STANDARD KEMAHIRAN PEKERJAAN KEBANGSAAN
(NATIONAL OCCUPATIONAL SKILLS STANDARD)

F439-002-2:2017
LANDSCAPE CONSTRUCTION
LEVEL 2

JPK

Jabatan Pembangunan Kemahiran
Kementerian Sumber Manusia, Malaysia

Department of Skills Development (DSD)
Ministry of Human Resources

62530 PUTRAJAYA, MALAYSIA

STANDARD KEMAHIRAN PEKERJAAN KEBANGSAAN

(NATIONAL OCCUPATIONAL SKILLS STANDARD)

FOR

LANDSCAPE CONSTRUCTION

LEVEL 2

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GLOSSARY & ABBREVIATION

GLOSSARY

Agronomy	The science and management of land, especially rural, agricultural land.
Arbore	A shady garden shelter or bower, often made of rustic wood or latticework on which vines, roses, etc. are grown.
Base Plan	In landscape architecture, an essential sheet showing site boundaries and significant site features, used as a basis for subsequent plan development.
Building (Construction) Permit	An authorization issued by a government agency allowing construction of a project according to approved plans and specifications.
Building Codes	Regulations specifying the type of construction methods and materials that are allowable on a project.
Built Environment	The man-made creation of or alterations to a specific area, including its natural resources.
CIDB Personnel Green Card	CIDB integrated programme involving the registration and accreditation of construction personnel, to enhance safety levels at construction work sites. Construction workers who register are automatically covered by a special insurance scheme that covers the construction personnel against death and accidents.
Circle Weeding	Weeding operation to prevent weed competition.
Construction Industry	Means the industry concerning construction works.
Construction Site Supervisor	A person assigned to the construction site by the contractor to supervise the construction works.
Construction Works	The construction, extension, installation, repair, maintenance, renewal, removal, renovation, alteration, dismantling, or demolition.
Contour	The form of the land. Contour lines are map lines connecting points of the same ground elevation and are used to depict and measure slope and drainage. Spot elevations are points of a specific elevation.

Contractor	A person who undertakes to carry out and complete any construction works.
Design	The creative illustration, planning and specification of space for the greatest possible amount of harmony, utility, value and beauty.
Designed Landscape	A site that might appear to be natural but has elements and features that were planned and specified by a landscape architect. Designed landscapes include central park to the siting of buildings.
Drainage	The running off of water from a land surface or subsurface, such as through sewers or natural means.
Finish Grading	Landscape construction clean-up, amendments or top soils install irrigation lines and heads.
Green Wall – Mur Vegetal	A system for growing plants on a nearly soilless vertical surface.
Hardscape	Elements added to a natural landscape, such as paving stones, gravel, walkways, irrigation systems, roads, retaining walls, sculpture, street amenities, fountains, and other mechanical features. The sidewalk, curb, gutter and street covering the soil surface.
Insecticide	A substance used to control certain populations of insect pests. In agriculture, insecticides are used to control insect pests that feed on crops or carry plant disease.
Insect-Resistant Crops	Plants with the ability to withstand, deter or repel insects and thereby prevent them from feeding on the plant.
Land Use	Any designated use or activity on a piece of land.
Landscape	An ecosystem of natural and built environments. Natural landscape consists of the land forms, geology, water bodies as well as flora and fauna. Built landscapes on the other hand includes human settlements, plantation areas, open spaces, public parks, public areas, as well as heritage and tourism areas, which include beauty and aesthetic values, architecture and the overall ecology and history of the area.
Landscape Architect	A professional who designs, plans, and manages outdoor spaces ranging from entire ecosystems to residential sites and whose media include natural and built elements.

Landscape Architecture	The science and art of design, planning, management and stewardship of the land that involves natural and built elements, cultural and scientific knowledge, and concern for resource conservation to the end that the resulting environment serves a useful and enjoyable purpose.
Landscape Contractors	A trained builder or installer of landscapes, retained to implement the plans of landscape architects.
Landscape Supervisor	A supervisor who works under general direction, organizes, monitors, and supervises the landscape operations and performs a variety of technical tasks relative to landscape operations.
Landscape Supervision	Activities to coordinate, implement, and supervise all phases of landscape installation on assigned projects to assure effective and efficient efforts to produce the desired results.
Landscape Management and Maintenance Programmes	Activities related to the management and maintenance of landscapes to ensure all aspects related to sustainable landscape development.
Landscape Research	Activities involving studies, testing, and evaluation of technologies, products, functions, standards, services, information sources, and natural resources related to the planning, development, and management of landscapes.
Landscape Reserve Land	Dedicated for landscape development in urban areas involving areas with limited land space.
Mulch	A protective layer of materials lay down over the soil to moderate its temperature, retain moisture and help reduce weeds.
Mulching	Protective covering, usually of organic matter such as leaves, straw, or peat, placed around plants to prevent the evaporation of moisture, the freezing of roots, and the growth of weeds.
Natural Landscape	Landscapes that evolve from natural processes.
Open Spaces	Any area of land either specified or not, allocated or reserved wholly or partially specifically for public gardens, public parks, public sports and recreation fields, public leisure spaces, public pedestrian walkways or as public places.
Pergola	A free standing structure with a roof or lath canopy designed to cast shade.

Pesticide	A substance used to prevent, destroy, repel or mitigate pests, such as harmful insects, weeds or microorganisms.
Pinching	Snipping out (or using fingernails to literally pinch out) the growing point of a plant to promote fuller, bushier plants.
Planting Bed	An area in which plants (as tomatoes or pansies) are grown usually from seed until ready for transplanting to other locations.
Pruning	Removing growth from a plant or tree to maintain its health, regulate its shape and control flowering.
Renewal Pruning	A system in which older wood is regularly removed in favor of younger growth.
Site Inventory	A listing of all physical aspects of the property.
Site Plan	A dimensioned drawing indicating the form of an existing area and the physical objects existing in it and those to be built or installed upon it.
Skilled Construction Worker	A person possessing the accepted level of skill as determined by the Construction Industrial Development Board (CIDB) of one or more of the trades as listed in the third schedule.
Soft landscape	The natural elements with which landscape architects work, such as plant materials and the soil itself.
Soil	Soil is a living breathing complex mixture of minerals, organic matter and living organisms. It provides support for plant roots, and is a source of water and nutrients essential for plant growth.
Thinning	Thinning refers to the pruning of trees and shrubs to help create a more open structure and to allow more sunlight penetration.
Thinning Out	The selective cutting away of individual branches to create open spaces within the plant, remove dead limbs or branches, produce symmetry and train a plant to look more natural. It also aids in better fruit production.
Tree	A woody, perennial plant usually with a well-defined trunk.
Weed	Any unwanted plant that interferes or tends to interfere with the growth of the individuals of favored species'.
Weeding	Operation done in the seedling stage in nursery or in a forest crop that involves the removal or cutting back of all weeds.
Well Drained Soil	Soil that drains quickly, even after heavy rain.

ABBREVIATION

ASLA	American Society of Landscape Architects
BOQ	Contract Bill of Quantities
CADD	Computer Aided (i.e. Assisted) Design and Drafting
CIDB	Construction Industrial Development Board
CPM	Critical Path Method
DID	Drainage and Irrigation Department
DNH	Department of National Heritage
DOA	Department of Agriculture
DOE	Department of Environment
FD	Forestry Department
FDTCP	Federal Department of Town and Country Planning
FRIM	Forest Research Institute, Malaysia
IFLA	International Federation of Landscape Architects
ILAM	Institute of Landscape Architect Malaysia
ISA	International Society Arboriculture
MARDI	Malaysian Agricultural Research and Development Institute
MITI	Ministry of International Trade and Industry
MOA	Ministry of Agriculture & Agro-based Industry
MSA	Malaysian Arborist Association
NLD	National Landscape Department
NRE	Ministry of Natural Resources and Environment
OHSA	Occupational Health and Safety Administration

STANDARD PRACTICE

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR; LANDSCAPE CONSTRUCTION LEVEL 2

1. INTRODUCTION

The Malaysian government has developed the National Landscape Policy (NLP) consisting of strategic policies and action plans to act as a catalyst with the aim of becoming the Beautiful Garden Nation by 2020 and towards Green Malaysia Vision and Policy. To envisage this, NLP together with Green Malaysia Policy is expected to boost the country towards a total quality living environment, as well as highlighting Malaysia's unique landscape identity. This aspiration can be done through the preservation and conservation of natural resources, the implementation of planned development, as well as a system of efficient landscape management. The establishment of a conducive environment will encourage balanced socio-economic growth and create an ethical and civilized society.

1.1 Occupation Overview

Landscape Construction deals with the work of landscape development projects for residential, commercial and public buildings and facilities (including parks). The scope of work consists of implementing the activities of landscape construction including site preparation and mobilisation work, materials handling, landscape structures and features, planting materials, post-construction clearing and cleaning activities and 'make-good' works carried out to ensure work executed are in accordance with specifications, procedures and requirements.

Additionally, to boost up the marketability of landscape construction industry, the implementing landscape works offer semi-skilled and skilled jobs in the construction, management and maintenance of landscape during construction and the defects liability period, as well as during post-construction period. These involved transport and handling specialized landscaping equipment; a range of horticulture planting work operation and upkeep of turf (grass) and provide training for other employees.

In addition, these requirements can only be attained through a well-trained and knowledgeable workers and staff. This is the main component in the new economy of a developing country. Training and knowledge learned will effectively elevate employees' contributions to work activities, especially in monitoring and decision making. Thus, this helps to ensure the quality of landscape construction.

1.2 Justification and Rationale of NOSS development

The Ministry of Human Resources (MOHR) has set out a decent work agenda with four action strategies, namely the welfare of workers, worker's employment, enterprise competitiveness, and nation resilience and progress work that contribute to the employment growth in the construction sector from 0.2% to 0.3%. This includes the growth of the worker's employment in Landscape Construction as one of the fastest growing worker employment areas (EPU, 2008)[1].

In line with the national development-oriented global market policy, the average monthly income by industry and occupation justifies the development of NOSS that outlines the required competency units and work activities to be referred and used by the industry to benchmark the level of skills of the construction workers against a certain skill standard for worker's employment, employees' career paths, and employees' professional development training. Thus, this improved the quality of production and income (salary) of skilled workers and creating more job placement opportunities for workers in a safe and healthy environments.

The level of skill possessed by the construction worker will determine his/her ability to contribute towards the overall quality of the end product which include the cost-efficiency of the product, worker's productivity, the time span to complete the product and flexibility in adapting to changes. In addition, the NOSS development process was administered to comply with the green card requirements and skills proficiencies set by the CIDB Act 520.This also serves as the occupational prerequisite or minimum requirements for any interested individual to undertake the job or career as a Landscape Construction personnel. Hence, the review of the National Occupational Skills Standard of Landscape Construction documents and standardization of training manuals by the Department of Skills Development are justified and well-timed.

1.3 Authority and Regulatory/Statutory Body Related to Industry

The National Landscape Department formed under the Ministry of Housing and Local Government is the agency responsible for programmes such as landscape development, development and promotion of landscaping industry, landscape management, publicpark and recreation development and research and conservation.

The Institute of Landscape Architects Malaysia (ILAM) is Malaysia's national professional association for landscape architects, representing more than 1,000 members. We lead the stewardship, planning, and design of built and natural environments across the nation.

[1]Note: Source from 10th Malaysia Plan, Economic Planning Unit, 2008

The Malaysian Public Works Department (JabatanKerja Raya Malaysia), under Ministry of Works Malaysia (MOW) is responsible for construction and maintenance of public infrastructure.

The Construction Industry Development Board ("CIDB") is a corporate body responsible for those engaged in the construction industry within Malaysia, largely through the levy which it imposes on all major construction projects, and the compulsory courses which it conducts.

The Department of Environment (DOE) is the regulatory body whose main function is to prevent, remove, control pollution and improve the environment, consistent with the purposes of the Environmental Quality Act 1974 and the regulations thereunder that is The Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987

The Department of Safety and Health (DOSH) is the regulatory body to ensure compliance of safety and health requirements in the working environment of landscape construction industry. Legislation involved for enforcement includes Factory and Machinery Act 1967 and Occupational Safety and Health Act 1994.

1.4 Occupational Pre-requisite

The National Occupational Skill Standards (NOSS) for the Landscape Construction Implementation was developed through a consensus of the best minds in the industry which comprises of professionals and experts with vast knowledge and extensive experience in their respective areas of discipline to ensure that the NOSS truly reflects the actual working environment in the industry. Therefore, it was decided that the minimum requirements for those interested to enrol in this course are as follows:-

- Able to read and write
- Physically fit
- Comply with the green card requirements and skills proficiencies set by the CIDB Act 520

2. **OCCUPATIONAL STRUCTURE (OS)**

Sector	CONSTRUCTION (F)	ADMINISTRATIVE AND SUPPORT SERVICES ACTIVITIES (N)							
Sub-Sector	OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)	LANDSCAPE CARE AND MAINTENANCE SERVICES ACTIVITIES (81)							
Area	LANDSCAPE CONSTRUCTION	LANDSCAPE PLANNING & DESIGN	LANDSCAPE MANAGEMENT & MAINTENANCE	HORTICULTURE PRODUCTION	ARBORICULTURE OPERATION		LANDSCAPE TECHNOLOGY	PLAYGRAOUND	PARK AND RECREATION	
Level 5	Landscape Construction Manager	Landscape Design Manager	Landscape Maintenance Manager	Horticulture Production Manager	Arboriculture Operation Manager		Landscape Technology Manager	Playground Manager	Park Manager	
Level 4	Landscape Construction Asst. Manager	Landscape Designer	Landscape Maintenance Asst. Manager	Horticulture Production Asst. Manager	Arboriculture Operation Assist. Manager		Landscape Technology Asst. Manager	Playground Asst. Manager	Park Asst. Manager	
Level 3	Landscape Construction Supervisor	Landscape Design Supervisor	Landscape Maintenance Supervisor	Horticulture Supervisor	Arboriculture Supervisor		Landscape Technology Supervisor	Playground Supervisor	Park Supervisor	Park Ranger
Level 2	**Landscape Construction Technician**	Landscape Design Technician	Landscape Maintenance Technician	Horticulture Technician	Tree Worker	Tree Climber	Landscape Technology Production	Park Technician	Park Technician	Park Assist. Ranger
Level 1	Landscape Construction Attendant	NA	Landscape Maintenance Attendant	Horticulture Attendant	NA		Landscape Technology Attendant	NA	Park Attendance	

Figure 2.1: Occupational Structure (OS) for Landscape Construction Level 2

3. **OCCUPATIONAL AREA STRUCTURE (OAS)**

Sector	CONSTRUCTION(F)	ADMINISTRATIVE AND SUPPORT SERVICES ACTIVITIES (N)							
Sub-Sector	OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)	LANDSCAPE CARE AND MAINTENANCE SERVICES ACTIVITIES (81)							
Area	LANDSCAPE CONSTRUCTION	LANDSCAPE PLANNING & DESIGN	LANDSCAPE SERVICES & MAINTENANCE	HORTICULTURE PRODUCTION	ARBORICULTURE OPERATION	LANDSCAPE TECHNOLOGY	PLAYGRAOUND	PARK AND RECREATION	
Level 5	Landscape Construction Management	Landscape Planning and Design Management	Landscape Maintenance Management	Horticulture Management	Arboriculture Management	Landscape Technology Management	Playground Management	Park Management	
Level 4	Landscape Construction Administration	Landscape Planning and Design	Landscape Maintenance Administration	Horticulture Production Administration	Arboriculture Administration	Landscape Technology Administration	Playground Administration	Park Administration	
Level 3	Landscape Construction Supervision	Landscape Design	Landscape Maintenance Supervision	Horticulture Supervision	Arboriculture Supervision	Landscape Technology Supervision	Playground Supervision	Park Supervision	Park Enforcement
Level 2	**Landscape Construction**	Landscape Drafting and Production	Landscape Maintenance Operation	Horticulture Production	Terrestrial Arboriculture Operation / Aerial Arboriculture Operation	Landscape Technology Production	Playground Operation	Park Operation	Park Enforcement
Level 1	Embedded in Level 2	NA	Embedded in Level 2	Horticulture Production	NA	Embedded in Level 2	NA	Embedded in Level 2	NA

Figure 3.1: Occupational Area Structure (OAS) for Landscape Construction Level 2

4. DEFINITION OF COMPETENCY LEVELS

The NOSS is developed for various occupational areas. Candidates for certification must be assessed and trained at certain levels to substantiate competencies. Below is a guideline of each NOSS Level as defined by the Department of Skills Development, Ministry of Human Resources, Malaysia.

Level 1: Competent in performing a range of varied work activities, most of which are routine and predictable.

Level 2: Competent in performing a significant range of varied work activities, performed in a variety of contexts. Some of the activities are non-routine and required individual responsibility and autonomy.

Level 3: Competent in performing a broad range of varied work activities, performed in a variety of contexts, most of which are complex and non-routine. There is considerable responsibility and autonomy and control or guidance of others is often required.

Level 4: Competent in performing a broad range of complex technical or professional work activities performed in a wide variety of contexts and with a substantial degree of personal responsibility and autonomy. Responsibility for the work of others and allocation of resources is often present.

Level 5: Competent in applying a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts. Very substantial personal autonomy and often significant responsibility for the work of others and for the allocation of substantial resources features strongly, as do personal accountabilities for analysis, diagnosis, planning, execution and evaluation.

5. AWARD OF CERTIFICATE

The Director General shall award, to any person upon completing successfully the NOSS program following skills level qualifications as stipulated under the National Skills Development Act, 652:

- Malaysia Skills Certificate / SijilKemahiran Malaysia (SKM) Level 1, 2 or 3
- Malaysia Skills Diploma / Diploma Kemahiran Malaysia (DKM) Level 4
- Malaysia Skills Advanced Diploma / Diploma LanjutanKemahiran Malaysia (DLKM) Level 5
- Statement of Achievement / PenyataPencapaian (PC)

6. JOB COMPETENCIES

The Landscape Construction Level 2 personnel is competent in performing the following core competencies:-

a. Landscape Construction Site Preparation
b. Landscape Construction Engineering Work
c. Landscape Construction Structural Work
d. Planting Work Operation
e. Plants Establishment
f. Landscape Site Reinstatement
g. Plants Handling and Care (Holding Area)

7. WORKING CONDITIONS

A Landscape Construction is an entry-level job area of the landscape construction. The work environment for landscape construction is expected to be fun, motivating and works directly with the Site Supervisor and Superintendent Officers (Landscape Construction Assistant Manager and Landscape Construction Manager). A Landscape Construction personnel will allow himself/herself to be coached by other team members to increase knowledge within their position.

Landscape Construction job requires personnel to prioritize the issue of workplace safety and proper work procedures. Besides preparing, carrying out and handling activities at job sites, they operate specific equipment, hand tools, and other special tools in the production area. It also involves with mulching, pruning, raking, blowing, weeding and various types of hand mowing. A Landscape Construction personnel holds an integral position, and its additional duties may be assigned as required. This requires them to wear a complete set of personnel protective equipment (PPE) to ensure effective and efficient performance in compliance with occupational, safety, health and environmental requirements.

They work as a team in the organisation/company. In most cases, they have similar operating schedules. In accordance to labour law, they usually work 8-10 hours a day (working operation from 7 am to 4 pm), during the day and overtime, working at odd hours to avoid traffic congestion. Personnel will be working in a small group, working on the correct technique and procedure, working outdoors and exposed to all weather conditions, sounds and noise levels that are distracting or uncomfortable. They will also be exposed to contaminants (such as pollutants, gasses, dust or odours), minor burns, cuts, bites or stings and will be mostly standing for extended periods of time in setting up the landscape according to specifications and regulation of the local authority/body.

8. EMPLOYMENT PROSPECTS

8.1 Malaysian Market

In Malaysian market, the state of development of residential, commercial, industrial and recreational booming the need for manpower in the field of landscape is increasing every year. Landscape interest has now become an attraction to the public on the development of an area. The job outlook for this field is the Landscape Construction Technician in the public and private sector, entrepreneurs in the area of landscape and trainers.

