Hunter Water Corporation ABN 46 228 513 446

Standard Technical Specification for:

STS 413
LANDSCAPE RESTORATION AND REVEGETATION

1 Purpose

This STS outlines the minimum acceptable requirements for landscape restoration associated with Hunter Water projects. The primary objective of this plan is to ensure comprehensive and sustainable restoration of work sites, supporting good environmental practices. Our focus is on creating landscapes that fulfil immediate needs and are resilient and adaptable in the long term.

These specifications are available from the Hunter Water website: www.hunterwater.com.au

1.1 Scope

STS 413 applies to all works completed by Hunter Water that result in ground disturbance.

2 Interpretation

For the purposes of interpreting *STS 413 Landscape Restoration and Revegetation*, except where the context requires otherwise:

- 'drawings' means the drawings detailing the work involved in a particular project in hand
- 'include' means including, but not limited to, and is used to provide clarification or examples of the type and nature of items intended
- 'specification' means a specification detailing the work involved in a particular project
- 'standard drawings' means Hunter Water drawings
- 'standards' means applicable industry standards and includes:
    - Australian Standards (AS)
    - Australian/New Zealand Standards (AS/NZS)
    - American National Standards Institute (ANSI) Standards and
    - International Organization for Standardization (ISO).
- 'standard technical specification' (STS) references any of Hunter Water's standard technical specifications, as implied by the text.

Headings are for the convenience of the reader and shall not be used in the interpretation of this standard technical specification.

Unless otherwise stated, expressions such as 'give notice', 'submit', 'approval', or 'directed' mean 'give notice to', 'submit to', 'approval by', or 'directed by' the person nominated by Hunter Water.

Approval does not imply acceptance of responsibility by Hunter Water for compliance with this STS. Unless issued in writing, approval has not been granted.

Failure to comply with the requirements of this STS or any referred documentation may result in rejection. Where equipment or manufacture are rejected, notice will be given by Hunter Water in writing. All associated rectification work shall be completed by the contractor at their cost.

2.1 Order of Precedence

All work shall meet all stated requirements in this STS in addition to project specifications or standards specified.

Any deviation from this STS shall be approved in writing on a case by case basis by Hunter Water's Document Owner.

The order of precedence for this STS are, from high to lowest:

- Legislative requirements
- Content in this STS
- Australian Standards

3 Roles and Responsibilities

3.1 Document Owner

The Document Owner of this Hunter Water Standard Technical Specification of STS 413 is Hunter Water's Group Manager Environment.

3.2 Responsibilities

The Document Owner shall approve in writing the issue of any updated version of this Standard Technical Specification.

Any concession to any requirement in this STS 413 is valid only when authorised in writing by the Document Owner.

4 Definitions

Where the following term, abbreviation or expression occurs in this STS 413, it is defined as follows, unless the context implies otherwise:-

Term / Abbreviation / Expression	Definition
Brush matting	Covering a bare area with woody or shrubby plant material by laying it over the ground as a soil protection layer
Bushland	Land supporting vegetation which is either a remainder of the natural vegetation or a disturbed area that still has vegetation that is representative of the structure and floristics of the natural vegetation
Bushland adjacent	Land within 50m of a bushland area
Grass	Monocotyledonous plants having narrow leaves, hollow stems, and clusters of very small, usually wind-pollinated flowers, and belonging to the large and nearly ubiquitous family Poaceae. Includes introduced species cultivated in lawns and pasture, cereal grasses and bamboos, as well as native grasses used in landscaping and occurring in natural bushland.
Ground cover	A low growing plant that covers sections of ground, including grasses, herbaceous plants, sedges, rushes, pasture and crops.
Hydroseeding	The hydraulic application of a mixture of seed, water, fertiliser and tracking dye sprayed on the topsoil.
Hydromulching	The hydraulic application of a mixture of seed, water, fertiliser, cellulose mulch, tracking dye and a binder/tackifier to improve moisture retention for seed establishment.
Mulch	Organic woodchips derived from removed vegetation placed around the plant providing a protective layer to help suppress weed growth, reduce erosion and retain soil moisture.
Native vegetation	Trees, shrubs, vines, herbs, sedges, rushes and grasses that are Indigenous to New South Wales
Provenance	The location from which a seed or plant is sourced
Riparian	Relating to, or living or located on, the bank of a natural watercourse (such as a river or stream)
Seeding	The application of seeds and other materials by manual, mechanical, pneumatic or hydraulic methods to revegetate exposed ground
Sensitive area	Riparian land, public area, water catchment area, coastal wetland, EEC vegetation, threatened species habitat, etc
Sloped sites	Land with a slope of 4:1 or steeper
Topsoil	The upper layer of soil, typically 100-300mm deep, which has the highest concentration of organic material

5 Planning and Design

During the design phase of the work, all efforts are to be made to reduce land disturbance to minimise the restoration and revegetation required.

