

Public Realm

Master Specification

Part PR-LS-S2 Earthworks and Topsoiling

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PR-LS-S2 Earthworks and Topsoiling

1 General

- 1.1 This Part specifies the requirements for clearing and grubbing, earthworks, soil testing, imported soil, spreading of soil, soil additives and management of stockpiled and spread soil for landscape works.
- 1.2 All clauses of this Part apply unless otherwise specified in the Contract Documents.
- 1.3 Where a specification differs between the Drawing and the Design Report, the Drawing shall take precedence.
- 1.4 Where a specification differs between the Drawing and the Soil Test Report, the Soil Test Report shall take precedence.
- 1.5 If not specified in the Drawings or Design Report, the clauses in this Part shall be followed.
- 1.6 Where required under the Controlled Substances Act 1984, and the Controlled Substances (Pesticides) Regulations 2017, employees undertaking pest control work shall hold a current Pest Management Technician's License.

2 Extent of Works

- 2.1 Machinery operations shall be confined within the Extent of Works area indicated on the Drawings or in the Design Report. Prior to commencing any onsite operations, the Contractor shall submit a site plan showing the proposed locations of onsite topsoil and site-won mulch stockpiles and machinery routes.
- 2.2 The provision of a site plan showing the proposed locations of stockpiles and machinery routes shall constitute a **Hold Point**.

3 Clearing and Grubbing

- 3.1 The Contractor shall clear and grub the areas shown on the Drawings or as listed in the Design Report. All deleterious material encountered in the excavation or immediately below it (including tree stumps, roots, stones and building debris exceeding 50 mm in diameter), which is unsuitable for respreading as onsite topsoil, shall be removed and disposed of offsite.

4 On Site Topsoil Stripping

- 4.1 Onsite topsoil shall be stripped from the areas to be affected by earthworks to a depth of 100 mm and stockpiled in approved areas for later respreading. Refer to Clause 2.2 Hold Point.
- 4.2 Where herbaceous weeds and grasses are to be stripped off together with onsite topsoil, the area shall be slashed to a height of 150 mm and trash build up and cut material removed prior to spraying with a knockdown herbicide (Roundup or equivalent) incorporating an herbicide marker dye. Roundup Biactive (or equivalent) shall be used around wetlands and waterways. All chemicals shall be used according to the manufacturer's recommended rates. Spraying shall not be carried out in windy conditions in order to avoid spray drift. Spraying shall be undertaken at least 10 days prior to onsite topsoil stripping.
- 4.3 All deleterious material encountered in the excavation or immediately below it (including tree stumps, roots, stones and building debris exceeding 50 mm in diameter), which is unsuitable for respreading as onsite topsoil, shall be removed and disposed of offsite.

5 Soil Testing

- 5.1 Analysis of the underlying subsoil, onsite topsoil and imported soil shall be carried out so that appropriate amendments can be applied to support the landscape treatments specified on the Drawings and in the Design Report.

- 5.2 Soil testing shall be carried out in accordance with AS 4419 "Soils for Landscaping and Garden Use" and analysis shall include tests for Bulk Density, Organic Matter Content, Wettability, Soil pH, Electrical Conductivity, Ammonium Toxicity, Phosphorus content, Nitrogen Drawdown (NDI), Toxicity, Dispersibility, Permeability, Soil Texture, Large Particles and Plant Propagule Content.
- 5.3 Additional soil testing shall also be undertaken to specify amendments required to address deficiencies in major and minor trace elements and Exchangeable Cations to support the landscaping treatments specified on the Drawings and in the Design Report.
- 5.4 Soil testing shall be undertaken for each onsite topsoil stockpile.
- 5.5 Soil tests shall be conducted by a laboratory accredited under ISO 9001 and the soil test results supplied to the Principal as a Soil Test Report prior to application of soil amendments or importation of soil for landscape areas.
- 5.6 Where soil testing has not been undertaken, the following soil additives are required for landscape areas:
- a) Gypsum
 - i) Agricultural gypsum (Calcium Sulphate) shall be applied to all planting areas prior to any ripping or cultivation at a rate of 2 kg/m², and shall be incorporated into the surface by harrowing or by an approved method. Gypsum shall not be applied to creek areas and permanent or ephemeral wetlands. Planting or grassing shall not be carried out within 2 weeks of the gypsum application. Gypsum derived from recycled plasterboard shall not be used.
 - b) Organic Compost
 - i) Two to three weeks before planting 2 cubic metres of organic compost per 100 square metres shall be spread and thoroughly incorporated into the cultivated zone during cultivation in order to stimulate soil microbial activity to convert some of the organic matter to available nutrients prior to planting.
- 5.7 Compost shall meet the requirements of AS 4454 "Composts, soil conditioners and mulches" for mature compost.

6 Soil for Landscape Areas

- 6.1 Soil for landscape areas are defined in AS 4419 and include onsite topsoil, and imported soils such as general purpose soil, low density soil, natural soil, organic soil, soil blend and top dressing.
- 6.2 The Contractor shall modify soil onsite to bring it up to the standard required to support the landscaping treatments specified on the Drawings and in the Design Report. Soil additives shall be mixed into the soil for landscape areas at the rates specified in the Soil Test Report immediately after the soil for landscape areas has been laid down, or thoroughly mixed into the soil for landscape areas while it is stockpiled prior to spreading. The supply, spreading and incorporation of the necessary fertilisers and additives into the soil shall be at the Contractor's expense.
- 6.3 Approved onsite topsoil shall be used prior to importing soil for landscape areas.
- 6.4 Unless specified otherwise in the Contract Documents, imported soil for landscape areas shall be in accordance with AS 4419 with a soil texture of sandy loam and shall be free of debris, stones, weeds, roots or other deleterious material, plant pathogens and other pests and free from contaminants including residual pesticides and herbicides.
- 6.5 Imported soil for landscape areas shall be able to sustain long term plant growth to maintain the landscape treatments specified on the Drawings and in the Design Report.
- 6.6 Compost shall meet the requirements of AS 4454 "Composts, soil conditioners and mulches" for mature compost.
- 6.7 The Contractor shall provide the Principal with documentation or test results for imported soil demonstrating it meets the requirements of AS 4419 prior to its importation.
- 6.8 The approval of imported topsoil by the Principal shall constitute a **Hold Point**.