8.1.1 Employment Opportunities

Source of employment mainly arise from high staff turnover because of the physical effort required, dirty work environment and low wages. Subject to the position, specific training is not necessarily required. Many openings will be filled by workers with solid experience in the fields of landscaping and horticulture, in such positions as gardening helper, landscape labourer and grounds maintenance worker. Hence excellent job outlook arises in the construction and other related industries with similar skills such as:

- Landscape Construction Supervisor
- Landscape Maintenance Supervisor
- Horticulture Production Supervisor
- Landscape Technology Supervisor
- Playground Supervisor
- Park Supervisor
- Landscape Maintenance Technician
- Horticulture Technician,
- Landscape Technology Technician
- Playground Technician
- Park Technician.

8.1.2 List of Industries

Similarly, excellent prospects exist in related industries such as:

- Landscape Architects
- Landscape Contractor
- Landscape Supply Outlets
- Nurseries
- Park And Amenity
- Tree Farms
- Greenhouses

- Garden Centres
- Landscape Consultant
- Governments / Local Authority

Nevertheless, industries such as golf, hotel, resort, housing developer, landscape supplier, landscape retail centre, and landscape nursery production industry are also related to landscape construction implementation work scope.

9. CAREER ADVANCEMENT

To advance their careers, a Landscape Construction Technician may consider completing postsecondary educational courses and programs at public or private sectors technical schools and colleges. Vocational Collages, Community Colleges, and Industrial Training Institutions offer certificates, diploma and associate's advance diploma/degree programs in Landscape Planning and Design, Landscape Services and Maintenance, Landscape Production (Nursery) and Park and Recreation. Classes include horticulture, plant reproduction, and soil studies. Alternatively, courses in nursery operation and ornamental plants are suitable for students considering a career in business and marketing management. While those looking for jobs in landscaping may take courses in landscape design, weed management, and pesticides. Students pursuing their bachelor's degree programs will have or hold a stronger foundation in plant biology, plant materials, growing practices, chemistry and business management.

10. SOURCES OF ADDITIONAL INFORMATION

The following organisations can be referred as sources of additional information which can assist in defining the document's contents.

a. JabatanLanskap Negara
KementerianPerumahandanKerajaanTempatan (KPKT)
Tingkat 7, Plaza Permata-IGB
Jalan Kampar off JalanTunRazak
50400 Kuala Lumpur.
Telephone: 03-40470000Fax: 03-40452415
Website: www.kpkt.gov.my/jln
Email: kpjln@kpkt.gov.my

b. JabatanKerja Raya
KementerianKerja Raya Malaysia
Unit KomunikasiKorporat, KementerianKerja Raya
Tingkat 6, Blok B KompleksKerja Raya
Jalan Sultan Salahuddin, 50580 Kuala Lumpur.
Telephone: 03-8000 8000
Fax: 03-2711 1101

Website: www.kkr.gov.my/ms
Email: pro@kkr.gov.my

c. InstitutArkitekLandskap Malaysia (ILAM)
1-10-3, Presint ALAMI, PusatPerniagaan Worldwide 2,
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Fax: (603) 5519-0827
E-mail: ilamalaysia1981@gmail.com

d. Lembaga Pembangunan IndustriPembinaan Malaysia (CIDB)
Tingkat 10, MenaraDatoOnn,
PusatDaganganDunia Putra (PWTC)
No.45, JalanTun Ismail, 50480 Kuala Lumpur.
Telephone: 03-40477000Fax: 03-40477070
Website: www.cidb.gov.my/
E-mail:

11. ACKNOWLEDGEMENT

The Director General of Department of Skills Development (DSD) would like to extend his gratitude to the organisations and individuals who have been involved in developing this standard, especially members of Standard Technical Evaluation Committee (STEC) for validated this document;

NO	NAME	ORGANISATION
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4	DR. HAJI AMAT RAMSAH YAMAN	DIRECTOR ARBOR CARE SDN. BHD.
5	LAr. ZURAIDAH BINTI SAINAN	PENGARAH JABATAN TAMAN DAN REKREASI, MAJLIS BANDARAYA PETALING JAYA

12. NOSS DEVELOPMENT COMMITTEE MEMBERS

LANDSCAPE CONSTRUCTION (LEVEL 2)		
1	AHMAD SYAHARUDDIN BIN KAMARUDDIN	KETUA PENONG PENGARAH / ARKITEK LANDSKAP, JABATAN LANDSKAP NEGARA
2	HAJI M. RAZMI BIN MAT ZAIN	KETUA JABATAN PEMASARAN RISDA SEMAIAN DAN LANDSKAP SDN. BHD.
3	HAJI ZAINUDDIN BIN HAJI YA	PENGARAH / ARKITEK LANDSKAP ZAINUDDIN DESIGN
4	MOHAMMAD SHAHROM BIN ISHAK	PENGURUS LANDSKAP (REKA DAN BINA) SHAGEENA DESIGN & SERVICES
5	MOHD MUKHRIZ BIN MOHD MOKHTAR	PENGARAH / ARKITEK LANDSKAP RIZNI LANDSCAPE ART
6	MOHD ZAILANI BIN JAMIL	PENGARAH / ARBORIST BERTAULIAH ARBOR CARE SDN. BHD.
7	MUHAMAD ZAEDI BIN MOHD ASRI	PRINSIPAL ARKITEK LANDSKAP ZAENVIRO STUDIO
8	NAZMIE SHAMRI BIN MIATIM	PENGURUS TAPAK LANDSKAP LAKARAN JITU SDN BHD
9	NIK NAZHAR BIN NIK KAMARUDDIN	ARKITEK LANDSKAP RAINFOREST CONCEPT
10	NOOR AIDA BINTI AMIR	PENGURUS LANDSKAP WAA DESIGN KUALA LUMPUR
11	NOR SALEHAN BINTI JAMALUDIN	KOORDINATOR LANDSKAP METROPOLIS DESIGN CONSULTANT
12	NORHALIZA BINTI HANIFAH	KETUA PENOLONG PENGARAH/ ARKITEK LANDSKAP JABATAN PERANCANGAN BANDAR, PERBADANAN PUTRAJAYA
13	NURUL HUDA BINTI ABDUL HAMID @ YUSOFF	PENSYARAH LANDSKAP UNIVERSITI TEKNOLOGI MARA (UITM)
14	RUSLI BIN HASHIM	ARKITEK LANDSKAP INSTITUT LATIHAN DEWAN BANDARAYA KUALA LUMPUR
FACILITATOR		
15	HAJAH RASHIDAH BINTI HASSAN	FACILITATOR INTERNATIONAL ISLAMIC RESEARCH

		ACADEMY, (I-IRA) SDN. BHD.

STANDARD CONTENT

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR;

LANDSCAPE CONSTRUCTION

LEVEL 2

13. COMPETENCY PROFILE CHART (CPC)

SECTOR	**CONSTRUCTION (F)**		
SUB SECTOR	**OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)**		
JOB AREA	**LANDSCAPE CONSTRUCTION**		
NOSS TITLE	**LANDSCAPE CONSTRUCTION**		
JOB LEVEL	**TWO (2)**	**NOSS CODE**	**F439-002-2:2017**

COMPETENCY UNIT

CORE	**LANDSCAPE CONSTRUCTION SITE PREPARATION**	**LANDSCAPE CONSTRUCTION ENGINEERING WORK**	**LANDSCAPE CONSTRUCTION STRUCTURAL WORK**	**PLANTING WORK OPERATION**	
	F439-002-2:2017-C01	**F439-002-2:2017-C02**	**F439-002-2:2017-C03**	**F439-002-2:2017-C04**	
	PLANTS ESTABLISHMENT	**LANDSCAPE SITE REINSTATEMENT**	**PLANTS HANDLING AND CARE (HOLDING AREA)**		
	F439-002-2:2017-C05	**F439-002-2:2017-C06**	**F439-002-2:2017-C07**		

14. COMPETENCY PROFILE (CP)

SECTOR	**CONSTRUCTION (F)**		
SUB SECTOR	**OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)**		
JOB AREA	**LANDSCAPE CONSTRUCTION**		
NOSS TITLE	**LANDSCAPE CONSTRUCTION**		
JOB LEVEL	**TWO (2)**	**NOSS CODE**	**F439-002-2:2017**

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
1. Landscape Construction Site Preparation	F439-002-2:2017-C01	Landscape Construction Site Preparation describes the competency in preparing the site to integrate with civil works and building design to minimise runoff from the site. It provides adequate soil depth and structure to maximise storm water infiltration and soil storage capacity to prevent potential damage to landscape plants like root zone trauma and soil structure disturbance. A competent person in this CU shall be able to prepare site work	1. Prepare site work requirement.	1.1. Site work requirement checklist interpreted as instructed by the superior written order. 1.2. The site work plan coordinated in line with the work program. 1.3. Construction phasing/sequencing of the construction schedule coordinated in accordance with the industry accepted best management practice. 1.4. Landscape site and boundaries secured on the site as indicated in the landscape drawings. 1.5. Site access and facilities arranged as per the superior written instruction.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		requirement, perform site mobilisation works, prepare on site material inventory, execute pre-earthwork activities and prepare plant materials according to contract operation manual and specification. The outcome of this competency is to ensure efficient and good landscape site that will ease the implementation of landscape construction works created in accordance with the contract document requirement and the landscape design.		1.6. Landscape protection and preservation areas such as wetlands and landscape sensitive areas, buffer zones, filter strips, and trees requiring special protection identified and mapped clearly on drawings, maps, and properly flagged on-site in accordance with design criteria and construction requirement. 1.7. Logistic plans for site clearing of unwanted element prepared as specified in the contract document.
			2. Perform site mobilisation works.	2.1. Construction-site access, construction routes, and equipment for parking areas defined according to the contract requirement. 2.2. Construction-site access pads installed prior to land disturbances as specified by the construction-exit pad details. 2.3. Location of existing surface utilities marked on site in accordance with the landscape drawings. 2.4. Underground utility route

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				flagged as stated in the local authority approval documentation. 2.5. Construction machinery and equipment organised as specified in the work requirements. 2.6. Site mobilisation work status recorded with respect to the work progress requirements.
			3. Prepare on site material inventory.	3.1. Site materials and plants types listed in terms of quality and quantity as specified by the inventory checklist. 3.2. Landscape construction materials and quantity selected based on the plants tabulation in the material handling manual. 3.3. Site material and plants ordered in proportion with the work requirements. 3.4. Types of materials and amount used recorded according to the materials and plant tabulation checklist. 3.5. Site materials stock handled and stored on site according to the OHS materials handling and storing manuals/guideline.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				3.6. Site materials and plants inventory reports submitted to superior consistence with the work requirements.
			4. Execute pre-earthwork activities.	4.1. A detailed survey of existing topographic information at the site performed with a qualified surveyor prior to grading-plan development. 4.2 Pre-earthwork levels identified as indicated in the landscape drawings. 4.3. Invert levels flagged systematically in line with the design plans and construction requirements. 4.4. Cut and fill conducted in accordance with the levelling tabulation documents. 4.5. Topsoil areas excavated, graded, filled, and shaped to the proper lines, grades, and elevations before topsoil placement is started as specified by the work specification. 4.6. Subsoil, drainage system, and piping work areas secured with marking tools as indicated in the design drawings.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				4.7. Clearing and cleaning activity conducted as stated in the work specifications. 4.8. Work progress recorded as specified by the job requirements.
			5. Prepare plant materials	5.1. Material site inventory checklist utilised according to the quality control requirements. 5.2. Existing trees marked consistent with the accepted arboriculture best practices. 5.3. Temporary nursery holders installed as specified by the planting requirements. 5.4. Soils and fertilizers applied based on the planting manual/guideline. 5.5. Plants holding holes excavated using appropriate equipment as instructed by the superior and according to horticulture /arboriculture best practices. 5.6. Planting beds prepared as specified in the planting quality control system. 5.7. Excavated earth removed from planting bed in compliance with the planting

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				manuals/guideline.
2. Landscape Construction Engineering Work	F439-002-2:2017-C02	Landscape Construction Engineering Work describes the competency in carrying out works of ensuring a level base, or a specified slope such as a foundation, the base course for landscape and garden improvements, or surface drainage that often called as the sub-grade or finished contouring. A competent person in this CU shall be able to carry out internal drainage system works install internal irrigation system works, execute internal sewerage and sanitary system, operate landscape lighting work and construct water features. The outcome of this competency is to ensure the landscape design	1. Carry out internal drainage system works.	1.1. Internal drainage system works plans arranged according to the work schedule requirements. 1.2. Drainage routes marked at precise locations as specified in the design plan. 1.3. Invert levels fixed with marking tools as stated the standard operating procedure (SOP). 1.4. Gravels and concrete works executed in accordance with the design plan. 1.5. Subsoil pipes laid as per layout plan and the work requirements. 1.6. Backfilling and compaction works carried out according to the SOP. 1.7. Finished drainage works recorded as specified by the work order.
			2. Install internal irrigation system works.	2.1. Internal irrigation system work plans coordinated in accordance to the contract requirements and procedures. 2.2. Tools and equipment arranged as specified by the work requirements.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		works that include grading or reshaping of land, to improve drainage and installing a sub-surface drainage system on time and within the budgets performed in accordance with the contract specification, and design plan.		2.3. Internal irrigation system work materials and quantities determined as stated in the material specification. 2.4. Infrastructure base works executed as indicated in the design plan. 2.5. Filter and pump system installed according to the job scope requirements. 2.6. Overhead irrigation at turf area installed as per job requirements. 2.7. Internal irrigation system work status recorded in accordance with horticulture best practices.
			3. Execute internal sewerage and sanitary system.	3.1. Working plan requirements gathered as specified by contract document and procedures. 3.2. Infrastructure base work activities carried out in conformance with the scope of works and contract specifications. 3.3. Sewerage pipes installed according to the design plan and job requirements. 3.4 Filter and pump system testing and commissioning

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				executed in accordance with operating manual and procedures. 3.5. Finished work data registered in the data system as specified by the job requirements.
			4. Operate landscape lighting work.	4.1. Lighting requirements arranged as specified by the design plan. 4.2. Types of lighting fixtures determined as indicated in the work planning. 4.3. Narrow trenches for cable path dug as stated in the design plan. 4.4. Lighting system components assembly coordinated as indicated in the design scheme. 4.5. Components cable laid out along the concrete walkway following the line of light fixtures. 4.6. Work progress recorded as stated in the job requirements.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
			5. Construct water features.	5.1. Water features materials organised as specified by the work order. 5.2. Water features base and frame erected as per marked location. 5.3 Ducting or trunking for electrical cabling laid as indicated by the working drawing. 5.4 Water features construction executed according to the word plan and the working drawings. 5.5. Water proofing layers laid as instructed by the work order and the working drawing. 5.6. Electrical cables and pump installation arranged in accordance with the design criteria and construction requirements. 5.7. Work progress records submitted to superior as stated by the work orders.
3. Landscape Construction Structural Work	F439-002-2:2017-C03	Landscape Construction Structural Work describes the competency in constructing landscape structures and features	1. Identify landscape structural work requirements.	1.1. Work schedule interpreted according to the design requirements and specifications. 1.2. Types of hardscape structure work determined according to

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		that include retention systems, decks, patios, walks, fences, garden structures and other items. It involved construction elements with various material types such wood, stone/cultured stone, cast/pre-cast concrete units, brick or concrete paving units. Many skill sets are employed during this process from masonry to carpentry, plumbing, and electrical. A competent person in this CU shall be able to identify landscape structural work requirements, construct landscape concrete structures and features, erect landscape brick and/or block structures and features, build landscape masonry structures and features, install landscape timber structures and features,		the design plan. 1.3. Work area located using GPS and relevant IT gadget as specified by the layout drawings and map. 1.4. Tools and equipment arranged as stated in the work plan. 1.5. Excavation work location marked with coloured marking tools according to the design plan. 1.6. Landscape structures materials allocated in terms of raw materials and labour requirements. 1.7. Identified hardscape structure work requirements recorded in accordance with the work plan.
			2. Construct landscape concrete structures and/or features.	2.1. Work area prepared as specified by the work requirements. 2.2. Potential risks and control measures identified as stipulated in the Occupational Health and Safety (OHS) procedures. 2.3. Concrete mix determined in terms of sand, cement and water ratio and the strength

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		fabricate landscape metal and non-metallic structures and features, and set up landscape paving works in accordance with contract documents and standard operation and manuals. The outcome of this competency is to ensure landscape structures and features that blend in planting schemes constructed and built exceeding expectations and completed on time in accordance with the contract specification, and design plan.		requirements of landscape features. 2.4. Concrete mix samples prepared for testing as stated in the work requirements. 2.5. Set levels and gradient measured according to Malaysian Standards. 2.6 Finished concrete surface quality controlled in line with the design requirements. 2.7. Concrete waste materials and debris removed in compliance with the work safety requirements and procedures.
			3. Erect landscape brick or block structures and/or features.	3.1. Tools and equipment serviceability tested as specified by the work requirements. 3.2. Quantity and quality of materials ordered in line with the design requirements and specifications. 3.3. Admixes including bonding and colouring agents added in conformance with the work requirements. 3.4. Damp proofing and base course of brick and/or block work laid according to the design plan and

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				specifications. 3.5. Viability and stability of brick and/or block structure in designated bond(s) recorded as specified in the work requirements. 3.6. Brick and block work finish surfaces cleaned in accordance with the design standards.
			4. Build landscape masonry structures and/or features.	4.1. Masonry structures and/or features position marked out according to design plan and requirements. 4.2. Tolerances profiles listed as stated in the contract document and specifications. 4.3. All debris, vegetable matter, and topsoil removed as specified by the work requirements. 4.4. Sub-base material compacted to the required finished levels as indicated by the design layout and work plans. 4.5. Finished levels and gradient measured according to Malaysian Standards. 4.6 Stone structures and/or features assembled according to the construction

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				assembling technique. 4.7. Stonework site cleaned as required by the work requirements and procedures.
			5. Install landscape timber structures and/or features.	5.1. The quantity and quality of timber materials checked in conformation with the interpreted design drawings and specifications. 5.2. Personal Protective Equipment (PPE) selected, used and maintained according to the procedures. 5.3. Timber structures and/or features positioned in accordance with the design drawings and work specifications. 5.4. Timber components cut and prepared for assembly according to the requirements contained in the design drawings and specifications. 5.5. Timber components fixed, joined or assembled into position and fixed into place according to the design drawings and specifications. 5.6. Quality of finished works checked for compliance with design drawings and

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				specifications. 5.7. Debris cleared and cleaned from structure and site according to the industry practice.
			6. Fabricate landscape metal and non-metallic structures and/or features.	6.1. Project requirements arranged according to the design plan and work conditions. 6.2. Equipment and material requirements organised as specified by the work requirements. 6.3. The site for metal and non-metallic structures and features marked out as indicated in the construction plans. 6.4. Metal/non-metallic structures and features constructed as specified by the work plan and requirements. 6.5. Finishing works applied according to the quality control manual and provision. 6.6. Work site clear and cleaned with respect to the job requirements. 6.7. Work progress recorded in accordance with the accepted industry practices.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
			7. Set up landscape paving works.	7.1. Paving work selected according to the work plan. 7.2. Paving work areas identified as stated in the design plan. 7.3. Paving materials delivered to site as specified by work requirements. 7.4. Paving work tools and equipment gathered in accordance with the work conditions. 7.5. Paving works constructed according to the design plan and work requirements. 7.6. Paving finishing work executed in accordance with the design drawings and requirements. 7.7. Paving site cleared and cleaned in compliance with the procedure and SHE guidelines.
4. Planting Work Operation	F439-002-2:2017-C04	Plants Work Operation describes the competency in the realization of landscape design to reality. It covers a lot of the skill set of site preparation for planting up to increase the land	1. Carry out site clearing and grubbing.	1.1. Unwanted existing landscape plants removed as indicated in the design plan. 1.2. Retained landscape plants protected as specified by the work requirements. 1.3. Topsoil protected in place for re-use in landscape work as specified by the work order.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		planted to create the optimum environment for the new landscape planting environment. A competent person in this CU shall be able to carry out site clearing and grubbing, prepare planting site, perform plants handling and care during transit, execute planting works, implement transplanting work and carry out turfing (grass) works. The outcome of this competency is to ensure the surrounding landscape improved by providing colour and texture of the plants and trees and provide attractive features throughout the growing season in accordance with horticultural practices/planting procedures and guiding standards/ planting		1.4. Tools and equipment assembled according to the lists provided and/or supervisor's instructions. 1.5. Site clearing and grubbing work executed based on the work requirements. 1.6. A clean and safe work site maintained while undertaking the plants work operation activities. 1.7. Work outcomes report submitted to superior as stated in the contract documents.
			2. Prepare planting site.	2.1. Design data, test reports, and plant and material certifications checked and discussed with superior with respect to the contract document and requirement. 2.2. Land tilling and digging executed in line with the design plans and work requirements. 2.3. Grading and compacting activities commenced according to OHS/SHE requirements and workplace information 2.4. Approved topsoil mixes added