When planning for restoration and revegetation the following table must be used to determine the extent of restoration required for land disturbed by Hunter Water projects.

Land Disturbance	Extent of restoration required
0 – 1000m^2 AND The land is NOT environmentally sensitive	Restore to minimum standards as outlined within section 7 – 'Minimum Standards for Restoration and Revegetation' unless specified by other project documentation.
>1000 m^2 AND/OR The land is environmentally sensitive	Engage a suitable landscape specialist to prepare a site restoration plan incorporating consultation with relevant stakeholders. The plan must meet or exceed the minimum requirements in section 7 – 'Minimum Standards for Restoration and Revegetation'

6 Development of the Site Restoration Plan

If the works require a site restoration plan to be developed, the plan is to:

- Be prepared by a Landscape Specialist (non-bushland areas) or Bush Regenerator (where restoration of native vegetation is required).
- Meet or exceed the minimum requirements of section 7 – 'Minimum Standards for Restoration and Revegetation' of STS 413
- Include a map designating the various restoration methods to be applied to the site, i.e. grassed, spread with brush matting or native mulch, planted with native plants, hydromulched as well as any erosion and sediment control measures that may be required. For guidance on erosion and sediment control measures please refer to Managing Urban Stormwater: Soils and Construction - Volume 1 (Blue Book).
- Include a list of plant species selected by the Landscaping Specialist or Bush Regenerator, together with quantities, sizes (Hiko, forestry tube, pot, etc) and planting densities.
- Consider ease of maintenance of the site and specify maintenance requirements including duration of maintenance – watering, weed control, and plant replacement.
- Specify completion criteria (e.g. plant survival rate).
- Take into consideration the requirements within AS3959 - Construction of buildings in bushfire prone areas

7 Minimum Standards for Restoration and Revegetation

7.1 Site Preparation

The following must be completed during site preparation.

- Remove and dispose of weedy vegetation from the site. Spot spray and appropriately treat any weed regrowth.
- Ensure the ground surface is free from rocks, soil clumps and compacted construction surfaces.
- In compacted areas, rip the ground surface to a depth of 300mm to reduce compaction and allow rainwater to be stored in the soil profile.
- Undertake soil testing and add appropriate amelioration to facilitate long term healthy growth of vegetation.
- Lay jute matting or netting in areas that may be subject to erosion, such as riparian areas and sloping land.

7.2 Topsoil Spreading

Prior to spreading topsoil, roughen subsoil surfaces for best results. Spread stockpiled topsoil evenly over the area to be grassed or landscaped. Apply topsoil to achieve a nominal 70-100mm compacted thickness over flat areas and a nominal 50-70mm on sloped areas.

On HW land that requires maintenance, it is desirable to have slopes flatter than 4-1. For areas where slopes are 2:1 or greater, input from a landscape or bush regeneration specialist is required and must include temporary erosion control structures and long-term establishment methods.

Where topsoil recovered from the site is not sufficient to complete topsoiling of the required areas, import additional topsoil that is fit for purpose and is an “organic type’ soil mix that confirms to AS4419. The topsoil must:

- Be of a friable porous nature;
- Not contain refuse or materials toxic to plant growth;
- Be free from asbestos and any other deleterious material
- Not contain stumps, roots, clay lumps or stones larger than 25 mm in size;
- Have an organic content of at least 15% to 20% by mass as determined by the method specified in AS 1289 D1.1 Part D;
- Have a neutral pH
- Have a soluble salt content not exceeding 0.06% by mass (or 600 ppm);
- Be suitable for phosphorus sensitive plants; and
- Be free of weed and weed refuse material.

7.3 Grassing

The designated areas, and areas of the site that have been disturbed while executing the work under the contract, shall be sown with grass to re-establish groundcover. This should be done progressively where feasible. As a minimum, all disturbed areas must be restored by project completion.

Native grasses are to be used in bushland areas as per the site restoration plan, couch grass is to be used in all other situations. The grassing shall achieve a close-knit vegetated cover that is free from weeds and bare patches that may be subjected to erosion. Maintenance of grassed areas must include levelling and filling depressions with topsoil.

