Planting Specification

All work and materials shall be in accordance with current British Standards components and to Code of Practice.

SITE CLEARANCE

- a - Remove general building rubble, litter and any stones greater than 75mm in size from the areas to be planted. Such materials are to be collected and taken to the Contractors tip or disposed of on site as directed.

EARTHWORKS

Planting Areas

- a - Approved topsoil, both site won and imported, shall be led onto site and spread evenly on the approved formation to give a finished depth of 150mm for grassed areas, 450mm for shrub planted areas and 1000mm depth for tree pits. All topsoil to be placed on a minimum of 300mm depth of subsoil.
- b - Finished levels of topsoil in grassed areas to be 25mm above adjoining paving. Finished level of topsoil in shrub beds to be 50mm lower than adjacent edge to allow placing of bark mulch.
- c - Supply and spread approved fertiliser such as SAI Enmag or similar standard at the rate of 70g/m² to be worked into top 200mm.

CULTIVATIONS AND PLANTING

Planting Areas

- a - Shrub beds shall be cultivated prior to planting to produce a medium tilth and all weeds, stones and other debris arising from this work are to be collected and removed from site.
- b - Spread approved tree and shrub planting compost over the planting beds at a rate of 20 litres/m² and work into the top 200mm.
- c - Shrubs to be sited in locations, numbers and densities shown in the planting schedule and on the soft landscape drawings. Shrubs to be placed to achieve an even spacing and matching of shapes. All shrubs are to be planted at the depth at which they have previously been growing, allowing for soil settlement after planting.
- d - Surfaces of shrub planting areas shall be left clean and neat with a raked surface between the planting during and on completion of planting.
- e - Immediately after planting all containerised plants shall be watered with 5 litres of water per plant.
- f - All grass edges to be cut vertically with an edging iron to a depth of 100mm. Resultant edges to be clean and straight or an even smooth radius. Edges to be left neat and tidy with ground on shrub side meeting cut face at an even gradient. All cuttings to be removed from site.
- g - A 50mm layer of matured conifer bark to be spread over planting areas and tops of tree pits, at least 75% of which shall exceed 60mm particle size and shall contain a minimum of wood particles, the bark is to be pest, disease and weed free.

Tree Planting - Planting Pits

- a - Excavate tree pits as follows:-
 - Standard / Feathered trees - 1000 x 1000 x 1000mm
 - Semi-Mature trees - 1500 x 1500 x 1000
- b - Loosen base to a further depth of 200mm and scarify sides. Dispose of unsuitable excavated material off site to approved tip.
- c - Trees to be double staked with stakes positioned parallel to the adjacent kerb line or paving. Tree stakes to be pressure treated, minimum diameter 65mm and pointed at one end. Stakes to be driven into the pit before planting to a minimum depth of 300mm below the base of the pit.