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		operation and maintenance manual.		to planting site according to the nursery guideline. 2.5. Pre-planting watering carried out according to the planting site conditions. 2.6. Waste material and debris produced during planting site preparation stored in a designated area according to supervisor's work order/instructions. 2.7. Completed planting preparation works recorded as specified by the standard operating procedure.
			3. Perform plants handling and care during transit.	3.1. Work instruction and transit permit confirmed in accordance with the plants handling and care guideline. 3.2. Transported or moved plants thoroughly wrapped and protected prior to transporting as specified by the horticulture guideline. 3.3. Rootballs wrapped and tied with gunny sack or hessian sacking (if not containerised) in accordance with the best and arboriculture best practices 3.4. Exposed trunks wrapped in

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				rice straw including the lower parts of the branch system during transportation as specified by the contract specification. 3.5. Plants injuries occurred during transit determined based on leaf discolouration, leaf wilting and leaf shedding. 3.6. Plants watering and fertilising during transit conducted in a safe and environmentally appropriate manner according to the arboriculture best practices. 3.7. Damaged trees tagged for rejection on arrival at site in accordance with the contract specification.
			4. Execute planting works.	4.1. Landscape plants and material certifications required by concern authorities checked before submission for superior endorsement as specified by the work order. 4.2. Plants, trees, shrubs and planting materials labelled to substantiate in compliance with specified requirements. 4.3. Reports on topsoil analysis from approved testing

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				sources submitted for superior's and client's approval as stated by the work requirement. 4.4. Delivered trees and shrubs covered with mulch, burlap or other acceptable means of retaining moisture to avoid weather and mechanical damage (if planting delayed) and to keep roots moist as specified by the horticulture best practices. 4.5. Planting pits, beds, and trenches with vertical sides excavated with bottom of excavation slightly raised at centre to provide proper drainage in accordance with the horticulture best practices. 4.6. Hard subsoil in bottom of excavation mitigated as specified by the planting excavation guideline and specification. 4.7. Dispose of subsoil removed from planting excavations area to avoid reuse of planting soil or use as backfill as stated by the work requirement.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
			5. Implement transplanting work.	5.1. Transplanting plants selected in accordance with the planting list provided or the planting work plan. 5.2. Rejected plants removed out from the site in accordance with the job requirements. 5.3. Transplanting holes/pits excavated at designated marks as specified by planting plan. 5.4. Plants removed from the container with care using prescribed techniques as stated in the planting guideline. 5.5. Soil placed around and under the root ball according to the horticulture best practices 5.6. Plants watering and fertilising conducted in a safe and environmentally appropriate manner according to the enterprise guidelines.
			6. Carry out turfing works.	6.1. Turfing types labelled and tagged properly based on the purpose and maintenance needs. 6.2 Turfing material cut with garden or turfing knife where required with respects to the

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				standard operating procedure (SOP) provided. 6.3. Planting media raked to level according to the work specifications. 6.4 A wheelbarrow and other turfing tools used for moving turf materials closer to actual site, prior to the turf laying process. 6.5 Turf laying executed according to the work specification and superior's work order. 6.6 Finished turfing works recorded as specified by the standard operating procedure.
5. Plants Establishment	F439-002-2:2017-C05	Plants Establishment describes the competency in maintaining the plants, trees and shrubs by providing the ongoing care at the beginning, during and end of the growing season. It involves skills set such as pruning and fertilizing to help them begin to grow energetically and regular water, fertilizer	1. Irrigate landscape plants.	1.1. Amount of water determined according to the types of soils and plants watering tabulation sheets. 1.2. Watering tools, equipment and machinery arranged as specified by the planting work requirements. 1.3. Plants watering carried out as stated in the watering schedule. 1.4. Plants suffered less or excessive water identified according to the soil condition

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		and maintenance to ensure that the plants stay healthy. A competent person in this CU shall be able to irrigate landscape plants, apply landscape plant fertiliser, perform plants mulching, install plants staking, handle plant protection, execute weed control works, carry out plants pest and disease (P&D) prevention and control, and implement plants trimming and pruning. The outcome of this competency is to ensure a beautiful horticultural area in accordance with the contract's planting works installation and maintenance manual/guidelines.		guidelines. 1.5. Watering techniques conducted according to the type of plants and worked specifications. 1.6. Drip systems and other water conserving irrigation system installed as stated by the design specifications.
			2. Apply landscape plant fertiliser.	2.1. Sample of landscape plants collected for fertiliser analysis according to the fertiliser requirements and procedure. 2.2. Types of fertilisers selected as specified by plant nutritional guidelines and standards. 2.3. Tools and equipment gathered according to landscape fertiliser manual. 2.4. Fertiliser dosage applied in accordance with plant nutritional requirements. 2.5. Clean and safe areas maintained according to the work specification and SHE procedures.
			3. Perform plants mulching.	3.1. Mulching materials identified in accordance with the types of mulches and plants.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				3.2. Mulching methods selected based on the types of plant and plant locations. 3.3. Mulching scheduling utilised according to plantings growth development. 3.4. Mulching materials laid over the plant bed as stated in the planting procedure. 3.5. Depth of mulch maintained as stated in planting works operating manual. 3.6. Mulching activities reported according to the horticulture best practices.
			4. Install plants staking.	4.1. Plants staking requirements arranged in accordance with the design plans. 4.2. Landscape plants marked and counted as specified in design specifications. 4.3. Staking methods applied as specified by the planting procedures. 4.4. Staking materials allocated in line with the stalking operation and maintenance manual. 4.5. Staking installations carried out by following the work

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				requirements. 4.6. Unserviceable staking dismantled as stated in the job requirements. 4.7. Dismantled staking materials stored according to standard operating procedures.
			5. Handle plant protection.	5.1. The site superior written instruction interpreted according to the work requirement. 5.2. Protected plants identified based as specified by the site superior written instructions. 5.3. List of tools and equipment required prepared as stated in the work plan. 5.4. Tools, equipment and protection materials delivered to site as per the work plan requirements. 5.5. Plants protection materials erected according to the protection procedure for existing and new plants. 5.6 The work site cleaned in accordance with the work safety procedure.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
			6. Execute weed control works.	6.1. Weeding areas secured as specified in the job requirements. 6.2. Weed species identified according to the plants list and guidelines. 6.3. Identified weeds listed as stated in the planting procedures. 6.4. Weeding control method applied consistent with the weeding operation and maintenance manuals. 6.5. Weed species removed as specified by the horticulture practices. 6.6. Weeding area cleaned from all debris in compliance with the SOP and safety requirements
			7. Carry out plants pest and disease (P&D) prevention and control.	7.1 Pests and disease (P&D) identified according to the common pests and disease maintenance guidelines horticultural best practices. 7.2. Infested and diseased plants labelled in accordance with the horticultural best practices.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				7.3. P&D hazards categorized as stated in the plant health care procedures. 7.4. P&D risks recorded as specified in the safety, health and environment (SHE) processes. 7.5. Plant P&D prevention and control method executed as stipulated in the horticultural best practices. 7.6. P&D prevention and control work progress reported according to the accepted landscape best practices.
			8. Implement plants trimming and pruning.	8.1. Trimming and pruning of plants classified according to the plants maintenance standards. 8.2. Tools and equipment pre-operational and safety check carried out according to the manufacturer's specifications. 8.3. Trimming and pruning materials prepared in compliance with the work requirements. 8.4. Site area protected with security and warning devices

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				as stated in the maintenance procedures. 8.5. Landscape plants trimmed and pruned according to the job requirements and specifications. 8.6. Trimming and pruning wastes disposed out of the site as specified in SHE standards.
6. Landscape Site Reinstatement	F439-002-2:2017-C06	Landscape Site Reinstatement describes the competency to keep the landscape areas clean and tidy at all times and dispose of all waste materials arising from the cleaning. These include removing and clear all debris, waste and/or any excess materials, construction plant, and temporary works from the site and do all things to clear up the site. A competent person in this CU shall be able to	1. Prepare cleaning and waste disposal requirements.	1.1. Construction waste and dispose collection centre selected as stated in the location plan. 1.2. Working area variation identified according to the work requirements. 1.3. Waste materials collection tools and equipment prepared as specified by the work requirements. 1.4. Serviceability of tools and equipment checked according to the operation and maintenance records. 1.5. Waste materials categorized according to the performed landscape construction work type. 1.6. Method and procedures for collecting waste materials

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		prepare cleaning and waste disposal requirements, coordinate construction wastes material disposal activities, carry out landscapeimplementation site cleaning, perform final inspection and carry out 'making good' landscape construction defects. The outcome of this competency is to ensure any damage to or pollution or the creation of any health or environmental hazard prevented at or around or adjacent to the site in accordance with the contract document and design drawings.		determined as specified by the operational procedures.
			2. Coordinate construction waste material disposal activities.	2.1. The construction design reviewed and discuss with superior in terms of environmental friendliness and waste generation. 2.2. Waste material loading and unloading activities schedule arranged as stated in the work requirements. 2.3. Manpower requirement allocated as specified by the work plan. 2.4. Disposal vehicles arranged in terms of the types and quantity of waste materials. 2.5. Construction waste material kept clean and separated to maintain reusability or recyclability in compliance with the construction waste management guideline. 2.6. Reporting procedures determined in accordance with the accepted industry practices. 2.7. The disposal data gathered and documented as specified by the work requirements.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
			3. Carry out landscape implementation site cleaning.	3.1. Landscape site cleaning work checklist utilised in accordance with the job requirements. 3.2. Method for site cleaning executed in accordance with the local authority requirements. 3.3. Landscape structures and features site cleaning conducted as stated in the work requirements. 3.4. Planting site cleaning executed as specified by the planting procedures. 3.5. Landscape development site cleaning works checklist updated in accordance with local authority requirements. 3.6 All reports recorded and submitted to superior in compliance with contract and local authority requirements.
			4. Perform final inspection.	4.1. A final inspection checklist prepared on the authority of the site superior. 4.2. All relevant documentation requirements reviewed to check deviations to the approved plan. 4.3. Violations to electrical code

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				identified as stated in the final inspection checklist. 4.4. Overcutting, penetrating and notching structural frame elements determined within the allowable range as specified in the SOP. 4.5. Safety clearances violation estimated in compliance with the contract safety requirements.
			5. Carry out 'making good' landscape construction defects .	5.1. Claimed defects checked with respect to the contract documents and design drawings. 5.2. Relevant local authorities engaged for final inspections of claimed defects in accordance with contract specifications. 5.3. List of remedial works prepared according to the final inspection reports and accepted industry practice. 5.4. Tools, equipment and machine involve organized upon the endorsement on the defect claims as specified in the contract documents. 5.5. Remedial works carried out in

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				accordance with the superior approval and work requirement. 5.6 Finished remedial works inspected prior to landscape reinstatement 5.7 Reports on remedial works checked and documented prior submission to superior for endorsement and approval.
7. Plants Handling and Care (Holding Area).	F439-002-2:2017-C07	Plants, Handling and Care (Holding Area) describe the competency in the cultivation and care of all varieties of plants in different weather conditions and protect them against major diseases. A competent person in this CU shall be able to perform special plant protection, carry out plant temporary labelling/tagging, execute plants arrangement, and	1. Perform special plant protection.	1.1. Special plant protection measures identified in terms of plant performance, storage protection requirement and plants quarantine purposes. 1.2. Equipment and materials for special plant protection organised based on the weather condition and type of major diseases. 1.3. Special plant protection environmental impacts discussed with superior (whenever necessary) as specified by the work order. 1.4. Suitable personal protective clothing selected and checked prior to use as specified by the OHS/SHE guideline.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		carry out plants care as stipulated in the contract operation and maintenance procedures. The outcome of this competency is to ensure the landscape's appearance, vitality, and the tree's safety maintained or improved using the most cost-effective and environmentally sensitive practices and treatments available in accordance with the horticulture standard practice guidelines/the planting procedures/the contract operating and maintenance manuals.		1.5. Thermal and mechanical specific plant protective measures employed in terms of timing, location and intensity to ensure maximum effectiveness with minimum detriment to beneficial organisms and allow plant acclimatization. 1.6. Alternative pest identification diagnostic methods used to enhance the speed and precision of the identification process according to horticulture best practices. 1.7. Site quarantine and biosecurity protocols practiced in accordance with the accepted horticultural best practices.
			2. Carry out plant temporary labelling/tagging.	2.1. Plants species determined according to plant list as specified by the design plan and work requirements. 2.2. Suitable label/tag materials secured according to the work specification and requirement. 2.3. Temporary labels/tags prepared for each plant with information in terms of plant numbering, species scientific

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				name, common name, date of arrival at holding site, name of plant supplier. 2.4. Plant temporary labels/tags placed on plants using suitable string/wire in accordance with the arboriculture and horticulture best practices 2.5. Progress works recorded and reported as specified in the work standard operating procedures. 2.6. All work done progress recorded and reported as imposed by the work order.
			3. Execute plants arrangement.	3.1. Plants arrangement executed as stated by the work order. 3.2. Site for holding plants received located according to the plant sources or suppliers 3.3. Plant beds/site prepared to accommodate plants at site in accordance with the horticulture best practices. 3.4. Plants arranged properly according to species, type and size of plants, and name of supplier. 3.5. Carry out plant staking and guying according to the type

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				of plants and requirements. 3.6. Works done recorded and as specified by the work requirement and the contract procedures.
			4. Carry out plant care.	4.1 Weeding area, tools and weedicides determined as specified by the work requirements. 4.2. Weeding methods (general or circle) applied according to the plants needs and work requirements. 4.3. Plants withering, scorching, sturdiness and stress checked from over watering and due to weather condition as required by the specification. 4.4. Plants pests and disease identified as specified by the SOP. 4.5. Immediate remedy carried out (if require) as per arboriculture and/or horticulture best practices. 4.6. Plants shading structure erected and nets placed to acclimatise plants in accordance with the horticulture best practices.

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				4.7. Suitable irrigation system selected according to plants types and requirement. 4.8. Excessive water drained out to avoid water ponding at site as stated by the contract requirement.

CURRICULUM

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR;

LANDSCAPE CONSTRUCTION

LEVEL 2

15. CURRICULUM OF COMPETENCY UNIT (COCU)

SECTOR	**CONSTRUCTION (F)**						
SUB SECTOR	**OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)**						
AREA	**LANDSCAPE CONSTRUCTION**						
NOSS TITLE	**LANDSCAPE CONSTRUCTION**						
COMPETENCY UNIT TITLE	**LANDSCAPE CONSTRUCTION SITE PREPARATION**						
PRE-REQUISITE (if applicable)	-						
LEARNING OUTCOMES	The outcome of this competency is to ensure efficient and good landscape site that will ease the implementation of landscape construction works created in accordance with the contract document requirement and the landscape design. Upon completion of this competency unit trainees will be able to: 1. Prepare site work requirement 2. Perform site mobilisation works 3. Prepare on site material inventory. 4. Execute pre-earthwork activities. 5. Prepare plant materials.						
COMPETENCY UNIT ID	F439-002-2:2017-C01	**LEVEL**	TWO (2)	**TRAINING DURATION**	160	**SKILLS CREDIT**	**16**

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
1. Prepare site work requirements.	1.1 Site organisational structure. • Client, • Overall Project Manager • Landscape Consultant	1.1 Identify site organisational structure. 1.2 Determine specific work order. 1.3 Differentiate various types	Attitude • Consciousness towards time and cost	Related Knowledge 8	Related Knowledge Lecture Group discussion Group assignment	1.1 Site organisational structure recognised to conform site line of order as stated in the standard operating procedure. 1.2 Specific work order determined as stated

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Site Management Team: ▪ Project Director ▪ Project Manager ▪ Supervisor 1.2 Work specification elements. • Work program • Work order • Work phasing/ sequencing/ scheduling • Work area and work area variation • Work requirement 1.3 Landscape construction drawings. • Symbols • Legend • Drawing scale 1.4 Type of landscape elements. • Hard landscape	and usage of landscape construction drawings. 1.4 Recognise symbols, legend and scale of drawing. 1.5 Locate work area base on landscape construction drawings. 1.6 Recognise work area variation (if any). 1.7 Identify types of landscape elements. 1.8 Select site setting out and clearing tools, equipment and materials. 1.9 Apply measuring and handling of tools, equipment and	<u>Safety</u> • Awareness to safety procedure <u>Environment</u> • Creativities in adopting green technology practices	<u>Related Skill</u> 16	Site visit <u>Related Skill</u> Demonstration Role play Observation Simulation Hands-on practice	by the work plan. 1.3 Landscape construction drawings types and usage differentiated based on the drawings details. 1.4 Work area and work area variation recognised base on landscape construction drawings. 1.5 Site setting out and clearing tools, equipment and materials selected according to the work plan. 1.6 Equipment tools, and site material handling procedure applied in compliance with the contract operating manual and procedure. 1.7 Reporting procedures applied for site data reporting as specified by the work order.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Soft landscape (planting works) 1.5 Site access and facilities. • Site entrance and exit way • Parking area, and etc. 1.6 Site tools equipment, and machinery requirement. • Setting out • Clearing • Measuring tools 1.7 Landscape protection and preservation areas. • Wetlands and landscape sensitive areas, • Buffer zones, • Filter strips, • Trees requiring special protection area 1.8 Landscape and tree preservation (Act A933)	material. 1.10 Use GPS or IT gadget to secure required landscape tree preservation and conservation area. 1.11 Engage rehabilitation measures during construction work. 1.12 Select data and apply reporting procedures.				

