

Master Specification

Part PR-LS-C7

Topsoil and Earthworks

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PR-LS-C7 Topsoil and Earthworks

1 General

- a) This Master Specification Part specifies the requirements for topsoil and earthworks for landscaping Works, including:
 - i) the documentation requirements, as set out in section 2;
 - ii) the extent of works requirements, as set out in section 3;
 - iii) the on-site topsoil stripping requirements, as set out in section 4;
 - iv) the subsoil requirements, as set out in section 5;
 - v) the soil testing requirements, as set out in section 6;
 - vi) the requirements for soil for landscape areas, as set out in section 7;
 - vii) the requirements for deep ripping prior to spreading topsoil for landscape area, as set out in section 8;
 - viii) the requirements for minor trimming or levelling of subgrade, as set out in section 9;
 - ix) the requirements for spreading of topsoil for landscape areas, as set out in section 10;
 - x) the requirements for deep ripping after spreading topsoil for landscaping areas, as set out in section 11;
 - xi) the cultivation and amelioration requirements, as set out in section 12;
 - xii) the requirements for excavation and removal of unsuitable materials, as set out in section 13;
 - xiii) the requirements for final levelling of soil for landscape areas, as set out in section 14;
 - xiv) the requirements for management of stockpiled and spread soil for landscape areas, as set out in section 15; and
 - xv) the Hold Point requirements, set out in section 16.
- b) This Master Specification Part does not apply to earthworks for purposes other than landscaping purposes, which are otherwise addressed by RD-EW-C1 "Earthworks".
- c) Topsoil and earthworks must comply with the Reference Documents including:
 - i) AS 4419 Soils for landscaping and garden use;
 - ii) AS 4454 Composts, soil conditioners and mulches;
 - iii) AS 4970 Protection of trees on development sites;
 - iv) AS/NZS ISO 9001 Quality management systems - Requirements; and
 - v) Department EHTM Attachment 6A - Protecting Waterways Guideline (available from: <https://dit.sa.gov.au/standards/manuals>).
- d) The Contractor must ensure that where required under the *Controlled Substances Act 1984* (SA), and the *Controlled Substances (Pesticides) Regulations 2017* (SA), all workers undertaking pest control work must hold a current Pest Management Technician's License. The Contractor must provide evidence of the Pest Management Technician's Licenses prior to commencement of a spraying program, as part of the Quality Management Records.

2 Documentation

2.1 Construction Documentation

In addition to the requirements of PC-CN3 “Construction Management”, the Construction Documentation must include the soil amendment reports, in accordance with section 6e) and 7i).

2.2 Quality Management Records

In addition to the requirements of PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable), the Quality Management Records must include:

- a) current Pest Management Technician’s Licenses, in accordance with section 1d);
- b) evidence of correct subgrade levels prior to spreading of soil for landscape areas, in accordance with section 9c); and
- c) records of weed control activities undertaken on soil stockpiled or otherwise spread on-site for landscaping, in accordance with section 15e).

3 Extent of works

- a) Machinery operations associated with the landscaping earthworks and topsoil works must be confined to those areas within the Earthworks Footprint.
- b) Prior to commencing any on-site landscaping earthworks or topsoil works, the Contractor must:
 - i) nominate the location of the Contractor’s Activity Zone (CAZ) in accordance with PC-SM2 “Site and Access Management”; and
 - ii) submit a site plan to the Principal showing the proposed locations of on-site topsoil and site-won mulch stockpiles and machinery routes, which will constitute a **Hold Point**. The Contractor must not commence on-site topsoil stripping until the Hold Point has been released.

4 On-site topsoil stripping

- a) On-site topsoil must be stripped from the areas within the Earthworks Footprint to a depth of 100 mm and stockpiled in the areas approved within the CAZ or the site plan in section 3b)ii) for later respreading.
- b) The Contractor must eradicate the area of weeds prior to on-site topsoil stripping by ensuring that:
 - i) any existing vegetative growth (excluding native vegetation) must be slashed to a height of 150 mm;
 - ii) trash build up and cut material must be removed from the area prior to spraying with a knockdown herbicide (Roundup or equivalent) incorporating an herbicide marker dye;
 - iii) where weed control is to be undertaken around waterways and wetlands, Roundup Biactive (or equivalent) must be used;
 - iv) all chemicals must be used according to the manufacturer’s recommended rates;
 - v) spraying must not be carried out in windy conditions to avoid spray drift; and
 - vi) spraying must be undertaken at least 10 days prior to on-site topsoil stripping.
- c) All deleterious material encountered during on-site topsoil stripping (including tree stumps, roots, stones and building debris exceeding 50 mm in diameter), which is unsuitable for respreading as on-site topsoil, must be removed and disposed of off-site by the Contractor.

5 Subsoil

- a) Subsoil must be suitable for horticultural purposes and able to support the long-term growth of landscaping as shown in the Design Documentation.
- b) All deleterious material encountered beneath the topsoil (including tree stumps, roots, rock, rubble, and building debris exceeding 50 mm in diameter) must be removed and disposed off-site by the Contractor.