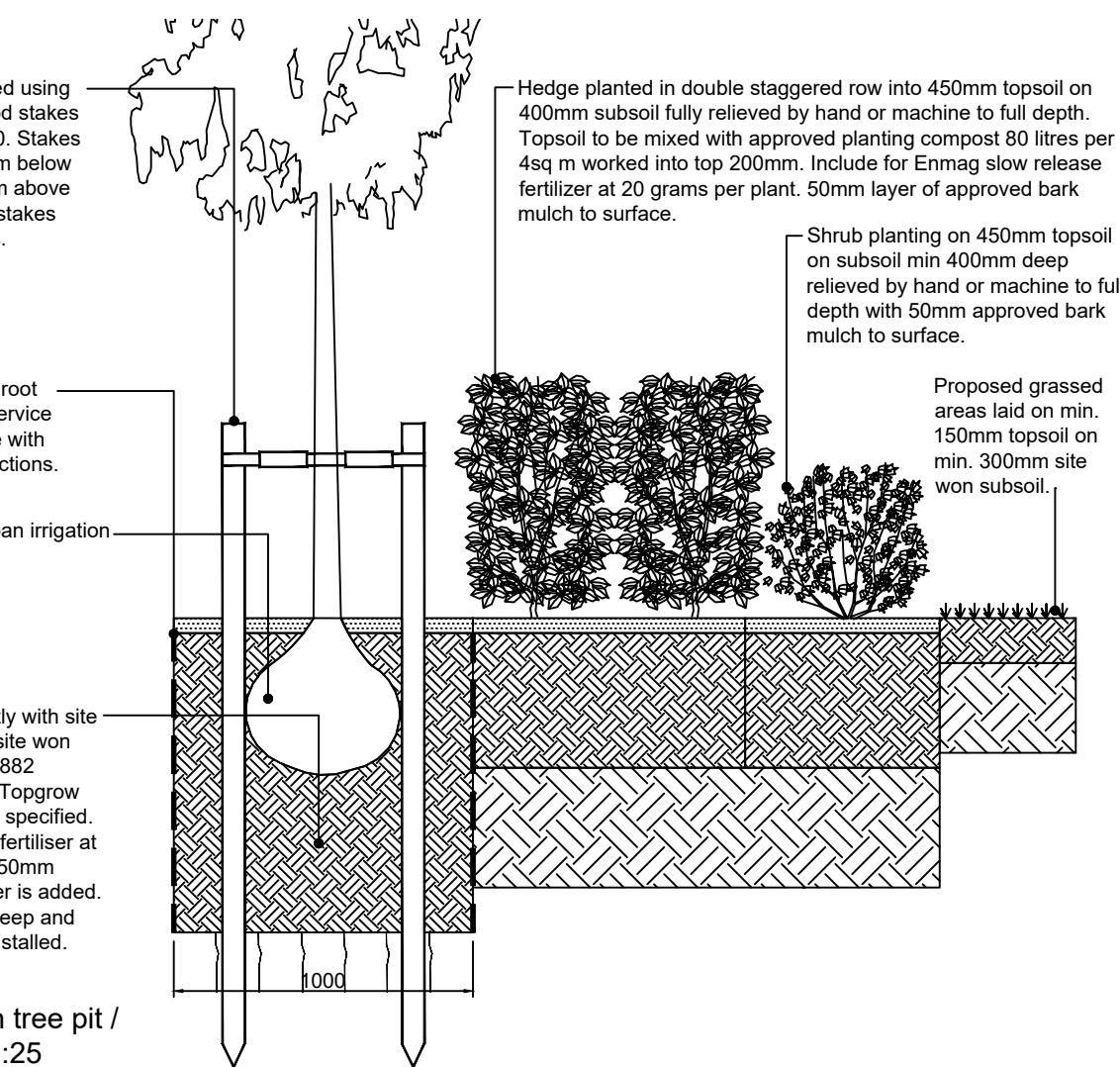
Tree planting to be double staked using 75mm diameter pointed softwood stakes treated with Tanalith E Class 4.0. Stakes to be driven into ground 1500mm below finished soil level and be 600mm above ground. Trees to be secured to stakes using adjustable rubber tree ties.

GreenBlue Urban ReRoot 1000 root barrier system within 6M of all service locations installed in compliance with manufacturers installation instructions.

GreenBlue Urban Root Rain urban irrigation system RRURB1.

1 x 1 x 1m tree pit backfilled firstly with site won subsoil (700mm) and then site won topsoil (300mm). Topsoil to BS5832 thoroughly mixed with Melcourt Topgrov Planting Compost in ratio 2:1 as specified. Include for Enmag slow release fertiliser at 100gms per pit, and backfill in 150mm layers firming in before next layer is added. Break up bottom of pit 200mm deep and sides where root barrier is not installed.

Typical section through tree pit / shrub planting. Scale 1:25



- d - After sowing, all amenity grass areas are to be consolidated using an approved type tined roller.
- e - Sowing shall be carried out in suitable weather conditions in transverse directions. After sowing, ground to be lightly raked and all stones over 12mm gauge shall be removed.

Turfed Areas

- a - Ensure soil below is prepared correctly, level and lightly watered before laying the turf. Each row of turf should be laid so that joints are offset by min 300mm. Start laying along a straight side in a row butt joining the ends tightly together.
- b - Do not stretch the turf, always push the turf into a joint. Avoid gaps, but if they do occur fill them in with a light soil/sand mixture. Ensure complete contact between the soil and the underside of the turf and if necessary use a flat board or head of a rake to lightly firm down the turf.
- c - Immediately after laying, start watering. Ensure that the new turf is never short of water. Water repeatedly for at least two weeks and/or until the turf is well established. Once established, weekly watering during dry periods should be adequate. First cut to be undertaken once grass sward is long enough to cut.