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	1.9 Reduce, reuse and recycle (3R) concept 1.10 Data and reporting procedures. • Format • Report content • Digital data					
2. Perform site mobilisation works.	2.1 Health and Safety Procedures. • Occupational Safety and Health Act 1994 • Occupational Safety and Health Officer Regulations • Factories and Machinery Act 1974. • Personal Protective Equipment (PPE) • Tools and equipment serviceability procedure. 2.2 Emergency	2.1 Comply with site safety procedures. 2.2 Determine serviceability of tools and equipment. 2.3 Identify types of storage bay. 2.4 Identify materials and storage requirements. 2.5 Locate storage location, loading / unloading points and delivery routes. 2.6 Interpret work and delivery	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Creativities in adopting green technology practices	<u>Related Knowledge</u> 8 <u>Related Skill</u> 28	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	2.1 Site safety procedures complied in accordance with the OHS/SHE procedures. 2.2 Tools and equipment serviceability determined following the manufacture operating manuals. 2.3 Storage bay types identified base on the materials and storage requirements 2.4 Storage location, located according to the work and delivery schedule. 2.5 Housekeeping works carried out in compliance with site

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	Procedures. • Chemicals hazard injuries • Vehicles and mobile apparatus Accident • Fire outbreak • First aid kits or boxes 2.3 Storage Policies. • Type of storage bay: ▪ Open storage, ▪ Sheltered storage • Storage materials and storage requirements • Storage location or position criteria • Storage capacity • Housekeeping techniques and guidelines 2.4 Plants species.	schedule. 2.7 Carry out housekeeping work. 2.8 Recognise plants and their characteristics . 2.9 Carry out plants maintenance.				safety procedure. 2.6 Plants maintenance identified in consistence with plants characteristic 2.7 Data inventory report prepared and updated according to the acceptable industry practice.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Trees • Palms • Shrubs • Groundcovers • Turf 2.5 Green technology. • Equipment • Biodegradable materials					
3. Prepare on-site materials inventory.	3.1 On-site materials classification and specification. 3.2 Type of on-site materials inventory. • Existing landscape, • Hard landscape and, • Planting materials. 3.3 Materials storage and handling techniques. • Wheeled Trolley • Forklift Truck	3.1 Determine the specific work order of on-site material inventory. 3.2 Identify type of on-site materials inventory. 3.3 Identify tools, equipment and materials on-site. 3.4 Determine on-site materials required and received quantity. 3.5 Select best	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Creativities in adopting green technology practices	<u>Related Knowledge</u> 8 <u>Related Skill</u> 24	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On	3.1 The on-site material inventory specific work order determined upon approval of the site superior. 3.2 The on-site materials inventory type identified based on the work order. 3.3 The on-site tools, equipment and materials identified as stated by the word order. 3.4 The on-site materials quantity required and received determined

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Trailer • Conveyors • Overhead Crane • Industrial Robot • Automated Guided Vehicles 3.4 Best practice inventory management. • Financial concepts - balance sheet reporting of inventory values • First In, First Out (FIFO) and Last In, Last Out (LIFO) physical control 3.5 Data reporting. • Format • Procedures • Digital data	/acceptable industry practice on reporting format and procedures. 3.6 Prepare and update data inventory report.			Practice	according to the work requirement. 3.5 Best industry reporting format used as specified in the contract requirement.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
4. Execute pre-earthwork activities.	4.1 Pre-earthwork elements. • Design criteria • Construction requirements • Earthwork level • Work scheduling • Work progress 4.2 Pre-earthwork marking system and tools. • Tape • Peg • Flag system 4.3 Pre-earthworks cut and fill (levelling) tabulation. • Original elevations • Proposed elevations • Cut areas • Fill areas • Cut and fill calculations 4.4 Basic introduction on landscape subsoil, drainage system, and piping work. • Soil moisture relationship	4.1 Conform pre-earthwork levels and invert levels. 4.2 Mark pre-earthwork invert levels using flags. 4.3 Determine cut and fill pre-earthworks site area. 4.4 Recheck cut and fill pre-earthworks tabulation. 4.5 Arrange pre-earthwork loading and unloading activities. 4.6 Use marking tools to secure subsoil, drainage system, and piping work area. 4.7 Prepare pre-earthwork clearing and cleaning activity. 4.8 Record pre-	Attitude • Consciousness towards time and cost Safety • Adherence to safety procedure Environment • Embracing sustainable and green culture 57	Related Knowledge 8 Related Skill 20	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill Demonstration Role Play Observation Simulation Hands-On Practice	4.1 Pre-earthwork levels conformed as indicated in the landscape drawings. 4.2. Pre-earthwork invert levels marked using flags systematically in accordance with the design plans and construction requirements. 4.3. Pre-earthworks cut and fill rechecked in conformance with the levelling tabulation documents. 4.4. Loading and unloading activities carried out according to the work schedules. 4.5. Working area for subsoil, drainage system, and piping secured as indicated in the design drawings. 4.6. Pre-earthwork cleaning activities conducted as stated in the contract requirement. 4.7. Pre-earthwork

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
5. Prepare plant materials.	5.1 General type of plants. • Tree • Palm • Bamboo • Shrubs • Hedge • Herbaceous Plants • Climbers • Ground Cover • Hedging Plants 5.2 Type of planting medium. • Sand • Soil • Gravel • Biodegradable materials 5.3 Plants handling and care. • During transit • During construction • During planting • During transplanting	5.1 Select plants type. 5.2 Ascertain quantity required. 5.3 Ascertain characteristics of planting medium. 5.4 Determine handling techniques. 5.5 Identify type of underground services in landscape construction. 5.6 Identify position and thickness of planting bed. 5.7 Apply measuring technique. 5.8 Conform quantity of soil mixture and fertilizer used. 5.9 Conform disposal of unwanted	Attitude • Consciousness towards time and cost Safety • Adherence to safety procedure Environment • Creativities in adopting sustainable environmental concept	Related Knowledge 10 Related Skill 30	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill Demonstration Role Play Observation Simulation Hands-On Practice	5.1 Plants type selected based on plants species and categories 5.2 Plants quantity ascertained in accordance with the work requirements 5.3 Panting medium composed as per the work order. 5.4 Plants handling techniques chose as specified by the planting guideline. 5.5Underground services type recognised as indicated by the design plan. 5.6 Planting bed position and thickness formulated in accordance with the planting guideline. 5.7 Soil mixture and fertiliser quantity modified according to the work order. 5.8 Unwanted materials disposed as per

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	5.4 Type of underground services. • Electricity cables • Gas pipes • Water pipes and sewers • Telecommunication cables 5.5 Type of trenches. • Shallow trenches • Deep trenches 5.6 Planting procedure on plants pit holes. • Dimensions and measuring technique • Quantity of soil mixture • Type of plants fertilizer • Types of plants container	materials.				superior's approval.

Employability Skills

Core Abilities		Social Skills
01.01	Identify and gather information	1. Communication skills
01.02	Document information, procedures or processes	2. Conceptual skills
01.03	Utilize basic IT applications	3. Interpersonal skills
01.04	Analyse information	4. Learning skills
01.05	Utilize the internet to locate and gather information	5. Leadership skills
01.06	Utilize word processor to process information	6. Multitasking and prioritising
02.01	Interpret and follow manuals, instructions and SOP's	7. Self-discipline
02.02	Follow telephone/ telecommunication procedures	8. Teamwork
02.03	Communicate clearly	
02.04	Prepare brief reports and checklists using standard forms	
02.05	Read/interpret flowcharts and pictorial information	
02.06	Write memos and letters	
02.07	Utilize Local Area Network (LAN)/Internet to exchange	
02.08	information	
	Prepare pictorial and graphic information	
03.01	Apply cultural requirements to the workplace	
03.02	Demonstrate integrity and apply ethical practices	
03.03	Accept responsibility for own work and work area	
03.04	Seek and act constructively upon feedback about	
03.05	performance	
	Demonstrate safety skills	
03.06	Respond appropriately to people and situations	
03.07	Resolve interpersonal conflicts	
03.08	Develop and maintain a cooperation within work group	
04. 01	Organize own work activities	

Core Abilities	Social Skills
04.02 Set and revise own objectives and goals 04.03 Organize and maintain own workplace 04.04 Apply problem solving strategies 04.05 Demonstrate initiative and flexibility 06.01 Understand systems 06.02 Comply with and follow chain of command 06.03 Identify and highlight problems 06.04 Adapt competencies to new situations / systems 06.05 Analyse technical systems 06.06 Monitor and correct performance of systems	

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Organisational chart	1 : 5
2. Contract Documents, Work Program, Work Plan, Work Order	1 : 5
3. Landscape Drawings, Design Drawings, Working Drawings	1 : 5
4. Clearing and Cleaning Tools:	
• Axe (Pick Axe)	1 : 1
• Broom	1 : 1
• Brush	1 : 1
• Fork	1 : 1
• Hammer	1 : 1
• Handsaw	1 : 5
• Hoe	1 : 1
• Parang	1 : 1
• Rake	1 : 1

ITEMS	RATIO (TEM : Trainees)
• Scatters	1 : 1
• Scythe	1 : 1
• Sickle	1 : 1
• Spade	1 : 1
5. Clearing and Cleaning Equipment and Machinery:	
• Blower	1 : 5
• Bucket	1 : 5
• Chainsaw	1 : 5
• Cutter	1 : 5
• Generator set	1 : 5
• Hacker	1 : 5
• Power ripper	1 : 5
• Wheel barrow	1 : 5
6. Clearing and Cleaning Materials:	
• Broom	1 : 5
• Brush	1 : 5
• Fuel	1 : 5
• Garbage bag	1 : 5
• Hand tool	1 : 5
• Lubricant	1 : 5
• Marking tape	1 : 5
• Nails	1 : 5
• Paint	1 : 5
• Rope	1 : 5
• Spade	1 : 5
• Timber	1 : 5
• Wire rope	1 : 5
7. Plants Material:	
• Annuals plants	As required

ITEMS	RATIO (TEM : Trainees)
• Shrubs	As required
• Trees	As required
• Trees and shrubs with compound leaves	As required
• Evergreen groundcovers	As required
• Evergreen shrubs with showy fruit	As required
• Needled Conifers	As required
• Scale-Leaved Conifers	As required
• Interior Plants	As required
• Broad-Leaved Evergreens	As required
• Grasses and Evergreen Herbaceous Perennials	As required
• Non-Evergreen Herbaceous Perennials	As required
• Spring Flowering Trees and Shrubs	As required
8. Safety kit :	
• Safety tape	1 : 5
• Safety barriers	1 : 5
• Cone	1 : 5
• Safety signage	1 : 5
• First aid kit	1 : 5
• PPE attire:	
▪ Earplugs	1 : 1
▪ Earmuffs	1 : 1
▪ Hard hats	1 : 1
▪ Safety goggles (glasses)	1 : 1
▪ Gloves (e.g. dielectric rubber glove)	1 : 1
▪ Full-face mask	1 : 1
▪ Safety footwear/boots	1 : 1
▪ Safety helmet	1 : 1

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16. CURRICULUM OF COMPETENCY UNIT (COCU)

SECTOR	**CONSTRUCTION (F)**						
SUB SECTOR	**OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)**						
AREA	**LANDSCAPE CONSTRUCTION**						
NOSS TITLE	**LANDSCAPE CONSTRUCTION**						
COMPETENCY UNIT TITLE	**LANDSCAPE CONSTRUCTION ENGINEERING WORK**						
PRE-REQUISITE (if applicable)	-						
LEARNING OUTCOMES	The outcome of this competency is to ensure the landscape design works that include grading or reshaping of land, to improve drainage and installing a sub-surface drainage system on time and within the budgets performed in accordance with the contract specification, and design plan. Upon completion of this competency unit trainees will be able to: 1. Carry out internal drainage system works. 2. Install internal irrigation system works. 3. Execute internal sewerage and sanitary system 4. Operate landscape lighting work. 5. Construct water features.						
COMPETENCY UNIT ID	F439-002-2:2017-C02	**LEVEL**	TWO (2)	**TRAINING DURATION**	160	**SKILLS CREDIT**	**16**

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
1. Carry out internal drainage system works.	1.1 Components of contract documents and usage. • Work specification	1.1 Check work plan against work schedule. 1.2 Peg drainage route at site as required.	Attitude • Consciousnes s towards time and cost	Related Knowledge 8	Related Knowledge Lecture Group Discussion/	1.1 Work plan conformed in consistence with the work schedule. 1.2 Drainage route pegged at site as indicated by the working drawings.

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	• Approved landscape construction drawings • Schedule of Rates, and • Bills of Quantities 1.2 Elements of drainage system drawings. • Symbols • Legends • Scales 1.3 Marking tools. • Tape • Pegs • Labels 1.4 Formwork materials and characteristics • Timber formwork • Steel formwork. 1.5 Type of subsoil pipes.	1.3 Check invert level at few points along drainage route. 1.4 Prepare formwork for concreting work. 1.5 Lay gravels and subsoil pipes or concrete pipe 1.6 Pour concrete mixture. 1.7 Lay and compact backfilling materials. 1.8 Record and submit work done to superior.	<u>Safety</u> • Adherence to safety procedures <u>Environment</u> • Embracing sustainable /green environmental	<u>Related Skill</u> 28	Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	1.3 Invert level setat few points along drainage route as per the work order. 1.4 Formwork installed for concreting work according to the detail drawings. 1.5 Gravels and subsoil pipes or concrete pipe laid in accordance with the working drawings. 1.6 Concrete mixture poured as specified by the work order. 1.7 Backfilling materials laid and compacted according to the procedure. 1.8 All work done recorded and submitted to superior.

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	• Ceramic pipes • Unreinforced concrete pipes • Reinforced Concrete pipes • Corrugated steel pipes • Nestable corrugated steel pipes 1.6 Classification of subsoil pipes • Rigid pipes • Flexible pipes 1.7 Reduce, reuse and recycle concept 1.8 Work progress reporting technique.					
2. Install internal irrigation system works.	2.1 Two basic types of irrigation systems. • Pen canal	2.1 Check internal irrigation system work plans. 2.2 Select tools	<u>Attitude</u> • Consciousnes s towards time and cost	<u>Related Knowledge</u> 8	<u>Related Knowledge</u> Lecture Group	2.1 Internal irrigation system type selected as stated by the work order. 2.2 Concreting tools and equipment organised as

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	systems • Pressured piped systems 2.2 Use of irrigation plan and drawings • Symbols • Legends • Scales 2.3 Type of concreting tools, equipment and machinery for infrastructure works. • Concrete mixers • Construction equipment • Brick making machines • Mobile concrete mixers 2.4 Irrigation techniques. • Traditional surface	and equipment. 2.3 Check quantity of irrigation materials brought to site. 2.4 Peg internal irrigation line according to the design plan 2.5 Execute infrastructure works. 2.6 Lay internal irrigation pipes. 2.7 Install filter, pump system and overhead irrigation line system. 2.8 Record work done.	<u>Safety</u> • Adherence to safety procedures <u>Environment</u> • Creativeness towards sustainable /green environmental	<u>Related Skill</u> 24	Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	per the work requirements. 2.3 Irrigation materials and quality checked in accordance with the contract specification. 2.4 Infrastructure works for internal irrigation system built as per the work order. 2.5 Internal irrigation pipes fixed for testing and commissioning as indicated by the working drawing. 2.6 Finished work data updated in accordance with the accepted industry practice.

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	irrigation • Piped irrigation techniques 2.5 The main component of piped systems. • The control station (head control unit) • The mains and submains (pipelines) • The hydrants • The manifolds (feeder pipelines) • The laterals (irrigating pipelines) with the emitters 2.6 Method of laying internal irrigation pipes. 2.7 Work reporting procedures. 2.8 Rain water					

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	harvesting system concept					
3. Execute internal sewerage and sanitary system.	3.1 Introduction to sewerage and sanitary system. • Purpose • Design Requirements • sanitary sewer systems Mainline • Manholes • Laterals • Testing and Inspection • Construction Specifications 3.2 Sewerage and sanitary components. • Pipes, • Filters, • Pump system, etc.	3.1 Gather sewerage and sanitary system work plans. 3.2 Check materials and quantity for sewerage pipes and sanitary system. 3.3 Mark sewerage and sanitary lines on site. 3.4 Execute infrastructure base work. 3.5 Install internal sewerage pipes, filter and pump system. 3.6 Assist in testing and commissioning works for pump system. 3.7 Fill sewerage	Attitude • Consciousness towards time and cost Safety • Adherence to safety procedures Environment • Creativeness towards sustainable /green environmental	Related Knowledge 8 Related Skill 28	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill Demonstration Role Play Observation Simulation Hands-On Practice	3.1 Sewerage and sanitary system work plans interpreted base on work orders. 3.2 Materials quantity conformed according to the sewerage pipes and sanitary system requirements. 3.3 Internal sewerage and sanitary lines marked on site at precise position as indicated in the working drawings. 3.4 Infrastructure base work executed according to the work plan. 3.5 Sewerage pipes, filter and pump system installed in compliance with the manufacturing procedure. 3.6 Testing and commissioning works for pump system ran efficiently as specified by the work plan. 3.7 Status work done recorded

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	3.3 Method of setting out sewerage and sanitary pipe line. 3.4 Zero waste concept 3.5 Best industry practices on work reporting procedures.	and sanitary pipe line with gravels/soil to grade. 3.8 Record all work done.				and submitted to superior for endorsement.
4. Operate landscape lighting work.	4.1 Basic introduction to landscape lighting work • Type of landscape lighting system, • Usage of landscape lighting, • Lighting material, • Lighting components, and • Lighting fittings/fixtures	4.1 Check landscape lighting plan and fixtures. 4.2 Mark line and lay lighting cables. 4.3 Excavate ground for underground utility. 4.4 Prepare trenches for cable path. 4.5 Terminate lighting cable for power supply.	<u>Attitude</u> • Consciousnes s towards time and cost <u>Safety</u> • Adherence to safety procedures <u>Environment</u> • Creativeness towards sustainable /green	<u>Related Knowledge</u> 8 <u>Related Skill</u> 24	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstratio n Role Play Observation	4.1 Landscape lighting plan and fixtures used in accordance with the work orders. 4.2 Lighting cables line marked and laid as indicated by the working drawings. 4.3 Ground excavated for underground utility as specified by the work orders. 4.4 Trenches for cable path dug on site according to the work plan. 4.5 Lighting cable terminated for power supply in compliance with the

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	4.2 Landscape lighting tools, and equipment. • Three modes connection • Adjustable power • AC power tracking • Extended range for the largest irrigation systems • Power hum rejection • Sealed controls and display 4.3 Landscape lighting installation techniques. • Area lighting, • Accent lighting, • Uplighting, • Downlighting,	4.6 Install lighting system components and connect fittings. 4.7 Energise lighting system 4.8 Record and submit work progress and work done record to superior.	environmental		Simulation Hands-On Practice	lighting installation procedure. 4.6 Lighting components installed and fittings connected as per the work order. 4.7 Work progress recorded and submitted to superior timely.

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	• Moonlighting, • Silhouetting (backlighting), • Grazing, and • Spotlighting • Energy saving/LED bulbs. 4.5 Safety practices in landscape lighting system. 4.6 Data reporting format and technique.					
5. Construct water features.	5.1 Type of water features. • Ponds / water gardens • Pond-less waterfalls • Retaining wall waterfalls • Bubbling rock fountains 5.2 Types of water garden pumps (energy saving), styles,	5.1 Check working drawings to prepare water features materials. 5.2 Mark location for water features base and frame. 5.3 Erect water features. 5.4 Lay ducting/trunking for electrical	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Adherence to safety procedures	<u>Related Knowledge</u> 10 <u>Related</u>	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit. <u>Related</u>	5.1 Water features materials arranged in accordance with the work specification. 5.2 Water features base and frame located on precise marked position as indicated by the working drawings. 5.3 Electrical cabling ducting/ trunking laid according to the electrical installation procedure. 5.4 Water proofing layer applied to water features

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	features and the advantages. • Submersible • External • Magnetic drive • Direct drive 5.3 Purpose and type of water inlet, outlets and controls pipes • Orifice control. • Dropped kerb inlet • Slot weir outlet • Slot weir outlet with steel plate • Overflow outlet • Shallow geocellular storage 5.4 Water proofing materials for landscape water features. • Polyurethane • Waterproof cement	cabling and pump installation. 5.5 Lay water proofing layer. 5.6 Install pipes for water inlet and outlet. 5.7 Assist in water leakage and electrical supply malfunction test. 5.8 Submit records to superior.	<u>Environment</u> • Creativeness towards sustainable /green environmental	<u>Skill</u> 24	<u>Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice.	components as per specified by the work orders. 5.5 Water inlet and outlet pipes installed according to the working drawings. 5.7 Water leakage and electrical supply malfunction testing assisted in compliance with the testing procedure. 5.8 Work progress records submitted to superior.

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	• Bitumen • Fibreglass 5.6 Testing and commissioning of water features pump system. • Test for water leakage • Electrical supply malfunction 5.7 Work reporting procedures – digital data.					

