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Project THE VINERY P O L I N G , W E S T S U S S E X							
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Topsoil, Growing Media and Ameliorants	L	SPEC		Q28			
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LANDSCAPE SPECIFICATION

Q28 Topsoil, Growing Media and Ameliorants

To be read with Preliminaries/ General conditions.

50 SCOPE

- The works will include, but will not necessarily be restricted to, the following:
 - Testing existing topsoil and imported topsoil/media for suitability for general landscape purposes.
 - Testing existing topsoil and imported topsoil/media for suitability for specialist landscape purposes.
 - Checking depth and quality of subsoil to formations beneath soft landscape areas.
 - Ripping and/or cultivation of formations to break up all compaction and aid drainage.
 - Grading of formation levels to achieve specified soil depths.
 - Digging, loading and carting topsoil/subsoil from on site spoil heaps.
 - Importing additional topsoil as necessary to complete the works. OR
 - Importing topsoil from an approved source (use where no suitable topsoil exists on site).
 - Importing additional subsoil as necessary to complete the works.
 - Spreading topsoil to required depths and profiles.
 - Spreading subsoil, where used as a growing medium, to required depths and profiles.
 - Preparing areas of insitu topsoil so that they are in a suitable state for seeding and planting operations specified in other sections.

NOTE: It is assumed the Landscape Subcontractor will carry out those operations covered in this section in order to maintain the validity of plant guarantees.

70 INTERFACES WITH OTHER WORKS

- Co-ordinate with:
 - General ground works operations.
 - Drainage and below ground services.
 - Seeding and planting operations.

SYSTEM OUTLINE

105 TOPSOIL SYSTEM EXISTING TOPSOIL FROM SITE TO BE REUSED

- Topsoil: Existing topsoil to be stripped, stored and reused
- Testing: To Clause 612
- Storage: To Clauses 681 and 690
- Ameliorants: To Clause 365.

110 IMPORTED TOPSOIL SYSTEM

- Topsoil: Imported topsoil to BS3882 and to clause 325.
- Ameliorants: To clause 365

PRODUCTS

300 PREPARATION MATERIALS GENERALLY

- Purity: Free of pests, disease, and fungus.
- Foreign matter: On visual inspection, free of fragments and roots of aggressive weeds, sticks, straw, subsoil, pieces of brick, concrete, glass, wire, large lumps of clay or vegetation, and the like.
- Contamination: Do not use topsoil contaminated with subsoil, rubbish or other materials that are:
 - Corrosive, explosive or flammable.
 - Hazardous to human or animal life.
 - Detrimental to healthy plant growth.
- Subsoil: In areas to receive topsoil or planting media, do not use subsoil contaminated with

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the above materials.

- Objectionable odour: None.
- Give notice: If any evidence or symptoms of soil contamination are discovered on the site or in topsoil or planting media to be imported.

305 PERMITTED MATERIALS

- Materials: Bark/Biosolids from sewage sludge/composted animal manure/composted food waste/composted horticultural waste/composted sewage sludge/river dredgings. If these are from a non organic source they may contain heavy materials for which a certificate is required.
- Give notice: Before ordering or using.
- Declaration of compliance: Required.

325 IMPORTED TOPSOIL

- Provide as necessary to make up any deficiency of topsoil existing on site and to complete the work.
- Source: Contractor to provide details
- Texture: Sand (0.05-2.0mm) max. 75% min. 20%
- Silt (0.002-0.05) max, 60% min. 5%
- Clay (less than 0.002mm) max. 30% min. 5% .
- Reaction: pH 6.5 - 7.0 to BS 1377:Part 3.
- Organic matter: Not less than 4% on dry weight basis
- Electrical conductivity: Below 1500 microhoms per cm in 1:2.5 soil: water extract.
- Chemical content threshold for grassed areas shall be an index of 3 or over for phosphates and 2 or over for potassium. For shrub areas an index of 3 or over for phosphates, potassium, magnesium and nitrogen.
- Phytotoxic elements:
 - Total Copper (CU): less than 100mg/kg
 - Total Nickel (Ni): less than 60mg/kg
 - Total Zinc (Zn): less than 200mg/kg
 - Water soluble Boron (b): less than 3mg/kg
- Zootoxic elements: In line with BS 3882 Topsoil should be free from chemical contamination that may pose a risk to the health of future site users and below the GAC values derived by CL Voelcker ESG using EA CLEA model:
Metals and semi-metals:
 - Total Arsenic (As): less than 32mg/kg
 - Total Cadmium (Cd): less than 10mg/kg
 - Total Chromium (Cr): less than 3000mg/kg
 - Chromium IV(hexavalent):less than 4.2mg/kg
 - Total Lead (Pb): less than 185mg/kg
 - Total Mercury (Hg): less than 20mg/kg
 - Total Selenium (Se): less than 351 mg/kg
 Polycyclic Aromatic Hydrocarbons:
 - Benzo(a)pyrene: less than 0.94 mg/kg
 - Dibenzo(a,h)anthracene: less than 0.85 mg/kg
 - Naphthalene: less than 3.7 mg/kg
 Total Petroleum Hydrocarbons:
 - TPH >C8-C10: less than 19 mg/kg
 - TPH >C10-C12: less than 46 mg/kg
 - PH >C12-C16: less than 307 mg/kg
 - TPH >C16-C21: less than 482 mg/kg
 - TPH >C21-C35: less than 1110 mg/kg
 Other:
 - Total Phenol: less than 290 mg/kg

