73-75 Avenue Road Rootzone and Subsoil spec over basement areas
Doc REF: 2037/RZ/06.04.16

Note: Rootzone soil fill is to be undertaken by the soft landscape contractor only as part of the landscape works. Please refer to washed sand specification for stage 1 tender fill.

Rootzone 1 – General Planting

Rootzone 1 is to be used for tree, shrub and hedge planting over the underground basement areas. 500mm depth required with remaining depth made up of subsoil/washed sand as per washed sand specification. Rootzone 1 shall meet the following criteria:

Visual Examination
The rootzone shall be free from non-soil material, brick and other building materials and wastes, hydrocarbons, plant matter, weed seeds or roots, and any other foreign matter or material or substance that would render the rootzone unsuitable for horticultural use.

Clay & Silt (less than 0.05mm)…. % <25
Sand (0.05 - 2.00mm)…….. % >75
At least 50% of the total soil fraction shall fall within the fine to medium sand range

Max. Stone Content (2 - 20mm)…. % by weight 10
Max. Stone Size in any dimension . mm 20
Permeability …….. mm/hr 20 - 130
Porosity (total) …….. % >35

pH value …… units 6.0 - 8.2
Electrical Conductivity (water extract) µS/cm <1500
Electrical Conductivity (CaSO4 extract) µS/cm <2800
Organic Matter …….. % 4.0 – 6.0
Total Nitrogen …… % >0.2 #
Extractable Phosphorus …… mg/l >26 #
Extractable Potassium …….. mg/l >300 #
Extractable Magnesium …… mg/l >50 #

Total Arsenic (As) …… mg/kg <20
Total Cadmium (Cd) …… mg/kg <1
Total Chromium (Cr) …… mg/kg <130
Total Lead (Pb) …….. mg/kg <450
Total Mercury (Hg) …….. mg/kg <8
Total Selenium (Se) …….. mg/kg <35
Total Copper (Cu)…….. mg/kg <130
Total Nickel (Ni)…… mg/kg <50
Total Zinc (Zn) …….. mg/kg <300
Water-Soluble Boron (B)…… mg/kg <5
Total Cyanide …… mg/kg <20
Phenols …….. mg/kg <3
Sulphate (soluble)…….. g/l <1.2
Sulphide (total) …… mg/kg <25
Sulphur (elemental)…….. mg/kg <500
PAHs (sum US EPA16) …… mg/kg <40
Benzo-a-pyrene ……. mg/kg <1.0
TPH (sum C10-C40) …… mg/kg <150

rootzone to be supplemented with fertiliser, as required, to meet this level of fertility

Rootzone 2 – Lawns

Rootzone 3 is to be used for lawn areas over the underground basement slab. 300mm depth required with remaining depth made up of washed sand as per washed sand specification. Rootzone 2 shall meet the following criteria:

Visual Examination
The rootzone shall be free from non-soil material, brick and other building materials and wastes, hydrocarbons, plant matter, weed seeds or roots, and any other foreign matter or material or substance that would render the rootzone unsuitable for horticultural use.

Clay & Silt (less than 0.05mm)…. % <10
Sand (0.05 - 2.00mm)…….. % >90
At least 60% of the total soil fraction shall fall within the medium to coarse sand range

Max. Stone Content (2 - 10mm)…. % by weight 5
Max. Stone Size in any dimension . mm 10
Permeability …….. mm/hr 150 - 300
Porosity (total) …….. % 35 – 55

pH value …….. units 6.0 - 8.2
Electrical Conductivity (water extract) µS/cm <1500
Electrical Conductivity (CaSO4 extract) µS/cm <2800
Organic Matter …….. % 2.0 - 4.0
Total Nitrogen …… % >0.15 #
Extractable Phosphorus …… mg/l >26 #
Extractable Potassium …….. mg/l >240 #
Extractable Magnesium …… mg/l >50 #