Grass Subsidence/Damage

- a - Any subsidence of seeded or turfed areas below the specified levels shall be made good and re-seeded. These works shall be rectified at the Contractor's expense.
- b - The Contractor shall make good any damage caused by work personnel, plant or material whilst carrying out and maintaining the work on site.

Watering

- a - Contractor shall be entirely responsible for all watering necessitated by dry weather and it shall be undertaken by stationary rotary sprays.

Completion

- a - Grass areas shall be accepted as having reached practical completion only when germination has proved satisfactory and healthy weed free swards have been established.

MAINTENANCE

Grass Seed Mixes

- a - The Contractor shall be responsible for the maintenance of the planting and grassed areas for a 12 month period following the completion of the works and will be responsible for any defects due to faulty materials, including plant failures, or workmanship during this time.
- b - The Contractor shall carry out maintenance work at suitable intervals and in suitable weather conditions.

Firming In

- a - All plants and tree stakes loosened by planting operations, wind or frost shall be firmed in. Allow 1 no. visit per year.

Litter Collection

- a - Whole site to be kept in a clean and tidy condition throughout the establishment period. Litter to be removed from site. Allow 20 no. visits per year.

Defects Liability Period

- a - Any trees, shrubs and grass found to be defective or missing for any reason before practical completion shall be replaced by the Contractor entirely at his own expense.
- b - Thereafter any failures within 12 months of the date of practical completion shall also be replaced to the original specification by the Contractor entirely at his own expense, in the next planting season.
- c - Thereafter any failures within the next 4 years shall also be replaced to the original specification in accordance with the planting conditions.

Weed Control

- a - Keep shrub beds and areas around trees free from annual and perennial weeds by hand weeding. All airings to be removed from site. Allow 7 no. visits per year.
- b - Apply translocated herbicide to shrub beds using weed wiper. Allow 3 visits a year with dead weed growth removed after each visit.

Mulch

- a - Bark mulch to be reinstated to original depths at the end of each growing season. Allow 1 no. visit per year.

Watering

- a - All planting shall be watered with a low pressure hose during dry spells, within the first year of growth only at the following rates:-
 - Feathered/standard trees - 36 litres/tree/visit
 - Heavy standard trees - 42 litres/tree/visit
 - Semi-mature trees - 48 litres/tree/visit
 - Shrubs - 5 litres/plant/visit

Fertiliser

- a - At the end of the establishment period, 30gms of slow release fertiliser to be applied around each plant. Allow 1 no. visit at end of Year 2

Grass Cutting

- a - Areas sown with amenity mix:-
 - 16no. visits between April and October. Grass areas to be cut to a height of c.40mm. NB: in drought conditions adjust cutting heights to c.60mm. In very wet conditions, all operations involving grass cutting shall cease until conditions allow operations to continue without damaging the surfacing, levels and contours of the ground. Allow for sweeping clean of all paths and roads of grass cuttings at each mowing

- c - IN ALL CASES all airings are to be removed from site.

Firming In

- a - All plants and tree stakes loosened by planting operations, wind or frost shall be firmed in. Allow 1 no. visit per year.

Litter Collection

- a - Whole site to be kept in a clean and tidy condition throughout the establishment period. Litter to be removed from site. Allow 20 no. visits per year.

REV.	DESCRIPTION.	DATE.	REV.	DESCRIPTION.	DATE.	REV.	DESCRIPTION.	DATE.
A	Amended to reflect changes to site layout. LH/DP	25.11.24						
B	Amendments to rain gardens following SAB comments. LH/DP	30.07.25						

IMPORTANT CDM / H&S NOTE

The designers would draw the reader's attention to key residual construction health and safety hazards that have not been eliminated from the designs shown on the drawings by the design process. These hazards are identified below:

Working on or adjacent to the public highway.

Working adjacent to waterbodies during storm conditions.

Any construction personnel including operatives intending to construct the designs shown on this drawing should ensure that they have been thoroughly briefed by the principle contractor on all health and safety matters and have sight of:

- The full designers and contractors hazard risk assessments and risk registers.
- The developed construction phase health and safety plan.
- The contractors construction method statements.