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- Total Cyanide: less than 3.4 mg/kg
- Asbestos no bulk fibres present
- Screened or blended topsoil will not be acceptable
- Made up of discernible crumbs, typically of 2 - 7 mm diameter, each comprising an aggregation of soil particles attracted around a sticky humus centre.
- Maximum size of stones in any dimension: 20 mm.
- Maximum stone content by dry weight: 35 % of which the fraction 2mm-5mm must not exceed 20% by dry weight.
- On visual inspection, free of fragments and roots of aggressive weeds, sticks, straw, subsoil, pieces of brick, concrete, glass, wire, large lumps of clay or vegetation, or other foreign matter.
- Submit certificate of analysis as clause 612
- Objectionable odour: None.

365 COMPOSTED MATERIALS TO BE USED AS AMELIORANTS

- Type: Composted animal manure, composted bark, composted bracken, composted cocoa shell, composted coir fibre, composted food waste, composted green material, composted horticultural waste.
- Source: To be approved by CA
- Horticultural parameters:
 - pH (1:5 water extract): 7.0-8.7.
 - Electrical conductivity (maximum, 1:5 water extract): 200 mS/m.
 - Moisture content (m/m of fresh weight): 35-55%.
 - Organic matter content (minimum): 25%.
 - Grading (air dried samples): 99% passing 25 mm screen, and 90% passing 10 mm screen mesh aperture.
 - Carbon:Nitrogen ratio (maximum): 20:1.
- Texture: Friable.
- Objectionable odour: None.

380 MYCORRHIZAL INOCULANT

- Manufacturer: Plantworks Ltd, Tel 01795 411 527.
- Product reference: Rootgrow Professional.

390 FERTILIZERS TO BE INCORPORATED INTO SOIL/GROWING MEDIUM

- Manufacturer: The Scotts Co, Papermill Lane, Bramford, Ipswich, Suffolk. Tel 0871 220 5353
- Product reference: Sierrablen Flora.
- Application: Spread evenly.
- Timing: Immediately before cultivation.
- Coverage: 70g/m²

400 MAINTENANCE FERTILIZERS

- Type: Maintenance Fertilizer.
- Product reference: Sierrablen Flora15+9+9, The Scotts Company Ltd, Tel 0871 220 5353.

500 SITE PREPARATION

- General: All excavating, filling and rough grading of soft landscape areas to formation levels beneath finished topsoil levels will be carried out by the Main Contractor or Earth Works Contractor prior to the commencement of soiling operations specified in this section.

505 FORMATIONS TO SOFT LANDSCAPE AREAS

- General: Before the commencement of soiling operations, inspect all formation levels and obtain instructions if:

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- Areas have not been excavated and/or filled to the required levels below finished soil levels.
- A formation of naturally occurring subsoil/imported subsoil is not obtained at the specified depths below formation levels.
- The formation is unduly compacted, waterlogged or excessively contaminated with builders rubbish, rubble or other deleterious material.

510 CLIMATIC CONDITIONS

- General: Carry out soiling operations whilst weather and soil conditions are reasonably dry e.g. The soil crumbles in the hand when rolled and does not smear. Do not spread topsoil or carry out other soiling operations during periods of heavy rain or if the ground is waterlogged or frozen.

515 MACHINERY AND TOOLS

- Type: Use only tracked machinery with a low ground pressure for all soiling operations to avoid undue compaction of the ground. Fit machinery used for excavating and spreading soil with a toothed bucket to prevent smearing and compaction.
- Hand tools: Use in confined spaces where it is impractical to use machinery.