Employability Skills

Core Abilities		Social Skills
01.01	Identify and gather information	1. Communication skills
01.02	Document information, procedures or processes	2. Conceptual skills
01.03	Utilize basic IT applications	3. Interpersonal skills
01.04	Analyse information	4. Learning skills
01.05	Utilize the internet to locate and gather information	5. Leadership skills
01.06	Utilize word processor to process information	6. Multitasking and prioritising
02.01	Interpret and follow manuals, instructions and SOP's	
02.02	Follow telephone/ telecommunication procedures	

Core Abilities		Social Skills
02.03	Communicate clearly	7. Self-discipline
02.04	Prepare brief reports and checklists using standard forms	8. Teamwork
02.05	Read/interpret flowcharts and pictorial information	
02.06	Write memos and letters	
02.07	Utilize Local Area Network (LAN)/Internet to exchange information	
02.08	Prepare pictorial and graphic information	
03.01	Apply cultural requirements to the workplace	
03.02	Demonstrate integrity and apply ethical practices	
03.03	Accept responsibility for own work and work area	
03.04	Seek and act constructively upon feedback about performance	
03.05	Demonstrate safety skills	
03.06	Respond appropriately to people and situations	
03.07	Resolve interpersonal conflicts	
03.08	Develop and maintain a cooperation within work group	
04. 01	Organize own work activities	
04.02	Set and revise own objectives and goals	
04.03	Organize and maintain own workplace	
04.04	Apply problem solving strategies	
04.05	Demonstrate initiative and flexibility	
06.01	Understand systems	
06.02	Comply with and follow chain of command	
06.03	Identify and highlight problems	
06.04	Adapt competencies to new situations / systems	
06.05	Analyse technical systems	
06.06	Monitor and correct performance of systems	

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Organisational Chart	1 : 5
2. Contract Documents, Work Program, Work Plan, Work Order	1 : 5
3. Landscape Drawings, Design Drawings, Working Drawings	1 : 5
4. Measuring and Surveying - Setting Out Materials:	1 : 5
• Steel line pin safety caps for top of line pins	1 : 5
• Wire nail	1 : 5
• Wooden profile board	1 : 5
• Wooden setting out micro peg	1 : 5
• Wooden Setting Out Stake	1 : 5
• Wooden setting out stake rake	1 : 5
5. Contractors Tools:	
• Steel Digging Tools	1 : 5
▪ Cable laying shovel	1 : 5
▪ Clay grafting tool	1 : 5
▪ Draining tool	1 : 5
▪ Trenching fork	1 : 5
▪ Trenching shovel	1 : 5
▪ Cable laying shovel fibreglass shaft, etc.	1 : 5
• Floor Scraper c/w Wooden Handle	1 : 5
• Picks and Mattocks	1 : 5
• Post Hole Diggers	1 : 5
• Rakes	1 : 5
• Rammers and Crowbars	1 : 5
• Wheelbarrows	1 : 5

ITEMS	RATIO (TEM : Trainees)
• Concrete test cube tamping bar	1 : 5
• Concrete Test Equipment:	
• Cast iron concrete test cube mould	
▪ Concrete testing slump cone	1 : 5
▪ Slump cone tamping rod	1 : 5
▪ Test cube curing tank, etc.	1 : 5
▪ Test cube mould release oil	1 : 5
6. Covering Up Materials:	
• Bubble Wrap	1 : 5
• Damp Proof Membrane Polythene Sheeting	1 : 5
• Heavy Duty Polythene Sheeting Clear	1 : 5
• Layflat Temporary Downpipe Tubing	1 : 5
• Pallet Shrink Wrap	1 : 5
7. Safety kit :	
• Cone	1 : 5
• First aid kit	1 : 5
• PPE attire:	
▪ Earmuffs	1 : 1
▪ Earplugs	1 : 1
▪ Full-face mask	1 : 1
▪ Gloves (e.g. dielectric rubber glove)	1 : 1
▪ Hard hats	1 : 1
▪ Safety footwear	1 : 1
▪ Safety goggles (glasses)	1 : 1
▪ Safety helmet	1 : 1
• Safety barriers	1 : 5
• Safety signage	1 : 5
• Safety tape	1 : 5

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17. CURRICULUM OF COMPETENCY UNIT (COCU)

SECTOR	**CONSTRUCTION (F)**						
SUB SECTOR	**OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)**						
AREA	**LANDSCAPE CONSTRUCTION**						
NOSS TITLE	**LANDSCAPE CONSTRUCTION**						
COMPETENCY UNIT TITLE	**LANDSCAPE CONSTRUCTION STRUCTURAL WORK**						
PRE-REQUISITE (if applicable)	-						
LEARNING OUTCOMES	The outcome of this competency is to ensure landscape structures and features that blend in planting schemes constructed and built exceeding expectations and completed on time in accordance with the contract specification, and design plan. Upon completion of this competency unit trainees will be able to: 1. Identify landscape structural work requirements. 2. Construct landscape concrete structures and features. 3. Erect landscape brick and/or block structures and features. 4. Build landscape masonry structures and features. 5. Install landscape timber structures and features. 6. Fabricate landscape metal and non-metallic structures and features. 7. Set up landscape paving works.						
COMPETENCY UNIT ID	F439-002-2:2017-C03	**LEVEL**	TWO (2)	**TRAINING DURATION**	160	**SKILLS CREDIT**	**16**

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
1. Identify landscape structural work requirements	1.1 Type of landscape structural work. • Decking • Fences	1.1 Interpret working schedule. 1.2 Select types of	<u>Attitude</u> • Consciousness towards time and cost	<u>Related Knowledge</u> 8	<u>Related Knowledge</u> Lecture Group	1.1 Works plan and works schedule used to arrange site work requirements

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
.	• Sheds and non-habitable shelters • Canopy • Roof • Paving • Gazebos • Pergolas • Cabanas • Ornamental ponds • Water features • Other structural ornamentation 1.2 Various types of construction structures. • Insulated concrete forms • Insulated panels • Direct and indirect solar homes • Thermal mass 1.3 Types of Landscape Plans. • Site analysis plan	landscape structures and features required. 1.3 Determine location and work area for landscape structure. 1.4 Arrange tools and equipment . 1.5 Identify location for excavation work. 1.6 Arrange materials for site use. 1.7 Check quantity and quality of site materials. 1.8 Check for availability	<u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Practice sustainable /green environmental.	<u>Related Skill</u> 16	Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	based on the work specifications. 1.2. Required hard landscape structures or/and features work identified according to the work order. 1.3. Landscape structures or/and features requirement details tabulated in terms of the implementation dates and work activities. 1.4 Tools, equipment and machineries involve organised following the work plan and work orders. 1.5. All materials stored properly according to OHS's materials handling, storage, use and disposal standard.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Bubble plan • Plot plan • Concept images • Renderings/Perspectives • Planting plan 1.4 Various type of structural materials. • Concrete, brick and/or block • Stone/ masonry • Timber • Metal and non-metal 1.5 Concept of green building and the 'less-is-more'. 1.6 Types of site reports – digital data.	of green building and the 'less-is-more' concept. 1.9 Prepare types of work record.				
2. Construct landscape concrete structures and/or features.	2.1 Types of concrete used in construction works. • Dry ready mix • Ready mix	2.1 Measure and construct structures/ features profiles using	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u>	<u>Related Knowledge</u> 10	<u>Related Knowledge</u> Lecture Group Discussion/ Group	2.1 Work order checked to prepare working area as specified by the work plan. 2.2 Potential risks at site identified to

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Bulk dry materials • Transit mix 2.2 Concrete materials. • Air • Water • Cements • Supplementary cementing materials • Aggregates 2.3 Types of concrete testing. • Compression testing • Compaction testing • Flexural and transverse testing 2.4 Methods of constructing sub-base for concrete work. 2.5 Sub-grade materials 2.6 Basic introduction to environmental	mathematical techniques. 2.2 Establish levels using levelling equipment. 2.3 Interpret tests performed on a concrete mix. 2.4 Place, consolidate and finish all concrete structures/ features work.	• Adherence to safety procedure <u>Environment</u> • Practice sustainable /green environmental.	<u>Related Skill</u> 24	Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	control potential risk as reported in the site safety procedures. 2.3 Required types of concrete mix selected in accordance with the work requirement. 2.4 Concrete mixture sample prepared for testing in compliance with the accepted industry standards. 2.5 Concrete mixture poured to form landscape structures/features according to the work order and landscape design. 2.6 Completed landscape structures and/or features work checked and finished with appropriate concrete finishes

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	assessment and implications. 2.7 Industry standards - reinforcing and consolidating concrete. 2.8 Type of potential risk control and safety procedures.					as specified by the work orders. 2.7 Concrete waste materials removed from site as stated in the contract requirements.
4. Erect landscape brick and/or block structures and/or features.	3.1 Brick/block work tools and equipment. 3.2 Types and usage of bricks and/or blocks • Admixture. 3.3 Test for bonding and colouring. 3.4 Method of installation and checking for viability and stability. 3.5 Brick/block work finishing	3.1 Plan and prepare work activities. 3.2 Set out and prepare the work site. 3.3 Apply sustainable construction in landscape brick and/or	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Practice sustainable /green environmental.	<u>Related Knowledge</u> 8 <u>Related Skill</u> 20	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration	3.1 Work plans and specifications interpreted and clarified with the supervisor. 3.2 Tools and equipment checked according to manufacturer guideline. 3.3 The structures/ features position marked out according to the design drawings. 3.4 Brick and/or block work courses laid

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	and cleaning surfaces. 3.6 Potential hazard and risk control safety procedures. 3.7 Basic introduction to environmental assessment and implications. 3.8 Data reporting practices and procedure - digital.	block structures and features. 3.4 React to reported hazard and risk at site. 3.5 Inspect quality of brick/block work. 3.6 Clean-up work site.			Role Play Observation Simulation Hands-On Practice	using designated bond(s) in accordance with the design drawings and specifications. 3.5 Finishing work applied to brick and/or block structures/ features according to the specifications. 3.6 Brick and/or block work surfaces cleaned in an environmentally safe and sensitive manner.
4. Build landscape masonry structures and/or features.	4.1 Tools, and materials for landscape masonry structures and features. 4.2 Shallow and deep foundation. 4.3 Type of joints in masonry work. • Concave joint	4.1 Mark position of masonry/ stone structures or features. 4.2 Establish tolerances profile. 4.3 Remove all debris,	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Adherence to safety procedure	<u>Related Knowledge</u> 8 hours	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u>	4.1 Tools, materials and masonry/ stone structural components identified base on the work order and working drawings. 4.2 Required foundation excavated to a depth and fall using pegs,

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• V Joint • Struck joint • Weather joint • Raked joint • Flush joint 4.4 Dry mix, concrete and dry mortar. 4.4 Safety standards and procedure. • Lifting • Carrying and handling plants • Tools and equipment 4.5 Safe working environment guideline. • Duties in relation to the work environment and facilities • Work environment • Welfare facilities • Guidance for specific types	vegetable matter and topsoil. 4.4 Lay and compact sub-base material to finish level. 4.5 Assemble masonry/ stone structures/ features. 4.6 Clear masonry/ stonework site from any debris.	<u>Environment</u> • Practice sustainable /green environmental.	<u>Related Skill</u> 16	Demonstration Role Play Observation Simulation Hands-On Practice	straight edge and spirit level. 4.3 Consolidated hardcore levelled and blinded with sand to desired fall according to the work order and specification. 4.4 Masonry structures and/or features constructed under direction as specified by the contract requirement. 4.5 Lifting, carrying and handling plants, tools and equipment safety procedures operated to create and maintain a safe working environment in accordance with the safety standards.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	of work • Emergency plans 4.6 Basic introduction to environmental assessment and implications.					
5. Install landscape timber structures and/or features.	5.1 Local utility company of underground services. 5.2 Types of timber structures and/or features. • Timber retaining wall • Picnic table • Landscape timber edging 5.3 Timber materials. • Natural timber (treated or untreated) • Synthetic timber (recycled	5.1 Identify relevant local utility company of underground services involve. 5.2 Mark location of underground services. 5.3 Excavate the trench. 5.4 Build foundation row. 5.5 Lay out pieces of	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Practice sustainable /green environmental.	<u>Related Knowledge</u> 8 <u>Related Skill</u> 16	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On	5.1 Work area measured to determine the materials needed for the project as specified by the work order. 5.2 Relevant local utility company of underground services contacted upon the site superior approval. 5.3 Ground soil dug out to place foundation trenches as indicated in the working drawings. 5.4 Erect timber structures and/or

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	plastic). 5.4 Types of timber protection. • Constructive prevention • Wood preservatives 5.5 Preservation methods. • Charring • Dip treatment • Brushing/ spraying • Soaking • Hot and cold bath • Diffusion processes • Pressure treatment 5.6 Basic introduction to environmental assessment and implications.	landscape timbers. 5.6 Connect timber using corner braces, hand drill machines and mending plates.			Practice.	features as specified by work specification. 5.5 Timber structures and/or features sturdiness checked in accordance with the work order. 5.6 Timber preservative coating or treatment applied as detailed by the design drawings. 5.7 Waste materials and debris disposed from work site in compliance with the site safety procedures.
6. Fabricate landscape metal and non-metallic	6.1 Surveying principles and techniques. • Measuring	6.1 Arrange work activities. 6.2 Apply	<u>Attitude</u> • Consciousness towards time	<u>Related Knowledge</u> 8	<u>Related Knowledge</u> Lecture	6.1 Lengths of metal components measured and marked accurately

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
structures and/or features.	angles and distances • Measuring distances • Combining angles and distances to determine positions • Triangulation • Trilateration 6.2 Safety requirement forhand and power tools in metal and non-metal work. • Tools condition • Right tool for the job. • Tools serviceability • Operating procedure • Personal protective equipment. 6.4 Sequence of activities in fabricating	surveying principles and techniques to set work site for the structure. 6.3 Measure and mark required length of metal componen ts. 6.4 Cut and erect structures and/or features. 6.5 Check quality of fabricated work. 6.6 Clear and clean-up site.	and cost <u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Practice sustainable /green environmental.	<u>Related Skill</u> 20	Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstratio n Role Play Observation Simulation Hands-On Practice	as stated by the work order. 6.2 Metal components cut and joined using different techniques and methods as specified by the procedure. 6.3 Materials quantity and quality checked in conformance with the design criteria and construction drawings. 6.4 Non-metals footings excavated according to the type of structures or features to be installed. 6.5 Metal components assembled into position and fixed into place according to design drawings. 6.6 Finished workmanship inspected

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	work. • Surface cleaning • Cutting and machining • Punching and drilling • Straightening • Bending and rolling • Fitting and reaming • Fastening (bolting, riveting and welding) • Finishing • Quality control • Surface treatment 6.5 Construction impacts on environment. • Traffic conditions • Archaeological resources • Historic resources					according to the standard of finished structures/feature. 6.7 Tools and equipment cleaned and unused metal components stored according to manufacturer guidelines.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Community noise patterns • Air quality conditions 6.5 Types of metal coating. • Zinc or galvanized • Aluminium • Chromium and nickel plating (electroplating) • black oxide plating (electroless plating)					
7. Set up landscape paving works.	7.1 Type of paving work. • Patio • Walkway • Driveway • Pools decks 7.2 Paving shapes, colours, materials textures and sizes. 7.3 Paving materials.	7.1 Outline paving work area. 7.2 Calculate amount of pavers required. 7.3 Determine paver sizes, shapes, and colours.	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Practice	<u>Related Knowledge</u> 8 <u>Related Skill</u> 20	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u>	7.1 Paving work area marked or paint sprayed outside the outline as specified by the work order. 7.2 A gradient or slope provided at pavers area to prevent long term water pooling or ponding as stated by the design criteria and

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Natural stone • Concrete • Clay brick • Rubber • Decomposed granite/pebble • Grass pavers. 7.4 Paver installation. • Herringbone (45° or 90°) • Running bond • Basket weave 7.6 Type of paving base. • Sand bedding • Concrete or crushed rock base 7.5 Basic introduction to landscape paving work. • Marking and cutting pavers.	7.4 Excavate paving the installation area. 7.5 Select and lay base material. 7.6 Level base materials to receive paving. 7.7 Install edge restraints and place sand bedding or concrete base. 7.8 Install and cut pavers as needed. 7.9 Use plate compactor to tamp the pavers into the sand. 7.10 Seal pavers	sustainable /green environmental.		Demonstration Role Play Observation Simulation Hands-On Practice	working drawing. 7.3 The base material laid, spread evenly and compacted several times to ensure its level, slope and grade in conformance with the established pavers height. 7.4 Plastic/pre-cast concrete/metal/ wood edge restraint installed to protect paved surface as indicated by the working drawings. 7.5 Bedding sand placed over the compacted base material to allow pavers laying in the pattern and planned design as instructed by the superior work orders. 7.6 Fine grained sand used to fill up pavers joints

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Type of joint in paving work. • Method of laying the pavers. • Method of compacting the pavers. • Cleaning and sealing of pavers. • Paver lighting. 7.6 Basic introduction to environmental assessment and implications.	and sweep sand into the joints. 7.11 Use fine dry sand to provide interlocking and pavers in place.				according to the specifications.

Employability Skills

Core Abilities	Social Skills
01.01 Identify and gather information 01.02 Document information, procedures or processes	1. Communication skills 2. Conceptual skills

Core Abilities		Social Skills
01.03	Utilize basic IT applications	3. Interpersonal skills
01.04	Analyse information	4. Learning skills
01.05	Utilize the internet to locate and gather information	5. Leadership skills
01.06	Utilize word processor to process information	6. Multitasking and prioritising
02.01	Interpret and follow manuals, instructions and SOP's	7. Self-discipline
02.02	Follow telephone/ telecommunication procedures	8. Teamwork
02.03	Communicate clearly	
02.04	Prepare brief reports and checklists using standard forms	
02.05	Read/interpret flowcharts and pictorial information	
02.06	Write memos and letters	
02.07	Utilize Local Area Network (LAN)/Internet to exchange information	
02.08	Prepare pictorial and graphic information	
03.01	Apply cultural requirements to the workplace	
03.02	Demonstrate integrity and apply ethical practices	
03.03	Accept responsibility for own work and work area	
03.04	Seek and act constructively upon feedback about performance	
03.05	Demonstrate safety skills	
03.06	Respond appropriately to people and situations	
03.07	Resolve interpersonal conflicts	
03.08	Develop and maintain a cooperation within work group	
04. 01	Organize own work activities	
04.02	Set and revise own objectives and goals	
04.03	Organize and maintain own workplace	
04.04	Apply problem solving strategies	

Core Abilities	Social Skills
04.05 Demonstrate initiative and flexibility 06.01 Understand systems 06.02 Comply with and follow chain of command 06.03 Identify and highlight problems 06.04 Adapt competencies to new situations / systems 06.05 Analyse technical systems 06.06 Monitor and correct performance of systems	

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Organisational Chart	1 : 5
2. Contract Documents/ Work Order	1 : 5
3. Landscape Construction Drawings/ Design Drawings/ Working Drawings/ Details Drawings	1 : 5
4. Masonry Tools and Equipment:	
• Diamond blades for masonry	1 : 25
• Dry cutting hand-held circular saw	1 : 25
• Mason trowels	1 : 5
• Masonry accessories	1 : 5
• Masonry floats	1 : 5
• Masonry saw	1 : 5
• Masonry saw accessories	1 : 5
• Mortar mixers	1 : 5
• Wet saw for tile and masonry	1 : 5
5. Concrete Tools	
• Asphalt blades	1 : 1

ITEMS	RATIO (TEM : Trainees)
• Concrete core bits	1 : 1
• Concrete grinding cups	1 : 1
• Concrete mixers	1 : 1
• Concrete polishers	1 : 1
• Concrete saw blades	1 : 1
• Concrete saws	1 : 1
• Concrete trowels, floats and brooms	1 : 1
• Core Rigs, etc.	1 : 1
6. Bricklaying Tools	
• Brick carriers	1 : 1
• Brick rules/tapes/accessories	1 : 1
• Brick splitters	1 : 1
• Brick trowels	1 : 1
• Caulking/tuck pointer trowels	1 : 1
• Grout bags	1 : 1
• Hammers Jointers	1 : 1
• Levels	1 : 1
• Limber blade trowels	1 : 1
• Line blocks and twigs	1 : 1
• Line stretchers	1 : 1
• Margin trowels, etc.	
7. Landscape Structures and/or Features Materials.	
• Brick/Block	As required
• Concrete:	As required
▪ Cast-in-Place Concrete	As required
▪ Precast Concrete	As required
▪ Masonry and bluestone	As required
• Metal and non-metallic	As required

ITEMS	RATIO (TEM : Trainees)
• Treated and Untreated Timber/Woods	As required
• Pavers:	
▪ Granite	As required
▪ Limestone	As required
▪ Slate	As required
▪ Tile	As required
▪ Travertine	As required
8. Safety kit	
• Gloves	1 : 5
• Safety tape	1 : 5
• Safety barriers	1 : 5
• Cone	1 : 5
• Dust mask	1 : 5
• Safety signage	1 : 5
• First aid kit	1 : 5
• PPE:	
▪ Earplugs	1 : 1
▪ Earmuffs	1 : 1
▪ Hard hats	1 : 1
▪ Safety goggles (glasses)	1 : 1
▪ Gloves (e.g. dielectric rubber glove)	1 : 1
▪ Full-face mask	1 : 1
▪ Safety footwear	1 : 1
▪ Safety helmet	1 : 1
▪ Earmuffs	1 : 1
▪ Hard hats	1 : 1
▪ Safety goggles (glasses)	1 : 1

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18. CURRICULUM OF COMPETENCY UNIT (COCU)

SECTOR	**CONSTRUCTION (F)**						
SUB SECTOR	**OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)**						
AREA	**LANDSCAPE CONSTRUCTION**						
NOSS TITLE	**LANDSCAPE CONSTRUCTION**						
COMPETENCY UNIT TITLE	**PLANTING WORK OPERATION**						
PRE-REQUISITE (if applicable)	-						
LEARNING OUTCOMES	The outcome of this competency is to ensure the surrounding landscape improved by providing colour and texture of the plants and trees and provide attractive features throughout the growing season in accordance with horticultural practices/planting procedures and guiding standards/ planting operation and maintenance manual. Upon completion of this competency unit trainees will be able to: 1. Carry out site clearing and grubbing. 2. Prepare planting site. 3. Perform plants handling and care during transit. 4. Execute planting works. 5. Implement transplanting work. 6. Carry out turfing works.						
COMPETENCY UNIT ID	F439-002-2:2017-C04	**LEVEL**	TWO (2)	**TRAINING DURATION**	160	**SKILLS CREDIT**	**16**