6 Soil testing

- a) Soil testing analysis of the underlying subsoil, each on-site site-won stockpile, and each stockpile of imported soil must be carried out by the Contractor so that appropriate amendments can be identified and applied on-site to support the landscape treatments specified in the Design Documentation.
- b) Soil testing must:
 - i) be carried out in accordance with AS 4419 Soils for landscaping and garden use; and
 - ii) be conducted by a laboratory accredited under AS/NZS ISO 9001 Quality management systems - requirements.
- c) Soil testing analysis must 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.
- d) A soil amendment report containing the soil test results and recommended soil amendments and amelioration process, and the soil amendment report must be prepared by a qualified agronomist and must be supplied to the Principal, which will constitute a **Hold Point**. The application of amendments, spreading of soil, amelioration of soil or importation of topsoil to Site must not occur until the Hold Point has been released.
- e) The soil amendment report required by section 6d) must also be submitted as part of the Construction Documentation.

7 Soil for landscape areas

- a) The Contractor must modify soil on-site in accordance with the soil amendment report required by section 6d) to bring it up to the standard required to support the landscaping treatments specified in the Design Documentation.
- b) Soil ameliorants must be mixed into the soil for landscape areas at the rates specified in the soil amendment report required by section 6d) immediately after the soil has been laid down, or thoroughly mixed into the soil while it is stockpiled in advance of spreading as specified in the soil amendment report.
- c) The Contractor is responsible for the supply, spreading and incorporation of the necessary fertilisers and ameliorants into the soil.
- d) On-site topsoil must be used prior to importing soil for landscape areas.
- e) Imported soil for landscape areas must be in accordance with AS 4419 Soils for landscaping and garden use, and must:
 - i) have a soil texture of sandy loam;
 - ii) be free of debris, stones, weeds, roots or other deleterious material, plant pathogens and other pests; and
 - iii) where topsoil is proposed to be stripped from a location outside the Project boundary and brought to Site, the topsoil must be confirmed free from contaminants including residual pesticides and herbicides.

- f) Imported soil for landscape areas must be able to sustain long term plant growth to maintain the landscape treatments specified in the Design Documentation.
- g) Compost must meet the requirements of AS 4454 Composts, soil conditioners and mulches, for mature compost.
- h) If gypsum (calcium sulphate) is required, it must not be derived from recycled plasterboard.
- i) The Contractor must undertake soil testing of the imported soil in accordance with section 6a) to 6c). A soil amendment report containing the soil test results and recommended soil amendments and amelioration process must be supplied to the Principal, which will constitute a Hold Point. The importation of topsoil must not commence until this Hold Point has been released.
- j) The soil amendment report required by section 7i) must also be submitted as part of the Construction Documentation.

8 Deep ripping prior to spreading topsoil for landscape areas

- a) The Contractor must undertake deep ripping of all areas specified in the Design Documentation to be deep ripped prior to spreading of topsoil for landscape areas.
- b) Specified areas must be deep ripped to a depth of 300 mm with minimum spacing of 500 mm.
- c) Heavy subsoil material and large rocks must not be lifted to the surface during deep ripping.
- d) Riplines must follow contours.
- e) Ripping must not occur within the extent of existing vegetation to be retained or within the dripline of existing trees to be retained.
- f) The Contractor must make an enquiry with Before You Dig Australia (BYDA) prior to deep ripping. The Contractor must locate and mark all Utility Services on Site prior to deep ripping.
- g) Utility Services must not be disturbed by ripping.
- h) Inspection by the Principal of deep ripping prior to the placing of topsoil for landscape areas will constitute a **Hold Point**. The placing of soil for landscape areas must not commence until the Hold Point has been released.

9 Minor trimming or levelling of subgrade

- a) Prior to placing topsoil for landscape areas, the Contractor must trim and grade all subgrade areas as required to provide a smooth, consolidated, even, free draining surface, free from depressions and undulations to final design levels shown in the Design Documentation. Where subgrade levels are not shown in the Design Documentation, the levels must be finished in accordance with PC-SI1 "Site Surveys".
- b) When not specified in the Design Documentation, mass planting beds with mulch adjacent to surrounding edges must be trimmed to a minimum depth of 160 mm and width of 300 mm to prevent spillage of soil or mulch over adjacent surfaces.
- c) The Contractor must submit to the Principal evidence or documentation of correct subgrade levels as part of the Quality Management Records prior to spreading of topsoil for landscape areas.
- d) Inspection by the Principal of trimming and levelling of subgrade prior to the placing of topsoil for landscape areas will constitute a **Hold Point**. The placing of topsoil for landscape areas must not commence until the Hold Point has been released.

10 Spreading of topsoil for landscape areas

- a) The Contractor must place a 100 mm layer of topsoil in areas for landscaping shown in the Design Documentation.

