Modification history

Release	Comments
Release 1	This version released with AHC Agriculture, Horticulture, Conservation and Land Management Training Package Version 1.0.

AHCTRF501	**Design sand based profile for sports turf surfaces**
Application	This unit of competency describes the skills and knowledge required to design a sand based profile from site analysis, profile and turf selection to drainage design for a sports turf surface including the development of establishment and maintenance procedures. It applies to individuals who engage with clients and allied professionals and analyse information and exercise judgement to complete a range of advanced skilled activities with a demonstrated deep knowledge in specific technical areas. They have accountability for the work of others and analyse, design and communicate solutions to a range of complex problems. No occupational licensing, legislative or certification requirements are known to apply to this unit at the time of publication.
Prerequisite Unit	Nil
Unit Sector	Turf (TRF)

Elements	**Performance Criteria**
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop a performance brief for establishing sports turf playing surface	1.1 Liaise with client and allied professionals to determine project scope, technical requirements for sports turf playing surface 1.2 Assess site for hydrological, biophysical, chemical and climatic characteristics and interpret effect on sports turf surface 1.3 Assess and evaluate the current drainage and irrigation conditions and calculate drainage design rate 1.4 Establish a site survey and locate existing features, levels and services and transfer data to design plan 1.5 Investigate legislative and regulatory implications for turf surface and profile design and recommend action 1.6 Identify and assess environmental impact of turf surface and profile design, and recommend action 1.7 Compile results, and recommendations and develop a performance brief for sports turf profile and submit to client for approval
2. Evaluate and select root zone profile materials	2.1 Identify and select a reliable source of potential root zone profile materials 2.2 Conduct tests to determine physical characteristics of potential profile materials according to industry best practice 2.3 Conduct tests to determine the chemical properties and characteristics of potential profile materials according to industry best practice 2.4 Compare test results against known performance benchmarks 2.5 Assess materials against performance brief and select acceptable materials
3. Develop concepts for sand based profile design	3.1 Investigate and evaluate natural soil profile options for sports turf site 3.2 Investigate and evaluate constructed soil profile options for sports turf site 3.3 Develop design models of profile and drainage construction and assess suitable options to meet performance brief outcomes 3.4 Estimate earth works, materials and construction costs for suitable options 3.5 Document concept designs and present to client for approval

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Elements	Performance Criteria
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
4. Design sand based profile and specifications for sports turf	4.1 Compile technical data for design, and reconcile against performance brief and concept plan 4.2 Design profile and drainage systems for sports turf playing surface consistent with concept plan 4.3 Produce scale drawings of profile design according to client requirements and industry standards 4.4 Investigate and select turf grass species and cultivars to meet performance brief outcomes 4.5 Prepare specifications and bill of materials for sports turf soil profile construction works 4.6 Determine resources and contractor requirements for construction of soil profile 4.7 Determine construction and establishment procedures for sports turf profile consistent with the concept plan, site factors and available resources 4.8 Determine thatch management and maintenance procedures for the established sports turf surface
5. Document and present sand based profile design for sports turf establishment	5.1 Compile design drawings, specifications and schedules and reconcile against concept plans and performance brief 5.2 Document specifications, bill of materials, procedures and schedules for establishing a root zone profile for sports turf playing surface 5.3 Present design drawings and documentation to client for final approval

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.

Skill	Description
Reading	• Organises, evaluates and critiques ideas and information from a wide range of complex texts to compile and consolidate information when planning
Writing	• Prepares logical, succinct and accurate documentation expressing, exploring and communicating complex ideas and issues on soil profile design to clients
Numeracy	• Analyses and synthesises highly embedded mathematical information in a broad range of contexts for testing materials, drainage pipe sizes and flow rates and developing root zone profile designs
Interact with others	• Establishes and maintains complex and effective communications in a broad range of contexts to elicit information from clients and to present results and ideas on concepts and final design
Get the work done	• Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to assist decision making for root zone profile designs

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
AHCTRFXXX Design sand based profile for sports turf surfaces	AHCTRF501 Plan the establishment of sports turf playing surfaces	Units revised the establishment of a sand based profile for turf	No equivalent unit

Links	Companion Volumes, including Implementation Guides, are available at VETNet: https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72

TITLE	Assessment requirements for AHCTRFXX Design sand based profile for sports turf surfaces

Performance Evidence

An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit. There must be evidence that the individual has on at least one occasion demonstrated the ability to design a sand based profile for the establishment of a sports turf playing surface ensuring they have:

- liaised with client and allied professional and established the scope of the sports turf project
- assessed the hydrological, biophysical and chemical characteristics and their impact on turf site and playing surface design
- determined drainage and irrigation requirements for turf surface site
- established a site survey depicting key features, levels and services
- developed a performance brief for a sports turf surface and presented to client for approval
- sourced, tested and evaluated materials suitable for sand profile including tested for the following:
  - saturated infiltration
  - porosity
  - volumetric moisture retention
  - bulk density
  - moisture release
  - particle size and distribution
  - pH
- selected suitable materials for turf grass profile construction consistent with performance brief and industry best practice
- assessed and recommended turf grass species and sports turf construction and establishment procedures
- prepared a concept plan and communicated with client for approval
- selected turf establishment procedures and ensured soil profile, irrigation and drainage systems are consistent with concept plan
- designed and produced drawings and plans for sports turf profile which includes:
  - section drawings of soil profile
  - elevations and views consistent with industry standards
  - a schedule of works
  - construction documentation
  - specifications for agronomic and physical characteristics and sub grade structure
  - drainage design and construction process
  - bill of materials
  - sub-contracted works
- prepared work procedures for turf establishment activities and practices
- prepared a maintenance procedures for turf establishment.

Knowledge Evidence

An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:

- establishing and maintaining sports turf playing surfaces
  - construction procedures, turf species selection and cultural practices for sports turf playing surfaces
  - growth habits and cultural requirements of specific turf plant species and cultivars under a range of soil and environmental conditions
- best practices in turf grass profile design including:
  - United States Golf Association (USGA) method
  - California method
  - National best practice
  - Local practices
- irrigation, drainage and the interrelationship of soil air, water and the physical structure of existing and manufactured soils and sports turf mixes

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Knowledge Evidence

- considerations for establishment of type and depth of soil profiles including:
  - retaining existing soil profile and infrastructure
  - remedial action on existing profile
  - full renovation/replacement of soil profile
- sources of irrigation water including
  - types and quality of water supply
  - relative cost
  - irrigation demand and specifications (flow rate, pressure)
- hydrological characteristics of soil profile, materials and tests for root zone profiles including:
  - saturated infiltration rate and testing procedures
  - sub-soil stability and moisture content
  - water table
  - climate and rainfall and impact on soil moisture and growth rate
  - factors for establishing 'drainage design rate' (drainage modulus)
  - volumetric moisture retention (water holding capacity) and moisture release
  - precipitation rate
  - infiltration rate and depth of soil profile
- computations for soil profile design and specifications including:
  - calculating areas and volumes
  - hydrological calculations, flow rates, infiltration rate, precipitation rates, 'Hooghoutdts' equation,
  - costing and documenting a bill of materials
- biophysical environment of the turf surface establishment site including:
  - microbial activity (pests, diseases, beneficial organisms)
  - competition with weeds
  - shade trees and shade patterns
- physical and chemical tests for root zone profile materials including:
  - compaction, porosity and bulk density
  - pH, salinity and nutrition
  - soil profiles, texture, soil type and particle size distribution
  - soil sampling techniques
  - field testing techniques for soils
- legislation and regulations relating to sports turf sites and turf surface establishment works including national and international standards for sports turf surfaces
- maintenance requirements and practices for specific turf plant species and cultivars prior to and after initial establishment
- site evaluation techniques including analysis of the condition of soils, plants and the site for turf establishment activities
  - surveying principles and techniques
  - surveying services
  - basic surveying techniques and equipment for establishing main features, services and levels
  - basic geospatial and digital surveying techniques
  - basic computer aided design (CAD) and simple plan drawing
- role of project briefs and client consultation processes in planning turf establishment works
  - client liaison and negotiation skills
  - working with consultants and professional services
- preparation of plans, specifications and bill of materials including:
  - drawing skills, views, scale, dimensions and documentation
  - plan development including manual and computer aided design and drawing principles (CAD)
  - industry standards for drawing plans
- identifying resource implications including:
  - availability and use of tools, equipment and machinery used in preparing new turf surfaces
  - sports turf treatments and costs
  - delivery and management of raw materials during construction.

Assessment Conditions

Assessment of skills must take place under the following conditions:

Assessment Conditions

• physical conditions:
  • skills must be demonstrated in a typical workplace environment or an environment that accurately represents workplace conditions
  • access to a site suitable for establishing a sports turf surface
• resources, equipment and materials:
  • computers with computer aided design programs
  • drawing equipment
  • digital or geospatial survey equipment
• specifications:
  • workplace documents including work instructions, turf area construction plans
  • access to local, national and international standards for turf grass establishment
  • reports, results and testing equipment for soil, plant tissue and biophysical characteristics of the site
  • access to meteorological data to assess climatic conditions of site
  • access to plans and maps of the site location, hydrological,
• relationships:
  • access to clients, professional and contractors with whom there are to communicate
 	
Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links	Companion Volumes, including Implementation Guides, are available at VETNet: https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72