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
1. Carry out site clearing and grubbing.	1.1 Site clearing tools, equipment /machineries and safety protective	1.1 Identify tools and equipment/ machineries. 1.2 Set out /block areas or	Attitude • Consciousness towards time and cost	Related Knowledge 8	Related Knowledge Lecture Group Discussion	1.1 Tools, equipment and safety protective devices selected and used to perform assign task as stated by the work order.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	devices. • Hammers • Chisels • Screwdriver • Drilling machines • Portable power tools • Floor polishing machines • Fork-lift trucks • Vehicle hoists • Ladders • Kick stools • Water pressure cleaners 1.2 Plants materials. • Needled Conifers • Interior Plants • Broad-leaved Evergreens	boundaries for retained / preserved landscape plants. 1.3 Handle tools and machines based on work. 1.4 List plants material in work area. 1.5 Identify factors for successful restoration requirements. 1.6 Remove and cut unwanted plants in the working area 1.7 Load all waste and debris into open trucks. 1.8 Check for safety at working site.	<u>Safety</u> • Awareness to safety procedure <u>Environment</u> • Creativities in adopting green technology practices.	<u>Related Skill</u> 16	Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	1.2 Designated trees and other vegetation to remain undisturbed protected from damage in accordance with ANSI as well as standard general nursery specifications. 1.3 Unpreserved trees, snags, logs, brush, stumps, shrubs, rubbish and similar materials cleared from the work areas according to the superior instructions. 1.4 Larger stumps, roots and root clusters grubbed out to embankment sites and other designated areas in accordance with the work order. 1.5 Tools and equipment cleaned, and stored according to the established standard practices.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Grasses and Evergreen Herbaceous Perennials • Non-evergreen Herbaceous Perennials • Spring Flowering • Trees and Shrubs 1.3 Landscape rehabilitation during construction work. • Landscape and tree preservation (Act A933). • Safety procedure for retained landscape plants i.e. handling, operating and storing.					1.6 Clean and safe area maintained throughout and on completion of work in accordance with the contract requirement.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Factors Influencing Successful Restoration: ▪ Soil moisture availability ▪ Species mix selection ▪ Weed management ▪ Plant nutrition ▪ Site preparation 1.4 Reduce. Reuse and recycle concept.					
2. Prepare planting site.	2.1 Safety procedure for planting site. 2.2 Planting site condition. 2.3 Planting media. • Peat	2.1 Select tools and equipment. 2.2 Dig out earth for planting. 2.3 Implement manual or machine	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Awareness	<u>Related Knowledge</u> 8	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment	2.1 Local utility companies contacted to mark the water and electric utilities existing lines location as specified by the contract document. 2.2 Weeds removed from

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Coir pith • Woodfibers • Bark • Composted materials (green waste, and bark) 2.4 Planting holes requirement. • Glazing • Planting balled and burlapped trees • Planting container trees • Planting bare-rooted trees 2.5 Planting work process. • Preparation of planting soil • Preparation for planting areas and lawns	planting site tilling. 2.4 Execute planting levelling work. 2.5 Mix planting media. 2.6 Prepare planting holes. 2.7 Mark and record planting holes depth. 2.8 Carry out ponding test. 2.9 Report issues arise on site.	to safety procedure <u>Environment</u> • Creativities in adopting green technology practices.	<u>Related Skill</u> 24	Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	planting areas to prevent competition for water, light and nutrients in accordance with the planting guidelines. 2.3 Landscape material such as mulch, topsoil, and soil amendments on the site areas stored as specified by the work order. 2.4 Removed topsoil during landscape process stored and replaced on site when needed as instructed by the superior. 2.5 Planting holes for trees and shrubs prepared before delivered to planting site as indicated by the working drawing. 2.6 Soil compacted for a firm seedbed according to the accepted

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Excavation for trees and shrubs • Planting trees and shrubs • Seeding new lawns • Control insect pests. 2.6 Arboriculture best practice. 2.7 Reduce. Reuse and recycle concept.					arboriculture practice.
3. Perform plants handling and care during transit.	3.1 Plants health. • Prevention • Detection: ▪ Trapping sites ▪ Public alerts • Eradication: ▪ Bait spotting ▪ Sterile insect	3.1 Prepare plants handling and care tools, equipment and devices during transit. 3.2. Recognise unfit plants during transits. 3.3 Install watering device to plants.	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Awareness to safety procedure	<u>Related Knowledge</u> 12	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related</u>	3.1 The plant transportation process studied and exposed plant conditions discussed in consultation with the superior and transportation team. 3.2 Information regarding local transport authority restrictions provided in

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	technique 3.2 Plants information/ documentation during transits. • Location of the consignment • Description of product • Size of the consignment • Origin of the plant or plant product • Destination 3.4 Planting techniques selection requirements for trees and shrubs. • Drainage requirements • Soil conditions • Availability of irrigation water. 3.5 Lifting equipment for	3.4 Water the plant roots. 3.5 Spray water to the leaves. 3.6 Identify plants injuries, mitigation measures and treatment 3.7 Apply plants stress treatment during transit.	<u>Environment</u> • Creativities in adopting green technology practices	<u>Related Skill</u> 20	<u>Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	accordance with the work instruction or specification. 3.3 Transportation type organised based on the route or travelling distance to avoid plants injuries. 3.4 Plants packed in a box and anchored securely to prevent sliding during transit in accordance with the acceptable industry practice. 3.5 The sides of plants box punched for air holes and the lid loosely fasten as specified by the work order.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	loading and unloading. 3.6 Plant injuries, mitigation measures and treatment. 3.7 Plants stress and plants stress treatment 3.8 Plants emergency response during transit. 3.9 Reduce. Reuse and recycle concept.					
4. Execute planting works.	4.1 Source of planting material. • Government nurseries • Other enterprise nurseries 4.2 Inspection of planting site. • Plant	4.1 Collect data on different type of plants. 4.2 Inspect planting site. 4.3 Tag selected plants before planting. 4.4 Load and unload plants to planting	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Awareness to safety	<u>Related Knowledge</u> 12 <u>Related</u>	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related</u>	4.1 Tagging plant materials inspected before delivery from the planting sites for compliance with the work specification. 4.2 Trees or shrubs stock selected and labelled with number to assure for uniform height and planting

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	inspection laws and regulations • Plant inspection checklist 4.3 Planting trees and shrubs. • Tools and materials • Placement and selection • Planting steps 4.4 Preparation of planting soil. • Testing of soil's pH value • Plants' primary nutrients • Soil fixes • Soil amendments 4.5 Preparation for planting areas and lawns.	pits. 4.5 Label rejected plants to transport out. 4.6 Clear and clean-up work area and recycle or dispose planting materials.	procedure <u>Environment</u> • Creativities in adopting green technology practices	<u>Skill</u> 20	<u>Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	symmetry in conformance with the accepted horticultural practice. 4.3 Existing soil roots, plants, sods, stones, and clay lumps cleaned before mixing of planting soil. 4.4 Planting areas moisten and watered thoroughly before planting in accordance with the work requirement. 4.5 Pits, beds, and trenches excavated with vertical sides and raised at centre of bottom excavation to provide proper drainage.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	4.6 Seeding new lawns. 4.7 Reduce. Reuse and recycle concept.					
5. Implement transplanting work.	5.1 Planting list and planting work plan. 5.2 Excavation of transplanting holes/pits. 5.3 Transplanting plants watering and fertilising. 5.4 Transplanting method. • Balled and burlap • Tree spade • Bare root 5.5 Transplanting trees and shrubs. • Transplanting time. • Transplanting process.	5.1 Select the healthiest plants for transplanting work. 5.2 Water all the transplant plants. 5.3 Determine and execute transplanting methods. 5.4 Fill up transplanting holes/pitswith planting soil. 5.5 Remove the plant from its original site.	Attitude • Consciousness towards time and cost Safety • Awareness to safety procedure Environment • Creativities in adopting green technology practices	Related Knowledge 8 Related Skill 20	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill Demonstration Role Play Observation Simulation Hands-On Practice	5.1 The planting soil amended and mixed with compost organic fertilizer according to the planting guideline. 5.2 Transplanting process ended by drenching the soil with water to eliminate air pockets around the roots as specified by the work order. 5.3 Transplants shielded temporarily from sun and wind by covering them after transplanting in accordance with the work operating procedure. 5.4 Transplanting of new

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	5.6 Reduce. Reuse and recycle (3R) and zero waste concepts.					plants carried out the sun is not so hot as specified by the work requirement.
6. Carry out turfing work.	6.1 Types of turf • Meadow grass turf • Seeded turf 6.1 Turfing process and procedure. • Turf preparation • Turf ordering • Laying the turf • Establishing the lawn • Early turf care and turf maintenance • Feeding and mowing 6.3 Turfing	6.1 Identify turfing materials. 6.2 Prepare turfing for loading to site. 6.3 Roll turf to avoid breakage and loosening of soil. 6.4 Select type of rake to suit work condition. 6.5 Set planting media thickness. 6.6 Carry out topsoil dressing. 6.7 Water the turf (grass/lawn) 6.8 Prepare list of issues on	Attitude • Consciousness towards time and cost Safety • Awareness to safety procedure Environment • Creativities in adopting green technology practices	Related Knowledge 10 Related Skill 20	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill Demonstration Role Play Observation Simulation Hands-On Practice.	6.1 The top layer of grass weeds scraped away to create a fresh landscape as stated in the contract work requirement. 6.2 New topsoil and pre-turfing grass feed added across exposed soil prior to the establishment of new turf. 6.3 The topsoil surface raked carefully to achieve a fine tilth and an even surface as specified by the work order. 6.4 Turfing boards used during turf laying to avoid treading on newly laid turf in accordance with the

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	watering techniques. 6.4 Turf cutter to include manual and machine cutter. 6.5 Standard turfing specification. 6.6 Topsoil dressing. 6.7 Raking tools and technique. 6.8 Worksite condition. 6.9 Zero waste concepts.	turfing works arise on site. 6.9 Submit checklist and list of issues to superior.				manufacturer guidelines. 6.5 Anew turf unrolled in place, and nudged up to create a very snug fit according to the turfing guideline.

Employability Skills

Core Abilities	Social Skills
01.01 Identify and gather information 01.02 Document information, procedures or processes 01.03 Utilize basic IT applications	1. Communication skills 2. Conceptual skills 3. Interpersonal skills

Core Abilities		Social Skills
01.04	Analyse information	4. Learning skills
01.05	Utilize the internet to locate and gather information	5. Leadership skills
01.06	Utilize word processor to process information	6. Multitasking and prioritising
02.01	Interpret and follow manuals, instructions and SOP's	7. Self-discipline
02.02	Follow telephone/ telecommunication procedures	8. Teamwork
02.03	Communicate clearly	
02.04	Prepare brief reports and checklists using standard forms	
02.05	Read/interpret flowcharts and pictorial information	
02.06	Write memos and letters	
02.07	Utilize Local Area Network (LAN)/Internet to exchange information	
02.08	Prepare pictorial and graphic information	
03.01	Apply cultural requirements to the workplace	
03.02	Demonstrate integrity and apply ethical practices	
03.03	Accept responsibility for own work and work area	
03.04	Seek and act constructively upon feedback about performance	
03.05	Demonstrate safety skills	
03.06	Respond appropriately to people and situations	
03.07	Resolve interpersonal conflicts	
03.08	Develop and maintain a cooperation within work group	
04. 01	Organize own work activities	
04.02	Set and revise own objectives and goals	
04.03	Organize and maintain own workplace	
04.04	Apply problem solving strategies	
04.05	Demonstrate initiative and flexibility	

Core Abilities	Social Skills
06.01 Understand systems 06.02 Comply with and follow chain of command 06.03 Identify and highlight problems 06.04 Adapt competencies to new situations / systems 06.05 Analyse technical systems 06.06 Monitor and correct performance of systems	

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Organisational Chart	1 : 5
2. Contract documents/ work order/ work plan/work program /	1 : 5
3. Landscape construction drawings/ design drawings/ working drawings/ details drawings	1 : 5
4. Plants Work Operation Planting Tools, Equipment and Machinery:	
• Edging shears	1 : 5
• Garden fork	1 : 5
• Garden line	1 : 5
• Hand tools	1 : 5
• Hedge-clippers	1 : 5
• Hoe	1 : 5
• Lopping shears	1 : 5
• Pruning saw	1 : 5
• Rake	1 : 5
• Riddle or garden sieve	1 : 5
• Secateurs	1 : 5
• Spade	1 : 5
• Trowel	1 : 5

ITEMS	RATIO (TEM : Trainees)
• Watering can, etc.	1 : 5
5. Transplanting tools, equipment and machinery:	As required
• Grip transplanter	1 : 25
• Hoedag planter mattock	1 : 25
• Mini shovel	1 : 1
• Multipurpose planting tool	1 : 1
• Planting hoe	1 : 1
• Stainless steel hoe & fork combo	1 : 1
• Triangle Hoe	1 : 5
• Weeder root cutter	1 : 5
• Widger	1 : 5
• Wooden dibbler	1 : 5
6. Planting materials:	
• Bamboos	As required
• Bonsai	As required
• Climbers	As required
• Ground Covers	As required
• Palms	As required
• Shrubs	As required
• Trees	As required
• Traditional turf	
▪ Garden lawn turf	As required
▪ Garden grass turf	As required
▪ Landscape grass turf	As required
▪ Landscape lawn turf	As required
• Fine turf	
▪ Sports greens turf	As required
▪ Garden fine turf	As required
7. Safety kit :	
• Safety tape	1 : 5

ITEMS	RATIO (TEM : Trainees)
• Safety barriers • Cone • Safety signage • First aid kit • PPE	1 : 5 1 : 5 1 : 5 1 : 5 1 : 1

References

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2. Gilman, E.F. and C. Wiese. 2012. *Root Pruning at Planting and Planting Depth in the Nursery Impact Root System Morphology and Anchorage*. J. Arboriculture and Urban Forestry. 38 (5): 229-236
3. Harris, J.R. *et al*. (1993). *Production Method Affects Growth and Post-Transplant Establishmentof 'East Palatka' hol*ly. J. Amer. Soc. Hort. Sci. 118:194-200.
4. Ian J. Mason (2004). *Nursery Management*. Published by Landlinks Press Collingwood VIC Australia.. ISBN 0-643-0902-4.

19. CURRICULUM OF COMPETENCY UNIT (COCU)

SECTOR	**CONSTRUCTION (F)**						
SUB SECTOR	**OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)**						
AREA	**LANDSCAPE CONSTRUCTION**						
NOSS TITLE	**LANDSCAPE CONSTRUCTION**						
COMPETENCY UNIT TITLE	**PLANTS ESTABLISHMENT**						
PRE-REQUISITE (if applicable)	-						
LEARNING OUTCOMES	The outcome of this competency is to ensure a beautiful horticultural area in accordance with the contract's planting works installation and maintenance manual/guidelines Upon completion of this competency unit trainees will be able to: 1. Irrigate landscape plants. 2. Apply landscape plant fertilizer. 3. Perform plants mulching. 4. Install plants staking. 5. Execute plant protection. 6. Implement weed control works. 7. Carry out plants pest and disease (P&D) prevention and control. 8. Implement plants trimming and pruning.						
COMPETENCY UNIT ID	F439-002-2:2017-C05	**LEVEL**	TWO (2)	**TRAINING DURATION**	160	**SKILLS CREDIT**	**16**

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
1. Irrigate landscape plants.	1.1 Types and usage of tool, equipment and machineries. 1.2 Irrigation of	1.1 Identify and prepare list of plants on site base on water requirement.	<u>Attitude</u> • Consciousness towards time and cost	<u>Related Knowledge</u> 8	<u>Related Knowledge</u> Lecture	1.1 Plants watered timely in consistence with the watering work schedule and or in

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	landscape plants. • Effects of improper irrigation • Drought and irrigation management 1.3 Introduction to landscape irrigation best management practices. • Purpose • Definitions of: ▪ Landscape irrigation best management practice ▪ Practice guidelines • Qualified Irrigation Professionals 1.4 Types of irrigation system. • Drip • Shower • Spray	1.2 Identify and prepare listof required tools and equipment. 1.3 Identify source of water. 1.4 Handle watering hand tools and check watering mechanical equipment serviceability. 1.6 Check and update watering work schedule. 1.7 Place warning sign during watering activities. 1.8 Install irrigation system.	• <u>Safety</u> • Awareness to safety procedure <u>Environment</u> • Creativities in adopting green technology practices.	<u>Related Skill</u> 12	Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	windy weather. 1.2 Drip irrigation and soaker hoses used to deliver water as specified by the plants watering work order. 1.3 Soil moisture checked before watering as stated in SOP. 1.4 Mulches used on soil surface to conserve moisture, control weeds, and maintain a uniform soil temperature in accordance with plants watering manual. 1.5 Established trees and shrubs watered at their drip line to discourage root and crown diseases.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Emitter • Rotary systematic 1.5 Reduce. Reuse and recycle (3R) and Zero Waste concepts.					
2. Apply landscape plants fertiliser.	2.1 Types of nutrient andfertilizer • Nitrogen • Phosphorus • Potassium • Calcium 2.2 Types and usage of tools and equipment. 2.3 Fertilizing method. 2.5 Type of deficient nutrient symptoms • Leaves are small and light green • Dark-green foliage • Lower leaves may be mottled	2.1 Create plant list base on nutrient requirements. 2.2 Select types of suitable fertilizer based on nutrient type. 2.3 Identify plants with special needs ofnutrient. 2.4 Prepare fertilising tools and equipment. 2.5 Execute suitable fertilising method. 2.6 Record and submit fertilising work done.	Attitude • Consciousness towards time and cost Safety • Awareness to safety procedure Environment • Creativities in adopting green technology practices	Related Knowledge 8 Related Skill 16	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill Demonstration Role Play Observation Simulation Hands-On Practice	2.1 Woody ornamentals such as nonflowering trees and shrubs that don't require fertilizer identified according to the fertilising guidelines. 2.2 The actual cause of unhealthy-looking plants determined before fertilizing as specified by the work order. 2.3 Fertilizer requirements for fruit trees, vegetables, and flowering annual plants

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	2.6 Plant care guidelines. 2.7 Reduce. Reuse and recycle (3R) and zero waste concepts.					distinguished based on the manufacturer fertiliser manual. 2.4 A slow-release type organic fertilizers selected to feed the plant as specified by the contract document. 2.5 Fertilizer applied at the drip line of trees and shrubs as indicated by the manufacturer illustration manuals. 2.6 Fertilising work done recorded and submitted to superior approval and endorsement as stated by the work order.
3. Perform plants mulching	3.1 Benefits of mulch and function 3.2 Type of	3.1 Identify mulching materials 3.2 Select mulching	<u>Attitude</u> • Consciousness towards time and	<u>Related Knowledge</u> 8	<u>Related Knowledge</u> Lecture	3.1 Mulch spread under trees, shrubs, and throughout

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	mulching material such as: • Coco peat • Wood shred • Wood chip • Stones • Paddy husk • Leaves 3.3 Factors to be considered • Texture • Nutrient value • Availability • Aesthetics 3.4 Methods and techniques of applying mulch. 3.5 Work schedule and work report. 3.6 Reduce. Reuse and recycle (3R) and zero waste concepts.	method based on plant 3.3 Carry out mulching work according to work schedule and plant growth 3.4 Calculate amount of mulch required of each plant 3.5 Lay mulching materials 3.6 Record work done 3.7 Submit record to superior	cost <u>Safety</u> • Awareness to safety procedure <u>Environment</u> • Creativities in adopting green technology practices	<u>Related Skill</u> 16	Group Discussion/ Group Assignment Site Visit. <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	planting beds to a recommended depth for medium to coarse textured materials as specified by the mulching SOP. 3.2 Mulch pulled away from the bases of tree and shrub trunks creating a donut-hole to avoid mulch piling against the trunk in accordance with the mulching requirement. 3.3 A larger mulched area established to avoid insect pests' diseases and decay as indicated by the mulch application procedure. 3.4 Mulch depth checked and replenished as necessary