- b) Soil for landscaping areas must be evenly spread, lightly consolidated, and levelled to provide a surface free from lumps and hollows.
- c) For planting beds with mulch, topsoil must be finished 100 mm below adjacent levels and surfaces to allow for placement of mulch.
- d) Inspection by the Principal of spreading of topsoil for landscape areas will constitute a **Hold Point**. Deep ripping after the spreading of topsoil, spreading of mulch, planting, and laying of turf or seeding must not commence until the Hold Point has been released.

11 Deep ripping after spreading of topsoil for landscape areas

- a) The Contractor must undertake deep ripping of all areas specified in the Design Documentation to be deep ripped after spreading of soil for landscape areas.
- b) Specified areas must be deep ripped to a depth of 300 mm with minimum spacing of 500 mm.
- c) At the time of ripping after spreading of topsoil for landscape areas, the soil must be slightly moist. Soil must not be wetter than field capacity or drier than wilting point.
- d) Heavy subsoil material and large rocks must not be lifted to the surface during deep ripping.
- e) Riplines must follow contours.
- f) Ripping must not occur within the extent of existing vegetation to be retained or within the dripline of existing trees to be retained.
- g) Utility Services must not be disturbed by ripping.
- h) Inspection by the Principal of deep ripping after spreading of topsoil for landscape areas will constitute a **Hold Point**. Cultivation and amelioration, planting, mulching or hydroseeding must not commence until the Hold Point has been released.

12 Cultivation and amelioration

- a) The Contractor must cultivate all areas specified to be cultivated in the Design Documentation to a minimum depth of 300 mm.
- b) Utility Services and roots of trees to be retained must not be disturbed during cultivation. If necessary, these areas must be cultivated by hand.
- c) During cultivation, any ameliorants specified in the soil amendment report required by section 6d) must be thoroughly mixed into the cultivated zone.
- d) All areas specified to be cultivated in the Design Documentation must be cultivated in the direction parallel to the contours.
- e) Inspection by the Principal of spreading of ameliorants and cultivation of landscape areas will constitute a **Hold Point**. Final levelling of soil, planting, mulching, laying of turf or seeding must not commence until the Hold Point has been released.

13 Excavation and removal of unsuitable materials

Where the landscape treatment specified in the Design Documentation requires landscape planting, 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 must be removed and disposed of off-site.

14 Final levelling of soil for landscape areas

- a) The Contractor must level the soil to the finished soil levels specified in the Design Documentation. Where finished soil levels are not shown in the Design Documentation, the levels must be finished in accordance with PC-SI1 "Site Surveys".

- b) Soil must be evenly spread, lightly consolidated, and levelled to provide a surface free from lumps and hollows.
- c) Excessive compaction of soil must be avoided.
- d) Soil must not be worked in a muddy condition.
- e) The finished soil surface must be graded to drain freely and must be finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips, subject to sections 14f) and 14g).
- f) Where both mulch and soil for landscape areas are to be spread, the finished soil level must be a minimum of 100 mm below adjacent hard surfaces such as kerbs, paths, and mowing strips to allow for placement of mulch.
- g) Where instant turf lawns are to be placed, the finished soil level must be 30 mm below adjacent hard surfaces such as kerbs, paths, and mowing strips to allow for placement of turf.

15 Management of stockpiled and spread soil for landscape areas

- a) Weeds growing in soil stockpiled on-site prior to spreading must be controlled by the Contractor:
 - i) before they reach maturity and are able to reproduce; or
 - ii) the weed mass is greater than 5% of the stockpile,whichever occurs first.
- b) Up until the completion of the landscaping works, weeds growing in soil that has been spread on-site for landscaping must be controlled by the Contractor prior to the weeds being capable of reproduction.
- c) Up until the completion of the landscaping works, the Contractor must implement appropriate erosion control measures for soil for landscape areas stockpiled and spread on-site in accordance with PC-ENV2 "Environmental Protection Requirements" and Department EHTM Attachment 6A - Protecting Waterways Guideline.
- d) The Contractor must rectify any soil erosion that occurs prior to final landscaping.
- e) Records of weed control activities undertaken on soil stockpiled or spread on-site for landscaping must be provided to the Principal at least monthly. The records must form part of the Quality Management Records and include chemicals, rates and quantities applied.

16 Hold Points

Table PR-LS-C7 16-1 details the review period or notification period, and type (documentation or construction quality) for each Hold Point referred to in this Master Specification Part.

Table PR-LS-C7 16-1 Hold Points

Section reference	Hold Point	Documentation or construction quality	Review period or notification period
3b)ii)	Provision of site plan showing the proposed locations of stockpiles and machinery routes	Documentation	3 Business Days review
6d)	Provision of the soil amendment report	Documentation	5 Business Days review
7i)	Provision of soil amendment report for imported topsoil	Documentation	5 Business Days review
8h)	Inspection of deep ripping prior to placing of soil	Construction quality	3 days notification
9d)	Inspection of trimming and levelling of subgrade prior to the placing of soil	Construction quality	3 days notification
10d)	Inspection of spreading of soil for landscape areas	Construction quality	3 days notification
11h)	Inspection of deep ripping after spreading of soil	Construction quality	3 days notification
12e)	Inspection of spreading of ameliorants and cultivation	Construction quality	3 days notification