Total Arsenic (As) …… mg/kg <20
Total Cadmium (Cd) …… mg/kg <1
Total Chromium (Cr) …… mg/kg <130
Total Lead (Pb) …….. mg/kg <450
Total Mercury (Hg) …….. mg/kg <8
Total Selenium (Se) …….. mg/kg <35
Total Copper (Cu)…….. mg/kg <130
Total Nickel (Ni)…… mg/kg <50
Total Zinc (Zn) …….. mg/kg <300
Water-Soluble Boron (B)…… mg/kg <5
Total Cyanide …… mg/kg <20
Phenols …….. mg/kg <3
Sulphate (soluble)…….. g/l <1.2
Sulphide (total) …… mg/kg <25
Sulphur (elemental)…….. mg/kg <500
PAHs (sum US EPA16) …… mg/kg <40
Benzo-a-pyrene ……. mg/kg <1.0
TPH (sum C10-C40) …… mg/kg <150

rootzone to be supplemented with fertiliser, as required, to meet this level of fertility

73-75 Avenue Road Stage 1 Fill over Podium Slab

As part of the phase 1 site works, the podium slabs to the rear garden within soft landscape areas should be filled with approx 500mm of washed sand/subsoil material over the waterproofing and drainage layers specified by TFF Architects.

Following the sand fill it should be temporarily protected during the remainder of the construction works until the soft landscaping takes place. A terram 1000 layer should be carefully laid over the sand ensuring adequate overlapping to protect the sand from contamination. Once the terram is in place, fill over with 100mm of 20/40 clean free draining limestone with low fines content. This layer can be disposed of once soft landscape works begin.

The contractor may decide to use ground guards in addition to the limestone fill to provide a level working area and prevent rutting of the material.

Washed Sand/Sub Soil Material

Washed Sand that is to be used between the rootzone and the drainage layer shall be a quarried, washed sand material that meets the following requirements:

Visual Examination
The sand shall be from a quarried source and shall be free from non-soil material, brick and other building materials and wastes, hydrocarbons, plant matter, weed seeds or roots, and any other foreign matter or material or substance that would render the sand unsuitable for horticultural use.

Fines (less than 0.15mm)…….. % 0 - 10
Sand (0.15 - 2.00mm)…….. % 90 - 100
At least 50% of the total soil fraction shall fall within the medium (0.25-0.50mm) sand range

Max. Stone Content (2 - 10mm)…. % by weight 5
Max. Stone Size in any dimension . mm 10
Permeability …….. mm/hr 270 - 360
pH value …….. units 5.5 – 7.5
Electrical Conductivity (water extract) µS/cm <500
Organic Matter …….. % <0.5
Calcium carbonate …….. % <0.5

washed sand has a bulk density of approx. 1.7 Mg/m3. If this amount of sand presents a loading issue, you could use a light weight aggregate (eg. Maxit LWA – 10mm) in the lower 300-500mm section of the multi-stem planters.

Material Testing

Rootzone

Each source of imported rootzone that is to be used in this scheme shall be sampled, analysed and approved prior to delivery to site.

Rootzone Sampling

The samples shall be truly representative of the rootzone to be used, and 1 No. composite sample of each Rootzone shall be tested from each source/supplier.

Each composite sample should be made up of 10 No. sub-samples taken from evenly spaced locations across the stockpile. The sub-samples shall be mixed together and quartered down to form a 14kg composite sample. The composite samples shall be placed in clean plastic bags and labelled with the source reference and date of sampling.

The composite samples shall be sent to an approved independent soil science consultancy with a request for each sample to be analysed strictly in accordance with Rootzone Testing Schedule clause below.

An approved firm is: Tim O'Hare Associates LLP, Howbery Park, Wallingford, Oxon OX10 8BA
Tel: 01491 822653 Email: info@toha.co.uk.