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
						according to the work order.
4. Install plants staking.	4.1 Types of plant. • Woody and herbaceous plants • Small trees • Trees. 4.2 Types of staking materials for single and multiple staking. 4.3 Installation method for staking. 4.4 Plants staking storage procedure. 4.5 Reduce. Reuse and recycle (3R) and zero waste concepts.	4.1 Identify and prepare list of plants and site that require staking. 4.2 Organise staking materials. 4.3 Mark plant on site for staking. 4.4 Install staking materials based on plant requirement. 4.5 Check and tighten staking regularly. 4.6 Dismantle staking if damage or plant has grown bigger. 4.7 Keep unused staking at storage area.	Attitude • Consciousness towards time and cost Safety • Awareness to safety procedure Environment • Creativities in adopting green technology practices	Related Knowledge 8 Related Skill 12	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill Demonstration Role Play Observation Simulation Hands-On Practice	4.1 Staking ties selected and prepared based on plants types as stated by the plants staking guidelines. 4.2 Stake position chose correctly to help the plant grow straight as specified by the accepted industry practices. 4.3 The stake hammered firmly into the ground according to the staking guidelines. 4.4 Staking tie secured near the bottom of the tree to straighten up the branches on the tree in accordance with

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
						the work order. 4.5 Plants checked regularly and additional ties added when the plant grow according to the staking guidelines.
5. Handle plant protection.	5.1 List of plants requiring protection. 5.2 Work schedule. 5.3 Plant protection materials. 5.4 Method of installing plant protection. 5.5 Types and usage of tools and equipment. 5.6 Reduce. Reuse and recycle (3R) concept.	5.1 Identify plants protection requirement. 5.2 Identify protection materials available and suitable. 5.3 Prepare work schedule. 5.4 Select tools and equipment for plant protection installation. 5.5 Mark plant area to install plant protection 5.6 Install plant protection 5.7 Check sturdiness of plant	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Awareness to safety procedure <u>Environment</u> • Creativities in adopting green technology practices	<u>Related Knowledge</u> 8 <u>Related Skill</u> 16	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play	5.1 All plant material protected and wrapped carefully during lifting, awaiting transportation, during transportation, unloading and during storage on site as stated in the contract document. 5.2 Plants rejected based on any evidence of unsatisfactory protection to roots, stems, branches and leaves.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
		protection.			Observation Simulation Hands-On Practice	5.3 All plants kept moist during transportation and storage as specified by the work order. 5.4 All plant material planted according to the work schedule. 5.5 All work around the base of existing trees and in confined spaces executed by hand in accordance with the SOP.
6. Execute weed control works.	6.1 Name of common weeds such as: • Yarrow (Achilleamillefolium) • Daisy weed (Bellisperennis) • Creeping thistle	6.1 Select weeding works areas. 6.2 Identify weeds species. 6.3 Check and compare list of weeds at site with list in planting procedure. 6.4 Prepare	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Awareness to safety procedure	<u>Related Knowledge</u> 8	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit	6.1 Organic mulch composted or treated before use to eliminate weed seeds as stated by the weed control manual. 6.2 Granular and liquid treatments performed to reduce weeds

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	(Cirsiumarvense) 6.2 Types of weeding tool and equipment. • Long-handled garden hoe • Oscillating hoe • Fishtail weeder 6.3 Weed control methods. • Crabgrass control • Nutsedge control • Broadleaf weed control 6.4 Introduction to pre-emergent and post-emergent herbicides. • Bio herbicides • Natural materials 6.5 Safety handling and storage of weed control	weeding works requirement. 6.5 Apply weed control method. 6.6 Apply safe handling and storage of weed control chemicals 6.7 Remove weed species. 6.8 Clean all debris from weeding area.	<u>Environment</u> • Creativities in adopting green technology practices	<u>Related Skill</u> 12	<u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	seed germination in mulched beds as specified by the work order. 6.3 Spot-spraying treatment applied to control weeds present in landscape beds according to the weed control manual. 6.4 Weeding control tools and equipment cleaned and stored in compliance with the weeding control manual. 6.5 All debris and unwanted weed species disposed from weeding area as specified by the work order.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	chemicals.					
7. Carry out plants pest and disease (P&D) prevention and control.	7.1 Types of plants pest. • Arthropod pests • Thrips • Aphids • Spider mites 7.2 Types of plants disease such as: • Powdery mildew • Graymold 7.3 Introduction to Hazard Identification, Risk Assessment and Control Procedure. • Purpose • Definitions • Responsibilities 7.4 Plants pest and disease (P&D) work program. 7.5 Pest prevention using best horticultural	7.1 Identify types of P&D required 7.2 Label infested and diseased plants. 7.3 Identify and categorise plants with P&D hazard. 7.4 Check and list for P&D risk. 7.5 Execute plants P&D prevention and control method include treatment, contain and eradicate. 7.6 Apply safe handling and storage of pest and disease control chemicals	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Awareness to safety procedure <u>Environment</u> • Creativities in adopting green technology practices.	<u>Related Knowledge</u> 8 <u>Related Skill</u> 20	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit. <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice.	7.1 Common greenhouse problems identified according to the plants P&D manual. 7.2 Regular plants infestations scouted in accordance with the plants P&D guideline. 7.3 Plant growth areas cleaned frequently as specified by the work order. 7.4 Dead or diseased plant material disposed properly in compliance with the P&D prevention and control SOP. 7.5 Insecticide or fungicide spraying applied with a

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	practices. • Treatment, • Contain and • Eradicate 7.6 Biological P&D prevention and control methods. 7.7 Safety handling and storage of pest and disease control chemicals.					reasonable precautions upon superior's approval and a licensed applicator.
8. Implement plants trimming and pruning.	8.1 Types of trimming and pruning. • Young tree or formative pruning 8.2 Types and usage of pruning tools and equipment such as: • Anvil Pruners. • Ratchet Pruners. • Bypass Pruners, • Pole Pruner etc.	8.1 Prepare plants list. 8.2 Check and classify plants for trimming and pruning. 8.3 Prepare work schedule. 8.4 Select tools and equipment. 8.5 Check operational and safety procedure for tools and equipment. 8.6 Prepare trimming and	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Awareness to safety procedure <u>Environment</u> • Creativities in adopting green technology practices.	<u>Related Knowledge</u> 8 <u>Related Skill</u> 12	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation	8.1 Hand pruners and a pruning saw were used to remove stray branches and large individual as indicated by the plants trimming and pruning manual and illustration. 8.2 The Limbs that rub against each other, and poorly angled branches, trimmed and pruned after planting as

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	8.3 Method of trimming and pruning ofplants and trees which include: • Keys to good pruning, • Annual tree pruning steps from planting to maturity, etc. 8.6 Tree care products such as: • Ooze Tube Watering System • Root maker Knit Bag, etc. 8.7 Rules and regulation of construction wastes material which include: • Bulk Waste • Yard Waste • Needles/ Syringes • Burnt	pruning materials. 8.7 Protect site area with security and warning devices. 8.8 Trim and prune plants. 8.9 Collect and dispose all waste from trimming and pruning works and clean site area.			Simulation Hands-On Practice	specified by the contract document. 8.3 Limbs damaged in transit from the nursery to the planting site inspected and removed immediately after planting upon the superior's work order. 8.4 Trimming and pruning tool blades and other metal surfaces wiped with an oily cloth to keep cutting edges sharp as indicated by the accepted industry practice and guideline.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	Firewood and Ashes, etc. 8.8 Reduce, reuse and recycle concept					

Employability Skills

Core Abilities	Social Skills
01.01 Identify and gather information 01.02 Document information, procedures or processes 01.03 Utilize basic IT applications 01.04 Analyse information 01.05 Utilize the internet to locate and gather information 01.06 Utilize word processor to process information 02.01 Interpret and follow manuals, instructions and SOP's 02.02 Follow telephone/ telecommunication procedures 02.03 Communicate clearly 02.04 Prepare brief reports and checklists using standard forms Read/interpret flowcharts and pictorial information 02.05 Write memos and letters 02.06 Utilize Local Area Network (LAN)/Internet to exchange information 02.07 Prepare pictorial and graphic information 02.08 Apply cultural requirements to the workplace 03.01 Demonstrate integrity and apply ethical practices 03.02 Accept responsibility for own work and work area	1. Communication skills 2. Conceptual skills 3. Interpersonal skills 4. Learning skills 5. Leadership skills 6. Multitasking and prioritising 7. Self-discipline 8. Teamwork

Core Abilities		Social Skills
03.03	Seek and act constructively upon feedback about performance	
03.04		
03.05	Demonstrate safety skills	
	Respond appropriately to people and situations	
03.06	Resolve interpersonal conflicts	
03.07	Develop and maintain a cooperation within work group	
03.08	Organize own work activities	
04. 01	Set and revise own objectives and goals	
04.02	Organize and maintain own workplace	
04.03	Apply problem solving strategies	
04.04	Demonstrate initiative and flexibility	
04.05	Understand systems	
06.01	Comply with and follow chain of command	
06.02	Identify and highlight problems	
06.03	Adapt competencies to new situations / systems	
06.04	Analyse technical systems	
06.05	Monitor and correct performance of systems	
06.06		

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Organisational Chart	1 : 5
2. Contract Documents/ Work Order/ Landscape Construction Drawings/ Design Drawings/ Working Drawings/ Details Drawings	1 : 5
3. Plants Establishment Tool, Equipment and Materials: Staking tools:	
• 450g / 16oz claw hammer	1 : 5
• Brass Stem Support	1 : 5
• Outdoor Soft Flexi Plant Tie (50m)	1 : 5
• Permanent Stakes	1 : 5
• Plant attacher stapler	1 : 5
• Plant Stakes	1 : 5
• Spare blades	1 : 5
• Staking ties (soft ties, chain ties and fabric ties)	1 : 5
• Tapes	1 : 5
• Twin pack scissors (for general purpose)	1 : 5
• Tying tools	1 : 5
• Link Stakes	1 : 5
• Tripod Cap	1 : 5
4. Mulching materials:	
• Landscape fabric wood chips	As required
• Newspaper and cardboard grass clippings compost as a mulch	As required
• Pebble mulch/gravel rock mulch (medium to large stones)	As required
• Pine straw	As required
• Pumice rock mulch	As required

ITEMS	RATIO (TEM : Trainees)
• Sawdust Cocoa hull mulch	As required
• Shredded bark	As required
• Straw mulch	As required
5. Weed control materials:	
• Clear, Translucent, and Coloured Plastic Films	As required
• Groundmat weed control	As required
• Herbicides	As required
• Landscape fabric and plastic sheeting	As required
• Weed Barrier & Underlayment	As required
6. Staking materials:	
• Vegetable	As required
• Stakes	As required
• Tomato cage	As required
• String, twine or hook-and-loop tape	As required
• Metal plant ring (optional)	As required
7. Safety kit :	
• Safety tape	1 : 5
• First aid kit	1 : 5
• Safety barriers	1 : 5
• Cone	1 : 5
• Safety signage	1 : 5
• PPE	1 : 1

References

1. Christensen, Alan (2005). *Dictionary of Landscape Architecture and Construction* (1st Edition), United State, the McGraw Hill Education. ISBN-EAN 0071441425 / 9780071441421(hardcopy reference).
2. S. W. Adkins *et. al.* (2015). Seedlings: Biology of Plant Establishment. Publisher: CABI Publishing. ISBN-13: 978-1845937904 (Online ISBN-10: 1845937902).
3. BenedikzThorarinn*et. al*. (2005). *Plant Quality and Establishment*. Published by Springer Berlin Heidelberg. Print ISBN 978-3-540-25126-2 (Online ISBN 978-3-540-27684-5)
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20. CURRICULUM OF COMPETENCY UNIT (COCU)

SECTOR	**CONSTRUCTION (F)**						
SUB SECTOR	**OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)**						
AREA	**LANDSCAPE CONSTRUCTION**						
NOSS TITLE	**LANDSCAPE CONSTRUCTION**						
COMPETENCY UNIT TITLE	**LANDSCAPE SITE REINSTATEMENT**						
PRE-REQUISITE (if applicable)	-						
LEARNING OUTCOMES	The outcome of this competency is to ensure any damage to or pollution or the creation of any health or environmental hazard prevented at or around or adjacent to the site in accordance with the contract document and design drawings. Upon completion of this competency unit trainees will be able to: 1. Prepare cleaning and waste disposal requirements. 2. Coordinate construction wastes material disposal activities. 3. Carry out landscape implementation site cleaning. 4. Perform final inspection. 5. Carry out 'making good' landscape construction defects.						
COMPETENCY UNIT ID	F439-002-2:2017-C06	**LEVEL**	TWO (2)	**TRAINING DURATION**	160	**SKILLS CREDIT**	**16**

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
1. Prepare cleaning and waste disposal requirements.	1.1 Types of waste disposal materials • Concrete, • Porcelain, rigid plastics, • Tile,	1.1 Prepare work plan. 1.2 Identify dispose collection centre. 1.3 Identify	<u>Attitude</u> • Consciousness towards time and cost	<u>Related Knowledge</u> 8	<u>Related Knowledge</u> Lecture Group Discussion/ Group	1.1 Tools and equipment requirement for site clearing and cleaning prescribed in accordance with

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	• Lumber, • Metals, etc. 1.2 Rules and regulation of construction wastes material which include: • Bulk waste • Yard waste • Needles/ syringes • Burnt firewood and ashes. 1.3 Uses and functions of Personnel Protection Equipment (PPE), tools, and equipment. 1.4 Reduce, reuse and recycle (3R) concept 1.5 Debris and recyclable materials. • Concrete • Porcelain rigid plastics	variations of working condition. 1.4 Identify tools, equipment and machineries required. 1.5 List out tools and equipment required to be serviced. 1.6 Use tools, equipment and PPE. 1.7 Identify material and technique for composting.	<u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Creativeness in ensuring a safe and green workplace environment	<u>Related Skill</u> 12	Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	the work plan. 1.2 Designated disposal area requirement for gathered wastes and debris set in accordance with the environmental standards. 1.3 Site post-clearing and grubbing activities work plans prepared with respect to local authority rules and requirement. 1.4 Essential safety protective devices identified in accordance with the OHS or SHE standards. 1.5 Tools and equipment storage layout submitted for management approval as specified by the work order.

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	• Tile • Lumber • Metals • Masonry • Plastic • Rock • Carpet • Insulation 1.6 Introduction to composting. • Purposeful biodegradation of organic matter • Composting product • Benefits of composting 1.7 Type of composting materials and techniques use. • Sheet composting • Invessel composting • Biodynamic composting • Anaerobic					

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	composting • Trench composting					
2. Coordinate construction wastes material disposal activities.	2.1 Introduction to work plan and work order. 2.2 Types of unwanted vegetation and debris such as: • Noxious weed • Nuisance vegetation (grass) • Dead trees or leafs 2.3 Recyclable debris materials such as: • Concrete • Porcelain, rigid plastics • Tile • Lumber • Metals • Masonry • Plastic • Rock	2.1 Execute work schedule. 2.2 Identify types of waste. 2.3 Allocate work to manpower. 2.4 Collect construction waste from site. 2.5 Select tools, equipment and machineries. 2.6 Arrange disposal vehicle and transportation. 2.7 Dispose waste materials at	<u>Attitude</u> • Consciousness towards time and cost <u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Creativeness in ensuring a safe and green workplace environment	<u>Related Knowledge</u> 8 <u>Related Skill</u> 24	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit. <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice.	2.1 Tools and equipment for wastes material disposal activities prescribed in accordance with the work instructions. 2.2 Unwanted vegetation and debris removed and recyclable debris materials segregated according to the plants type. 2.3 Disposal vehicle arranged based on collected wastes and plants debris type. 2.4 Designated waste collecting centre and dispose area identified based on the local

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	• Carpet • Insulation 2.4 Safety protective devices such as: • Safety tape • Safety barriers • Cone • Safety signage • First aid kit • Personnel Protective Equipment (PPE) 2.5 Functions and uses of tools, equipment. 2.6 Waste and debris collection systems such as: • Rear lift system • Front lift system • Bulk:	approved dumping site. 2.8 Gather disposal data. 2.9 Report data follows required procedure.				authority's requirement and in accordance with the environmental standards. 2.5 Construction site post-clearing and grubbing activities performed using appropriate safety protective devices as stated by the work order. 2.6 Used tools and equipment cleaned, maintained and stored according to the established industry standard and practices.

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	▪ Roll-on/roll-off (RORO) • Compaction system 2.7 Rules and regulation of construction wastes material which include: • Bulk Waste • Yard Waste • Needles/Syringes • Burnt Firewood and Ashes • Building Materials • Hazardous Waste • Public Safety					
3. Carry out landscape implementation site cleaning.	3.1 Site organisational chart. 3.2 Introduction to site cleaning work schedule. 3.3 List of planting materials such	3.1 Prepare checklist for site cleaning. 3.2 Executework schedule.	<u>Attitude</u> • Diligent in interpreting plans and specifications. <u>Safety</u>	<u>Related Knowledge</u> 8	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment	3.1 Newly graded site ground cleaned after completion of grading work as specified by the contract specification.

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	as 3.4 Type of clearing and cleaning tools such as: • Hoe/Cangkul • Scythe/Tajak • Sickle/Sabit • Parang • Axe • Pick axe 3.5 Type of clearing equipment and machineries such as: • Wheel barrow • Bucket • Cutter • Power ripper • Hacker • Blower • Chainsaw • Generator set. 3.6 Type of clearing materials which include: • Rope • Wire rope	3.3 Identify methods of site cleaning. 3.4 Execute site cleaning. 3.5 Execute planting site clearing. 3.6 Update checklist site cleaning works. 3.7 Record all work done. 3.8 Submit report to superior.	• Adherence toward safety measures and procedure. <u>Environment</u> • Innovative towards green technologies culture.	<u>Related Skill</u> 16	Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	3.2 All subsoil areas to be top soiled cleaned free of rubbish, weeds, all stones and builders debris removed from site in accordance with the designed grading plans. 3.3 Site-grading tools and equipment cleaned, maintained and stored according to the established standard practices. 3.4 Clean and safe area maintenance undertaken throughout and upon completion of work in accordance with the contract requirement. 3.5 Work output reported to concern

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	• Marking tape • Fuel • Timber • Nails • Paint • Lubricant • Garbage bag • Spade • Broom • Brush • Hand tool 3.7 Reduce, reuse and recycle (3R) concept					management or authority according to the accepted industry practices.
4. Perform final inspection.	4.1 Type of inspection checklist such as: • Landscape engineering work • Landscape structural work • Planting work. 4.2 Type and usage of	4.1 Prepare final inspection checklist. 4.2 Reviewed relevant documentation requirement 4.3 Identify conformance to approved plans 4.4 Check for	<u>Attitude</u> • Conscious with time and cost <u>Safety</u> • Adherence to safety measures and procedures <u>Environment</u> • Creativeness	<u>Related Knowledge</u> 12 <u>Related Skill</u> 20	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstratio	4.1 All necessary documents prepared and checked in conformance with the relevant approving authority's requirement. 4.2 Landscape works inspected based on as-built drawings to ensure no deviation of work

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	approved plans: • Design drawings • As built drawings 4.3 List of required documents for final inspection such as: • Sub-contractor list • General and sub-contractor business license verification • Final letters from project geotech, civil and structural engineers, etc. 4.4 Final Inspection Report. • Listing requirements	deviation of documentation to approved plan. 4.5 Identify any violations to regulations (if any). 4.6 Discuss final inspection report before submitted to the concern authorised superior.	towards green technologies culture		n Role Play Observation Simulation Hands-On Practice	and are in accordance with the requirements of approving authority. 4.3 All materials and workmanship produced of the high standards and quality as demanded by the contract specification. 4.4 Construction debris and mud kept out of street and alleys, including adjacent properties as specified by the contract requirement. 4.5 Trash receptacles / containers on each job site emptied and/or replaced when filled as

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	for corrective construction actions • Remaining documentation • Reinspection fee 4.5 Introduction to final inspection of landscape construction industry best practices. 4.6 3R and Zero Waste awareness					instructed by the work order. 4.6 Landscape construction items located safely at designated places in accordance with the local authority's approval document.
5. Carry out 'making good' landscape construction defects.	5.1 Common landscape construction defects. • Mold • Water issues • Electrical systems • Landscaping and soil • Foundation, floor, wall and roof cracks	5.1 Define landscape construction defects. 5.2 Prepare list of landscape construction defects which include photograph, date,	Attitude • Conscious with time and cost Safety • Adherence to safety measures and procedures. Environment	Related Knowledge 8 Related Skill	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill	5.1 Excavation soils on basement slabs and footings buffered upward to prevent the potential uplift according to the final inspection reports and company's SOP. 5.2 Listed defects checked based

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	• Dry rot • Structural failure 5.2 Common causes of construction defects. • Improper soil analysis and preparation • Site selection and planning • Civil and structural engineering • Negligent construction • Defective building materials 5.3 Best practices to avoid a defect on: • Post-tension floors, • Noise, • Horizontal water proofing, • Windows, etc. 5.4 Basic	location, and nature of defects. 5.3 Identify common causes of construction defects. 5.4 Replace plants failures such as dead or dying plants.	• Creativeness towards green technologies culture.	24	Demonstration Role Play Observation Simulation Hands-On Practice	on the work order and contract requirement. 5.3 The 'making good' defect or remedial works approval secured based on the inspection report submitted. 5.4 The 'making good' defects activities executed in accordance with the site superior approval documents. 5.5 The 'making good' defects activities records updated as stated in the work plan.