The contractor shall be responsible for the satisfactory growth of grass. Satisfactory growth is deemed to be 80% established coverage or otherwise as defined within the design plans. If this is not achieved after three months, the area shall be re-grassed as necessary and re-watered to achieve the specified result.

Suitable methods for establishing grass include turfing small areas with Couch grass or Hydromulching large areas.

Hydromulching is not to occur under the following weather conditions:

- When the temperature is higher than 35°C.
- When winds exceed 15 km/hr.
- Where, in the opinion of Hunter Water, the surface is too wet.
- During rain periods or when rain appears imminent.

7.4 Mulching

Mulch may consist of weed-free native vegetation cleared from the site or imported native mulch that meets AS4454. Imported mulch must not comprise mulch derived from construction waste.

Mulch must be laid at a depth of 75 to 100 mm across the site unless specified by other project documentation.

7.5 Planting Works

Local provenance plants are to be sourced from local suppliers as a priority for use in revegetation works. Plant delivery is to be scheduled to maximise chances of successful establishment.

Fertiliser that meets the following criteria is to be used as required:

- Be a slow-release type in tablet or granular form.
- Have an 8 to 9 months release period.
- Have an N:P:K (Nitrogen:Phosphorus:Potassium) analysis (stated in elemental form) as follows:
  - N: 20%
  - P: 4%
  - K: 8%
- Be delivered to the site in unopened bags or containers bearing the manufacturer's description, analysis and quantity of its constituents.

- If the slow-release fertiliser does not contain water-saving crystals, these are to be added at the same time as the slow-release fertiliser.

A survival rate of >80% for native tubestock is to be achieved by the end of the maintenance period unless specified by other project documentation.

7.6 Planting Protection - Stakes and Plant Guards

Any planting plans must include suitable measures for protection establishing plants, including stakes and plant guards where appropriate.

7.7 Watering

Maintenance watering is required at weekly intervals for 12 weeks. For tubestock plantings, maintenance watering is to continue at fourteen (14) day intervals for a further 6 months.

The frequency of watering can be adjusted during periods of adequate rainfall, provided that ground moisture remains suitable for healthy plant establishment.

7.8 Maintenance Period

The site must be maintained for a minimum of 12 weeks for grassing works and a minimum of 12 months for tubestock planting following completion. Maintenance activities are to include watering, weeding and replacement of dead tubestock.

7.9 Biosecurity Hygiene Management

Under the *Biosecurity Act 2015,* everyone has an obligation (known as the 'General Biosecurity Duty') to be aware of their surroundings and take action to prevent the introduction and spread of pests, diseases, weeds and contaminants. To ensure appropriate steps are taken to reduce the risks associated with the spread of biosecurity matter, Hunter Water's *Biosecurity Hygiene Protocol* (Environmental Procedure EP0156) is to be applied to all works. Failure to apply the protocol would be considered an environmental non-conformance and may be considered an offence under the *Biosecurity Act 2015*.

8 Completion criteria

At the completion of works involving ground disturbance, the site must be restored to the standards as defined in section 7 of this STS and/or the specific landscape restoration plan.

All rubbish, equipment and temporary structures (including sediment and erosion control devices) are to be removed from the site.

9 Related Documents

The text below is indicative only.

In addition to STS 413, all work shall comply with relevant current Standards and regulations inclusive of all amendments. In particular:

- Workplace Health and Safety Regulations
- WorkCover NSW Codes of Practice
- Safe Work Australia Model Codes of Practice
- NSW EPA and National Environmental Regulations and Codes of Practice
- NSW Biosecurity Act 2015
- Managing Urban Stormwater: Soils and Construction - Volume 1 (Blue Book).
- AS4454 - Australian Standard - Composts, soil conditioners and mulches
- AS1289 - Australian Standard - Methods of testing soils for engineering purposes
- AS4419 - Australian Standard – Soils for landscaping and garden use

Hunter Water's *Biosecurity Hygiene Protocol* (Environmental Procedure EP0156)

Hunter Water's Standard Technical Specifications

Hunter Water's Standard Drawings

10 Document information

Version history

Document review date is as per the Integrated Management System Standard (HW2013-421/22.002).

Version	Author	Changes	Approved By	Date Approved
1	A Antcliff	Initial Release	Angus Seberry – Group Manager Environment	16/10/24

Document control

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