PROJECT
Gellinudd, Pontardawe

DRAWING TITLE
Soft Landscape Proposals

DRAWING No.
1235.01 Rev B

SCALE (A1)
1:200

DATE
Oct/24

DRAWN
LH

CHKD
DP

Notes: Do not scale this drawing. Use figured dimensions in all cases. Check all dimensions on site. Report any discrepancies to dp landscape architecture before proceeding. This document is copyright and must not be used, amended or reproduced in any form without written consent from dp landscape architecture ltd.

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— Site Boundary



Base Map
Company: Bing Maps Autodesk Licence
DWG Title: -
DWG Number: -
Date: -

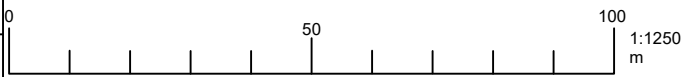
Drawn	Checked	Amendment	Date	Rev.
Rhodos Properties (No 22) Ltd				
Gellinudd Care Home, Gellinudd				
Site Location Plan				
Scale	Date	Drawn by	Check by	Rev.
1:1250@A4	06/08/25	DA	IJ	-

T&P

Regen

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Rev.	Drawing No.
-	P1188-01-001



Areas of POS:

Made ground and/or reworked topsoil shall be removed down to 150mm below finished level or the top of the natural soils, whichever is least, to provide a more favourable growth medium. Levels shall be reinstated to reflect engineering requirements utilising either: Chemically and physically suitable imported topsoil; or due to the acceptably low contaminant concentrations within on-site reworked topsoil, these soils may be riddled to remove anthropogenic materials and then reused once an appropriate texture is achieved, negating the requirement for import of capping material.

● Proposed verification soft landscaping inspection locations.

General notes

- Upgraded water supply pipework shall be used within the development.
- Any positively identified or suspected contaminated soils shall be stockpiled upon an impermeable barrier to mitigate the potential for cross contamination of underlying soils.
- Where specialist planting is dictated by landscaping proposals, a deeper growth medium may be required, including up to 450mm in areas of proposed shrubs and up to 900mm for tree pits (which may also require specialist installation in line with BS 5837). These details should be confirmed with the project landscaping adviser.
- In root protection areas (if imposed), it may not be possible to excavate to the required depth using conventional machinery, to provide clean capping. In such circumstances, it is considered that staged excavation of soils, undertaken with an air lance or vacuum excavation equipment would be achievable, with capping soils placed as excavations progress laterally to minimise root disturbance. Alternatively, in the event that excavations within root protection areas cannot be achieved, a 100mm 'no-dig' Cellular Confinement System (CCS) should be placed above existing soils, with a minimum of 100mm of suitable topsoil placed above to provide appropriate risk mitigation. The above should be discussed and agreed with the project landscaping advisor.
- Vigilance should be employed for any unforeseen ground conditions when excavating and when grubbing out, where specialist advice may be required. If during the subsequent construction works additional suspected contaminated soils are subsequently revealed, it will be necessary to contact a suitably qualified environmental consultant who will be able to attend site and advise upon the most appropriate course of action.
- On-site boreholes should be protected until such time as the regulators have confirmed agreement with the gas risk conclusions. Following approval from the regulators, the monitoring boreholes should be decommissioned in line with Environment Agency guidance.



Base Map
Company: - DP Landscape Architecture
DWG Title: - Soft Landscape Proposals
DWG Number: - 1235.01 Rev B
Date: - October 24

-	-	-	-	-
Drawn	Checked	Amendment	Date	Rev
Rhodos Properties (No 22) Ltd			Client	
Gellinudd Care Home, Gellinudd			Project	
Remedial Strategy Plan			Title	
Scale	Date	Drawn by	Checked by	
1:500@A3	01/08/25	DA	IJ	



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Rev.	Dr
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Scale	Date	Drawn by	Check by	Rev.	Drawing No.
1:500@A3	01/08/25	DA	IJ	-	P1188-01-003