Rootzone Testing Schedule

The composite rootzone samples shall be tested prior to approval by the Landscape Architect. The following parameters shall be requested:

1. Visual examination to record the presence of any deleterious materials
2. pH Value (1:2.5 soil/KCl extract)
3. Electrical Conductivity (1:2.5 soil/water extract)
4. Electrical Conductivity (1:2.5 soil/CaSO4 extract)
5. Particle Size Analysis (clay, silt, 5 sands)
6. Permeability (falling head 2.5kg rammer) & Porosity (USGA)
7. Stone Content by % weight (>2mm, >10mm)
8. Total Nitrogen (% - Dumas Method)
9. Extractable Phosphorus, Potassium & Magnesium (RB427 Method)
10. Organic Matter (% - RB427 LOI Method)
11. Zootoxic Heavy Metals - As, Cd, Cr, Pb, Hg, Se
12. Phytotoxic Heavy Metals – Cu, Ni, Zn, B
13. Total Cyanide & Total (mono) Phenols
14. Soluble Sulphate, Elemental Sulphur & Total Sulphide
15. Polyaromatic Hydrocarbons (speciated US EPA 16)
16. Total Petroleum Hydrocarbons (C10-C40 by GC-FID)

The results of the rootzone testing shall be presented on a Certificate of Analysis, and be accompanied by an interpretive report. The report shall confirm each sample's compliance/non-compliance with the relevant specification and shall provide recommendations for fertiliser applications, where necessary.

The report shall be submitted to the project Landscape Architect for approval before the rootzone is imported

Washed Sand

Each source of imported washed sand that is to be used in this scheme shall be sampled, analysed and approved prior to delivery to site.

Washed Sand Sampling

The samples shall be truly representative of the sand to be used. One Composite Sample shall be taken for every 500m3 of sand to be used.

Each composite sample should be made up of 10 No. sub-samples taken from evenly spaced locations across the stockpile. The sub-samples shall be mixed together and quartered down to form a 10kg composite sample. Each composite sample shall be placed in a clean plastic bag and labelled with the source reference and date of sampling.

The composite sample shall be sent to an approved independent soil science consultancy with a request for each sample to be analysed strictly in accordance with Washed Sand Testing Schedule clause below.

An approved firm is: Tim O'Hare Associates LLP, Howbery Park, Wallingford, Oxon OX10 8BA Tel: 01491 822653 Email: info@toha.co.uk.

Washed Sand Testing Schedule

The composite sand sample(s) shall be tested prior to approval by the Landscape Architect. The following parameters shall be requested:

1. Visual examination to record the presence of any deleterious materials
2. pH Value (1:2.5 soil/water extract)
3. Electrical Conductivity (1:2.5 soil/water extract)
4. Particle Size Analysis (clay, silt, 5 sands)
5. Permeability (falling head 2.5kg rammer)
6. Stone Content by % weight (>2mm, >10mm)
7. Organic Matter (% - RB427 LOI Method)
8. Calcium Carbonate Content

The results of the rootzone testing shall be presented on a Certificate of Analysis, and be accompanied by an interpretive report. The report shall confirm each sample's compliance/non-compliance with the relevant specification and shall provide recommendations for fertiliser applications, where necessary.

The report shall be submitted to the project Landscape Architect for approval before the washed sand is imported to site.

NOTE

Rootzone & Washed sand to be used only over underground basement slabs and areas are to be fully irrigated. If irrigation is omitted from the scheme for any reason, the rootzone soil may need to be substituted for an appropriate sandy loam top soil. Landscape Architects to be consulted if this arises so an appropriate specification can be provided.

BOWLES & WYER
A Landscape Company

73-75 Avenue Road – Infiltration/Percolation Testing criteria
Date: 08.04.16 Ref: 2037/INF/01

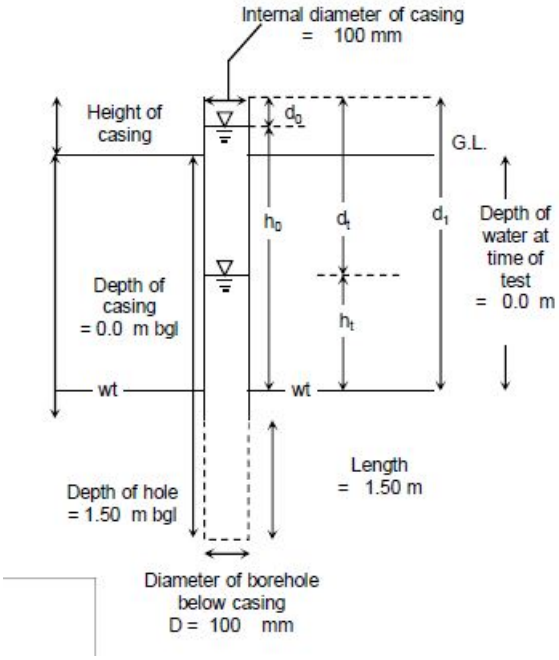
Scope of Works
The works are to comprise the forming of 9 boreholes using soil power auger techniques, logging of the soil profile, installation of 50mm internal diameter temporary monitoring wells and carrying out infiltration testing.