520 CO-ORDINATE SOILING OPERATIONS

- General: Carry out operations in such a way that trafficking and compaction of the prepared sub-grade and topsoiled areas is minimised.
- Insitu topsoil: Prevent trafficking of areas that are to be incorporated into the final landscape scheme or which are to be stripped and stored for later re-use.

525 UNDERGROUND SERVICES

- General: Confirm positions and depths of all existing and new underground services prior to commencing soiling operations.

EXECUTION

611 SUBSOIL ANALYSIS

- Obtain approval of a sample of on site and imported topsoil of every 1000m³, for variable condition every 500m³, with a report from CL Voelcker ESG (0118 932 4453) or Tim O'Hare Associates (01491 822 653) of physical and chemical properties as below (two weeks are needed for such tests).
- Samples must be representative of the soil being offered. Take 10 equal samples, mix together thoroughly and divide into 4 equal amounts.
- Send 1 - 2 kg of the mixture (in a plastic bag labelled with name and details of origin) to the analyst with a request for the following information:
 - Soil reaction and lime requirement
 - Electrical conductivity
 - Mechanical analysis
 - Soil texture
 - Stone content
 - Submit the original of the Soil Analyst's Report to the CA together with the Soil Analyst's recommendations for making good any deficiencies and treatments related to grassing and planting proposals.

612 TOPSOIL ANALYSIS

- Obtain approval of a sample of on site and imported topsoil of every 1000m³, for variable condition every 500m³, with a report from CL Voelcker ESG (0118 932 4453) of physical and chemical properties as below (two weeks are needed for such tests).
- Samples must be representative of the soil being offered. Take 10 equal samples, mix

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together thoroughly and divide into 4 equal amounts.

- Send 1 - 2 kg of the mixture (in a plastic bag labelled with name and details of origin) to the analyst with a request for the following information:
 - Soil reaction and lime requirement
 - Electrical conductivity
 - Mechanical analysis
 - Soil texture
 - Stone content
 - Nutrient levels: Nitrogen, available Phosphorus, available Potassium, available Magnesium.
 - Organic matter.
 - Submit the original of the Soil Analyst's Report to the CA together with the Soil Analyst's recommendations for making good any deficiencies and fertiliser treatment related to grassing and planting proposals.
- At the reasonable request of the CA the Contractor shall test samples of topsoil on site by an independent soil scientist for anaerobic conditions.

620 IMPORTING TOPSOIL

- Give notice: Before stripping topsoil for transfer to site.
 - Notice period: 7 days.

621 INSPECTION OF IMPORTED TOPSOIL/SUBSOIL

- Visual Inspection: For each provisionally approved source provide a sample load of not less than 5m³ before making further deliveries to site. Sample must be representative of soil being offered.
- Samples: Retain on site for visual comparison with subsequent loads.
- Rejected samples: Remove from site.
- Testing: Collect random samples from delivered loads as instructed for further analysis to ensure uniformity of quality. Submit certificates in accordance with clause 611 and 612 at no additional cost.

626 CONDEMNED TOPSOIL

Where a topsoil analysis proves that the topsoil may be treated at the Contractor's expense to comply with the specification the topsoil may be used after treatment, otherwise the topsoil will be condemned and shall be removed from site at the Contractor's expense.

635 DOCUMENTATION FOR COMPOST AND COMPOSTED MATERIALS

- Timing: Submit at handover.
- Contents:
 - Full description of all compost components.
 - Record of source for all compost components.
 - Analyst's report for each test carried out.
 - Declaration of compliance: in accordance with PAS 100 and BSI PD CR 13456.
 - Quality Compost Protocol certification: To be provided.

650 NOTICE

- Give notice before:
 - Setting out.
 - Spreading topsoil.
 - Applying herbicide.
 - Applying fertilizer.
 - Visiting site during maintenance period.
- Period of notice: 7 days