10

25

50

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m

Appendix B – Imported Soil Criteria

SOIL TARGET CONCENTRATIONS – HUMAN HEALTH

Contaminant	Assessment Criteria				
	Residential with homegrown produce	Residential without homegrown produce	POS _{RESI}	Commercial	Source
Heavy Metals					
Arsenic	37	40	79	640	C4SL
Beryllium	1.7	1.7	2.2	12	S4UL
Cadmium	22	150	220	410	C4SL
Chromium III	910	910	1,500	8,600	S4UL
Hexavalent chromium	21	21	21	49	C4SL
Lead*1	200	310	630	2,300	C4SL
Mercury - inorganic	200	300	610	5,100	C4SL
Nickel	180	180	230	980	S4UL
Vanadium	410	1,200	2,000	9,000	S4UL
Selenium	250	430	1,100	12,000	S4UL
Phytotoxic Metals					
Copper	2,400	7,100	12,000	68,000	S4UL
Zinc	3,700	40,000	81,000	730,000	S4UL
Boron	290	11,000	21,000	240,000	S4UL
Organics					
Phenol	280	750.0	760	760	S4UL
PAHs					
Naphthalene*3	15	15	11,000	1,600	C4SL
Acenaphthylene*3	170	2,900	15,000	83,000	S4UL
Acenaphthene*3	210	3,000	15,000	84,000	S4UL
Fluorene*3	170	2,800	9,900	63,000	S4UL
Phenanthrene*3	95	1,300	3,100	22,000	S4UL
Anthracene*3	2,400	31,000	74,000	520,000	S4UL
Fluoranthene*3	280	1,500	3,100	23,000	S4UL
Pyrene*3	620	3,700	7,400	54,000	S4UL
Benz(a)anthracene*3	7.2	11	29	170	S4UL
Chrysene*3	15	30	57	350	S4UL
Benzo(b)fluoranthene*3	2.6	3.9	7.1	44	S4UL
Benzo(k)fluoranthene*3	77	110	190	1,200	S4UL
Benzo(a)pyrene*2	5.0	5.3	10	77	C4SL
Indeno(123-cd) pyrene*3	27	45	82	500	S4UL
Dibenz(ah)anthracene*3	0.24	0.31	0.57	3.5	S4UL
Benzo(ghi)perylene*3	320	360	640	3,900	S4UL
Fuel range hydrocarbons					
Benzene	0.20	0.89	140	27	C4SL
Toluene	130	880	56,000	56,000	S4UL
Ethyl Benzene	47	83	24,000	5,700	S4UL
Xylenes	56	79	41,000	5,900	S4UL
Aromatic C5-C7	70	370	56,000	26,000	S4UL
Aromatic C7-C8	130	860	56,000	56,000	S4UL
Aromatic C8-C10	34	47	5,000	3,500	S4UL
Aromatic C10-C12	74	250	5,100	16,000	S4UL
Aromatic C12-C16	140	1,800	3,800	36,000	S4UL
Aromatic C16-C21	260	1,900	3,800	28,000	S4UL
Aromatic C21-C35	1,100	1,900	3,800	28,000	S4UL
Aromatic C35-C44	1,100	1,900	3,800	28,000	S4UL
Aliphatic C5-C6	42	42	570,000	3,200	S4UL
Aliphatic C6-C8	100	100	60,000	7,800	S4UL
Aliphatic C8-C10	27	27	1,300	2,000	S4UL
Aliphatic C10-C12	130	130	1,300	9,700	S4UL
Aliphatic C12-C16	1,100	1,100	1,300	59,000	S4UL
Aliphatic C16-C35	65,000	65,000	250,000	1,600,000	S4UL
Aliphatic C35-C44	65,000	65,000	250,000	1,600,000	S4UL

Notes:

All values are mg/kg unless stated

C4SL – Category 4 Screening Level as produced by Defra and CL:AIRE –based on 1% SOM

S4UL – Suitable 4 Use Levels as produced by Land Quality Management – based on 1% SOM.

*1 – C4SL for lead based on the LLTC of 3.5µg/dL⁻¹ and C4SL exposure changes.

*2 – BaP can be considered as a marker compound for consideration of other PAHs.

*3 – Threshold values may be discounted based upon use of BaP as a marker compound.

SOIL TARGET CONCENTRATIONS – PHYTOTOXICITY

	Assessment Criteria (Phytotoxic thresholds for plants)	Source
Phytotoxic Metals		
Selenium	10.0	SGV9 Document
Boron	3.0	ICRCL 59/83
Copper	130.0	
Nickel	70.0	
Zinc	300.0	
Cadmium	8.0	Amended Dutch RIVM – Ecotoxilogical risk
Chromium	154.0	
Mercury	28.0	