Terms of Reference
The assessment should be carried out generally, where possible, in accordance with the following guidance.
• Code of Practice for Site Investigations, British Standards Institution BS5930: 1999+A2:2010

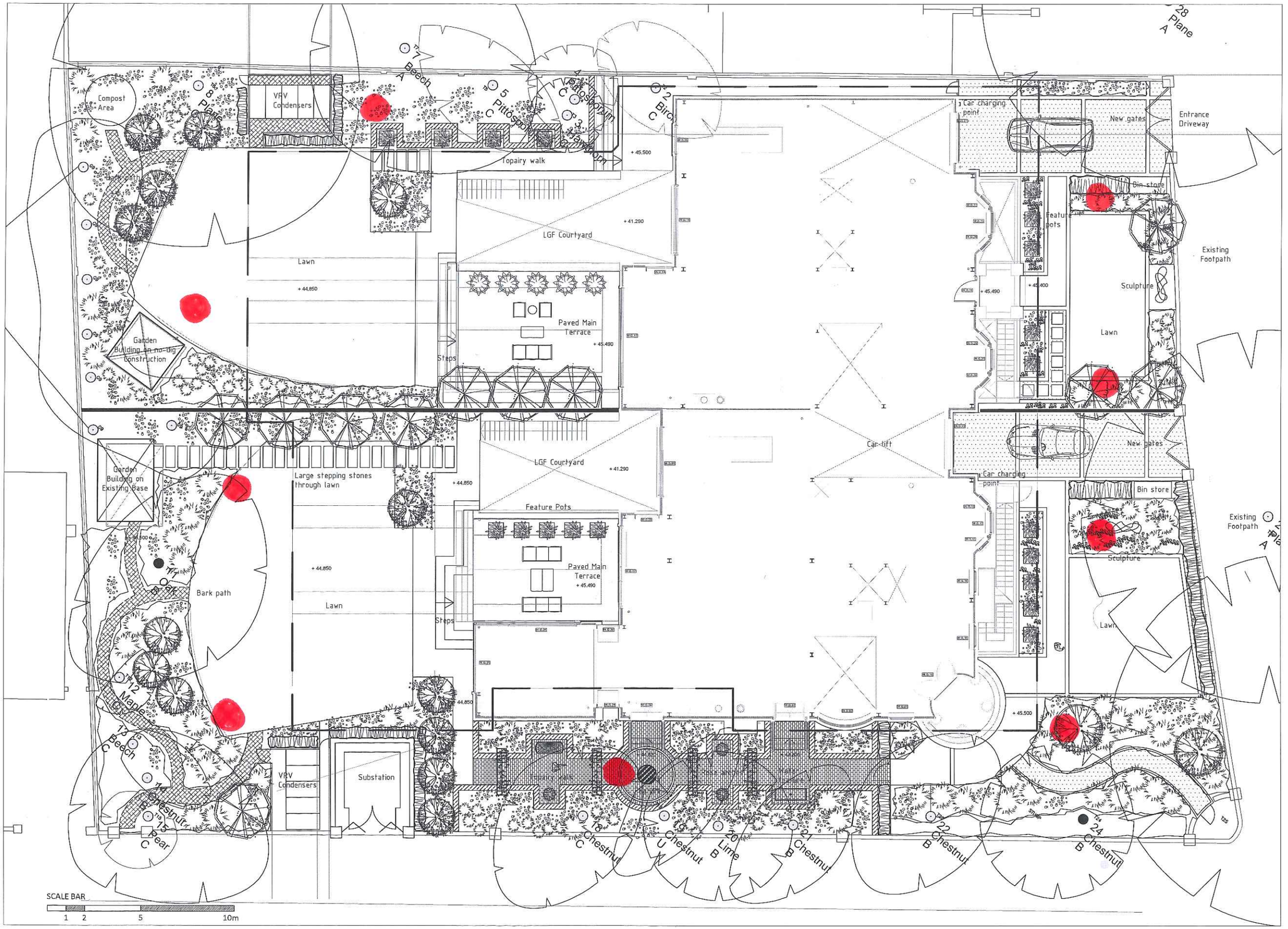
Site work
The site work should be carried out prior to backfilling over the basement slab to determine the efficiency of existing soft landscape drainage on site using soil power auger techniques. 100mm diameter boreholes should be drilled to approx. 1.5m below ground level or to allow suitable testing. Each location shown is approximate only and can be adjusted if required to avoid hard standing, obstructions and buried services. The boreholes should be positioned as indicated on Bowles & Wyer marked up plan dated 06.04.16.