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- 655 **SUBSOIL DEPTHS**
- General: Ensure the following minimum subsoil depths have been provided beneath formation levels to soft landscape areas:
 - Grass areas: 400mm.
 - Trees: 1000mm
 - Shrub planting areas: 500mm.
 - Insufficient depth: Excavate and dispose of material, loosen formation and make up with additional subsoil or second quality topsoil.
- 660 **GRADING SUBSOIL**
- General: Grade to smooth flowing contours to achieve specified finished levels of topsoil.
 - Areas of thicker topsoil: Excavate locally.
 - Restore finished levels after settlement. Import subsoil as necessary.
- 661 **PERENNIAL WEEDS**
- Apply herbicide and allow period of time recommended by manufacturer to elapse before grading.
- 662 **CONTAMINATED SUBSOIL**
- Thoroughly clean subsoil of all builders rubbish, concrete, bricks, reinforcement mesh and rods, polythene sheets, etc., to a depth of at least 1 metre below finished levels in tree and shrub areas and 600mm in grass areas before ripping ground. Obtain approval before either spreading additional subsoil to make up levels, or spreading topsoil as specified.
- 663 **GENERALLY RIPPING SUBSOIL**
- Ripping should be carried out with a winged tine cultivator. The tines should be spaced at no more than 1.2m apart and the outer tines should be in line with the tracks of the pulling unit. Ripping should be aligned down slope (if this is safe and practical) to facilitate drainage. Ripping should only be carried out when the soil is dry or friable in order to cause maximum heave and shattering.
- 665 **SUBSOIL SURFACE PREPARATION**
- General: Excavate and/ or place fill to required profiles and levels, as section D20.
- Loosening:
- Light and non-cohesive subsoils: When ground conditions are reasonably dry, loosen thoroughly to a depth of 700mm at 600mm centres in two directions obliquely cross the slope.
 - Stiff clay and cohesive subsoils: When ground conditions are reasonably dry, loosen thoroughly to a depth of 500mm at 500mm intervals drawn by a crawler tractor in two directions obliquely across the slope. Cross ripping will be necessary on compacted or heavy soil.
 - Rock and chalk subgrades: Lightly scarify to promote free drainage.
 - Stones: Immediately before spreading topsoil, remove stones larger than 75mm.
 - Slopes: Draw obliquely across the slope to facilitate drainage, in transverse directions.
 - Confined spaces: Use suitable hand tools and/or a toothed bucket on the back of a machine to thoroughly loosen subsoil to a minimum depth of 400mm.
 - Other items: Remove bricks, kerbs, lumps of concrete, plaster, timber, plastic, glass, metal and any other building debris brought to the surface.
 - Approval: Make advance arrangements for finished subsoil formations to be inspected before spreading further subsoil or topsoil. Make adjustments to levels and profiles as required.
 - Where the landscape subcontractor is responsible for topsoiling operations, he will be responsible for replacing all plant material that fails as a result of waterlogging.
- 670 **INSPECTING FORMATIONS**
- Give notice: Before spreading topsoil for all areas.
 - Notice period: 7 days.

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675 PREPARATION OF UNDISTURBED TOPSOIL

- General: Prepare areas to receive soft landscaping as necessary to ensure that the topsoil is in a suitable state for cultivation operations specified in sections Q30 and/or Q31.
- Hard ground: Break up with a ripper operated in transverse directions. Remove roots and boulders.
- Apply herbicide where ground is covered with turf or thick sward.
- Areas covered with turf or thick sward: Plough or dig over to full depth of topsoil.
- Apply herbicide where ground is covered with turf or thick sward.
- Fallow period:
 - After preparation leave for not less than 2 months.
 - Weed control: At appropriate times

681 EXISTING TOPSOIL STORED ON SITE IN SPOIL HEAPS

- General: Maintain weed free for the duration of the contract. Apply approved herbicide at appropriate times.
- Contamination: Do not allow to become contaminated with site materials or subsoil.
- Handling: Do not allow machinery or vehicles to operate on topsoil heaps.
- Subsoil stored in heaps for subsequent spreading as a growing medium: Maintain as topsoil heaps.
- Height (maximum): 1.5 m
- Width (maximum): 4.5m
- Protection:
 - Do not place any other material on top of storage heaps.
 - Do not allow construction plant to pass over storage heaps.
 - Prevent compaction and contamination, by fencing and covering as appropriate.

682 SCREENING TOPSOIL FROM ON-SITE SPOIL HEAPS

- If necessary screen site topsoil to remove stones, clay and weed. Remove top weed layer prior to screening and spreading from heap.
- Subsoil stored in heaps for subsequent spreading as a growing medium: Screen as topsoil
 - maximum size of stone 25mm.

686 CONTAMINATION

- General: Do not use topsoil contaminated with subsoil, rubbish or other materials that are:
 - Corrosive, explosive or flammable.
 - Hazardous to human or animal life.
 - Detrimental to healthy plant growth.
- Subsoil: In areas to receive topsoil, do not use subsoil contaminated with the above materials.
- Give notice: If any evidence or symptoms of soil contamination are discovered on the site, or in topsoil to be imported.