7 Deep Ripping Prior to Spreading Soil for Landscape Areas

- 7.1 All areas specified on the Drawings or in the Design Report to be deep ripped prior to spreading of soil for landscape areas shall be deep ripped to a depth of 300 mm with minimum spacing of 500 mm. During ripping, care shall be taken not to lift heavy subsoil material and large rocks to the surface. Riplines shall follow contours. Ripping shall not occur within the extent of existing vegetation to be retained or within the dripline of existing trees to be retained. Services shall not be disturbed.

8 Minor Trimming or Levelling of Subgrade

- 8.1 The Contractor shall trim and grade all subgrade areas as required prior to placing soil for landscape areas to provide a smooth, consolidated, even, free draining surface, free from depressions and undulations to final design levels shown on the Drawings. Where subgrade levels are not shown on the drawings, the levels shall be finished in accordance with Part PC-SI1 "Site Surveys". Mass planting beds with mulch adjacent to surrounding edges shall be trimmed to a minimum depth of 160 mm and width of 300 mm to prevent spillage of soil and / or mulch over adjacent surfaces.
- 8.2 The Contractor shall submit to the Principal evidence or documentation of correct subgrade levels prior to spreading of soil for landscape areas.

9 Spreading of Soil for Landscape Areas

- 9.1 A 100 mm layer of soil for landscape areas shall be placed in areas for landscaping shown on the Drawings or in the Design Report. Soil shall be evenly spread, lightly consolidated and levelled to provide a surface free from lumps and hollows. For planting beds with mulch, soil shall be finished 100 mm below adjacent levels and surfaces to allow for placement of mulch.

10 Deep Ripping after Spreading of Soil for Landscape Areas

- 10.1 All areas specified on the Drawings or in the Design Report to be deep ripped after spreading of soil for landscape areas shall be deep ripped to a depth of 300 mm with minimum spacing of 500 mm. At the time of ripping, soil shall be slightly moist. It shall not be wetter than Field Capacity or drier than Wilting Point. During ripping, care shall be taken not to lift heavy subsoil material and large rocks to the surface. Riplines shall follow contours. Ripping shall not occur within the extent of existing vegetation to be retained or within the dripline of existing trees to be retained.

11 Cultivation and Amelioration

- 11.1 All areas specified to be cultivated on the Drawings or in the Design Report shall be cultivated to a minimum depth of 300 mm. Services and roots of trees to be retained shall not be disturbed. If necessary, these areas shall be cultivated by hand. During cultivation any soil additives specified in the Drawings, Design Report or Soil Test Report shall be thoroughly mixed into the cultivated zone. All areas shall be cultivated in the direction parallel to the contours.

12 Excavation and Removal of Unsuitable Materials

- 12.1 Where the landscape treatment specified on the drawings requires ongoing slashing or mowing for maintenance, any unsuitable materials (including tree stumps, roots, stones, and building and construction debris exceeding 50 mm in diameter) in the top 150 mm of soil shall be removed and disposed of offsite.

13 Final Levelling of Soil for Landscape Areas

- 13.1 Finished soil levels shall be as shown on the Drawings or as specified in the Design Report, and shall be consolidated lightly and uniformly and levelled to provide a surface free from lumps and hollows. Excessive compaction shall be avoided. Soil shall not be worked in a muddy condition.

- 13.2 The finished soil surface shall be graded to drain freely and is to be finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips. Where both mulch and soil for landscape areas are to be spread, a minimum of 100 mm below kerbs and paths shall be left to allow for placement of mulch. Where "roll out" turf lawns are to be placed, 30 mm below kerbs and paths shall be left to allow for placement of turf.

14 Management of Stockpiled and Spread Soil for Landscape Areas

- 14.1 Weeds growing in soil stockpiled on site shall be controlled prior to the weeds being capable of reproduction.
- 14.2 Weeds growing in soil for landscape areas spread on site shall be controlled prior to the weeds being capable of reproduction
- 14.3 The Contractor shall implement appropriate erosion control measures for soil for landscape areas stockpiled and spread on site. The Contractor shall be responsible for rectifying any soil erosion that occurs prior to final landscaping.
- 14.4 Records of weed control activities undertaken on soil stockpiled or spread on site shall be provided to the Principal.

15 Hold Points

- 15.1 The following is a summary of Hold Points referenced in this Part:

Document Ref.	Hold Point	Response Time
2.2	Provision of site plan showing the proposed locations of stockpiles and machinery routes	3 working days
6.8	Approval of imported topsoil	5 working days

16 Verification Requirements and Records

Document Ref.	Subject	Record to be Provided
5.5	Soil Testing	Soil Test Report
8.2	Subgrade levels prior to spreading of soil for landscape areas	Evidence of correct subgrade levels prior to spreading of soil for landscape areas
14.4	Weed control on stockpiled and spread soil	Records of weed control activities including chemicals, rates and quantities applied