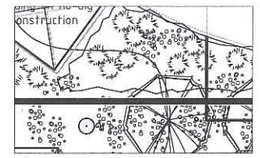
A temporary slotted 50mm internal diameter monitoring well should be installed within each borehole to act as casing to mitigate the risk of the borehole collapsing when filled with water. The boreholes should be filled to the surface with clean water and an infiltration test carried out to the Falling Head within Boreholes BS5930:1999+A2:2010 methodology. The initial test should be allowed to fully drain before the test is repeated in each bore hole.

Following testing the temporary wells are to be removed and the boreholes backfilled with arising. A report is to be formulated including an opinion on soil strength, possible configuration of strata, or conditions between exploratory points and below the maximum depth of investigation.

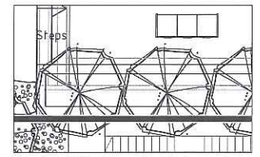


INFILTRATION / PERCOLATION TEST AREAS — BOWLES+WYER 06.04.16 ● = BOREHOLE LOCATIONS: REFER TO 2037/INF/01.

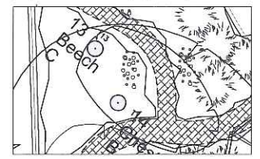




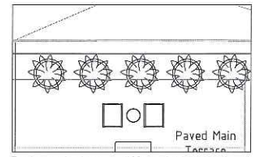
New tree single stem and multi-stem tree planting with beds of mixed decorative evergreen and herbaceous planting



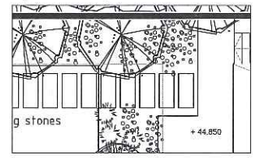
Raised bed 1.2m internal width to provide space for new tree planting between properties. 300mm Coping to top of wall



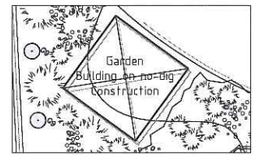
Existing trees - refer to Arboricultural report for full details & RPAs



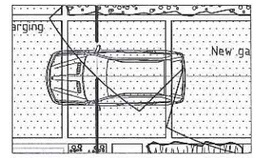
Feature planters - different sizes and styles for each garden



Stepping stones through lawn - can also double up as skylight or be adapted to suit requirements



Indicative positions for garden buildings with flexibility for M&E space



Resin bound gravel & setts to driveways

NOTE:
1. This drawing to be read in conjunction with all relevant architect's and engineer's drawings and the specification.
2. Any discrepancies or details on or between these drawings must be drawn to the attention of the landscape architect (and to the architect or engineer as appropriate) in writing for clarification.
3. All dimensions are in millimetres unless otherwise noted.
4. This drawing is the copyright of Bowles & Wyer (and other consultants where parts of their drawings have been incorporated) and cannot be reproduced or used without their written permission.

STATUS: WORKING DWG

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Description: 73-75 AVENUE ROAD		Drawing Name: LANDSCAPE MASTERPLAN	
		Dwg number: 2037-11-01	Rev: G
Drawn: JFW	Checked: JS	Scale: 1:100 @A1	Date: 22.02.16