695 CULTIVATION

- Compacted topsoil: Break up to full depth.
- Tilth: Loosen, aerate and break up topsoil to a tilth suitable for blade grading.
 - Depth: 100 mm.
 - Particle size (maximum): 10 mm.
 - Timing: Within a few days before planting.
 - Weather and ground conditions: Suitably dry.
- Surface: Leave regular and even.
- Levels: As D20.
- Undesirable material brought to the surface: Remove visible weeds, roots and large stones with any dimension exceeding 50 mm.
- Soil within root spread of trees and shrubs to be retained: Do not dig or cultivate.

700 GRADING OF TOPSOIL

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- Topsoil condition: Reasonably dry and workable.
- Contours: Smooth and flowing, with falls for adequate drainage.
 - Hollows and ridges: Not permitted.
- Finished levels after settlement: 30mm above adjoining paving, kerbs, manholes etc.
- Blade grading: May be used to adjust topsoil levels provided depth of topsoil is nowhere less than 150mm.
- Give notice: If required levels cannot be achieved by movement of existing soil.

705 HANDLING TOPSOIL/SUBSOIL

- Aggressive weeds:
 - Species: Included in the Weeds Act, section 2 or the Wildlife and Countryside Act, Schedule 9, part II.
 - Give notice and obtain instructions before moving topsoil.
- Plant: Select and use plant to minimize disturbance, trafficking and compaction.
- Contamination: Do not mix topsoil with:
 - Subsoil, stone, hardcore, rubbish or material from demolition work.
 - Oil fuel, cement or other substances harmful to plant growth
 - Other grades of topsoil.
- Multiple handling: Keep to a minimum. Use topsoil immediately after stripping.
- Wet conditions: Handle topsoil in the driest condition possible. Do not handle during or after heavy rainfall or when it is wetter than the plastic limit as defined by BS3882.

710 SPREADING TOPSOIL

- Temporary roads/surfacing: Remove before spreading topsoil.
- Layers:
 - Depth (maximum): 150 mm.
 - Gently firm each layer before spreading the next.
- Overall minimum depths after firming and settlement to be:
 - Grass Areas: 150mm
 - Shrub Areas: 450mm
 - Aquatics: 300mm
 - Trees: According to stock type
- Subsoil used as a growing medium: Overall minimum depths after firming and settlement to be:
 - Wildflower grass areas: 150mm
- Crumb structure: Do not compact topsoil. Preserve a friable texture of separate visible crumbs wherever possible.

715 LOOSE TIPPING OF TOPSOIL

- General: Do not firm, consolidate or compact topsoil when laying. Tip and grade to approximate levels in one operation with minimum of trafficking by plant.
- Depths after settlement (minimum): As clause 710.

716 REMOVE By hand to full depth of topsoil all roots of weeds, grasses and all other debris, vegetable or otherwise. Do not proceed with grass works or planting until condition of topsoil is approved by CA.

720 FINISHED LEVELS OF TOPSOIL AFTER SETTLEMENT

- Above adjoining paving or kerbs: 30 mm.
- Below dpc of adjoining buildings: Not less than 150 mm.
- Shrub areas: Higher than adjoining grass areas by 50 mm.
- Within root spread of existing trees: Unchanged.
- Adjoining soil areas: Marry in.
- Thickness of turf or mulch: Included.

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- 740 FALLOW PERIOD
Carry out cultivation of topsoil sufficiently early for it to lie fallow for several months. During the period prevent growth and seeding of weeds by further cultivation or, if permitted, by application of herbicides.
- 810 APPLYING COMPOST
- Application rate for trees and shrubs: 100mm thick layer.
 - Timing: Apply prior to cultivation.
 - Application rate for grass: 25-50mm thick layer.
 - Timing: Apply prior to cultivation.
- 820 APPLYING GENERAL FERTILIZER
- Application: Spread evenly, carefully incorporating below mulch materials.
 - Timing: Immediately before cultivation.
 - Application rate: 70g/m²
- 825 PRESEED / TURFING FERTILISER
- British Seed Houses
BSH 1
Rate 70g/m²
or
BSH 2 (impoverished soils)
Rate 70g/m²
- British Seed Houses Bewsey Industrial Estate Pitt Street Warrington Cheshire, WA5 5LE
- or equivalent.