Work Activities	Related Knowledge	Related Skill	Attitude/ safety/ environment	Training Hours	Delivery Mode	Assessment Criteria
	introduction to "Certificate of Making Good Defects". 5.5 3R and Zero Waste awareness					

Employability Skills

Core Abilities		Social Skills
01.01	Identify and gather information	1. Communication skills
01.02	Document information, procedures or processes	2. Conceptual skills
01.03	Utilize basic IT applications	3. Interpersonal skills
01.04	Analyse information	4. Learning skills
01.05	Utilize the internet to locate and gather information	5. Leadership skills
01.06	Utilize word processor to process information	6. Multitasking and prioritising
02.01	Interpret and follow manuals, instructions and SOP's	7. Self-discipline
02.02	Follow telephone/ telecommunication procedures	8. Teamwork
02.03	Communicate clearly	
02.04	Prepare brief reports and checklists using standard forms	
02.05	Read/interpret flowcharts and pictorial information	
02.06	Write memos and letters	
02.07	Utilize Local Area Network (LAN)/Internet to exchange	
02.08	information	
03.01	Prepare pictorial and graphic information	

Core Abilities		Social Skills
03.02	Apply cultural requirements to the workplace	
03.03	Demonstrate integrity and apply ethical practices	
	Accept responsibility for own work and work area	
03.04	Seek and act constructively upon feedback about	
03.05	performance	
03.06	Demonstrate safety skills	
03.07	Respond appropriately to people and situations	
03.08	Resolve interpersonal conflicts	
	Develop and maintain a cooperation within work group	
04. 01	Organize own work activities	
04.02	Set and revise own objectives and goals	
04.03	Organize and maintain own workplace	
04.04	Apply problem solving strategies	
04.05	Demonstrate initiative and flexibility	
06.01	Understand systems	
06.02	Comply with and follow chain of command	
06.03	Identify and highlight problems	
06.04	Adapt competencies to new situations / systems	
06.05	Analyse technical systems	
06.06	Monitor and correct performance of systems	

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Organisational chart	1 : 25
2. Contract Documents/ Work Order/ Landscape Construction Drawings/ Design Drawings/ Working Drawings/ Details Drawings	1 : 25
3. Clearing tools:	
• Hoe	1 : 5
• Scythe	1 : 5
• Sickle	1 : 5
• Axe	1 : 5
• Pick axe	1 : 1
• Handsaw	1 : 1
• Hammer	1 : 1
• Fork	1 : 1
• Rake	1 : 1
• Spade	1 : 1
• Broom	1 : 1
• Brush	1 : 1
4. Clearing equipment and machinery:	
• Wheel barrow	1 : 5
• Bucket	1 : 5
• Cutter	1 : 5
• Power ripper	1 : 25
• Hacker	1 : 25
• Blower	1 : 25

ITEMS	RATIO (TEM : Trainees)
• Chainsaw	1 : 5
• Generator set	1 : 25
6. Safety kit :	
• Safety tape	1 : 5
• Safety barriers	1 : 5
• Cone	1 : 5
• Safety signage	1 : 5
• First aid kit	1 : 5
• PPE	1 : 1

References

1. Christensen, Alan (2005). *Dictionary of Landscape Architecture and Construction* (1st Edition), United State, the McGraw Hill Education. ISBN-EAN 0071441425 / 9780071441421(hardcopy reference).
2. Geoffrey A. & Susan Jellicoe (1995). *The Landscape of Man Shaping the Environment from Prehistory to the Present Day* (3rd Edition, Expanded and Updated). Published: April 17th, 1995, ISBN-10: 0500278199, ISBN-13: 9780500278192.
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21. CURRICULUM OF COMPETENCY UNIT (COCU)

SECTOR	**CONSTRUCTION (F)**						
SUB SECTOR	**OTHER SPECIALISED CONSTRUCTION ACTIVITIES n.e.c. (non-existence classification) (43)**						
AREA	**LANDSCAPE CONSTRUCTION**						
NOSS TITLE	**LANDSCAPE CONSTRUCTION**						
COMPETENCY UNIT TITLE	**PLANT HANDLING AND CARE (HOLDING AREA)**						
PRE-REQUISITE (if applicable)	-						
LEARNING OUTCOMES	The outcome of this competency is to ensure the landscape's appearance, vitality, and the tree's safety maintained or improved using the most cost-effective and environmentally sensitive practices and treatments available in accordance with the horticulture standard practice guidelines/the planting procedures/the contract operating and maintenance manuals. Upon completion of this competency unit trainees will be able to: 1. Perform special plant protection. 2. Carry out plant temporary labelling/ tagging. 3. Execute plants arrangement. 4. Carry out plant care.						
COMPETENCY UNIT ID	F439-002-2:2017-C07	**LEVEL**	TWO (2)	**TRAINING DURATION**	160	**SKILLS CREDIT**	**16**

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
1. Perform special plant protection.	1.1 The plants list. • Bamboo orchid • Nepenthes rajah • Rafflesiaarnoldii • Rafflesiakerrii	1.1 Identify special plants protection requirements. 1.2 Identify	Attitude • Consciousness towards focus and diligence	Related Knowledge 8 hours	Related Knowledge Lecture Group Discussion/ Group	1.1 Plants pests and diseases diagnose activities organised according to the direct effective protection orders. 1.2 Plant protection

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Vietnamese White Pine 1.2 Plants protection spraying techniques. • Hand sprayer • Stirrup pump sprayer • Hand compression sprayer • Rocker sprayer 1.3 Plant protection equipment and their uses. • Frost Protection Fabric • Shade cloth • Polycarbonate sheets and polycarbonate panels 1.4 Method of installing plant protection tents.	available and suitable plants protection materials. 1.3 Prepare special plant protection work schedule. 1.4 Organise required equipment and materials. 1.5 Mark trees to install plant protection. 1.6 Carry out plants watering. 1.8 Check plant sturdiness protection.	<u>Safety</u> • Adherence towards safety measures and procedures <u>Environment</u> • Creativeness in adopting green technology as work culture	<u>Related Skill</u> 20 hours	Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	quarantine protection conducted in accordance with the protection operating manuals. 1.3 Plant damaging recognised based on the plants pests and diseases diagnostic results. 1.4 Environment friendly plant protection implemented in compliance with the plant protection methods. 1.5 New and improve plant protection applied to decrease plant pesticide load in accordance with the plant protection procedures and accepted industry practice.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
2. Carry out plant temporary labelling/ tagging.	2.1 An introduction to plant names. • Scientific names • Cultivar names • Common names 2.2 Type of plant species. • Invasive plants species • Exotic plants species • Vegetation plants species 2.3 Horticulture tags/labels purpose, sizes and label types. • Direct thermal labels • Thermal transfer labels • Thermal transfer ribbons 2.4 Various labelling technique. • Enzymatic labelling	2.1. Refer plants species guideline. 2.2 Choose required plants species. 2.3 Select suitable label/tag materials. 2.4 Display plants information on temporary labels/tags. 2.5 Tie plant temporary labels/tags using suitable string/wire. 2.6 Record and report relevant works progress	<u>Attitude</u> • Meticulous in identifying the plants species <u>Safety</u> • Adherence to safety procedure <u>Environment</u> • Ensure 'go green' culture at holding site	<u>Related Knowledge</u> 8 hours <u>Related Skill</u> 28 hours	<u>Related Knowledge</u> Lecture Group Discussion/ Group Assignment Site Visit <u>Related Skill</u> Demonstration Role Play Observation Simulation Hands-On Practice	2.1 Plants species selected according to plant list as specified by the design plan and work requirements. 2.2 Suitable label/tag materials use as specified by the work specification and requirement. 2.3 Plant numbering, species scientific name, common name, date of arrival and name of plant supplier displayed on temporary labels/tags according to horticulture best practices. 2.4 Plant temporary labels/tags tied properly on plants using suitable string/wire in accordance with the

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Protein labelling • Genetic labelling					industry accepted practices. 2.5 All work done recorded progressively in accordance with the accepted industry practices.
3. Execute plants arrangement.	3.1 Type of plants. • Common annuals (marigold, vinca, begonia, coleus) • Pitcher plants (nepenthes) • Sensitive plants (mimosa pudica) • Aloe Plants • Rafflesiaarnoldii 3.2 Type of plants arrangements. • Indoor • Outdoor • Floral arrangement	3.1 Choose suitable plants arrangement. 3.2 Identify on-site holding plants location. 3.3 Prepare holding/plants beds on-site. 3.4 Identify required plants staking at holding site. 3.5 Carry out staking and guying for newly planted	Attitude • Consciousness towards diligence and perseverance Safety • Adherence to safety procedures Environment • Adopt green technology practices	Related Knowledge 12 hours Related Skill 32 hours	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill Demonstration Role Play Observation Simulation Hands-On Practice	3.1 Selected plants arrangement communicated with site teams in accordance with the contract requirements. 3.2 On-site holding plants location prepared as specified by the by the work order. 3.3 Holding beds transition plants organized to lodge plants at site in accordance with the horticulture guideline. 3.4 Plants arrangement at holding site laid properly as stated

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	3.3 Soil preparation and planting procedures. • Survey planting site • Select plants • Hold plants until planted • Planting in individual holes • Planting in beds 3.4 Staking and guying trees. • Materials • Techniques	plants.				in the contract requirements. 3.5 Staking and guying newly planted tree s carried out in accordance with the best arboriculture and/or horticulture practices.
4. Carry out plants care.	4.1 Types of weeds. • Broadleaf weeds • Glasslike weeds 4.2 Functions of plants weedicides. 4.3 Types of weeding tools and usage. • Chemicals	4.1 Study plants weeding work requirements. 4.2 Prepare list of plants type. 4.3 Determine weeding area. 4.4 Identify types of weedicides. 4.5 Arrange weeding tools and materials.	Attitude • Consciousnes s towards diligence and perseverance Safety • Adherence to safety procedures	Related Knowledge 8 hours Related Skill	Related Knowledge Lecture Group Discussion/ Group Assignment Site Visit Related Skill	4.1 Work plan and weeding location identified and discussed with superior in accordance with the working drawing. 4.2 Weedicides use selected according to the types of weeds and work specification.

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	(selective herbicide; wide spectrum) • Scythe • Small bolo • Small round/flat bar • Spade • Trowel 4.4 Weed control methods • Manual/hand weeding • Cropping • Chemicals /spraying • Biological 4.5 Basic introduction on plants care. • Plants pest and diseases, • Plants shading for acclimatisation • Irrigation and drainage system • Tools and materials for	4.6 Recognise effects of weeds and species invaders on landscape plants. 4.7 Identify unfit plants for quarantine 4.8 Plan safety measures for plants care work execution. 4.9 Report irrigation and drainage work safety measures to superior.	<u>Environment</u> • Creativeness towards 3r (reduce, reuse, recycle) culture	30 hours	Demonstration Role Play Observation Simulation Hands-On Practice	4.3 Tools and materials for plants care gathered and delivered to work site as stated in the work requirement. 4.4 Different knapsack sprayer pumps used based on the reduced amount of water needed and level of productivity. 4.5 Active pest problems identified and listed in term of pests and disease and plant types. 4.6 Preventive treatments performed to minimize future pest activity as specified in the work plan. 4.7 Impromptu actions to improve the health and landscape appearance documented in accordance with the

Work Activities	Related Knowledge	Related Skill	Attitude/ Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	plants care • Special condition on plants quarantine 4.6 Plant pests and diseases. • Bugs and beetles • Aphids • Roots rot • White mold 4.7 Plants health care practices. • Arboriculture best practices • Horticulture best practices, • Integrated Pest and Disease Management • Turf Management 4.8 Reporting procedure. • Format • Contents					accepted industry practice. 4.8 Written observations and work done report provided for superior review and endorsement as stated by the contract requirement.

Employability Skills

Core Abilities		Social Skills
01.01	Identify and gather information	9. Communication skills
01.02	Document information, procedures or processes	10. Conceptual skills
01.03	Utilize basic IT applications	11. Interpersonal skills
01.04	Analyse information	12. Learning skills
01.05	Utilize the internet to locate and gather information	13. Leadership skills
01.06	Utilize word processor to process information	14. Multitasking and prioritising
02.01	Interpret and follow manuals, instructions and SOP's	15. Self-discipline
02.02	Follow telephone/ telecommunication procedures	16. Teamwork
02.03	Communicate clearly	
02.04	Prepare brief reports and checklists using standard forms	
02.05	Read/interpret flowcharts and pictorial information	
02.06	Write memos and letters	
02.07	Utilize Local Area Network (LAN)/Internet to exchange information	
02.08	Prepare pictorial and graphic information	
03.01	Apply cultural requirements to the workplace	
03.02	Demonstrate integrity and apply ethical practices	
03.03	Accept responsibility for own work and work area	
03.04	Seek and act constructively upon feedback about performance	
03.05	Demonstrate safety skills	
03.06	Respond appropriately to people and situations	
03.07	Resolve interpersonal conflicts	
03.08	Develop and maintain a cooperation within work group	
04. 01	Organize own work activities	
04.02	Set and revise own objectives and goals	
04.03	Organize and maintain own workplace	
04.04	Apply problem solving strategies	

Core Abilities		Social Skills
04.05	Demonstrate initiative and flexibility	
06.01	Understand systems	
06.02	Comply with and follow chain of command	
06.03	Identify and highlight problems	
06.04	Adapt competencies to new situations / systems	
06.05	Analyse technical systems	
06.06	Monitor and correct performance of systems	

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Organisational chart	1 : 25
2. Contract documents/ work order/ work plan/work program	1 : 25
3. Landscape construction drawings/ design drawings/ working drawings/ details drawings	1 : 25
4. Special plant protection tools and equipment:	
• Biodegradable plant blanket	As required
• Biodegradable staples	1 : 1
• Blower sprayer	1 : 25
• Fogging machine	1 : 25
• Foot sprayer	1 : 25
• Hand compression sprayer	1 : 5
• Hand rotary duster	1 : 25
• Hand sprayer	1 : 1
• Knapsack power sprayer	1 : 5

ITEMS	RATIO (TEM : Trainees)
• Knapsack sprayer	1 : 5
• Motorised knapsack mist blower	1 : 25
• Power sprayers	1 : 5
5. Pruning tools:	
• Anvil cutter	1 : 1
• Chisels	1 : 1
• Hedge shears (manual and power)	1 : 1
• Lopping shears	1 : 5
• Mallets	1 : 1
• Pole saw	1 : 5
• Pruning knives	1 : 1
• Pruning saw (folding and bow saw)	1 : 1
• Pruning shears	1 : 1
• Scissor action	1 : 1
6. Tools and equipment for weeding operations:	
• Chemicals (types: selective herbicide; wide spectrum)	As required
• Scythe (karet)	1 : 5`
• Small bolo “dulos”	1 : 5
• Small round/flat bar	1 : 1
• Spade	1 : 1
• Trowel	1 : 1
7. Watering tools and equipment:	
• Hoses	1 : 1
• Plumbing tools	1 : 1
• Watering butts	1 : 5
• Water hose with and without sprinklers	1 : 5
• Water truck	1 : 25
• Watering accessories	1 : 5
• Watering cans	1 : 1

ITEMS	RATIO (TEM : Trainees)
8. PPE: ▪ Overalls ▪ Gloves ▪ Hat/hard hat ▪ Rain boots ▪ Reflectorized vest (depends on the location of work)	 1 : 1 1 : 1 1 : 1 1 : 1 1 : 1

References

1. Michael A. Dirr (2011). *Dirr's Encyclopaedia of Trees and Shrubs*. Published in 2011 by Timber Press Inc. ISBN 978-0-88192-901-0.
2. Ken Druse (1994). *The Natural Habitat Garden*. Published byClarkson Potter March 1994, 1994. ISBN 13:9780517589892.
3. W. David Yates (2010). *Safety Professional's Reference and Study Guide*, Second Edition (2nd Edition). ISBN-13: 9781439834855.
4. John Evans (1994). *The Complete Book of House Plants*: *A Practical Guide to Selecting and Caring for Houseplants*. Publisher: Taylor & Francis. ISBN: 978-06708-5868-2.
5. Nancy J. Ondra (2009). The Perennial Care Manual: A Plant-by-Plant Guide: What to Do & When to Do It. Storey Publishing dated July 15, 2009. ISBN 978-1-60342-150-8.

22. TRAINING HOUR SUMMARY

CU Code	Competency Unit Title	Work Activities	Related Knowledge (A)	Related Skill (B)	Hours (C) = (A)+(B)	Total (Hours) ∑(C)
F439-002-2:2017-C01	Landscape Construction Site Preparation	1. Prepare site work requirements.	8	16	24	160
		2. Perform site mobilisation works.	8	28	36	
		3. Prepare on- site materials inventory.	8	24	32	
		4. Execute pre-earthwork activities.	8	20	28	
		5. Prepare plant materials.	10	30	40	
F439-002-2:2017-C02	Landscape Construction Engineering Work	1. Carry out internal drainage system works.	8	28	36	170
		2. Install internal irrigation system works.	8	24	32	
		3. Execute internal sewerage and sanitary system.	8	28	36	
		4. Operate landscape lighting work.	8	24	32	
		5. Construct water features.	10	24	34	
F439-002-2:2017-C03	Landscape Construction Structural Work	1. Identify landscape structural work requirements.	8	16	24	190
		2. Construct landscape concrete structures and/or features.	10	24	34	
		3. Erect landscape brick and/or block structures and/or features.	8	20	28	
		4. Build landscape masonry structures and/or features.	8	16	24	
		5. Install landscape timber structures and/or features.	8	16	24	

CU Code	Competency Unit Title	Work Activities	Related Knowledge (A)	Related Skill (B)	Hours (C) = (A)+(B)	Total (Hours) ∑(C)
		6. Fabricate landscape metal and non-metallic structures and/or features.	8	20	28	
		7. Set up landscape paving works.	8	20	28	
F439-002-2:2017-C04	Planting Work Operation	1. Carry out site clearing and grubbing.	8	16	24	180
		2. Prepare planting site.	8	24	32	
		3. Perform plants handling and care during transit.	12	20	32	
		4. Execute planting works.	12	20	32	
		5. Implement transplanting work.	8	20	28	
		6. Carry out turfing work.	10	20	30	
F439-002-2:2017-C05	Plants Establishment	1. Irrigate landscape plants.	8	12	20	180
		2. Apply landscape plants fertiliser.	8	16	24	
		3. Perform plants mulching.	8	16	24	
		4. Install plants staking.	8	12	20	
		5. Handle plant protection.	8	16	24	
		6. Execute weed control works.	8	12	20	
		7. Carry out plants pest and disease (P&D) prevention and control.	8	20	28	

CU Code	Competency Unit Title	Work Activities	Related Knowledge (A)	Related Skill (B)	Hours (C) = (A)+(B)	Total (Hours) ∑(C)
		8. Implement plants trimming and pruning.	8	12	20	
F439-002-2:2017-C06	Landscape Site Reinstatement	1. Prepare cleaning and waste disposal requirements.	8	12	20	140
		2. Coordinate construction wastes material disposal activities.	8	24	32	
		3. Carry out landscape implementation site cleaning.	8	16	24	
		4. Perform final inspection.	12	20	32	
		5. Carry out 'making good' landscape construction defects.	8	24	32	
F439-002-2:2017-C07	Plant Handling And Care (Holding Area)	1. Perform special plant protection.	8	20	28	180
		2. Carry out plant temporary labelling/ tagging.	8	28	36	
		3. Execute plants arrangement.	12	32	44	
		4. Carry out plant care.	16	56	72	
TOTAL HOURS (CORE COMPETENCY)			**352**	**848**	**1,200**	**1,200**